



CNS

2019 ANNUAL MEETING



**SAN FRANCISCO
CALIFORNIA
OCTOBER 19-23, 2019**

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CNS

2019 ANNUAL MEETING



**SAN FRANCISCO
CALIFORNIA
OCTOBER 19-23, 2019**



2019 International Partner Society
Japanese Congress of Neurological Surgeons



CNS

The purpose of the 2019 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.

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The CNS is pleased to provide complimentary WiFi!

Moscone West Convention Center:
Network: CNS19

San Francisco Marriott Marquis:
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Password: sanfran19

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WELCOME MEMBERS:

Thank you for joining us for the 2019 Congress of Neurological Surgeons Annual Meeting. This year's meeting is taking controversy head on. Think you know the right thing to do for a patient with a low-grade glioma? How about advising an athlete about Chronic Traumatic Encephalopathy? Is a randomized controlled trial the most ethical way to decide whether or not a treatment is effective? In keeping with this year's meeting theme, "The Age of Reason for Neurosurgery," you'll be presented with the latest evidence on either side of these issues to help you determine the best way to help your patients.

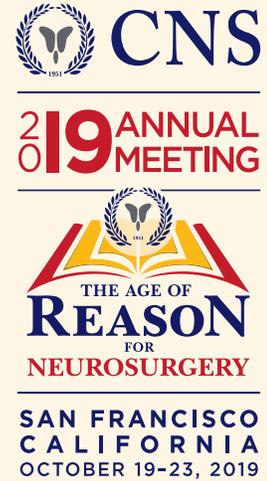
The Scientific Program Committee, led by Alexander Khalessi, Nader Pouratian, and Brian Nahed, has put together an outstanding program with exciting speakers and relevant content. We are featuring specialty-specific, all-day symposia on Saturday and Sunday at a lower price. We're also introducing three International Symposia featuring neurosurgeons from around the world and providing more opportunities to present original science. For the first time, we included an abstract category on operative technique in order to highlight novel surgical strategies for treating neurological disease across all disciplines.

In addition to top-line neurosurgical content, we have special speakers who will provide you with a unique perspective on a variety of topics. There are also many social events for you to enjoy.

On behalf of the Congress of Neurological Surgeons' Executive Committee, the Scientific Program Committee, and the 2019 Honored Guest Raymond Sawaya, I welcome you to this year's CNS Annual Meeting in San Francisco, California.

Sincerely,

Ganesh Rao, MD
CNS President



Ganesh Rao, MD
CNS President



Alexander A. Khalessi, MD
Annual Meeting Chair



Nader Pouratian, MD, PhD
Scientific Program Chair



Brian V. Nahed, MD
Vice-Scientific Program Chair

THE CNS WELCOMES YOU TO SAN FRANCISCO

The Moscone Center is in the trendy SoMa neighborhood of San Francisco. After coming into prominence as a high-tech hub in the 1990s, SoMa—short for South of Market—is one of the coolest neighborhoods in the city, packed with shops, museums, art galleries, and restaurants.



HONORED GUEST

Raymond Sawaya, MD

Professor and Founding Chair of the Department of Neurosurgery, and the Anne C. Brooks & Anthony D. Bullock III Distinguished Chair in Neurosurgery at The University of Texas MD Anderson Cancer Center



Raymond Sawaya, MD, was the founding chair of Neurosurgery at The University of Texas MD Anderson Cancer Center, as well as an advisor to the leaders of the Glioblastoma Multiforme (GBM) Moon Shot™. He also served as director of the Brain Tumor Center and is currently holder of the Anne C. Brooks & Anthony D. Bullock III Distinguished Chair in Neurosurgery. Dr. Sawaya was the chairman of the Department of Neurosurgery at Baylor College of Medicine from 2005 to 2015.

Dr. Sawaya earned his medical degree from St. Joseph University of Beirut, Lebanon, and completed a surgical internship at Beekman Downtown Hospital in New York City. Multiple residencies followed: in general surgery at Upstate Medical Center State University of New York, in pediatric neurosurgery at Children's Hospital Medical Center in Cincinnati, and in neurosurgery at the University of Cincinnati College of Medicine. In 1980, he accepted the position of chief resident in neurosurgery at Johns Hopkins Hospital and then held a fellowship at the National Institutes of Health (NIH) as a Fogarty International fellow. At NIH, he found his career focus: brain tumors and, in particular, glioblastomas. He was recruited back to the University of Cincinnati in 1982, where he spent eight years building that institution's brain tumor program.

Dr. Sawaya has influenced the field of neurosurgical oncology in several major ways. Ever since he was recruited in 1990 to establish a newly formed Department of Neurosurgery at MD Anderson, he has built the most comprehensive and best recognized neurosurgical oncology program in the country (Neurosurgery 56: 841-50, 2005). Dr. Sawaya was also residency program director at Baylor College of Medicine for several years during his term as chairman. He continues to contribute his expertise to one of the largest residency programs in the United States.

Dr. Sawaya is an internationally recognized leader in neurosurgery, with particular expertise in primary and metastatic brain tumors. His laboratory work helped identify molecular determinates of brain tumor invasiveness, and in particular, the role of serine proteases and their roles in glioma oncogenesis (over 60 publications). On the clinical side, he has helped identify brain metastases as a major threat to the well-being of cancer patients, and was the first to promote the treatment of patients with multiple brain metastases (J Neurosurg 79: 210-6, 1993; 368 citations). Dr. Sawaya is renowned for his great strides in enhancing the accessibility and safety of brain tumor surgery. This can best be demonstrated in his landmark paper on the importance of extent of resection on the survival of glioblastoma patients (J Neurosurg 95: 190-8, 2001; 1440 citations). He has also conducted the first prospective trial on the use of intraoperative MRI to maximize the extent of resection (Neurosurgery 64: 1073-81, 2009; 105 citations).

Dr. Sawaya has published more than 300 articles and book chapters and has served as both reviewer and editor for a number of peer-reviewed journals. He is the past president of the American Radium Society, the past president of the Houston Neurological Society and past chair of the American Association of Neurological Surgeons/Congress of Neurological Surgeons Section on Tumors. He is in demand as a lecturer across the nation and around the world and has received a number of awards in recognition of his expertise.

Dr. Sawaya is a "triple threat" who has excelled as a surgeon, researcher, and teacher and has been very successful as a leader and an advocate for the field. Dr. Sawaya considers his greatest achievement the building and maintaining of MD Anderson's comprehensive brain tumor program, which has allowed him to touch the lives of many patients.

Look for Dr. Sawaya at the following sessions:

MONDAY, OCTOBER 21

General Scientific Session II	M1
9:13–9:40 am	12:15–1:45 pm
Honored Guest	Honored Guest Luncheon
Presentation: <i>Role of Resection for Glioblastoma: Can Technology Overcome Biology?</i>	Seminar: <i>Leadership Engagements</i>
	<i>Advanced registration required.</i>

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

TUESDAY, OCTOBER 22

General Scientific Session III
8:51–9:13 am
Honored Guest
Presentation: *Evidence-based Medicine Through Development of Home-grown Databases*

WEDNESDAY, OCTOBER 23

General Scientific Session IV
8:50–9:12 am
Honored Guest
Presentation: *The Evolving Landscape and Management of Brain Metastases*

FEATURED SPEAKERS

Lucy Kalanithi, MD

A Conversation with Lucy Kalanithi

SUNDAY, OCTOBER 20

General Scientific Session I

5:56–6:30 pm

 *Lucy Kalanithi will be signing copies of “When Breath Becomes Air” immediately following the conclusion of her lecture in the 3rd floor foyer of Moscone West Convention Center.*

Lucy Kalanithi, MD, is the widow of the late Dr. Paul Kalanithi, author of The New York Times #1 bestselling memoir “When Breath Becomes Air” for which she wrote the epilogue. An internal medicine physician and faculty member at the Stanford School of Medicine in Palo Alto, California, Dr. Kalanithi completed her medical degree at Yale, where she was inducted into the Alpha Omega Alpha national medical honor society, her residency at the University of California-San Francisco, and a postdoctoral fellowship training in healthcare delivery innovation at Stanford’s Clinical Excellence Research Center. At the cross-section of her career as a medical professional and her personal experience standing alongside her husband during his life, diagnosis, treatment, and death, Dr. Kalanithi has special interests in healthcare value, meaning in medicine, patient-centered care, and end-of-life care. She has appeared on “PBS NewsHour,” “NPR Morning Edition,” and “Yahoo News with Katie Couric,” and been interviewed for People, NPR, and The New York Times. She lives in the San Francisco Bay Area with her daughter, Elizabeth Acadia.



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

Shankar Vedantam

Hidden Brain

MONDAY, OCTOBER 21

General Scientific Session II

8:48–9:13 am

 *Shankar Vedantam will be signing copies of his book, “The Hidden Brain” in the CNS Xperience Lounge during the morning beverage break.*

Shankar Vedantam is the host of NPR’s “Hidden Brain” podcast and radio show. His goal is to help people think about the world in new and interesting ways. He is endlessly fascinated by research in fields ranging from psychology and history to sociology and economics.

Before joining NPR in 2011, Vedantam spent 10 years as a reporter at The Washington Post. From 2007 to 2009, he was also a columnist, and wrote the “Department of Human Behavior” column for the Post.

Vedantam is the author of the non-fiction book, “The Hidden Brain: How Our Unconscious Minds Elect Presidents, Control Markets, Wage Wars and Save Our Lives.” The book, published in 2010, describes how unconscious biases influence people.

In 2009–2010, Vedantam served as a fellow at the Nieman Foundation for Journalism at Harvard University.

“Hidden Brain” is among the most popular podcasts in the world, with over two million downloads per week. The “Hidden Brain” radio show is featured on more than 250 public radio stations across the United States.

Vedantam and “Hidden Brain” have been recognized with the Edward R. Murrow Award, and honors from the American Association for the Advancement of Science, the Webby Awards, and others.

Vedantam has served as a part-time lecturer at Harvard University and Columbia University. He has also served as a senior scholar at the Woodrow Wilson International Center in Washington.



FEATURED SPEAKERS

WALTER E. DANDY ORATOR

Doris Kearns Goodwin

Leadership in Turbulent Times

MONDAY, OCTOBER 21

General Scientific Session II

11:23 am–12:10 pm

 Doris Kearns Goodwin will be signing copies of her book, “Leadership: In Turbulent Times,” in the CNS Xperience Lounge immediately following the conclusion of this session.

Doris Kearns Goodwin is a world-renowned presidential historian, public speaker, and Pulitzer Prize-winning New York Times #1 best-selling author. Her career as a presidential historian and author was inspired when, as a 24-year-old graduate student at Harvard, she was selected to join the White House Fellows, one of America’s most prestigious programs for leadership and public service. Goodwin worked with Lyndon Johnson in the White House and later assisted him in the writing of his memoirs. She then wrote “Lyndon Johnson and the American Dream,” which became a national bestseller and achieved critical acclaim.

Goodwin was awarded the Pulitzer Prize for “No Ordinary Time: Franklin and Eleanor Roosevelt—The Home Front in World War II.” Her sixth book, “The Bully Pulpit: Theodore Roosevelt, William Howard Taft, and the Golden Age of Journalism,” won the Carnegie Medal and is being developed into a film.

Goodwin’s “Team of Rivals: The Political Genius of Abraham Lincoln” served as the basis for Steven Spielberg’s hit film “Lincoln,” and was awarded the prestigious Lincoln Prize, the inaugural Book Prize for American History, and the Lincoln Leadership Prize.

Goodwin is frequently seen in documentaries including Ken Burns’ “The History of Baseball” and “The Roosevelts: An Intimate History;” on news and cable networks, and shows including “Meet the Press” and “The Late Show with Stephen Colbert.”

Goodwin graduated magna cum laude from Colby College. She earned a doctorate degree in Government from Harvard University, where she taught Government, including a course on the American Presidency.

Among her many honors and awards, Goodwin was awarded the Charles Frankel Prize, the Sarah Josepha Hale Medal, the New England Book Award, as well as the Carl Sandburg Literary Award.

Goodwin lives in Concord, Massachusetts. She was the first woman to enter the Boston Red Sox locker room in 1979, and is a devoted fan of the World Series-winning team.



Carl Zimmer

A Journey to the Center of the Brain

TUESDAY, OCTOBER 22

General Scientific Session III

9:13 am–9:40 am

 Carl Zimmer will be signing copies of his book, “She Has Her Mother’s Laugh: The Powers, Perversions, and Potential of Heredity,” in the CNS Xperience Lounge during the morning beverage break.

Carl Zimmer is the author of 13 books about science. His newest book is “She Has Her Mother’s Laugh: The Power, Perversions, and Potential of Heredity.” His column, “Matter,” appears each week in The New York Times.

Zimmer’s writing has earned a number of awards, including the 2016 Stephen Jay Gould Prize, awarded by the Society for the Study of Evolution to recognize individuals whose sustained efforts have advanced public understanding of evolutionary science. In 2017, he won an Online Journalism Award for his series of articles in which he explored his genome. “She Has Her Mother’s Laugh” was named a Notable Book of the Year by The New York Times Book Review. It was also selected for Publisher’s Weekly Best 10 Books of 2018 and the 2018 shortlist for Baillie-Gifford Prize for Nonfiction. The Guardian named it the best science book of 2018.

Zimmer created the podcast “What Is Life?” and is a familiar voice on other programs such as Radiolab. A professor adjunct at Yale University, he lives in Connecticut with his wife Grace and their children, Charlotte and Veronica. He is, to his knowledge, the only writer after whom a species of tapeworm has been named. *For more information on Carl Zimmer please visit www.prhspeakers.com.*



Bret Stephens

U.S. Foreign Policy and the World

TUESDAY, OCTOBER 22

General Scientific Session III

11:41 am–12:10 pm

 *Bret Stephens will be signing copies of his book, “America in Retreat,” in the CNS Xperience Lounge immediately following the conclusion of this session.*

Bret Stephens became an op-ed columnist and associate editor for The New York Times in April 2017. Before that, he spent 11 years as the author of “Global View,” the foreign-affairs column of the Wall Street Journal, for which he was awarded the Pulitzer Prize for distinguished commentary in 2013. He also served eight years as the Journal’s deputy editorial-page editor, responsible for the newspaper’s global opinion section, as well as a member of the editorial board.



Stephens began his career at The Wall Street Journal in 1998 as an editor in New York, and later wrote editorials and articles for the newspaper from Brussels. In January 2002, he was named editor-in-chief of The Jerusalem Post, a position he assumed at age 28. At the Post, he was responsible for the newspaper’s news, editorial, digital, and international editions, and also wrote a weekly column.

Stephens returned to the Journal in late 2004. He has reported stories from around the world, including Pakistan, Afghanistan, Iraq, Lebanon, Gaza, and interviewed dozens of world leaders. In June 2017 he became a regular political analyst for MSNBC.

Stephens has twice been chairman of Pulitzer Prize juries and is a national judge of the prestigious Livingston Awards. He holds two honorary doctorates. In 2014 he was awarded the Professional Achievement Prize by the University of Chicago, a distinction he shares with composer Philip Glass, astronomer Carl Sagan, and Nobel laureate Gary Becker.

In 2014 Penguin published his book “America in Retreat: The New Isolationism and the Coming Global Disorder.”

Stephens was born in New York and raised in Mexico City. He holds a BA with honors from the University of Chicago and an MSc from the London School of Economics. He lives with his wife Corinna, a classical music and opera critic for The New York Times, and their three children. The family divides its time between New York City and Hamburg, Germany.

JOHN THOMPSON HISTORY OF MEDICINE LECTURE

Rebecca Skloot

WEDNESDAY, OCTOBER 23

General Scientific Session IV

9:12–9:40 am

 *Rebecca Skloot will be signing copies of her book, “The Immortal Life of Henrietta Lacks,” in the CNS Xperience Lounge during the morning beverage break.*

Bestselling author Rebecca Skloot spent more than 10 years doggedly uncovering the truth about the life, death, and ultimate “immortality” of a poor Black tobacco farmer named Henrietta Lacks. Her phenomenal book, “The Immortal Life of Henrietta Lacks,” has sold nearly 3 million copies to date.



In “The Immortal Life,” Skloot tells the story of a young Black woman who died of cervical cancer in 1951—and left behind an inexplicably immortal line of cells known as HeLa. Henrietta’s cells—harvested without her knowledge or consent—contributed to scientific advancements as varied as the polio vaccine, treatments for cancers and viruses, in-vitro fertilization, and the impact of space travel on human cells.

Recognizable for its engaging, straightforward language, Skloot’s writing—both in “The Immortal Life” and her many feature articles for major publications—has charmed readers around the world. More than 250 communities, schools, and universities have chosen “The Immortal Life” for their common read programs.

“The Immortal Life” was selected as a best book of 2010 by over 60 media outlets. It spent more than four years on The New York Times bestseller list, was named one of Amazon’s 100 Books to Read in a Lifetime, and has been translated into more than 25 languages. Skloot was named One of Five Surprising Leaders of 2010 by The Washington Post. “The Immortal Life of Henrietta Lacks” was also made into an HBO film produced by Oprah Winfrey and Alan Ball.

Rebecca Skloot has a BS in biological sciences and an MFA in creative nonfiction. She has taught creative writing and science journalism at the University of Memphis, the University of Pittsburgh, and New York University. She is the founder and president of the Henrietta Lacks Foundation, which strives to provide financial assistance to needy individuals who have made important contributions to scientific research without their knowledge or consent. Skloot remains in close contact with the Lacks family.

FEATURED SPEAKERS

Aaron Carroll

Healthcare in the U.S.

WEDNESDAY, OCTOBER 23

General Scientific Session IV

11:31 am–12:10 pm

Meet Aaron Carroll in the CNS Xperience Lounge immediately following the conclusion of this session.

Aaron Carroll, MD, is a Professor of Pediatrics, Associate Dean for Research Mentoring, and the Director of the Center for Health Policy and Professionalism Research at the Indiana University School of Medicine. His research focuses on health care financing reform; the study of information technology to improve pediatric care; and areas of health policy including physician malpractice and the pharmaceutical industry/physician relationship. Dr. Carroll also serves as Regenstrief Institute's Vice President for Faculty Development where he leads Regenstrief's faculty development strategy and implementation efforts.

He was one of the first to study the use of mobile devices in actual care and has written numerous publications on the subject. Dr. Carroll has held millions of dollars in various government agency grants to explore the use of information technology in health care and is one of the leading pediatric informaticists in the U.S. He has also served in this capacity in committees for the American Academy of Pediatrics and is the co-founder of Medical Data Solutions, one of the first software companies to create programs for health professionals for mobile devices.

Dr. Carroll is the web and social media editor at JAMA Pediatrics, co-editor of The Incidental Economist and host of "Healthcare Triage," a YouTube channel that received the National Institute of Health Care Management Digital Media Award. He is a regular contributor to The New York Times' "The Upshot," as well as other media outlets, and he has appeared on "Good Morning America," the "CBS Evening News," "ABC News," and "The Colbert Report." Dr. Carroll's latest book, "Bad Food Bible," joins the three books he co-authored on medical myths.

Dr. Carroll earned a BA in chemistry from Amherst College, an MD from the University of Pennsylvania School of Medicine, and an MS in health services research from the University of Washington, where he was also a Robert Wood Johnson Clinical Scholar.



The Congress of Neurological Surgeons Welcomes

2019 International Partner The Japanese Congress of Neurological Surgeons



Yukihiro Sonoda
Japanese CNS President





Executive Committee, back row: Akash J. Patel, Clemens M. Schirmer, Ashok R. Asthagiri, Lola B. Chambless, Brian V. Nahed, Martina Stippler, Garni Barkhoudarian, Mohamad Bydon, Jennifer A. Sweet, and Daniel J. Hoh.

Front row: Regina Shupak, Nader Pouratian, Brian L. Hoh, Praveen V. Mummaneni, Steven N. Kalkanis, Ganesh Rao, Ashwini D. Sharan, Elad I. Levy, Alex A. Khalessi, Nicholas C. Bambakidis, and Maya A. Babu.



Congress of
Neurological
Surgeons

The CNS provides relevant learning experiences for today's practice challenges, with informative, world-class education. Discover more at cns.org.

CNS Education Courses*

Innovative live courses that move our specialty forward and foster collaboration and growth in our community.

CNS Tumor Complications
January 25–26, 2020 | Las Vegas, Nevada
cns.org/TCC

CNS Minimally Invasive Cranial Course
March 2020 | San Diego, California

CNS Spine Complications Course
February 7–9, 2020 | Park City, Utah
cns.org/SCC

CNS 2020 CNS Annual Meeting
September 12–16, 2020 | Miami, Florida
"Vision for the Future"

CNS Oral Boards Review Course
February 22–23, 2020 | Houston, Texas

CNS Leadership Institute
May 2020 | Rosemont, Illinois

CNS SANS Written Boards Course
February 22–23, 2020 | Houston, Texas

CNS 2020 Skull Base Course
August 27–28 | 2020 Cleveland, OH

Jointly Provided Courses

Spine Summit 2020
March 5–8, 2020 | Las Vegas, Nevada
cns.org/spine

ASSFN Biennial Meeting
June 20–23, 2020 | Boston, Massachusetts
www.assfn.org/biennial.html

Pain Section 2020 Annual Meeting
March 5–7, 2020 | Las Vegas, Nevada
cns.org/pain

Tumor Section Satellite Symposium
September 11–12, 2020 | Miami, Florida

* Schedule subject to change

2019 SCHEDULE OF EVENTS

All events will be held at Moscone West Convention Center unless otherwise indicated.

Saturday, October 19

7:00 am–6:00 pm	CNS Oral Boards Review Course	Golden Gate C2-C3 San Francisco Marriott Marquis
7:00 am–4:30 pm	Speaker Ready Room	3000
7:00 am–4:30 pm	Sergeant-at-Arms Office	2022 Overlook
7:00 am–5:30 pm	Registration and CNS Central	Level 1 Lobby
7:30–9:00 am	CSNS/CNS Caucus	Pacific I San Francisco Marriott Marquis
8:00 am–4:15 pm	SYM1: Spine Trauma and Spinal Cord Injury Symposium	3022
8:00 am–4:15 pm	SYM2: Functional Neurosurgery Update: Emerging Concepts	2016
8:00 am–4:15 pm	SYM3: Maximizing Your Neurosurgical Employment Opportunities (Non-CME)	2011
8:00 am–4:15 pm	SYM4: Cerebrovascular Symposia: Stenting and Bypasses Bundle	2001
8:00 am–12:00 pm	SYM4A: New Era in Stenting	
12:45–4:15 pm	SYM4B: Bypass Techniques in Cerebrovascular Surgery	
8:00 am–4:15 pm	SYM5: Advanced Topics in Spinal Operative Techniques Bundle	2008
8:00 am–12:00 pm	SYM5A: Advanced Minimally Invasive Spine Surgery—Operative Nuances, Indications, and Complication Avoidance	
12:45–4:15 pm	SYM5B: Cervical Spine Case Management: When to Preserve Motion and When Not To—The Evidence in the Age of Reason	
8:00 am–4:15 pm	SYM6: Brain Tumor Update Bundle	2004
8:00 am–12:00 pm	SYM6A: Brain Tumor Update: Advanced and Minimally Invasive Techniques for Resection of Malignant Brain Tumors (Breakout Session with NX Development from 10–10:30 am in Room 2006.)	
12:45–4:15 pm	SYM6B: Brain Tumor Update: Benign Brain Tumors	
8:00 am–12:00 pm	SYM7: Morbidity and Mortality	2007
9:15 am–12:00 pm	CSNS Plenary Session	Golden Gate B San Francisco Marriott Marquis
12:00–1:00 pm	CSNS Luncheon	Golden Gate A San Francisco Marriott Marquis
12:15–4:15 pm	SYM8: Residency Program Update & Training the Trainers	2007
12:15–4:15 pm	SYM9: Appropriate Coding, ICD, and CPT—2019 Update	2012
1:00–3:00 pm	CNS Education Committee Meeting	Yerba Buena Salons 1-2 San Francisco Marriott Marquis
3:00–4:00 pm	CNS Ad Hoc Committee on Wellness	Laurel San Francisco Marriott Marquis
3:00–4:00 pm	CNS Nexus Committee Meeting	Yerba Buena Salons 1-2 San Francisco Marriott Marquis
3:30–4:30 pm	Joint Communications and Public Relations Meeting	Pacific I San Francisco Marriott Marquis
4:00–5:00 pm	CNS Ad Hoc Data Science Committee Meeting	Laurel San Francisco Marriott Marquis
4:00–5:00 pm	CNS SANS Committee Meeting	Yerba Buena Salons 1-2 San Francisco Marriott Marquis
4:15–5:45 pm	CNS Resident Social and CSNS Young Neurosurgeons Reception	2000

4:30–5:30 pm	Neurosurgery PAC Board Meeting	Pacific H San Francisco Marriott Marquis
5:30–7:00 pm	CNS International Reception	Yerba Buena Ballroom Salon 7 San Francisco Marriott Marquis
6:30–8:30 pm	DIN1: How Do I Avoid Getting Penalized—ICD-10, CPTs, MACRA, ACOs, and APMs?	Boulevard 1 Mission Street, San Francisco

Sunday, October 20

7:00–8:30 am	CNS Leadership Institute Meeting	Yerba Buena Salon 8 San Francisco Marriott Marquis
7:00–11:00 am	CNS Oral Boards Review Course Spine Breakout	Golden Gate C2 San Francisco Marriott Marquis
7:00–11:00 am	CNS Oral Boards Review Course Core Topics Breakout	Golden Gate C1 San Francisco Marriott Marquis
7:00–11:00 am	CNS Oral Boards Review Course Specialty Breakout	Golden Gate C3 San Francisco Marriott Marquis
7:00 am–6:30 pm	Speaker Ready Room	3000
7:00 am–4:30 pm	Sergeant-at-Arms Office	2022 Overlook
7:00 am–7:30 pm	Registration and CNS Central	Level 1 Lobby
8:00 am–4:15 pm	Association of Neurosurgical Physician Assistants (ANSPA) Fall 2019 CME Meeting Presented in Collaboration with Congress of Neurological Surgeons	3014
8:00 am–4:15 pm	SYM10: Acute Stroke Care: Guidelines Review and Future Directions (Breakout Session with Penumbra from 2:00–2:30 pm in Room 3016.)	3018
8:00 am–4:15 pm	SYM11: Neurotrauma Update (Breakout Session with Natus Neurology from 9:00–9:30 am in Room 3024.)	3022
8:00 am–4:15 pm	SYM12: A Comprehensive and Evidence-based Guidelines Review for the Treatment of Intracranial Aneurysms	2016
8:00 am–4:15 pm	SYM13: Spine Biomechanics and Deformity Symposium Bundle	2011
8:00 am–12:00 pm	SYM13A: Spinal Biomechanics for the Practicing Neurosurgeon: What I Need to Know for My Practice	
12:45–4:15 pm	SYM13B: Thoracolumbar Spinal Deformity for the Non-deformity Spine Surgeon	
8:00 am–4:15 pm	SYM14: Advanced Functional Mapping and 3D Anatomy for the Neurosurgeon Bundle	2004
8:00 am–12:00 pm	SYM14A: Surgical Management of Eloquent Area Tumors: Functional Mapping and/or Navigation	
12:45–4:15 pm	SYM14B: 3D Surgical Neuroanatomy	
8:00 am–4:15 pm	SYM15: Emerging Technologies in Neurosurgery Bundle	2008
8:00 am–12:00 pm	SYM15A: Intraoperative Technological Adjuncts: Indications and Techniques for Laser Therapy, Robotics, and Exoscopes	
12:45–4:15 pm	SYM15B: Virtual and Augmented Reality: Science and Clinical Applications	
8:00 am–4:15 pm	SYM16: Pain and Peripheral Nerve Symposium Bundle	3003
8:00 am–12:00 pm	SYM16A: Non-spinal Targets for Pain: Nerve, DRG, and Brain	
12:45–4:15 pm	SYM16B: Peripheral Nerve Surgery: Techniques and Exposure	
8:00 am–4:15 pm	SYM17: Quality Summit Bundle	2014
8:00 am–12:00 pm	SYM17A: QI: Implementation and Results	
12:45–4:15 pm	SYM17B: Using Big Data to Help Neurosurgeons and Their Patients	
8:00 am–12:00 pm	SYM18: Morbidity and Mortality	2007
8:30 am–12:00 pm	SNS Summit	Yerba Buena Salons 11-12 San Francisco Marriott Marquis

9:00–10:00 am	CNS Resident Committee Meeting	Yerba Buena Salons 3-4 San Francisco Marriott Marquis
9:00–10:00 am	Joint Guidelines Committee Meeting	Yerba Buena Salons 1-2 San Francisco Marriott Marquis
10:00–10:30 am	CNS Quarterly Editorial Board Meeting	Yerba Buena Salon 5 San Francisco Marriott Marquis
10:00–10:45 am	ThinkFirst Executive Committee Meeting	Yerba Buena Salon 14-15 San Francisco Marriott Marquis
10:30–11:30 am	CNS Guidelines Committee Meeting	Yerba Buena Salons 1-2 San Francisco Marriott Marquis
10:45 am–12:15 pm	ThinkFirst Board of Directors Meeting	Yerba Buena Salon 14-15 San Francisco Marriott Marquis
11:00 am–12:00 pm	Joint Section on Disorders of the Spine and Peripheral Nerve Scientific Program Committee Meeting	Golden Gate B San Francisco Marriott Marquis
11:00 am–1:00 pm	Joint Section on Women in Neurosurgery Executive Committee Meeting	Yerba Buena Salon 10 San Francisco Marriott Marquis
11:00 am–1:00 pm	Neurosurgery Quality Council	Yerba Buena Salon 6 San Francisco Marriott Marquis
11:30 am–1:00 pm	Joint Section on Tumors Executive Committee Meeting	Golden Gate A San Francisco Marriott Marquis
12:30–2:00 pm	ThinkFirst Reception	Yerba Buena Salon 14-15 San Francisco Marriott Marquis
12:30–3:00 pm	Joint Section on Disorders of the Spine and Peripheral Nerve Executive Committee Meeting	Golden Gate B San Francisco Marriott Marquis
12:30–4:30 pm	American Society for Stereotactic and Functional Neurosurgery Executive Committee Meeting	Yerba Buena Salon 13 San Francisco Marriott Marquis
12:45–4:15 pm	SYM19: My Worst Spinal Complication: Lessons Learned	2022
12:45–4:15 pm	SYM20: Modern Approaches to SRS	2007
1:00–3:00 pm	Resident SANS Challenge Preliminary Round	2018
2:00–4:00 pm	Joint Section on Cerebrovascular Surgery Executive Committee Meeting	Golden Gate A San Francisco Marriott Marquis
2:30–4:30 pm	Joint Section on Pain Executive Committee Meeting	Yerba Buena Salon 10 San Francisco Marriott Marquis
4:30–6:30 pm	GENERAL SCIENTIFIC SESSION I Presiding Officer: Ganesh Rao Moderators: Lola B. Chambless, Alexander A. Khalessi	Ballroom
5:03–5:47 pm	CONTROVERSY: Chronic Traumatic Encephalopathy	
5:59–6:30 pm	FEATURED SPEAKER A Conversation with Lucy Kalanithi Lucy Kalanithi	
6:30–8:30 pm	Opening Reception	Level 2 Lobby
Monday, October 21		
6:00–7:00 am	Joint Drugs & Devices Committee Meeting	Pacific J San Francisco Marriott Marquis
6:30 am–6:30 pm	Speaker Ready Room	3000
6:30 am–6:30 pm	Registration and CNS Central	Level 1 Lobby
8:00–10:30 am	Spouse Hospitality	2nd Floor Atrium San Francisco Marriott Marquis
7:00–8:30 am	Sunrise Science and Late-breaking Abstract Session (Tumor)	3014
7:00–8:30 am	Sunrise Science and Late-breaking Abstract Session (Cerebrovascular)	2014
7:00–8:30 am	Guidelines for the Management of Metastatic Disease to the Spine: The Evidence	2016

7:00–8:30 am	Guidelines for DBS for Parkinson’s Disease and Neuroablation for Pain	3020
7:00–8:30 am	Neurotrauma Debates	3022
8:40 am–12:10 pm	GENERAL SCIENTIFIC SESSION II Presiding Officer: Steven N. Kalkanis Moderators: Nader Pouratian, Martina Stippler	Ballroom
8:51–9:13 am	FEATURED SPEAKER Hidden Brain Shankar Vedantam	
9:18–9:40 am	HONORED GUEST PRESENTATION Role of Resection for Glioblastoma: Can Technology Overcome Biology? Raymond Sawaya	
10:48–10:55 am	JAPANESE CNS PRESIDENTIAL ADDRESS Yukihiko Sonoda	
10:55–11:00 am	2019 CNS RESIDENT AWARD PRESENTATION Ambulation on POD#0 is Associated with Decreased Adverse Events After Elective Lumbar Spine Surgery: Analysis of the Michigan Spine Surgery Improvement Collaborative (MSSIC) Hesham M. Zakaria	
11:03–11:23 am	PRESIDENTIAL ADDRESS The Age of Reason for Neurosurgery Ganesh Rao	
11:26 am–12:10 pm	WALTER E. DANDY ORATION Leadership in Turbulent Times Doris Kearns Goodwin	
9:30 am–4:00 pm	Exhibit Hall Open – Visit the CNS Xperience Lounge!	Exhibit Hall
9:40–10:40 am	Morning Beverage Break – Visit the Exhibit Hall and enjoy a complimentary cup of coffee!	Exhibit Hall
10:00–10:30 am	Live Tumor Surgery in 3D using Synaptive’s Robotic Digital Microscope (Presented by Synaptive)	CNS Xperience Lounge Exhibit Hall
10:30 am–2:30 pm	Sergeant-at-Arms Office	2022 Overlook
12:15–1:45 pm	M1: Honored Guest Luncheon: Leadership Engagements	2001
12:15–1:45 pm	M2: So You’ve Been Sued... Medical Practice 2019 Update	2012
12:15–1:45 pm	M3: Is Intracerebral Hemorrhage a Surgical Disease?	2003
12:15–1:45 pm	M4: Cervical Spondylotic Myelopathy—Anterior Versus Posterior	2005
12:15–1:45 pm	M5: Spinal Tumor Surgery: Case-based Management	2007
12:15–1:45 pm	M6: Peripheral Nerve Entrapment Syndromes: Diagnosis and Management	2008
12:15–1:45 pm	M7: Neurocritical Care: A Multidisciplinary Collaboration	2009
12:15–1:45 pm	M8: Pediatric Concussion	2000
12:15–1:45 pm	M9: Acoustic Neuromas: Current Management Strategies	2010
12:15–1:45 pm	M10: Harnessing the Immune System to Treat Brain Tumors	2011
12:15–1:45 pm	Non-CME Sponsored Luncheon Session: Stealth Autoguide™ Robotic Navigation Robotic Precision Powered by You Development and Clinical Experience by Dr. Stefan Wolfsberger	2002
12:15–1:45 pm	Non-CME Sponsored Luncheon Session: See Addendum for details	2004
12:15–1:45 pm	Non-CME Sponsored Luncheon Session: See Addendum for details	2006
12:15–1:45 pm	Joint Section on Neurotrauma & Critical Care Executive Committee Meeting	Yerba Buena Salons 5-6 San Francisco Marriott Marquis
1:45–2:45 pm	Afternoon Beverage Break – Visit the Exhibit Hall!	Exhibit Hall
1:45–2:45 pm	Special Session: The FDA: Investigational Device Exemptions, Regulatory Process, and Moving Medical Devices to Patients (Non-CME)	3001

1:45–2:45 pm	Special Session: ABNS Case Log Course	3003
2:45–4:15 pm	Council of State Neurosurgical Societies Achieving High Quality	3016
2:45–4:15 pm	Section on Cerebrovascular Surgery Artificial Intelligence in Cerebrovascular Neurosurgery	2014
2:45–4:15 pm	Section on Disorders of the Spine and Peripheral Nerves Spine Section Update	2016
2:45–4:15 pm	Section on Neurotrauma and Critical Care	3022
2:45–4:15 pm	Section on Pain Complex Facial Pain: When to Use What	3024
2:45–4:15 pm	Section on Pediatric Neurological Surgery Pediatric Brain Tumors: Advancements in Molecular Diagnosis and Update on Clinical Trials	3018
2:45–4:15 pm	Section on Peripheral Nerves Peripheral Nerve Task Force	2018
2:45–4:15 pm	Section on Stereotactic and Functional Neurosurgery The Future of Preoperative Functional Mapping	3020
2:45–4:15 pm	Section on Tumors Complications in Tumor Surgery: Navigating the Unexpected	3014
4:15–5:45 pm	Operative Techniques and Case-based Discussion Session CSNS: How to Build a Spine Center	3016
4:15–5:45 pm	Challenging Skull Based Tumors: Operative Techniques and Case-based Discussions	3014
4:15–5:45 pm	Treating Cerebral Vascular Malformations: Operative Techniques and Case-based Discussions	2014
4:15–5:45 pm	Spinal Deformity and MIS Surgery: Operative Techniques and Case-based Discussions	2016
4:15–5:45 pm	Challenging Cases in ICP Management: Operative Techniques and Case-based Discussions	3022
4:15–5:45 pm	The Case Against Spinal Cord Stimulation: Operative Techniques and Case-based Discussion	3024
4:15–5:45 pm	Recurrent Disease in Pediatric Brain Tumors Patients: Case- based Discussions and Operative Techniques	3018
4:15–5:45 pm	Challenging Cases in Epilepsy Surgery: Operative Techniques and Case-based Discussions	3020
4:15–5:45 pm	Peripheral Nerve: Operative Techniques and Case-based Discussions	2018
5:45–7:15 pm	The International Masters Symposium on Brain Tumor Surgery	3001
5:45–7:15 pm	The International Cerebrovascular Symposium	3003
5:45–7:15 pm	The International Functional Neurosurgery Symposium	3002
6:30–8:15 pm	Joint Military Committee	Pacific I San Francisco Marriott Marquis
6:30–7:30 pm	BNI Reception	Nob Hill D San Francisco Marriott Marquis
6:30–7:30 pm	USC Neurosurgery Reception	Yerba Buena Salon 4 San Francisco Marriott Marquis
7:30–9:30 pm	DIN2: Multi-modality AVM Treatment in the Past, Present, and Future	Prospect 300 Spear Street, San Francisco
7:30–9:30 pm	DIN3: Navigation and Robotics: Fad or Future?	Morton's 400 Post Street, San Francisco

Tuesday, October 22

6:30 am–6:30 pm	Registration and CNS Central	Level 1 Lobby
6:30 am–5:30 pm	Speaker Ready Room	3000
7:00–8:30 am	Sunrise Science and Late-breaking Abstract Session (Spine)	2016
7:00–8:30 am	Sunrise Science and Late-breaking Abstract Session (Socioeconomic)	3016
7:00–8:30 am	Guidelines on Management on Brain Metastases Update	3014
7:00–8:30 am	The Voice of Reason in Brain Death: From Bedside to the News	3022
8:00–10:30 am	Spouse Hospitality	2nd Floor Atrium San Francisco Marriott Marquis
San Francisco Marriott Marquis	<p>GENERAL SCIENTIFIC SESSION III Presiding Officer: Brian L. Hoh Moderators: Ashok R. Asthagiri, Jennifer A. Sweet HONORED GUEST PRESENTATION Evidence-based Medicine Through Development of Home-grown Databases Raymond Sawaya FEATURED SPEAKER A Journey to the Center of the Brain Carl Zimmer Controversy: Clinical Trials, Ethics, and Stem Cells: Are RCTs Necessary to Validate a Novel Therapy? FEATURED SPEAKER U.S. Foreign Policy and the World Bret Stephens</p>	Ballroom
9:30 am–3:00 pm	Exhibit Hall Open – Visit the CNS Xperience Lounge!	Exhibit Hall
9:40–10:40 am	Morning Beverage Break – Visit the Exhibit Hall and enjoy a complimentary cup of coffee!	Exhibit Hall
10:00–10:30 am	Live Surgery in the Exhibit Hall (Presented by Cerenovus)	CNS Xperience Lounge Exhibit Hall
10:30 am–2:30 pm	Sergeant-at-Arms Office	2022 Overlook
12:15–1:45 pm	T11: Perioperative Pain Management: Opioids, Non-opioids, and Neurosurgery Advocacy	2001
12:15–1:45 pm	T12: Carotid Artery Disease: Symptomatic/Asymptomatic/Stent/CEA	2003
12:15–1:45 pm	T13: Peak Performance: Optimizing the Spine Surgical Patient from Pre-op to Post-op	2005
12:15–1:45 pm	T14: Controversies in Spinal Deformity Surgery	2007
12:15–1:45 pm	T15: Is There an Outcome Worse than Death? Outcomes, Palliative Care, and Ethical Considerations in Neurosurgical Care	2008
12:15–1:45 pm	T16: Patient Specific Goal-directed Therapy in TBI	2009
12:15–1:45 pm	T17: Clinical Trials in Movement Disorder Surgery	2010
12:15–1:45 pm	T18: Management of Pituitary Adenomas and Parasellar Pathology	2012
12:15–1:45 pm	T19: Malignant Gliomas: Advances in Surgery and Adjuvant Therapy	2011
12:15–1:45 pm	T20: Beating Press Ganey	2000
12:15–1:45 pm	Non-CME Sponsored Luncheon Session: OLIF360SM Single-Position Surgery: OLIF and Posterior Fixation “Without the Flip”	2002
12:15–1:45 pm	Non-CME Sponsored Luncheon Session: See Addendum for details	2004
12:15–1:45 pm	Non-CME Sponsored Luncheon Session: Reversal of Specific Direct Oral Anticoagulants In Patients Experiencing Life-Threatening Bleeds: Review of Clinical Evidence and Practical Recommendations for Patient Management	2006

1:00–2:00 pm	NEUROSURGERY® Publications: Meet the Editors	3002
1:45–2:45 pm	Afternoon Beverage Break – CNS Wellness Afternoon. Enjoy a fresh fruit smoothie in the Xperience Lounge and listen to Voices of Neurosurgery stories. Also see presentations from our corporate partners at the Device Innovation Showcase.	Exhibit Hall
1:45–2:45 pm	Resident SANS Challenge Championship Round	2018
2:00–2:45 pm	CNS Annual Business Meeting	3001
2:45–4:15 pm	Council of State Neurosurgical Societies What is Value?	3016
2:45–4:15 pm	Section on Cerebrovascular Surgery Future Training of the Cerebrovascular Surgeon	2014
2:45–4:15 pm	Section on Disorders of the Spine and Peripheral Nerves Spine Update: The Evidence	2016
2:45–4:15 pm	Section on Neurotrauma and Critical Care Neuromodulation for Spinal Cord Injury	3022
2:45–4:15 pm	Section on Pain Targets Outside the Dorsal Columns for Pain	3024
2:45–4:15 pm	Section on Pediatric Neurological Surgery Post-hemorrhagic Hydrocephalus in Premature Infants: Time for a Paradigm Shift?	3018
2:45–4:15 pm	Section on Stereotactic and Functional Neurosurgery Stereotactic and Functional Neurosurgery Update	3020
2:45–4:15 pm	Section on Tumors Emerging Concepts in the Management of Brain Metastases	3014
4:15–5:45 pm	Operative Techniques and Case-based Discussion Session CSNS: Patient Safety in Neurosurgical Practice	3016
4:15–5:45 pm	Challenging Intrinsic Brain Tumors: Operative Techniques and Case-based Discussions	3014
4:15–5:45 pm	Treating Cerebral Aneurysms: Operative Techniques and Case-based Discussions	2014
4:15–5:45 pm	Cervical and Thoracolumbar Trauma: Operative Techniques and Case-based Discussions	2016
4:15–5:45 pm	Timing of Spinal Trauma Surgery: Operative Techniques and Case-based Discussions	3022
4:15–5:45 pm	Neurosurgery for Pain: Operative Techniques and Case-based Discussions	3024
4:15–5:45 pm	Challenges in Recurrent Pediatric Epilepsy: Operative Techniques and Case-based Discussions	3018
5:45–7:15 pm	Interactive Multimedia Research Presentation Session	Level 2 Lobby
6:30–8:30 pm	Tumor Section Young Neurosurgeon's Reception	Nob Hill AB San Francisco Marriott Marquis
6:30–8:30 pm	Women in Neurosurgery Reception	Foothill C San Francisco Marriott Marquis
7:15–8:15 pm	Duke University Alumni Reception	Yerba Buena Salon 1 San Francisco Marriott Marquis
7:15–8:15 pm	Brigham & Women's Hospital Alumni Reception	Yerba Buena Salon 2 San Francisco Marriott Marquis
7:15–8:15 pm	Weill Cornell Medicine Alumni Reception	Yerba Buena Salon 3 San Francisco Marriott Marquis
7:30–9:30 pm	DIN4: Advances in LITT	Harris' Steakhouse 2100 Van Ness Avenue San Francisco

Wednesday, October 23

6:30 am–3:15 pm	Registration and CNS Central	Level 1 Lobby
6:30 am–3:30 pm	Speaker Ready Room	3000
7:00–8:30 am	Sunrise Science and Late-breaking Abstract Session (Stereotactic and Functional)	3020
7:00–8:30 am	Sunrise Science and Late-breaking Abstract Session (Pain)	3024
7:00–8:30 am	Cerebrovascular Guidelines: Aneurysms, Arteriovenous Malformations, and Acute Ischemic Stroke	2014
7:00–8:30 am	Guidelines for Management of Glioblastoma	3014
7:00–8:30 am	Brain and Spine Trauma Guidelines—What You Need to Know	2016
8:00–10:30 am	Spouse Hospitality	2nd Floor Atrium San Francisco Marriott Marquis
8:40 am–12:10 pm	GENERAL SCIENTIFIC SESSION IV Presiding Officer: Elad I. Levy Moderators: Maya A. Babu, Praveen V. Mummaneni	Ballroom
8:50–9:12 am	HONORED GUEST PRESENTATION The Evolving Landscape and Management of Brain Metastases Raymond Sawaya	
9:15–9:40 am	JOHN THOMPSON HISTORY OF MEDICINE LECTURE Rebecca Skloot	
10:49–11:11 am	Controversy: Low-grade Glioma Management	
11:30 am–12:10 pm	FEATURED SPEAKER Healthcare in the U.S. Aaron Carroll	
9:30 am–2:00 pm	Exhibit Hall Open – Visit the CNS Xperience Lounge!	Exhibit Hall
9:40–10:40 am	Morning Beverage Break – Visit the Exhibit Hall and enjoy a complimentary cup of coffee!	Exhibit Hall
10:00–10:30 am	Live Surgery in the Exhibit Hall (see page 20 for details)	CNS Xperience Lounge Exhibit Hall
10:30 am–2:30 pm	Sergeant-at-Arms Office	2022 Overlook
12:15–1:45 pm	W21: Middle Meningeal Artery Embolization for Subdural Hematoma Treatment	2001
12:15–1:45 pm	W22: Contemporary and Practical Management of an Enigmatic Process: Cerebral Vasospasm (Delayed Cerebral Ischemia)	2003
12:15–1:45 pm	W23: Novel Techniques for Management of Lumbar Spondylolisthesis	2010
12:15–1:45 pm	W24: TBI in the Elderly	2011
12:15–1:45 pm	W25: Neurosurgeon Entrepreneur	2005
12:15–1:45 pm	W26: Chiari Malformations	2012
12:15–1:45 pm	W27: Clinical Trials in Epilepsy Surgery	2007
12:15–1:45 pm	W28: Update on Diagnosis and Management of Low Grade Gliomas	2008
12:15–1:45 pm	W29: Advanced Imaging in Brain Tumors	2009
12:15–1:45 pm	W30: Branding and Social Media in your Practice	2000
1:45–3:15 pm	Cranial Abstract Session	3020
1:45–3:15 pm	Spine Abstract Session	2016
1:45–3:15 pm	Late-breaking Abstract Session	3024
1:45–4:45 pm	Advanced Endoscopic and Exoscopic Neurosurgery Seminar	2014

CONGRATULATIONS TO THE 2019 CNS ABSTRACT AWARD RECIPIENTS!

Each year, merit-based abstract awards at the CNS Annual Meeting are granted to acknowledge the achievements of residents, fellows, and attending neurosurgeons in various categories.



Hesham M. Zakaria
CNS Resident Award



Clark C. Chen
Preuss Research Award



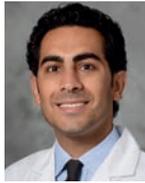
Michael Honey
Ronald R. Tasker Young Investigator Award



Bledi C. Brahimaj
Joint Tumor Section Skull Base Surgery Award



Daniel A. Orringer
Rosenblum-Mahaley Clinical Research Award



Karam P. Asmaro
Integra Foundation Award



Ching-Jen Chen
Galbraith Award



Matthew M. Grabowski
Journal of Neuro-Oncology Award



Tej D. Azad
Julius Goodman Resident Award



Matthew Shepard
Leksell Radiosurgery Award



Hao Chen
BrainLab Neurosurgery Award



Jack P. Rock
ThinkFirst Injury Prevention Research Award



Bryan D. Choi
American Brain Tumor Association Young Investigator Award



Connor Liu
Joint Tumor Section Neuro-Oncology Trainee Award



Zachary A. Medress
Samuel Hassenbusch Young Neurosurgeon Award



Conor Grady
Best Data Science Award



Jignesh Tailor
Columbia Softball Pediatric Brain Tumor Award



Courtney Pendleton
Sherry Apple Resident Travel Scholarship



Iahn Cajigas
Stereotactic and Functional Neurosurgery Resident Award

INTERNATIONAL ABSTRACT WINNERS

- Best International Basic Science:
Museung Park
South Korea
- Best International Clinical Research:
Naokado Ikeda
Japan
- Best International Operative Technique:
Toshiki Endo
Japan

IMMERSE YOURSELF IN THE CNS XPERIENCE LOUNGE



RELAX and connect with your colleagues. Grab a drink at the CNS Espresso Bar and see what's next on your agenda. Join us on designated afternoons for snacks, wine, and beer. On Tuesday, please attend our Wellness Afternoon, where we'll have a CNS sweatpants giveaway (limited quantity) as well as a bike blender to create your own smoothie.

MEET and interact with our Featured Speakers, and don't miss a chance to get their books signed. Also, experience live surgery via telemedicine technology, Educational Update Sessions, Innovator of the Year finalists, digital posters, NVIDIA: Artificial Intelligence for Neurosurgeons—a Hands-on Demo, and more!

COME pick up the latest copy of NEUROSURGERY® Publications, watch demos of the Surgeon's Armamentarium, listen to Neurosurgery Speaks! or chat with journal staff. Also, ask any membership questions you may have and get answers from the CNS team. We're here to help!

MONDAY

9:40 am

Book Signing: Shankar Vedantam, "The Hidden Brain"

Special Presentation: Executive Presence and a Glimpse into the CNS Leadership Institute: Alan Scarrow
Book signing immediately following

Meet and Greet: Honored Guest, Raymond Sawaya

12:15 pm

Book Signing: Doris Kearns Goodwin, "Leadership: In Turbulent Times"

2:00 pm

Special Presentation: Innovator of the Year Finalists

□ Harnessing AI and Smartphones to Develop the Next Generation of TBI Diagnostics
Lynn McGrath

□ Microangiography for Endovascular Neurosurgery
Peter Kan

□ Live Machine Learning Centered Architecture System to optimize Lumbar Stenosis Surgical Outcome
Ghaith Habboub

TUESDAY

9:40 am

Book Signing: Carl Zimmer, "She Has Her Mother's Laugh: The Powers, Perversions, and Potential of Heredity"

Special Presentation: NVIDIA: Artificial Intelligence for Neurosurgeons – A Hands-on Demo

12:15 pm

Book Signing: Bret Stephens, "America in Retreat"

1:45 pm

CNS Wellness Afternoon: Join us to receive CNS sweatpants (limited quantity), and take a ride on our smoothie blender bike.

Special Presentation: Voices of Neurosurgery: The Unforgettable Moments

2:30 pm

Book Signing: Gary Simonds, "The Thriving Physician: How to Avoid Burnout by Choosing Resilience Throughout Your Medical Career"

WEDNESDAY

9:40 am

Book Signing: Rebecca Skloot, "The Immortal Life of Henrietta Lacks"

9:40 am

Meet and Greet: Gary Simonds

12:15 pm

Meet and Greet: Aaron Carroll

HOURS:

MONDAY	9:30 am–4:00 pm
TUESDAY	9:30 am–3:00 pm
WEDNESDAY	9:30 am–2:00 pm



INDUSTRY INTERACTION HIGHLIGHTS

Come visit the CNS Exhibit Hall to discover cutting-edge technology to enhance your skills and your practice. Check out a variety of in-booth demonstrations with subspecialty experts and gain hands-on experience with the latest devices—all brought to you by more than 130 of our industry partners. For a complete list of exhibitors, see page 115.

Join Us in the Exhibit Hall



DAILY LIVE SURGERY PRESENTATIONS

Monday–Wednesday | 10:00–10:30 am
Join us in our Presentation Theater in the Xperience Lounge where surgeons from top institutions in the United States operate live via telemedicine, giving you the chance to observe and ask questions of the operating surgeon.

- Synaptive: Monday 10:00–10:30 am
Live Tumor Surgery in 3D using Synaptive’s Robotic Digital Microscope | Moderator: Dr. Brian Nahed
Surgeon: Dr. Costas Hadjipanayis from Mount Sinai
- Tuesday 10:00–10:30 am | See Addendum for details.
- Wednesday 10:00–10:30 am | See Addendum for details.

DEVICE INNOVATION SHOWCASE



See the newest products, services and technologies from our corporate partners with these live demonstrations from our technology theater during the afternoon break on Tuesday.

- 7D Surgical

IN-BOOTH DEMONSTRATIONS

- Synaptive Medical: Booth 318
Live Tumor Surgery in 3D using Synaptive’s Robotic Digital Microscope | Tuesday 9:50–10:20 am

EXHIBIT HALL BEVERAGE BREAKS

Monday–Wednesday Morning Break: 9:40–10:40 am
Monday and Tuesday Afternoon Break: 1:45–2:45 pm

EXHIBIT HALL HOURS:	
MONDAY	9:30 am–4:00 pm
TUESDAY	9:30 am–3:00 pm
WEDNESDAY	9:30 am–2:00 pm

Interact Outside of the Exhibit Hall

INDUSTRY-SPONSORED LUNCH SYMPOSIA

(CME is NOT offered for these sessions)

Monday–Tuesday | 12:15–1:45 pm

- Monday**
- Medtronic: Stealth Autoguide™ Robotic Navigation | Robotic Precision | Powered by You Development and Clinical Experience by Dr. Stefan Wolfsberger | Room 2002
 - Depuy Synthes: “The Art & Science of Cranial Reconstruction – Refinements & best practices learned from over 500 Cranioplasties at Johns Hopkins Multidisciplinary Adult Cranioplasty Center” | Room 2004
 - Sponsored Lunch with Olympus | Room 2006
- Tuesday**
- Medtronic: OLIF360SM Single-Position Surgery: OLIF and Posterior Fixation “Without the Flip”
Faculty: Ernest Braxton, MD | Room 2002
 - Sponsored Lunch with Cerenovus | Room 2004
 - Portola: Reversal of Specific Direct Oral Anticoagulants In Patients Experiencing Life-Threatening Bleeds: Review of Clinical Evidence and Practical Recommendations for Patient Management
Faculty: Shakeel Chowdhry | Room 2006

BREAKOUT SESSIONS DURING SYMPOSIA

During the full-day symposia on Saturday and Sunday, gain hands-on experience, training, and see demonstrations of the most advanced equipment and techniques during these 30-minute, non-CME breakout sessions. These will be held in individual rooms upstairs.



HANDS-ON CADAVER SESSION

New this year! These educational surgical cadaver suites located in the convention center give you the opportunity to gain hands-on experience with the latest and greatest neurosurgical technology. This is brought to you by our industry sponsors.

- **Medtronic:** Monday and Tuesday all day
- **Xoran Technologies:** Tuesday | 10:30 am–12:30 pm

Please reach out to companies directly to attend.



CNS

Thank You

The Congress of Neurological Surgeons gratefully acknowledges our Industry Allies Council Partners for their continued support.

AMBASSADOR

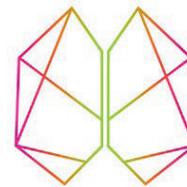
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Crossed-arms Neurosurgery With the NaoTrac autopilot robot

Make your decision, NaoTrac gives you a hand for precision.



The unique autonomous procedure allows you to focus on surgical planning and let NaoTrac be your new assistant. NaoTrac Robot merges high-tech and your experience of to improve accuracy and outcome by streamlining surgical procedures and improving the learning curve equipped with AI, Machine Vision, and Robotic-Assisted Surgery.

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- AUTOPILOT robot-assisted neurosurgery
- AUTOMATIC Surface Matching Facial Recognition & 3D Position Tracking
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Join the evolution of neurosurgery at booth #127, Oct 21 & 22, 2019

10:00 AM - Human Pilot study of NaoTrac

02:00 PM - Crossed-arm neurosurgery workshop

Share your first impression, idea, and become our partner!



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SUBSPECIALTY SESSION HIGHLIGHTS

SP SPINE

SATURDAY

8:00 am–4:15 pm

- **SYM1: Spine Trauma and Spinal Cord Injury Symposium**

8:00 am–4:15 pm

- **SYM5: Advanced Topics in Spinal Operative Techniques**

SUNDAY

8:00 am–4:15 pm

- **SYM13: Spine Biomechanics and Deformity Symposium**

12:45–4:15 pm

- **SYM19: My Worst Spinal Complication: Lessons Learned**

MONDAY

7:00–8:30 am

- **Guidelines for the Management of Metastatic Disease to the Spine: The Evidence**

7:00–8:30 am

- **Neurotrauma Debates**

12:15–1:45 pm

- **M4: Cervical Spondylotic Myelopathy—Anterior Versus Posterior**

12:15–1:45 pm

- **M5: Spinal Tumor Surgery: Case-based Management**

2:45–4:15 pm

- **Section on Disorders of the Spine and Peripheral Nerve: Spine Section Update**

4:15–5:45 pm

- **Spinal Deformity and MIS Surgery: Operative Techniques and Case-based Discussions**

7:30–9:30 pm

- **DIN3: Navigation and Robotics: Fad or Future?**

TUESDAY

7:00–8:00 am

- **Sunrise Science and Late Breaking Abstract Session**

12:15–1:45 pm

- **T13: Peak Performance: Optimizing the Spine Surgical Patient from Pre-op to Post-op**

12:15–1:45 pm

- **T14: Controversies in Spinal Deformity Surgery**

1:45–2:45 pm

- **The FDA: Investigational Device Exemptions, Regulatory Process, and Moving Medical Devices to Patients (Non-CME)**

2:45–4:15 pm

- **Section on DSPN—Spine Update: The Evidence**

4:15–5:45 pm

- **Cervical and Thoracolumbar Trauma: Operative Techniques and Case-based Discussions**

5:45–7:15 pm

- **Interactive Multimedia Research Presentation Session**

WEDNESDAY

7:00–8:30 am

- **Brain and Spine Trauma Guidelines—What You Need to Know**

12:15–1:45 pm

- **W23: Novel Techniques for Management of Lumbar Spondylolisthesis**

1:45–3:15 pm

- **Spine Oral Abstract Presentation Session**

1:45–4:45 pm

- **Advanced Endoscopic and Exoscopic Neurosurgery Seminar**

CV CEREBROVASCULAR

SATURDAY

8:00 am–4:15 pm

- **SYM4: Cerebrovascular Symposia: Stenting and Bypass**

SUNDAY

8:00 am–4:15 pm

- **SYM10: Acute Stroke Care: Guidelines Review and Future Directions**

8:00 am–4:15 pm

- **SYM12: Advanced Techniques in Assessment and Treatment of Intracranial Aneurysms**

MONDAY

7:00–8:30 am

- **Sunrise Science and Late Breaking Abstract Session**

12:15–1:45 pm

- **M3: Is Intracerebral Hemorrhage a Surgical Disease?**

2:45–4:15 pm

- **Section on Cerebrovascular Surgery—Artificial Intelligence in Cerebrovascular Neurosurgery**

4:15–5:45 pm

- **Treating Cerebral Vascular Malformations: Operative Techniques and Case-based Discussions**

5:45–7:15 pm

- **The International Cerebrovascular Symposium**

7:30–9:30 pm

- **DIN2: Multi-modality AVM Treatment in the Past, Present, and Future**

TUESDAY

12:15–1:45 pm

- **T12: Carotid Artery Disease: Symptomatic/Asymptomatic/Stent/CEA**

1:45–2:45 pm

- **The FDA: Investigational Device Exemptions, Regulatory Process, and Moving Medical Devices to Patients (Non-CME)**

2:45–4:15 pm

- **Section on Cerebrovascular Surgery: Future Training of the Cerebrovascular Surgeon**

4:15–5:45 pm

- **Treating Cerebral Aneurysms: Operative Techniques and Case-based Discussion**

5:45–7:15 pm

- **Interactive Multimedia Research Presentation Session**

WEDNESDAY

7:00–8:30 am

- **Cerebrovascular Guidelines: Aneurysms, Arteriovenous Malformations, and Acute Ischemic Stroke**

12:15–1:45 pm

- **W21: Middle Meningeal Artery Embolization for Subdural Hematoma Treatment**

12:15–1:45 pm

- **W22: Contemporary and Practical Management of and Enigmatic Process: Cerebral Vasospasm (Delayed Cerebral Ischemia)**

1:45–3:15 pm

- **Cranial Oral Abstract Presentation Session**

1:45–4:45 pm

- **Advanced Endoscopic and Exoscopic Neurosurgery Seminar**

SUBSPECIALTY SESSION HIGHLIGHTS

(SF) STEREOTACTIC AND FUNCTIONAL

SATURDAY

8:00 am–4:15 pm

- **SYM2: Functional Neurosurgery Update: Emerging Concepts**

SUNDAY

8:00 am–4:15 pm

- **SYM15: Emerging Technologies in Neurosurgery**

MONDAY

7:00–8:30 am

- **Guidelines for DBS for Parkinson’s Disease and Neuroablation for Pain**

4:15–5:45 pm

- **Section on Stereotactic and Functional Neurosurgery: The Future of Preoperative Functional Mapping**

4:15–5:45 pm

- **Challenging Cases in Epilepsy Surgery: Operative Techniques and Case-based Discussions**

5:45–7:15 pm

- **The International Functional Neurosurgery Symposium**

TUESDAY

12:15–1:45 pm

- **T17: Clinical Trials in Movement Disorder Surgery**

1:45–2:45 pm

- **The FDA: Investigational Device Exemptions, Regulatory Process, and Moving Medical Devices to Patients (Non-CME)**

2:45–4:15 pm

- **Section on Stereotactic and Functional Neurosurgery Stereotactic and Functional Neurosurgery Update**

5:45–7:15 pm

- **Interactive Multimedia Research Presentation Session**

7:30–9:30 pm

- **DIN4: Advances in LITT**

WEDNESDAY

7:00–8:30 am

- **Sunrise Science and Late Breaking Abstract Session**

12:15–1:45 pm

- **W27: Clinical Trials in Epilepsy Surgery**

1:45–3:15 pm

- **Cranial Oral Abstract Presentation Session**

(RE) RESIDENT

SATURDAY

8:00 am–4:15 pm

- **SYM3: Maximizing Your Neurosurgical Employment Opportunities**

SUNDAY

8:00 am–4:15 pm

- **SYM17: Quality Summit Bundle**

MONDAY

7:00–8:30 am

- **Guidelines for the Management of Metastatic Disease to the Spine: The Evidence**

7:00–8:30 am

- **Guidelines for DBS and for Parkinson’s Disease**

7:00–8:30 am

- **Neurotrauma Debates**

12:15–1:45 pm

- **M1: Honored Guest Luncheon**

1:45–2:45 pm

- **ABNS Candidate Case Log: POST (Non-CME)**

5:45–7:15 pm

- **All International Symposia**

TUESDAY

7:00–8:30 am

- **Guidelines on Management on Brain Metastases Update**

7:00–8:30 am

- **The Voice of Reason in Brain Death: From Bedside to the News**

5:45–7:15 pm

- **Interactive Multimedia Research Presentation Session**

WEDNESDAY

7:00–8:30 am

- **Cerebrovascular Guidelines: Aneurysms, Arteriovenous Malformations, and Acute Ischemic Stroke**

7:00–8:30 am

- **Guidelines for Management of Glioblastoma**

7:00–8:30 am

- **Brain and Spine Trauma Guidelines - What you Need to Know**

(SE) SOCIOECONOMIC

SATURDAY

12:45–4:15 pm

- **SYM9: Appropriate Coding, ICD, and CPT 2019 Update**

6:30–8:30 pm

- **DIN1: How Do I Avoid Getting Penalized—ICD-10, CPTs, MACRA, ACOs, and APMs?**

MONDAY

12:15–1:45 pm

- **M2: So You’ve Been Sued... Medical Practice 2019 Update**

2:45–4:15 pm

- **Council of State Neurosurgical Societies: Achieving High Quality**

4:15–5:45 pm

- **CSNS: How to Build a Spine Center**

5:45–7:15 pm

- **All International Symposia**

TUESDAY

2:45–4:15 pm

- **Council of State Neurosurgical Societies—What is Value**

4:15–5:45 pm

- **CSNS: Patient Safety in Neurosurgical Practice**

5:45–7:15 pm

- **Interactive Multimedia Research Presentation Session**

WEDNESDAY

7:00–8:30 am

- **Sunrise Science and Late Breaking Abstract Session**

12:15–1:45 pm

- **W25: Neurosurgeon Entrepreneur**

- **W30: Branding and Social Media in your Practice**

TU TUMOR

SATURDAY

8:00 am–4:15 pm

- **SYM6: Brain Tumor Update**

SUNDAY

8:00 am–4:15 pm

- **SYM14: Advanced Functional Mapping and 3D Anatomy for the Neurosurgeon**

8:00 am–4:15 pm

- **SYM15: Emerging Technologies in Neurosurgery**

12:45–4:15 pm

- **SYM20: Modern Approaches to SRS**

MONDAY

7:00–8:30 am

- **Sunrise Science and Late Breaking Abstract Session**

12:15–1:45 pm

- **M5: Spinal Tumor Surgery: Case-based Management**

12:15–1:45 pm

- **M9: Acoustic Neuromas: Current Management Strategies**

12:15–1:45 pm

- **M10: Harness the Immune System to Treat Brain Tumors**

2:45–4:15 pm

- **Section on Tumors—Complications in Tumor Surgery: Navigating the Unexpected**

4:15–5:45 pm

- **Challenging Skull Base Tumors: Operative Techniques and Case-based Discussions**

5:45–7:15 pm

- **The International Masters Symposium on Brain Tumor Surgery**

TUESDAY

7:00–8:30 am

- **Guidelines on Management on Brain Metastases Update**

12:15–1:45 pm

- **T18: Management of Pituitary Adenomas and Parasellar Pathology**

12:15–1:45 pm

- **T19: Malignant Gliomas: Advances in Surgery and Adjuvant Therapy**

2:45–4:15 pm

- **Section on Tumors—Emerging Concepts in the Management of Brain Metastases**

4:15–5:45 pm

- **Challenging Intrinsic Brain Tumors: Operative Techniques and Case-based Discussions**

7:30–9:30 pm

- **DIN4: Advances in LITT**

5:45–7:15 pm

- **Interactive Multimedia Research Presentation Session**

WEDNESDAY

7:00–8:30 am

- **Guidelines for Management of Glioblastoma**

12:15–1:45 pm

- **W28: Update on Diagnosis and Management of Low-grade Gliomas**

12:15–1:45 pm

- **W29: Advanced Imaging in Brain Tumors**

1:45–3:15 pm

- **Cranial Oral Abstract Presentation Session**

1:45–4:45 pm

- **Advanced Endoscopic and Exoscopic Neurosurgery Seminar**

AP ADVANCED PRACTICE PROVIDER

SATURDAY

8:00 am–4:15 pm

- **SYM1: Spine Trauma and Spinal Cord Injury Symposium**

SUNDAY

8:00 am–4:15 pm

- **ANSPA Fall 2019 CME Meeting in Collaboration with Congress of Neurological Surgeons**

- **SYM17: Quality Summit Bundle**

MONDAY

5:45–7:15 pm

- **All International Symposia**

TUESDAY

5:45–7:15 pm

- **Interactive Multimedia Research Presentation Session**

TR NEUROTRAUMA

SUNDAY

8:00 am–4:15 pm

- **SYM11: Neurotrauma Update**

MONDAY

7:00–8:30 am

- **Neurotrauma Debates**

12:15–1:45 pm

- **M6: Peripheral Nerve Entrapment Syndromes: Diagnosis and Management**

2:45–4:15 pm

- **Section on Neurotrauma and Critical Care Session**

4:15–5:45 pm

- **Challenging Cases in ICP Management: Operative Techniques and Case-based Discussions**

TUESDAY

7:00–8:30 am

- **The Voice of Reason in Brain Death: From Bedside to the News**

12:15–1:45 pm

- **T15: Is There an Outcome Worse than Death: Outcome, Palliative Care, and Ethical Considerations in Neurosurgical Care**

12:15–1:45 pm

- **T16: Patient Specific Goal-directed Therapy in TBI**

2:45–4:15 pm

- **Section on Neurotrauma and Critical Care Session—Neuromodulation for Spinal Cord Injury**

4:15–5:45 pm

- **Timing of Spinal Trauma Surgery: Operative Techniques and Case-based Discussions**

5:45–7:15 pm

- **Interactive Multimedia Research Presentation Session**

WEDNESDAY

7:00–8:30 am

- **Brain and Spine Trauma Guidelines—What You Need to Know**

12:15–1:45 pm

- **W24: TBI in the Elderly**

1:45–3:15 pm

- **Oral Abstract Presentation Session**

1:45–4:45 pm

- **Advanced Endoscopic and Exoscopic Neurosurgery Seminar**

SUBSPECIALTY SESSION HIGHLIGHTS

PA PAIN

SUNDAY

8:00 am–4:15 pm

- **SYM16: Pain and Peripheral Nerve Symposium**

MONDAY

2:45–4:15 pm

- **Section on Pain Session—When to Use What**
- 4:15–5:45 pm
- **The Case Against Spinal Cord Stimulation: Operative Techniques and Case-based Discussion**
- 5:45–7:15 pm
- **The International Functional Neurosurgery Symposium**

TUESDAY

12:15–1:45 pm

- **T11: Perioperative Pain Management: Opioids, Non-opioids, and Neurosurgery Advocacy**
- 2:45–4:15 pm
- **Section on Pain Session—Targets Outside the Dorsal Columns for Pain**
- 4:15–5:45 pm
- **Neurosurgery for Pain: Operative Techniques and Case-based Discussions**
- 5:45–7:15 pm
- **Interactive Multimedia Research Presentation Session**

WEDNESDAY

7:00–8:30 am

- **Sunrise Science and Late Breaking Abstract Session**

PE PEDIATRIC

SUNDAY

8:00 am–4:15 pm

- **SYM15: Emerging Technologies in Neurosurgery**

MONDAY

12:15–1:45 pm

- **M8: Pediatric Concussion**
- 2:45–4:15 pm
- **Section on Pediatric Neurological Surgery— Pediatric Brain Tumors: Advancements in Molecular Diagnosis and Updated on Clinical Trials**
- 4:15–5:45 pm
- **Recurrent Disease in Pediatric Brain Tumors Patients: Case-based Discussions and Operative Techniques**

TUESDAY

7:00–8:00 am

- **Sunrise Science and Late Breaking Abstract Session**
- 2:45–4:15 pm
- **Post-hemorrhagic Hydrocephalus in Premature Infants: Time for a Paradigm Shift?**
- 4:15–5:45 pm
- **Challenges in Recurrent Pediatric Epilepsy: Operative Techniques and Case-based Discussions**
- 5:45–7:15 pm
- **Interactive Multimedia Research Presentation Session**

WEDNESDAY

12:15–1:45 pm

- **W26: Chiari Malformations**

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We'll feature the latest trends in CNS swag—including t-shirts, jackets, umbrellas, and accessories.



PN PERIPHERAL NERVES

SUNDAY

8:00 am–4:15 pm

- **SYM16: Pain and Peripheral Nerve Symposium**

MONDAY

12:15–1:45 pm

- **M6: Peripheral Nerve Entrapment Syndromes: Diagnosis and Management**

2:45–4:15 pm

- **Section on Peripheral Nerve—Peripheral Nerve Task Force**

4:15–5:45 pm

- **Peripheral Nerve: Operative Techniques and Case-based Discussions**

TUESDAY

5:45–7:15 pm

- **Interactive Multimedia Research Presentation Session**

WINS WINS

SATURDAY

12:45–4:15 pm

- **SYM8: Training the Trainers**

SUNDAY

8:00 am–4:15 pm

- **SYM17: Quality Summit Bundle**

MONDAY

5:45–7:15 pm

- **All International Symposia**

TUESDAY

12:15–1:45 pm

- **T20: Beating Press Ganey**

5:45–7:15 pm

- **Interactive Multimedia Research Presentation Session**

WEDNESDAY

12:15–1:45 pm

- **W30: Branding and Social Media in your Practice**



SUBSPECIALTY SESSION HIGHLIGHTS KEY

AP ADVANCED PRACTICE PROVIDER

CV CEREBROVASCULAR

TR NEUROTRAUMA

PA PAIN

PE PEDIATRIC

PN PERIPHERAL NERVES

RE RESIDENT

SE SOCIOECONOMIC

SP SPINE

SF STEREOTACTIC AND FUNCTIONAL

TU TUMOR

WINS WINS

Full Day and Discounted Bundles (includes lunch):

Physician \$400, Nurse/NP/PA \$300, Resident/Fellow/Graduate Student/Post-doctoral Scholar/Medical Student \$175

Half Day: (Does not include lunch) Physician \$250, Nurse/NP/PA \$200, Resident/Fellow/Graduate Student/Post-doctoral Scholar/Medical Student \$125

(SP) (TR) 8:00 am–4:15 pm Room: 3022

SYM1: Spine Trauma and Spinal Cord Injury Symposium

CNS

SANS

Lifelong Learning

Course Directors: Sanjay S. Dhall, Michael G. Fehlings, James S. Harrop, Eve C. Tsai**Faculty:** Paul M. Arnold, Mohamad Bydon, D. Kojo Hamilton, Gregory W.J. Hawryluk, Zachary L. Hickman, Daniel J. Hoh, Paul K. Kim, Allan D. Levi, Daniel C. Lu, David O. Okonkwo, Kristine O'Phelan, Ann M. Parr, Patrick R. Pritchard, Richard B. Rodgers, Martina Stippler, Jefferson R. Wilson**Agenda Highlights**

- Research updates in spinal cord injury
- Top 3 management considerations for acute spinal cord injury and unstable fractures
- Rehabilitation and neuromodulation after spinal cord injury
- Spinal cord injury case management face offs
- Case-based discussion of central cord injury, geriatric odontoid fracture, cervical facet dislocation and unstable thoracic spinal columns fractures
- Non-operative and operative management to maximize outcomes, including timing, hemodynamics, and prognostication
- Timing of surgery for spinal trauma and spinal cord injury

(SF) 8:00 am–4:15 pm Room: 2016

SYM2: Functional Neurosurgery Update: Emerging Concepts**Course Directors:** Ellen L. Air, Casey H. Halpern, John D. Rolston**Faculty:** Raag Airan, Nicholas M. Barbaro, Edward F. Chang, Shabbar F. Danish, Robert S. Fisher, Kelly D. Foote, Wayne Goodman, Ryder P. Gwinn, Douglas Kondziolka, Vibhor Krishna, Jean-Philippe Langevin, Paul S. Larson, Kai J. Miller, Francisco A. Ponce, Robert M. Richardson, Sameer A. Sheth, Peter A. Tass, David P. Vansickle**Agenda Highlights**

- Update on electrode implantation techniques
- Emerging concepts in movement disorders surgery
- Non-motor brain stimulation
- Emerging concepts in stereotactic lesioning
- New versus established techniques in epilepsy surgery
- Emerging concepts in restorative neurosurgery

(RE) 8:00 am–4:15 pm Room: 2011

SYM3: Maximizing Your Neurosurgical Employment Opportunities Non-CME*Note: \$400 Physician; \$50 Nurse/NP/PA; \$50 Fellow/Resident/Medical Student***Course Directors:** Mohamad Bydon, Lola B. Chambless, Jennifer A. Sweet**Faculty:** John A. Braca, Andrew R. Conger, Timothy H. Lucas, Michael W. McDermott, Brian V. Nahed, Joseph S. Neimat, Judith Rosman, Justin A. Singer, Anand Veeravagu**Agenda Highlights**

- Critical insights and perspectives on starting your neurosurgery practice
- Advantages and considerations of distinct practice settings and models
- Valuing yourself as a neurosurgeon in the job search and in negotiations
- Do's and don'ts during job interviews
- Chair and Program Director's perspectives on establishing a new neurosurgery career
- Leadership insights and pathways

(CV) 8:00 am–4:15 pm Room: 2001

SYM4: Cerebrovascular Symposia: Stenting and Bypasses Bundle*Comprised of 2 sessions: SYM4A & SYM4B. Select this option to take both at a discounted rate.*

(CV) 8:00 am–12:00 pm

SYM4A: New Era in Stenting**Course Director:** Andrew W. Grande**Faculty:** Grahame C.D. Gould, Brian T. Jankowitz, Demetrius K. Lopes, Boris L. Pabon Guerreo, Ajit S. Puri, Justin G. Santarelli, Raymond D. Turner, Henry H. Woo**Agenda Highlights**

- Introduction and review of next generation low profile intracranial stents Indications for placement of next generation stents
- Technical tips for placement of next generation stents
- Hands on exposure and experience with new stents with simulators

(CV) 12:45–4:15 pm

SYM4B: Bypass Techniques in Cerebrovascular Surgery**Course Director:** Sepideh Amin-Hanjani**Faculty:** Adib A. Abba, Amir R. Dehdashti, Michael T. Lawton, Leonardo Rangel-Castilla, Jonathan Russin, Laligam N. Sekhar, Gregory J. Zipfel**Agenda Highlights**

- EC-IC bypass for complex aneurysms
- STA-MCA bypass for ischemia – indications and technique
- STA-MCA bypass for moyamoya – indications and technique
- Posterior Circulation bypass for ischemia
- Posterior Circulation bypass for aneurysms
- Alternative donors: Imax, STA stump
- IC-IC bypass options for complex aneurysms



CNS

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Look for this image for a SANS exam that accompanies this course and can be purchased on the Annual Meeting registration site.

SP 8:00 am–4:15 pm Room 2008

SYM5: Advanced Topics in Spinal Operative Techniques Bundle

Comprised of 2 sessions: SYM5A & SYM5B. Select this option to take both at a discounted rate.

SP 8:00 am–12:00 pm

SYM5A: Advanced Minimally Invasive Spine Surgery—Operative Nuances, Indications, and Complication Avoidance

Course Directors: Adam S. Kanter, Praveen V. Mummaneni

Faculty: Aaron J. Clark, Kevin T. Foley, Langston T. Holly, Catherine Miller-Simington, John Pollina, Khoi D. Than, Juan S. Uribe

Agenda Highlights

- Member-submitted case-based discussion of minimally invasive techniques and approaches to management of spinal disease
- Choosing between minimally invasive and open spine surgery
- Review of indications
- Patient selection in minimally invasive spine surgery
- Selecting the right approach for lumbar fusion: minimally invasive TLIF versus trans-psoas versus ALIF
- Complication avoidance and management in minimally invasive spine surgery

SP 12:45–4:15 pm

SYM5B: Cervical Spine Case Management: When to Preserve Motion and When Not To—The Evidence in the Age of Reason

Course Directors: Andrew T. Dailey, Charles A. Sansur
Faculty: Kurt M. Eichholz, R. John Hurlbert, Sheng-fu L. Lo, Mark E. Oppenlander, Srinivas K. Prasad, Wilson Z. Ray

Agenda Highlights

- Member-submitted case-based discussion of management options and approaches of degenerative cervical spine disease
- Review of indications: Knowing when to operate
- Surgical approach: Anterior versus Posterior
- Surgical approach: Fusion versus Motion preservation
- Complication avoidance and management in cervical spine surgery

TU 8:00 am–4:15 pm Room: 2004

SYM6: Brain Tumor Update Bundle

Comprised of 2 sessions: SYM6A & SYM6B. Select this option to take both at a discounted rate.

TU 8:00 am–12:00 pm

SYM6A: Brain Tumor Update: Advanced and Minimally Invasive Techniques for Resection of Malignant Brain Tumors

Course Directors: Manish K. Aghi, Andrew E. Sloan
Faculty: Kaisorn L. Chaichana, Nader Sanai, Jason P. Sheehan, Michael A. Vogelbaum, Jeffrey S. Weinberg

Agenda Highlights

- Awake Craniotomy with Motor and Language Mapping
- Intra-Operative MRI (iMRI) to optimize Tumor Resection
- Fluorescent-Guided Microsurgery using 5-ALA and other fluorophores

- Minimally Invasive approaches using Exoscopes and Tubular Retractors
- Laser Interstitial Thermotherapy/Stereotactic Laser Ablation (LITT/SLA)
- Convection Enhanced Delivery (CED) (Breakout Session with NX Development from 10–10:30 am in Room 2006.)
- Stereotactic Radiosurgery

TU 12:45–4:15 pm

SYM6B: Brain Tumor Update: Benign Brain Tumors

Course Directors: Ian F. Dunn, Koji Yoshimoto
Faculty: Mustafa K. Baskaya, Anand V. Germanwala, Albert H. Kim, John Y.K. Lee, James K. Liu, Jacques J. Morcos, Akash J. Patel, Walavan Sivakumar, Gabriel Zada

Agenda Highlights

- The role of microsurgery and endoscopy in the management of benign tumors
- Contemporary management of specific tumor histologies, including skull base meningiomas, pituitary adenomas, acoustic neuromas, chordomas, peripheral nerve tumors, and pediatric tumors
- Stereotactic Radiosurgery for benign tumors

GE 8:00 am–12:00 pm Room: 2007

SYM7: Morbidity and Mortality

Space is limited, check at registration for availability

Course Director: Mark E. Shaffrey

Faculty: Won Kim, Philipp Taussky, G. Edward Vates

Agenda Highlights

- Satisfy ABNS MOC requirement for quarterly participation in morbidity and mortality
- Case-based discussion of member submitted complications
- Identify opportunity to surgical technique and systems of care improvement
- Implementing improvements in clinical care
- Creating a no-blame environment for case review

WINS 12:45–4:15 pm Room: 2007

SYM8: Residency Program Update & Training the Trainers

This program is designed for Program Directors and Program Coordinators.

Course Director: Sarah Woodrow

Faculty: Ellen L. Air, Garni Barkhoudarian, Lola B. Chambless, Lawrence S. Chin, Catherine A. Mazzola, Daniel K. Resnick, Alan M. Scarrow, Warren R. Selman, Nathan R. Selden, Stacey Q. Wolfe, Nishant Yagnick, Gregory J. Zipfel

Agenda Highlights

- Overview of new ABNS milestones
- Adult learning theory
- Teaching to millennials/ diversity
- Different models of feedback
- Intra-operative teaching
- Incorporating structured teaching into rounds
- Teaching “soft” skills (communication, giving bad news, collaboration with other services)
- How to identify learning gaps and learning styles
- Giving feedback to a learner

Ⓢ 12:45–4:15 pm Room: 2012

SYM9: Appropriate Coding, ICD, and CPT—2019 Update

Course Directors: Mark E. Oppenlander, Clemens M. Schirmer
Faculty: Joseph S. Cheng, Scott A. Meyer, Kim Pollock, John K. Ratliff, Khoi D. Than, Luis M. Tumialan, Anand Veeravagu

Agenda Highlights

- ❑ Medicare update modifiers
- ❑ Evaluation and management coding
- ❑ CD-10 coding and hospital coding for surgeons
- ❑ Revenue cycle optimization to ensure payment, PA/NP billing

4:15–5:45 pm Room: 2000

CNS RESIDENT SOCIAL AND CSNS YOUNG NEUROSURGEONS RECEPTION

All residents are invited to attend and network with their peers. Recruiters will be available to assist with your future job search. Beer, wine, and appetizers will be served.

INTERNATIONAL RECEPTION

Saturday, October 19 | 5:30–7:00 pm

San Francisco Marriott Marquis | Yerba Buena Salon 7



Join your colleagues from around the world at the CNS 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 registered attendees and their registered guests are invited to attend.

DINNER SEMINAR 1 | SATURDAY, OCTOBER 19 | 6:30–8:30 PM

\$190 (includes three-course dinner and beverages)

Ⓢ **DIN1: How Do I Avoid Getting Penalized—ICD-10, CPTs, MACRA, ACOs, and APMs?**

Moderator: John K. Ratliff

Faculty: Atman Desai, Rachel Groman, Kim Pollock, Cheerag D. Upadhyaya



BOULEVARD

This high-end San Francisco landmark showcasing the culinary vision of Nancy Oakes continues to excel thanks to the robust flavors of its mind-blowing, market-driven American cuisine paired with a terrific wine list and served with the ultimate professionalism amid spectacular Bay Bridge views.

Boulevard is recognized on Zagat's "Most Popular" and "Best Business Dinners" lists in San Francisco.

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

Full Day and Discounted Bundles (includes lunch):

Physician \$400, Nurse/NP/PA \$300, Resident/Fellow/Graduate Student/Post-doctoral Scholar/Medical Student \$175

Half Day: (Does not include lunch) Physician \$250, Nurse/NP/PA \$200, Resident/Fellow/Graduate Student/Post-doctoral Scholar/Medical Student \$125

(AP) 8:00 am–4:15 pm Room: 3014

Association of Neurosurgical Physician Assistants (ANSPA) Fall 2019 CME Meeting Presented in Collaboration with Congress of Neurological Surgeons (CNS)

Complimentary to registered ANSPA members, Nurse/PA registrants

Moderators: Grace H. Bryan, Alice Edwards
Speakers: Rachelle Chua, Hugh G. Deen, Ricardo A. Hanel, Ronald Reimer, Leslie C. Schlachter, JoDee Winter

- Common Indications and Complications of Decompressive Craniectomy
- TBI in the Elderly and Disparities in TBI care
- Controversies in Hyperosmolar Therapy
- Update in Critical Care for the Neurosurgeon
- Cerebral Autoregulation: What a Neurosurgeon Should Know
- VTE Prophylaxis in TBI8. Objective Measures of Acute TBI: Ocular, Serum, and Radiographic (Breakout Session with Natus Neurology from 9:00–9:30 am in Room 3024)

(CV) 8:00 am–4:15 pm Room: 3018

SYM10: Acute Stroke Care: Guidelines Review and Future Directions

Course Directors: Mohammad A. Aziz-Sultan, Mandy J. Binning, R. Webster Crowley
Faculty: Andrei V. Alexandrov, Sepideh Amin-Hanjani, Jan-Karl Burkhardt, Paul J. Camarata, Geoffrey P. Colby, Robert J. Dempsey, Justin F. Fraser, Nestor R. Gonzalez, Mark R. Harrigan, Christopher P. Kellner, Demetrius K. Lopes, Grace K. Mandigo, J D. Mocco, Maxim Mokin, Thomas Oxley, Eric C. Peterson, Gustavo Pradilla, Matthew Reynolds, Robert H. Rosenwasser, Lauren Sansing, Alejandro M. Spiotta, Fernando Testai, Michael Tymianski, Stacey Q. Wolfe

Agenda Highlights

- Guidelines for the Pre-hospital Triage of Patients with Acute Stroke (Breakout Session with Penumbra from 2:00–2:30 pm in Room 3016.)
- Management of Emergent Large Vessel Occlusion: Medical and Interventional Management
- Stroke Systems of Care
- New Technology and Artificial Intelligence for the Pre-hospital Triage of Acute Stroke
- Surgical Options for Stroke: Decompressive craniectomy, stenting, and bypass
- Thrombectomy Tools and Techniques
- The Management of Tandem Lesions
- Surgical Management of Intracerebral Hemorrhage: Minimally invasive and endoscopic approaches
- Translational Science in Acute Stroke

(CV) 8:00 am–4:15 pm Room: 2016

SYM12: A Comprehensive and Evidenced-based Guidelines Review for the Treatment of Intracranial Aneurysms

Course Directors: Peter Kan, Stacey Q. Wolfe
Faculty: Adib A. Abla, Peter S. Amenta, Sepideh Amin-Hanjani, Adam S. Arthur, Mandy J. Binning, W. Christopher Fox, David M. Hasan, Babak S. Jahromi, Michael T. Lawton, Michael R. Levitt, R. Loch Macdonald, Adel M. Malek, Charles C. Matouk, J D. Mocco, Deanna M. Sasaki-Adams, Adnan H. Siddiqui, Michelle J. Smith, Robert M. Starke, Alejandro M. Spiotta, Richard W. Williamson

Agenda Highlights

- Guidelines for The Management of Unruptured and Ruptured Intracranial Aneurysms
- Imaging Guidelines for Small Unruptured Intracranial Aneurysms
- An Evidence Based Approach to Clip versus Coil for Unruptured and Ruptured Aneurysms
- New Horizons in the Treatment of Cerebral Vasospasm: Devices and Drugs
- Bifurcation aneurysms
- Treatment strategies for internal carotid aneurysms
- Guidelines for the Outpatient Management of Dual Anti-platelet Agents
- Endovascular Management of Basilar Apex Aneurysms—Management Strategies for Vertebral, Vertebrobasilar and Mid-Basilar Aneurysms

(TR) 8:00 am–4:15 pm Room: 3022

SYM11: Neurotrauma Update



CNS

SANS
Lifelong Learning

Course Directors: Gregory W.J. Hawryluk, Shelly D. Timmons
Faculty: Randy S. Bell, Tene A. Cage, Rodrigo M. Faleiro, Ramesh Grandhi, Alan S. Hoffer, Ryan S. Kitagawa, Laura B. Ngwenya, Richard B. Rodgers, Uzma Samadani, Emily P. Sieg, Martina Stippler, Jamie S. Ullman

Agenda Highlights

- Severe TBI and Advanced Neuromonitoring

(SP) 8:00 am–4:15 pm Room: 2011

SYM13: Spine Biomechanics and Deformity Symposium

Comprised of 2 sessions: SYM13A & SYM13B. Select this option to take both at a discounted rate.

(SP) 8:00 am–12:00 pm

SYM13A: Spinal Biomechanics for the Practicing Neurosurgeon: What I Need to Know for My Practice

Course Directors: Joseph S. Cheng, Tyler R. Koski
Faculty: Nader S. Dahdaleh, Aruna Ganju, Ajit A. Krishnaney, Christopher M. Maulucci, Rani Nasser, Zachary A. Smith, Jay D. Turner, Michael S. Virk, Rishi K. Wadhwa

Agenda Highlights

- Relevance of biomechanics in the management of degenerative, traumatic, and deformity-related spine disease



CNS

SANS
Lifelong Learning

Look for this image for a SANS exam that accompanies this course and can be purchased on the Annual Meeting registration site.

- Integrating biomechanics into surgical reconstructive plans
- Which biomechanical measures matter and how much
- Selecting spinal constructs based on biomechanical insights
- Complication avoidance and management based on an understanding of optimal biomechanical principles of spine alignment

Ⓢ 12:45–4:15 pm

SYM13B: Thoracolumbar Spinal Deformity for the Non-deformity Spine Surgeon

Course Directors: Dean Chou, Christopher I. Shaffrey
Faculty: Kai-Ming G. Fu, D. Kojo Hamilton, Paul Park, Rod J. Oskouian, John H. Shin, Justin S. Smith, Lee A. Tan

Agenda Highlights

- Case-based review of thoracolumbar deformity management
- Indications for larger spinal constructs versus minimal approaches
- Measures for diagnosis and classification of thoracolumbar deformity
- Techniques for correction of thoracolumbar spinal deformity
- Complication avoidance and management based of thoracolumbar deformity

Ⓣ 8:00 am–4:15 pm Room: 2004

SYM14: Advanced Functional Mapping and 3D Anatomy for the Neurosurgeon

Comprised of 2 sessions: SYM14A & SYM14B. Select this option to take both at a discounted rate.

Ⓣ 8:00 am–12:00 pm

SYM14A: Surgical Management of Eloquent Area Tumors: Functional Mapping and/or Navigation



Course Directors: Mitchel S. Berger, Sunit Das
Faculty: Lorenzo Bello, Richard W. Byrne, Edward F. Chang, Hugues Duffau, Shawn L. Hervey-Jumper, Jason Heth, Eric C. Leuthardt, George Samandouras, Michael E. Sughrue, Phiroz E. Tarapore

Agenda Highlights

- Preoperative assessment using structural and functional imaging
- Novel preoperative functional mapping techniques
- Intraoperative mapping: Surgical and anesthetic considerations
- Adjuncts to define and direct resection: Costas Hadjapanayis
- Case-based discussion

Ⓣ 12:45–4:15 pm

SYM14B: 3D Surgical Neuroanatomy

Course Director: Juan C. Fernandez-Miranda
Faculty: Mustafa K. Baskaya, Vladimir Benes, Spiros L. Blackburn, Aaron A. Cohen-Gadol, Paul A. Gardner,

Jeffrey M. Sorenson, Necmettin Tanriover, Ugur Ture

Agenda Highlights

- Review relevant surgical neuroanatomy using 3D stereoscopic projection and high-definition fiber tractography (HDFT), including cortical and white matter anatomy, cerebrovascular, and skull base anatomy
- Review of intricate anatomical regions such as insula, ventricles, basal cisterns, middle fossa, and cavernous sinus
- Surgical approaches to cerebellum and fourth ventricle, posterior circulation, and lateral and posterior skull base approaches, including the cerebello-pontine angle, clival and petroclival region, jugular foramen, and foramen magnum

Ⓢ Ⓟ 8:00 am–4:15 pm Room: 2008

SYM15: Emerging Technologies in Neurosurgery

Comprised of 2 sessions: SYM15A & SYM15B. Select this option to take both at a discounted rate.

Ⓢ Ⓟ 8:00 am–12:00 pm

SYM15A: Intraoperative Technological Adjuncts: Indications and Techniques for Laser Therapy, Robotics, and Exoscopes

Course Director: Daniel Curry

Faculty: David D. Gonda, Jeffrey S. Raskin, Mitesh V. Shah, Scellig S. D. Stone, Jon T. Willie

Agenda Highlights

- Survey of current robotic technologies and applications across neurosurgical specialties
- Laser technology options, indications, limitations, and complication avoidance and management
- Exoscope technologies, including visualization advantages, indications, and limitations
- Assessment of published outcomes using various new intraoperative adjunctive technologies, with a focus on specific advantages of each
- Complication avoidance and management with each adjunct
- Hands on experience with relevant technologies

Ⓢ Ⓣ 12:45–4:15 pm

SYM15B: Virtual and Augmented Reality: Science and Clinical Applications

Course Directors: Walter C. Jean, Cameron C. McIntyre

Faculty: Harith Akram, Joshua B. Bederson, Raphael Guzman, Alfred M.C. Iloreta, Paul S. Larson, Robert G. Louis, Nader Pouratian

Agenda Highlights

- Virtual Reality: Utility in surgical rehearsal, teaching and patient engagement
- Augmented Reality: Microscopes, endoscopies, and holography
- Image rendering: Novel MR sequences and analyses, tractography, and segmentation to guide surgical procedures

Ⓟ Ⓟ 8:00 am–4:15 pm Room: 3003

SYM16: Pain and Peripheral Nerve Symposium

Comprised of 2 sessions: SYM16A & SYM16B. Select this option to take both at a discounted rate.

Ⓟ Ⓟ 8:00 am–12:00 pm

SYM16A: Non-spinal Targets for Pain: Nerve, DRG, and Brain

Course Directors: Sean J. Nagel, Jennifer A. Sweet



Look for this image for a SANS exam that accompanies this course and can be purchased on the Annual Meeting registration site.

Faculty: Steven M. Falowski, Brian H. Kopell, Jean-Philippe Langevin, Andre Machado, Julie G. Pilitsis, Ahmed M.T. Raslan

Agenda Highlights

- History & Review of Targets
- Recent Clinical Trials & DBS for Pain
- DRG for pain
- Peripheral Stim for pain
- MRgFUS for pain
- Radiofrequency ablation for pain
- DBS and Future Treatments for pain

(PA) (PN) 12:45–4:15 pm

SYM16B: Peripheral Nerve Surgery: Techniques and Exposure

Course Directors: Rajiv Midha, Robert J. Spinner
Faculty: Justin M. Brown, Amgad S. Hanna, Marie-Noelle Hebert-Blouin, Line G. Jacques, Allan D. Levi, Mark A. Mahan, Elias B. Rizk, Thomas J. Wilson, Eric L. Zager

Agenda Highlights

- Basics of history and physical exam
- Basics of nerve injury and regeneration
- Brachial plexus disorders, anatomy, and exposure
- Upper and lower extremity entrapments
- Peripheral nerve surgery emergencies
- Peripheral Nerve Tumors

(AP) (GE) (RE) 8:00 am–4:15 pm Room: 2014

SYM17: Quality Summit Bundle

Comprised of 2 sessions: SYM17A & SYM17B. Select this option to take both at a discounted rate.

8:00 am–12:00 pm

SYM17A: QI: Implementation and Results

Course Directors: Mohamad Bydon, Jeremy T. Phelps
Faculty: Erica F. Bisson, Zoher Ghogawala, Michael Glantz, Elizabeth B. Habermann, John J. Knightly, Mark E. Shaffrey, Jonathan Slotkin

Agenda Highlights

- Quality Improvement
- Patient Reported Outcomes
- Trial Design
- Evidence based Medicine
- Registry Establishment
- National Benchmarking and MCID
- Cost equations and Risk adjustment

12:45–4:15 pm

SYM17B: Using Big Data to Help Neurosurgeons and Their Patients

Course Directors: Katie Link, Eric K. Oermann
Faculty: Lola B. Chambless, Jason Davies, Mona Flores, Elizabeth B. Habermann, Andriy Myronenko

Agenda Highlights

- Machine learning overview
- Deep neural networks
- Analysis of Administrative Datasets
- Analysis of registry data
- Descriptive analytics
- Translating big data into practice

(GE) 8:00 am–12:00 pm Room: 2007

SYM18: Morbidity and Mortality

Course Directors: Mark E. Shaffrey
Faculty: Judy Huang, Won Kim, Philip V. Theodosopoulos

Agenda Highlights

- Satisfy ABNS MOC requirement for quarterly participation in morbidity and mortality
- Case-based discussion of member submitted complications
- Identify opportunity to surgical technique and systems of care improvement
- Implementing improvements in clinical care
- Creating a no-blame environment for case review

(SP) 12:45–4:15 pm Room: 2012

SYM19: My Worst Spinal Complication: Lessons Learned

Course Directors: Daniel K. Resnick, Luis M. Tumialan
Faculty: Mark H. Bilsky, Richard G. Fessler, Michael W. Groff, Shekar N. Kurpad, Gerald E. Rodts, Hesham M. Soliman, Michael P. Steinmetz, Michael Y. Wang

Agenda Highlights

- Case-based discussion of recent complications
- Complication avoidance in spine surgery
- Complication management in spine surgery

(SF) (TU) 12:45–4:15 pm Room: 2007

SYM20: Modern Approaches to SRS

Course Directors: Gordon Li, Jason P. Sheehan
Faculty: John R. Adler, Iris C. Gibbs, Douglas Kondziolka, David Mathieu, Michael W. McDermott, Hirofumi Nakatomi, Manjul Tripathi, Masaaki Yamamoto

Agenda Highlights

- Stereotactic Radiosurgery for Acoustic Neuromas
- Stereotactic Radiosurgery for Meningiomas
- Stereotactic Radiosurgery for Trigeminal Neuralgia and Other Functional Indications
- Stereotactic Radiosurgery for Brain Metastasis
- Stereotactic Radiosurgery: Guidelines and What the Evidence Supports
- Stereotactic Radiosurgery: Evolutions in the field and the Role of Neurosurgeons

Join us to Watch the Riveting Live SANS Challenge!

Preliminary Rounds: Sunday, October 20,
1:00–3:00 pm **Room 2018**

Championship Round: Tuesday, October 22,
1:45–2:45 pm **Room 2018**

Jackson Memorial Hospital/University of Miami
National Capital Consortium
Ohio State University Hospital

Sidney Kimmel Medical College at Thomas Jefferson
University/TJUH

University of Chicago Department of Neurosurgery
University of Cincinnati Medical Center/College of Medicine
University of Colorado School of Medicine
University of Kansas School of Medicine
University of Kentucky College of Medicine
University of Texas Health Science Center School of Medicine
at San Antonio
University of Washington
Vanderbilt University Medical Center
Wake Forest School of Medicine



SUNDAY, OCTOBER 20 | 4:30–6:30 PM | BALLROOM

GENERAL SCIENTIFIC SESSION I

Presiding Officer: Ganesh Rao

Moderators: Lola B. Chambless, Alexander A. Khalessi

▲ GENERAL SCIENTIFIC SESSION I

SATURDAY

▲ SUNDAY

MONDAY

TUESDAY

WEDNESDAY

4:30–4:41 pm

Welcome to the 2019 CNS Annual Meeting
Ganesh Rao

4:41–4:49 pm

Neurosurgery Update: Cutting Edge in Neuro-oncology
Mitchel S. Berger

4:49–4:57 pm

Neurosurgery Update: Cutting Edge in Spinal Surgery – Prospective Studies versus Registries in the Age of Reason
Zohar Ghogawala

4:57–5:03 pm

Operative Technique Demonstration
Michael T. Lawton

5:03–5:07 pm

Introduction of Controversy: Chronic Traumatic Encephalopathy (CTE)
Joseph C. Maroon

5:07–5:25 pm

Controversies: The Evidence for CTE is Compelling
Julian E. Bailes

5:25–5:43 pm

Controversies: The Evidence for CTE is Underwhelming
Peter Cummings

5:43–5:47 pm

Controversies: Discussion and Outcomes
Joseph C. Maroon

5:47–5:49 pm

Introduction of Brain Tumor Guha Award
Manish K. Aghi

5:49–5:56 pm

Brain Tumor Guha Award Presentation
David H. Gutmann

5:56–5:59 pm

Introduction of Lucy Kalanithi
Anil Nanda and Julie G. Pilitsis



5:59–6:30 pm

FEATURED SPEAKER
A Conversation with Lucy Kalanithi
Lucy Kalanithi



Lucy Kalanithi

will be signing copies of the book “When Breath Becomes Air” immediately following the conclusion of her lecture.



JOIN US AT THE OPENING RECEPTION

6:30–8:30 pm

Moscone West Convention Center – Level 2 Lobby

GUIDELINES AND SUNRISE SCIENCE

7:00–8:30 am Room: 3014

TUMOR SUNRISE SCIENCE AND LATE-BREAKING ABSTRACT SESSION

Moderators: Maryam Rahman, Nader Sanai

For a listing of Sunrise Science and Late-breaking Oral Presentations, please see page 61.

7:00–8:30 am Room: 2014

CEREBROVASCULAR SUNRISE SCIENCE AND LATE-BREAKING ABSTRACT SESSION

Moderators: Jan-Karl Burkhardt, Rohan V. Chitale

For a listing of Sunrise Science and Late-breaking Oral Presentations, please see pages 60-61.

(SP) 7:00–8:30 am Room: 2016

Guidelines for the Management of Metastatic Disease to the Spine: The Evidence

Moderators: Sanjay S. Dhall, John E. O’Toole

Speakers: Kurt M. Eichholz, Benjamin D. Elder, Langston T. Holly, Todd D. McCall, Timothy C. Ryken, Daniel M. Sciubba, Nicholas J. Szerlip

7:00–7:06 am

Introduction

Timothy C. Ryken

7:06–7:20 am

Role of Radiotherapy and Radiosurgery in the Treatment of Patients with Metastatic Spine Disease

Nicholas J. Szerlip

7:20–7:34 am

Role of Combination Surgery and Radiotherapy in the Treatment of Patients with Symptomatic/Asymptomatic Metastatic Spinal Cord Compression

Langston T. Holly

7:34–7:48 am

Pre-Operative Embolization for the Management of Patients with Metastatic Spinal Disease

Kurt M. Eichholz

7:48–8:02 am

Spinal Instability and Risk of Pathological Fracture for Patients with Metastatic Spine Disease

Benjamin D. Elder

8:02–8:16 am

Non-chemotherapeutic Medical Treatment for the Management of Patients with Metastatic Spinal Disease

Daniel M. Sciubba

8:16–8:30 am

Role of Vertebral Augmentation in Patients with Metastatic Spine Disease

Todd D. McCall

(SF) 7:00–8:30 am Room: 3020

Guidelines for DBS for Parkinson’s Disease

Moderators: Clement Hamani, Ahmed M.T. Raslan

Speakers: Kelly D. Foote, Julie G. Pilitsis, Anand I. Rughani, Jason M. Schwalb

7:00–7:17 am

STN Versus GPI Efficacy in Treating Motor Symptoms of PD

Jason M. Schwalb

7:17–7:34 am

STN Versus GPI for Reduction of Dopaminergic Meds, How to Assess This in Your Clinical Practice

Kelly D. Foote

7:34–7:51 am

STN Versus GPI for Dyskinesias and Quality of Life

Clement Hamani

7:51–8:08 am

STN Versus GPI for Concern of Cognitive Decline, Depression, and Quality of Life

Julie G. Pilitsis

8:08–8:25 am

STN Versus GPI in Risk of Surgical Adverse Events

Anand I. Rughani

8:25–8:30 am

Questions and Discussion

(SP) (TR) 7:00–8:30 am Room: 3022

Neurotrauma Debates

Moderators: Odette Harris, David O. Okonkwo

Speakers: Bizhan Aarabi, Ryan S. Kitagawa, Patricia B. Raksin, Christian B. Ricks, Jamie S. Ullman

7:00–7:30 am

An MRI is Necessary In Acute Management of SCI

7:00–7:10 am

Yes

Bizhan Aarabi

7:10–7:20 am

No

Christian B. Ricks

7:20–7:25 am

Rebuttal Supporting the Notion

Bizhan Aarabi

7:25–7:30 am

Rebuttal Opposing the Notion

Christian B. Ricks

7:30–8:00 am

Decompressive Hemicraniectomy Is Here to Stay

7:30–7:40 am

Yes

Jamie S. Ullman

7:40–7:50 am

No

Ryan S. Kitagawa

7:50–7:55 am

Rebuttal Supporting the Notion

Jamie S. Ullman

7:55–8:00 am

Rebuttal Opposing the Notion

Ryan S. Kitagawa

8:00–8:30 am

Hypothermia Is Dead

8:00–8:10 am

Yes

Patricia B. Raksin

8:10–8:20 am

No

Ryan S. Kitagawa

8:20–8:25 am

Rebuttal Supporting the Notion

Patricia B. Raksin

8:25–8:30 am

Rebuttal Opposing the Notion

Ryan S. Kitagawa



SUBSPECIALTY SESSION HIGHLIGHTS KEY		
(AP) ADVANCED PRACTICE PROVIDER	(PE) PEDIATRIC	(SP) SPINE
(CV) CEREBROVASCULAR	(PN) PERIPHERAL NERVES	(SF) STEREOTACTIC AND FUNCTIONAL
(TR) NEUROTRAUMA	(RE) RESIDENT	(TU) TUMOR
(PA) PAIN	(SE) SOCIOECONOMIC	(WINS) WINS

GENERAL SCIENTIFIC SESSION II

Presiding Officer: Steven N. Kalkanis
Moderators: Nader Pouratian, Martina Stippler

8:40–8:48 am
GSS II Kickoff
Steven N. Kalkanis

8:48–8:51 am
Introduction of Shankar Vedantam
Akash J. Patel



8:51–9:13 am
FEATURED SPEAKER
Hidden Brain
Shankar Vedantam



Shankar Vedantam will be

signing copies of his book, “The Hidden Brain” in the CNS Xperience Lounge during the morning beverage break.

9:13–9:18 am
Introduction of Honored Guest
Frederick F. Lang



9:18–9:40 am
Honored Guest Presentation:
Role of Resection for Glioblastoma: Can Technology Overcome Biology?
Raymond Sawaya

9:40–10:40 am
MORNING BEVERAGE BREAK
Visit the Exhibit Hall and enjoy a complimentary cup of coffee!

10:00–10:30 am
LIVE SURGERY IN THE EXHIBIT HALL
See page 20 for details.

10:40–10:46 am
Operative Neurosurgery Highlight
Laurence D. Rhines

10:46–10:48 am
CNS Foundation Update
Elad I. Levy



10:48–10:55 am
Japanese CNS Presidential Address
Yukihiro Sonoda

10:55–11:01 am
CNS Resident Award Presentation
Ambulation on POD#0 is Associated with Decreased Adverse Events After Elective Lumbar Spine Surgery: Analysis of the Michigan Spine Surgery Improvement Collaborative (MSSIC)
Hesham M. Zakaria

11:01–11:03 am
Introduction of CNS President
Adam S. Arthur



11:03–11:23 am
Presidential Address:
The Age of Reason for Neurosurgery
Ganesh Rao

11:23–11:26 am
Introduction of Doris Kearns Goodwin
Daniel J. Hoh



11:26 am–12:10 pm
WALTER E. DANDY ORATOR
Leadership in Turbulent Times
Doris Kearns Goodwin

Doris Kearns Goodwin will be signing copies of her book, “Leadership: In Turbulent Times,” in the CNS Xperience Lounge immediately following the conclusion of this session.

MONDAY, OCTOBER 21 | 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, graduate students/post-doctoral scholars, medical students, and advance practice providers). Add a Luncheon Seminar to your profile at registration.

Room: 2001

(RE) M1: Honored Guest Luncheon: Leadership Engagements

Complimentary advanced registration recommended

Speaker: Raymond Sawaya

Room: 2012

(SE) M2: So You've Been Sued... Medical Practice 2019 Update

Moderators: Bharat Guthikonda, Rishi K. Wadhwa

Faculty: Deborah L. Benzil, Lawrence M. Shuer, James T. Tran, Richard N. Wohns

Room: 2003

(CV) M3: Is Intracerebral Hemorrhage a Surgical Disease?

Moderator: J D. Mocco

Faculty: Mark D. Bain, Abel P. Huang, Christopher P. Kellner, Gustavo Pradilla, Lauren Sansing, Alejandro M. Spiotta

Room: 2005



(SP) M4: Cervical Spondylotic Myelopathy—Anterior Versus Posterior

Moderator: Zoher Ghogawala

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

Room: 2007

(SP) (TU) M5: Spinal Tumor Surgery: Case-based Management

Moderators: Joseph S. Cheng, Ziya L. Gokaslan

Faculty: Mark H. Bilsky, Dean Chou, Michelle J. Clarke, Charles Fisher, Ilya Laufer, Paul C. McCormick, Laurence D. Rhines

Room: 2008



(PN) M6: Peripheral Nerve Entrapment Syndromes: Diagnosis and Management

Moderator: Line G. Jacques

Faculty: Jason H. Huang, Mark A. Mahan, Gabriel C. Tender, Christopher J. Winfree, Lynda J. Yang



Look for this image for a SANS exam that accompanies this course and can be purchased on the Annual Meeting registration site.

Room: 2009

(TR) M7: Neurocritical Care: A Multidisciplinary Collaboration

Moderator: Joshua E. Medow

Faculty: Nicholas J. Brandmeir, Kristine O'Phelan, Lori Shutter

Room: 2000

(PE) M8: Pediatric Concussion

Moderator: Susan R. Durham

Faculty: Robert J. Bollo, Meeryo C. Choe, Michael L. Levy, Carolyn Quinsey, Christina M. Sayama

Room: 2010

(TU) M9: Acoustic Neuromas: Current Management Strategies

Moderators: William T. Couldwell, Steven L. Giannotta

Faculty: Frederick G. Barker, Lola B. Chambless, John G. Golfinos, Michael J. Link, Jacques J. Morcos, Marc S. Schwartz

Room: 2011

(TU) M10: Harnessing the Immune System to Treat Brain Tumors

Moderators: Hideho Okada, E. Antonia Chiocca

Faculty: Gavin P. Dunn, Peter Fecci, Amy B. Heimberger, Michael Lim, Yoshitaka Narita

1:45–2:45 pm

AFTERNOON BEVERAGE BREAK

Visit the Exhibit Hall and enjoy a complimentary beverage. Coffee will be served throughout the Exhibit Hall and beer, wine, and snacks will be served in the CNS Xperience Lounge!

Give to the Future of Neurosurgery

Please visit the CNS Foundation booth and silent auction across from registration on Level 1 of Moscone West. Donate today!

The CNS Foundation's philanthropic mission is to improve worldwide patient health by supporting innovative programs that allow neurosurgeons to collaborate globally as researchers, learners, educators, and caregivers. Visit cns.org/Foundation to help us achieve our goals.



Special Session: The FDA: Investigational Device Exemptions, Regulatory Process, and Moving Medical Devices to Patients (Non-CME)

Speakers: Carlos Pena, Mohamad Bydon

The United States (U.S.) Food and Drug Administration (FDA) ensures that patients in the U.S. have access to safe and effective medical devices. The Division of Neurological and Physical Medicine Devices reviews medical devices that interface with the nervous system. This presentation will assist attendees in how to navigate the FDA's regulatory landscape to successfully move medical devices to patients.

- Agency Overview and Organization
- Neurological Medical Device Review and Oversight
- Clinical Overview and Perspectives
- Broader Engagement and Best Practices for FDA Engagement

RE Special Session: ABNS Candidate Case Log: POST (Non-CME)

Course Directors: John J. Knightly, Elad I. Levy

Speakers: Carl Heilman, John J. Knightly, Betsy Koehnen, Elad I. Levy

Session Description: Case reviews are a critical part of the certification process for the ABNS. In this high yield seminar, ABNS officers will provide a detailed yet focused review of how to use ABNS POST, the integrated platform for case submission. Officers will review what case information should be entered, what ABNS officers assess for each case that is submitted, and expectations for the “Cases” part of the oral certification exam.

1:45–1:55 pm

Getting Set Up in ABNS POST to Start Entering Cases

Betsy Koehnen

1:55–2:10 pm

What Case Information Should Be Entered into POST?

Elad I. Levy

2:10–2:25 pm

How an ABNS Director Reviews a POST Case Log

John J. Knightly

2:25–2:40 pm

The “Cases” Section of the Oral Exam

Carl Heilman

2:40–2:45 pm

Questions and Discussion



*Join Us for a Special Presentation by
Dr. Alan Scarrow:*

**Executive Presence and a Glimpse
into the CNS Leadership Institute**

Immediately following: Meet and greet, and book signing of his new release, “Hope over Experience: How Big Data, Automation, and AI Can Fix Healthcare”

Monday, October 21, at 9:40 am
in the Xperience Lounge!



AFTERNOON SESSIONS

SECTION SESSIONS

(SE) 2:45–4:15 pm Room: 3016

COUNCIL OF STATE NEUROSURGICAL SOCIETIES

Achieving High Quality

Moderators: Darlene A. Mayo, Paul L. Penar

Speakers: Anthony L. Asher, Rachel Groman, John J. Knightly, Ahilan Sivaganesan

2:45–2:59 pm

Data to Drive Quality Improvement

Anthony L. Asher

3:00–3:14 pm

How Do I Implement Quality?

John J. Knightly

3:15–3:24 pm

What Does the Government and CMS Think?

Rachel Groman

3:25–3:27 pm

Questions and Discussion

3:27–3:33 pm

Neurosurgery Socioeconomics, Health Policy, and Law Paper of the Year: Drivers of Variability in 90-day Cost for Elective Laminectomy and Fusion for Lumbar Degenerative Disease

Ahilan Sivaganesan

3:33–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 62.

(CV) 2:45–4:15 pm Room: 2014

SECTION ON CEREBROVASCULAR SURGERY

Artificial Intelligence in Cerebrovascular Neurosurgery

Moderator: E. Sander Connolly

Speakers: Sepideh Amin-Hanjani, Hormuzdiyar H. Dasenbrock, Johanna Fifi, Eric K. Oermann, Alejandro M. Spiotta

2:45–2:55 pm

AI in the Management of Acute Stroke

Johanna Fifi

2:55–3:05 pm

AI as a Database Research Tool

Hormuzdiyar H. Dasenbrock

3:05–3:15 pm

AI in Neuroimaging of Acute Neurologic Disease

Eric K. Oermann

3:15–3:25 pm

AI in Clinical Decision Making

Alejandro M. Spiotta

3:25–3:27 pm

Questions and Discussion

3:27 – 3:33 pm

Neurosurgery Cerebrovascular Paper of the Year: Accuracy in Identifying the Source of Subarachnoid Hemorrhage in the Setting of Multiple Intracranial Aneurysms

Sepideh Amin-Hanjani

3:33–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 62.

(SP) 2:45–4:15 pm Room: 2016

SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES

Spine Section Update

Moderators: Domagoj Coric, Michael P. Steinmetz

Speakers: Regis W. Haid, Paul K. Kim, Paul Park, Kevin M. Walsh, Michael Y. Wang

2:45–2:53 pm

Outpatient Degenerative Spine Surgery: Patient Outcomes, Realities, and Finances

Paul K. Kim

2:54–3:02 pm

Pushing the Envelope of Spine Surgery: Update on ERAS, Outpatient Surgery, and Awake TLIFs

Michael Y. Wang

3:03–3:11 pm

Cervical Stenosis Without Myelopathy in Lumbar Pathology Patients: Do We Really Always Need to Decompress the Cervical Spine Before Lumbar Surgery?

Paul Park

3:12–3:20 pm

Cervical Laminectomy and Fusion: Should We Always Go to T1 or is Stopping at C7 Just as Good?

Kevin M. Walsh

3:21–3:28 pm

Interbody Surface Technology Update: Is it Worth the Additional Cost? The Evidence

Regis W. Haid

3:29–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see pages 62-63.

(TR) 2:45–4:15 pm Room: 3022

SECTION ON NEUROTRAUMA AND CRITICAL CARE

Moderators: Ramesh Grandhi, Daniel B. Michael

Speakers: Richard G. Fessler, D. Jay McCracken, J. Marc Simard

2:45–3:05 pm

Charles Tator Lecture – Bench to Bedside to Bench: A Physician-scientists 30-Year Journey in the World of Spinal Cord Injury

Richard G. Fessler

3:05–3:25 pm

Edema in Traumatic Brain Injury

J. Marc Simard

3:25–3:31 pm

Neurosurgery Neurotrauma and Critical Care Paper of the Year: The Intracerebral Hemorrhage Score: A Self-Fulfilling Prophecy?

D. Jay McCracken

3:31–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 63.

(PA) 2:45–4:15 pm Room: 3024

SECTION ON PAIN

Complex Facial Pain: When to Use What

Moderators: Sean J. Nagel, Ahmed M.T. Raslan

Speakers: Sharona Ben-Haim, Sean J. Nagel, Julie G. Pilitsis, Konstantin V. Slavin, Doris D. Wang

2:45–2:55 pm

Characterization of Complex Facial Pain Syndromes

Sharona Ben-Haim

2:56–3:06 pm

Neuromodulation Options for Complex Facial Pain

Konstantin V. Slavin

3:07–3:17 pm

Management of Recurrent TN/Revision MVD

Doris D. Wang

3:18–3:28 pm

When to Use What: Lesioning Versus Decompression Versus Neuromodulation for Complex Facial Pain

Sean J. Nagel

3:28–3:34 pm

Neurosurgery Pain Paper of the Year: Spinal Cord Stimulation for the Treatment of Chronic Pain Reduces Opioid Use and Results in Superior Clinical Outcomes When Used Without Opioids

Julie G. Pilitsis

3:34–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see pages 63-64.

(PE) 2:45–4:15 pm Room: 3018

SECTION ON PEDIATRIC NEUROLOGICAL SURGERY

Pediatric Brain Tumors: Advancements in Molecular Diagnosis and Update on Clinical Trials

Moderators: Toba Niazi, Amanda Muhs Saratsis

Speakers: Paul Klimo, Alyssa Reddy

2:45–3:19 pm

Discussion and Update on Advancements in Pediatric Brain Tumors, the Molecular Basis of Diagnosis, Current and Upcoming Clinical Trials, and Personalized Medicine

Alyssa Reddy

3:20–3:27 pm

Questions and Discussion

3:27–3:33 pm

Neurosurgery Pediatrics Paper of the Year: The Preventable Shunt Revision Rate: A Multicenter Evaluation

Paul Klimo, Jr.

3:33–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 64.

(PN) 2:45–4:15 pm Room: 2018

SECTION ON PERIPHERAL NERVES

Peripheral Nerve Task Force

Moderators: Lukas G. Rasulic, Lynda J. Yang

Speakers: B. Indira Devi, Mark A. Mahan, Wilson Z. Ray

2:45–3:02 pm

Nerve Transfers for Spinal Cord Injury: Results of a Prospective Trial

Wilson Z. Ray

3:03–3:20 pm

Targeted Muscle Reinnervation: Ready for Prime Time?

Mark A. Mahan

3:20–3:26 pm

Neurosurgery Peripheral Nerve Paper of the Year: Novel Findings in Obstetric Brachial Plexus Palsy: A Study of Corpus Callosum Volumetry and Resting-State Functional Magnetic Resonance Imaging of Sensorimotor Network

B. Indira Devi

3:26–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see pages 64-65.

(SF) 2:45–4:15 pm Room: 3020

SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY

The Future of Preoperative Functional Mapping

Moderators: Ellen L. Air, Nitin Tandon

Speakers: Raag Airan, Dario J. Englot, Hui Ming Khoo, Bomin Sun

2:45–2:58 pm

EEG-fMRI and Network-based Mapping for Localizing Epilepsy Foci

Hui Ming Khoo

2:59–3:12 pm

Focused US for Non-invasively Probing Brain Circuits

Raag Airan

3:13–3:26 pm

Connectivity-based Preoperative Functional Mapping to Predict Outcomes

Dario J. Englot

3:27–3:33 pm

Neurosurgery Stereotactic and Functional Paper of the Year: Long-Term Follow-up Study of MRI-Guided Bilateral Anterior Capsulotomy in Patients With Refractory Anorexia Nervosa

Bomin Sun

3:34–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 65.

(TU) 2:45–4:15 pm Room: 3014

SECTION ON TUMORS

Complications in Tumor Surgery: Navigating the Unexpected

Moderators: Wenya L. Bi, Walavan Sivakumar

Speakers: Frederick G. Barker, Mitchel S. Berger, William T. Couldwell, Daniel F. Kelly, Michael A. Vogelbaum

2:45–2:55 pm

Open Skull Base

William T. Couldwell

2:55–3:05 pm

Glioma Tumor Surgery Complications

Mitchel S. Berger

3:05–3:15 pm

Navigating Medicolegal Complications

Frederick G. Barker

3:15–3:25 pm

Endoscopic and Keyhole Surgery Complications

Daniel F. Kelly

3:25–3:28 pm

Questions and Discussion

3:28–3:34 pm

Neurosurgery Tumor Paper of the Year: Phase I Trial of Radiosurgery Dose Escalation Plus Bevacizumab in Patients With Recurrent/Progressive Glioblastoma
Michael A. Vogelbaum

OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION SESSIONS

(SE) 4:15–5:45 pm Room: 3016

CSNS: How to Build a Spine Center

Moderators: James S. Harrop, Anand Veeravagu
Speakers: Khalid M. Abbed, James S. Harrop, Richard N. Wohns

4:16–4:30 pm

Lessons Learned from Working with our Orthopedic Colleagues

James S. Harrop

4:31–4:45 pm

Building a Regional Network

Khalid M. Abbed

4:46–5:00 pm

Lessons on ASCs and Outpatient Surgery

Richard N. Wohns

5:01–5:15 pm

Questions and Discussion

5:16–5:40 pm

Abstract Presentations

For a listing of Oral Presentations, see page 66.

5:41–5:45 pm

Questions and Discussion

(TU) 4:15–5:45 pm Room: 3014

Challenging Skull Based Tumors: Operative Techniques and Case-based Discussions

Moderator: Jacques J. Morcos

Case Discussants: Lola B. Chambless, John G. Golfinos, Anil Nanda, Nelson M. Oyesiku, Marc S. Schwartz

Speakers: Juan C. Fernandez-Miranda, Akihiko Kondo, Soichi Oya

4:16–4:25 pm

Surgeries for Optic Nerve Tumors

Akihiko Kondo

4:26–4:35 pm

Extended Middle Fossa Approach with Anterior Petrosectomy and Anterior Clinoidectomy for Resection of Spheno-Cavernous-Tentorial Meningioma: The Hakuba-Kawase-Dolenc Approach: 3-Dimensional Operative Video

Juan C. Fernandez-Miranda

4:36–4:45 pm

Ultra-Early Optic Nerve Decompression for the Resection of Anterior Clinoidal Meningioma

Soichi Oya

4:46–4:59 pm

Abstract Presentations

For a listing of Oral Presentations, see pages 67-68.

5:00–5:45 pm

Case-based Discussion

3:34–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 65.

(CV) 4:15–5:45 pm Room: 2014

Treating Cerebral Vascular Malformations: Operative Techniques and Case-based Discussions

Moderator: Joshua W. Osburn

Case Discussants: Daniel L. Barrow, C. Michael Cawley, Andrew F. Ducruet, Michael R. Levitt, Min S. Park, Jonathan Russin, Linda Xu, Gregory J. Zipfel

Speakers: Joshua B. Bederson, Jan-Karl Burkhardt

4:16–4:25 pm

A Virtual-reality, 360-degree Fly-through of an Arteriovenous Malformation Resection: 2-dimensional Operative Video

Joshua B. Bederson

4:26–4:35 pm

Combination Superficial Temporal Artery-Middle Cerebral Artery Bypass and M2–M2 Reanastomosis With Trapping of a Stented Distal Middle Cerebral Artery Aneurysm: 3-Dimensional Operative Video

Jan-Karl Burkhardt

4:36–5:00 pm

Abstract Presentations

For a listing of Oral Presentations, see page 66.

5:00–5:45 pm

Case-based Discussion

(SP) 4:15–5:45 pm Room: 2016

Spinal Deformity and MIS Surgery: Operative Techniques and Case-based Discussions

Moderators: Yi Lu, Alfred T. Ogden

Case Discussants: Ali A. Baaj, Tyler R. Koski, Catherine Miller-Simington, Ron I. Riesenburger, Alexander E. Ropper, Charles A. Sansur

Speakers: Rajiv Iyer, Joshua W. Lucas

4:16–4:25 pm

Minimally Invasive Extraforaminal Discectomy Operative Neurosurgery Video

Joshua W. Lucas

4:26–4:35 pm

Use of an Articulating Hinge to Facilitate Cervicothoracic Deformity Correction During Vertebral Column Resection Operative Neurosurgery Video

Rajiv Iyer

4:36–5:00 pm

Abstract Presentations

For a listing of Oral Presentations, see page 66.

5:00–5:45 pm

Case-based Discussion

TR 4:15–5:45 pm Room: 3022
TBI and AI: Operative Techniques and Case-based Discussions

Moderators: Gregory J. Murad, Martina Stippler
Case Discussants: Samuel R. Browd, Ramesh Grandhi, Emily P. Sieg, Eve C. Tsai

4:15–4:39 pm

Abstract Presentations

For a listing of Oral Presentations, see pages 66–67.

4:40–5:45 pm

Case-based Discussion

PA 4:15–5:45 pm Room: 3024
The Case Against Spinal Cord Stimulation: Operative Techniques and Case-based Discussion

Moderators: Gaddum D. Reddy, Jason M. Schwalb
Speakers and Case Discussants: Steven M. Falowski, Wendall B. Lake, Jason M. Schwalb, Konstantin V. Slavin, Christopher J. Winfree

4:17–4:26 pm

Review the Literature that Shows Poor Outcomes/Poor Responders/Placebo Effect

Steven M. Falowski

4:27–4:36 pm

Why Does SCS Fail Long Term

Wendall B. Lake

4:37–4:46 pm

Complications and Patient Complaints

Konstantin V. Slavin

4:47–4:56 pm

Cost Analysis

Jason M. Schwalb

4:57–5:06 pm

Alternatives-revision Spine Surgery: Medications and Marijuana

Christopher J. Winfree

5:06–5:45 pm

Oral Abstract Presentations

5:30–5:45 pm

Case-based Discussion

PE 4:15–5:45 pm Room: 3018
Recurrent Disease in Pediatric Brain Tumors Patients: Case-based Discussions and Operative Techniques

Moderator: Liliانا Goumnerova
Case Discussants: Susan R. Durham, Stephanie Greene, Jason S. Hauptman, Eric M. Jackson, Mark D. Krieger, Amanda M. Saratsis
Speakers: William T. Couldwell, Thomas Santarius

4:16–4:25 pm

Management of Complex Pediatric Chordoma: Transnasal and Bilateral Far-lateral Approach for Resection with O-C4 Fusion: 3-Dimensional Operative Neurosurgery Video

William T. Couldwell

4:26–4:35 pm

Radical, Staged Approach to Extensive Posterior Fossa Pediatric Ependymoma: 3-Dimensional Operative Neurosurgery Video

Thomas Santarius

4:36–4:54 pm

Abstract Presentations

For a listing of Oral Presentations, see page 67.

4:55–5:45 pm

Case-based Discussion

SF 4:15–5:45 pm Room: 3020
Challenging Cases in Epilepsy Surgery: Operative Techniques and Case-based Discussions

Moderator: Joseph S. Neimat
Case Discussants: Ausaf A. Bari, Sharona Ben-Haim, Robert A. McGovern

Speakers: N. U. Farrukh Hameed, Jorge A. Gonzalez-Martinez

4:16–4:25 pm

sEEG Implant Strategies: Operative Neurosurgery Video

Jorge A. Gonzalez-Martinez

4:26–4:35 pm

Perioperative Multimodal Evaluation and Surgical Tactics of Tumor-Related Epilepsy: 2-Dimensional Operative Neurosurgery Video

N. U. Farrukh Hameed,

4:36–5:00 pm

Abstract Presentations

For a listing of Oral Presentations, see page 67.

5:00–5:45 pm

Case-based Discussion

PN 4:15–5:45 pm Room: 2018
Peripheral Nerve: Operative Techniques and Case-based Discussions

Moderators: Rajiv Midha, Robert J. Spinner, Gabriel C. Tender, Eric L. Zager

Discussants: Zarina S. Ali, Justin M. Brown, Amgad S. Hanna, Line G. Jacques, Mark A. Mahan, Shaun T. O'Leary, Christopher J. Winfree

4:15–4:35 pm

Technical Nuances and Cases: Benign Peripheral Nerve Tumors

Moderator: Robert J. Spinner

Discussants: Zarina S. Ali, Line G. Jacques

4:35–4:55 pm

Technical Nuances and Cases: Carpal Tunnel Release (Endoscopic Versus Open)

Moderator: Gabriel C. Tender

Discussants: Mark A. Mahan, Christopher J. Winfree

4:55–5:15 pm

Technical Nuances and Cases: Ulnar Nerve Decompression (Anterior Transposition Versus in Situ)

Moderator: Rajiv Midha

Discussants: Justin M. Brown, Shaun T. O'Leary

5:15–5:35 pm

Technical Nuances and Cases: Meralgia Paresthetica (Neurectomy Versus Decompression)

Moderator: Eric L. Zager

Discussants: Amgad S. Hanna, Line G. Jacques

5:35–5:45 pm

Questions on the Case Discussion

Line G. Jacques, Robert J. Spinner

INTERNATIONAL SYMPOSIA

NEW to the 2019 Scientific Program are three International Symposia, which feature world-renowned neurosurgeons sharing their insights on these cutting-edge topics.

(TU) 5:45–7:15 pm Room: 3001

THE INTERNATIONAL MASTERS SYMPOSIUM ON BRAIN TUMOR SURGERY

Moderators: Mitchel S. Berger, George Samandouras
Speakers: Mitchel S. Berger, Fred Gentili, Takeshi Kawase, George Samandouras, Theodore H. Schwartz

5:45–6:02 pm

USA—Mapping Techniques for Low-grade Gliomas

Mitchel S. Berger

6:03–6:20 pm

Japan—Surgery in the Cavernous Sinus

Takeshi Kawase

6:21–6:38 pm

Canada—Skull Base Meningioma Surgery

Fred Gentili

6:39–6:56 pm

Endoscopic Pituitary Surgery

Theodore H. Schwartz

6:57–7:14 pm

UK—Surgery for Insular Gliomas

George Samandouras

7:14–7:15 pm

Questions and Discussion

(CV) 5:45–7:15 pm Room: 3003

THE INTERNATIONAL CEREBROVASCULAR SYMPOSIUM

Moderators: Miki Fujimura, Clemens M. Schirmer
Speakers: Tomohito Hishikawa, Ichiro Nakagawa, Philipp Taussky

5:45–5:55 pm

Natural History and Management Strategy for Intracranial Aneurysms

Tomohito Hishikawa

5:56–6:10 pm

Endovascular Management of Complex Intracranial Aneurysms

Philipp Taussky

6:11–6:21 pm

Management Strategy for Cervical ICA: Hybrid Surgeon’s Choice

Ichiro Nakagawa

6:22–6:32 pm

Current Status of EC-IC Bypass: New Evidence in Moyamoya Disease

Miki Fujimura

6:33–6:38 pm

Questions and Discussion

6:39–7:15 pm

International Oral Abstract Presentations

For a listing of Oral Presentations, see page 68.

(SF) 5:45–7:15 pm Room: 3002

THE INTERNATIONAL FUNCTIONAL NEUROSURGERY SYMPOSIUM

Moderators: Jorge A. Gonzalez-Martinez, Makoto Taniguchi

Speakers: Masaki Iwasaki, Hui Ming Khoo, Takaomi Taira

5:45–6:00 pm

Current Status and Future Perspective of Epilepsy Surgery in Japan

Masaki Iwasaki

6:01–6:16 pm

Recent Advance in Epilepsy Research

Hui Ming Khoo

6:17–6:32 pm

Stereotactic Lesioning for Dystonia and Movement Disorders

Takaomi Taira

6:33–6:38 pm

Questions and Discussion

6:39–7:15 pm

International Oral Abstract Presentations

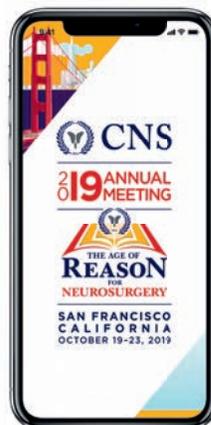
For a listing of Oral Presentations, see page 68.

STAY CONNECTED

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DINNER SEMINAR 2 | MONDAY, OCTOBER 21 | 7:30–9:30 PM

\$190 (includes three-course dinner and beverages)

CV DIN2: Multi-modality AVM Treatment in the Past, Present, and Future

Moderator: E. Sander Connolly

Faculty: Kevin M. Cockroft, Jason Davies, Iris C. Gibbs, Douglas Kondziolka, Babu G. Welch



PROSPECT

Prospect hosts a warm and modern urban environment, with high service standards and exceptional cuisine. The restaurant offers local sustainable, organic ingredients staying consistent with what you would expect from this San Francisco gem.

On Zagat’s Best Restaurant and Best Craft Cocktails lists in SoMa (South of Market neighborhood).

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

DINNER SEMINAR 3 | MONDAY, OCTOBER 21 | 7:30–9:30 PM

\$190 (includes three-course dinner and beverages)

SP DIN3: Navigation and Robotics: Fad or Future?

Moderators: Paul Park, Mark E. Shaffrey

Faculty: Victor W. Chang, Domagoj Coric, Laura A. Snyder, Nicholas Theodore, Juan S. Uribe, Michael Y. Wang



MORTON'S

Enjoy a classic steakhouse experience with perfectly cooked chops and welcoming service at Morton’s. This high-end restaurant is newly renovated and offers an award-winning wine list.

Morton’s Steakhouse is the top-scoring Fine-dining Chain in National Restaurant News’ Consumer Picks of 2016.

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

Visit the CNS Xperience Lounge in the Exhibit Hall

Connect with colleagues, grab a beverage, and see what’s next on your agenda!

- Connect with the CNS Membership Team
- Voices of Neurosurgery: The Unforgettable Moments
- Innovator of the Year Finalists
- Gary Simonds Presentation and Book Signing
- Digital Posters
- NVIDIA: Artificial Intelligence for Neurosurgeons – A Hands-on Demo
- Book signings with Featured Speakers
- Wellness Afternoon: Tuesday at 1:45–2:45 pm
- Meet Honored Guest, Raymond Sawaya, MD
- Alan Scarrow Presentation and Book Signing

For a complete schedule check the CNS Meeting App!

GUIDELINES AND SUNRISE SCIENCE

7:00–8:30 am Room: 2016

SPINE SUNRISE SCIENCE AND LATE-BREAKING ABSTRACT SESSION

Moderators: Nathaniel P. Brooks, Kevin M. Walsh

For a listing of Sunrise Science and Late-breaking Oral Presentations, please see page 70.

7:00–8:30 am Room: 3018

PEDIATRIC SUNRISE SCIENCE AND LATE-BREAKING ABSTRACT SESSION

Moderators: Stephanie Greene, David S. Hong

For a listing of Sunrise Science and Late-breaking Oral Presentations, please see page 71.

7:00–8:30 am Room: 3016

COUNCIL OF STATE NEUROSURGICAL SOCIETIES SUNRISE SCIENCE AND LATE-BREAKING ABSTRACT SESSION

Moderators: Kristopher T. Kimmell, Analiz Rodriguez

For a listing of Sunrise Science and Late-breaking Oral Presentations, please see page 69.

(TU) 7:00–8:30 am Room: 3014

Guidelines on Management on Brain Metastases Update

Moderators: Melanie H. Gephart, Jonathan H. Sherman
Speakers: James B. Elder, Ricardo J. Komotar, Michael A. Vogelbaum, Y. Josh Yamada

7:00–7:05 am

Introduction

7:05–7:25 am

Treatment Strategies for Single Versus Multiple Metastases

Ricardo J. Komotar

7:25–7:45 am

The Tipping Point: When to use SRS Versus WBRT

Y. Josh Yamada

7:45–8:05 am

The Role of Emerging Therapies Including LITT and Brachytherapy: The Need for Clinical Trials

James B. Elder

8:05–8:25 am

Brain Metastasis Guidelines: A Critical Overview

Michael A. Vogelbaum

8:25–8:30 am

Questions and Discussion

(TR) 7:00–8:30 am Room: 3022

The Voice of Reason in Brain Death: From Bedside to the News

Moderators: Kathryn M. Beauchamp, Jamie S. Ullman
Speakers: Justin Davanzo, Flora Hammond, Shaun D. Rodgers, Uzma Samadani

7:00–7:20 am

Status Quo of Brain Death: Guidelines and Protocols

Justin Davanzo

7:20–7:50 am

Behavioral Recovery and Early Decision-making in Disorders of Consciousness

Flora Hammond

7:50–8:10 am

Brain Death in the Media

Uzma Samadani

8:10–8:30 am

Mastering Pediatric Brain Death Determination

Shaun D. Rodgers

SUBSPECIALTY SESSION HIGHLIGHTS KEY

(AP) ADVANCED PRACTICE PROVIDER	(PE) PEDIATRIC	(SP) SPINE
(CV) CEREBROVASCULAR	(PN) PERIPHERAL NERVES	(SF) STEREOTACTIC AND FUNCTIONAL
(TR) NEUROTRAUMA	(RE) RESIDENT	(TU) TUMOR
(PA) PAIN	(SE) SOCIOECONOMIC	(WINS) WINS



TUESDAY, OCTOBER 22 | 8:40 AM–12:10 PM | BALLROOM

GENERAL SCIENTIFIC SESSION III

Presiding Officer: Brian L. Hoh
Moderators: Ashok R. Asthagiri, Jennifer A. Sweet

8:40–8:42 am
Introduction and Disclosures
Brian L. Hoh

8:42–8:45 am
NEUROSURGERY® Publications Update
Nelson M. Oyesiku

8:45–8:51 am
Neurosurgery Top and Spine Paper of the Year: Symptomatic Adjacent Level Disease Requiring Surgery: Analysis of 10-Year Results From a Prospective, Randomized, Clinical Trial Comparing Cervical Disc Arthroplasty to Anterior Cervical Fusion
Allan D. Levi



8:51–9:13 am
Honored Guest Presentation: Evidence-based Medicine Through Development of Home-grown Databases
Raymond Sawaya

9:13–9:15 am
Introduction of Carl Zimmer
Garni Barkhoudarian



9:15–9:40 am
FEATURED SPEAKER
Journey to the Center of the Brain
Carl Zimmer

 Carl Zimmer will be signing copies of his book, “She Has Her Mother’s Laugh: The Powers, Perversions, and Potential of Heredity,” in the CNS Xperience Lounge during the morning beverage break.

9:40–10:40 am
MORNING BEVERAGE BREAK
Visit the Exhibit Hall and enjoy a complimentary cup of coffee!

10:00–10:30 am
LIVE SURGERY IN THE EXHIBIT HALL
See page 20 for details.

10:40–10:44 am
AANS President
Christopher I. Shaffrey

10:44–10:49 am
Washington Committee
Ann R. Stroink

10:49–10:51 am
Introduction of Controversy: Clinical Trials, Ethics, and Stem Cells: Are RCTs Necessary to Validate a Novel Therapy?
Robert E. Gross

10:51–10:59 am
Controversies: RCTs Are Not Necessary and Might Not Be Ethical
Richard G. Fessler

10:59–11:07 am
Controversies: RCTs are Always Necessary for New Therapies
Gary K. Steinberg

11:07–11:12 am
Controversies: Discussion and Outcomes
Robert E. Gross

11:12–11:20 am
Neurosurgery Update: Cutting Edge in NeuroTrauma: Severe TBI Algorithm
Randall M. Chesnut

11:20–11:28 am
Neurosurgery Update: Cutting Edge in Cerebrovascular Surgery
Adnan H. Siddiqui



11:28–11:30 am
Educator of the Year Award Presentation
Neil E. Roundy
Presented by Ganesh Rao



11:30–11:33 am
Distinguished Service Award Presentation
David C. Berg
Presented by Ashwini D. Sharan



11:33–11:36 am
Founder’s Laurel Award Presentation
Daniel L. Barrow
Presented by Ashwini D. Sharan

11:36–11:41 am
SNS Update
Karin M. Muraszko

11:41–11:43 am
Introduction of Bret Stephens
Nicholas C. Bambakidis



11:43–12:10 pm
FEATURED SPEAKER
U.S. Foreign Policy and the World
Bret Stephens

 Bret Stephens will be signing copies of his book, “America in Retreat,” in the CNS Xperience Lounge immediately following the conclusion of this session.

LUNCHEON SEMINARS

All Luncheon Seminars include a plated lunch served in the seminar room. Luncheon Seminar fee is \$95 each (\$75 for residents, fellows, graduate students/post-doctoral scholars, medical students, and advance practice providers). Add a Luncheon Seminar to your profile at registration.

Room: 2001

PA T11: Perioperative Pain Management: Opioids, Non-opioids, and Neurosurgery Advocacy

Moderators: Robert F. Heary, Christopher J. Winfree
Faculty: Victor W. Chang, Joshua M. Rosenow, Jason M. Schwalb, Jennifer A. Sweet

Room: 2003

CV T12: Carotid Artery Disease: Symptomatic/Asymptomatic/Stent/CEA

Moderator: Stacey Q. Wolfe
Faculty: Mark R. Harrigan, Brian T. Jankowitz, Adnan H. Siddiqui, Justin A. Singer, John A. Wilson

Room: 2005

SP T13: Peak Performance: Optimizing the Spine Surgical Patient from Pre-op to Post-op

Moderators: Scott A. Meyer, Laura A. Snyder, Marjorie C. Wang
Faculty: Christopher M. Holland, Luke Macyszyn, Hesham M. Soliman, Michael S. Virk, Robert G. Whitmore

Room: 2007

SP T14: Controversies in Spinal Deformity Surgery

Moderator: Christopher P. Ames
Faculty: Richard G. Fessler, Kai-Ming G. Fu, Robert F. Heary, Justin S. Smith, Jay D. Turner, Juan S. Uribe

Room: 2008

TR T15: Is There an Outcome Worse than Death: Outcome, Palliative Care, and Ethical Considerations in Neurosurgical Care

Moderator: Martina Stippler
Faculty: Nicholas J. Brandmeir, Flora Hammond, Kimberly P. Kicielinski

Room: 2009

TR T16: Patient Specific Goal-directed Therapy in TBI

Moderator: Julian E. Bailes Jr.
Faculty: Randall M. Chesnut, Gregory W.J. Hawryluk, Laura B. Ngwenya, Eiichi Suehiro, Lori Shutter

Room: 2010

SF T17: Clinical Trials in Movement Disorder Surgery

Moderators: Sharona Ben-Haim, Ashwin Viswanathan
Faculty: H. Isaac Chen, John D. Rolston

Room: 2012

TU T18: Management of Pituitary Adenomas and Parasellar Pathology

Moderators: Daniel F. Kelly, Pamela S. Jones
Faculty: Paul A. Gardner, Anand V. Germanwala, Nelson M. Oyesiku, Dimitris G. Placantonakis, Daniel M. Prevedello, Gabriel Zada

Room: 2011

TU T19: Malignant Gliomas: Advances in Surgery and Adjuvant Therapy

Moderators: Jeffrey N. Bruce, James B. Elder
Faculty: E. Antonio Chiocca, Gavin P. Dunn, Constantinos G. Hadjipanayis, Melanie Hayden Gephart

Room: 2000

WINS T20: Beating Press Ganey

Moderator: Ellen L. Air
Faculty: Sharona Ben-Haim, Sheri Dewan, Lauren Ostling

1:00–2:00 pm Room 3002

NEUROSURGERY® PUBLICATIONS: MEET THE EDITORS

Hear from leading voices in scholarly publishing! The NEUROSURGERY® Publications: Meet the Editors Session is open to all attendees free of charge. Attendees will hear from the following editors of leading neurosurgical journals:

Edward C. Benzel, MD

Editor-in-Chief,
World Neurosurgery

Nancy E. Epstein, MD, FACS

Editor-in-Chief,
Surgical Neurology International

Tiit Mathiesen, MD, PhD

Editor-in-Chief,
Acta Neurochirurgica

Nelson M. Oyesiku, MD, PhD, FACS

Editor-in-Chief,
 NEUROSURGERY® Publications

James T. Rutka, MD, PhD

Editor-in-Chief,
 Journal of Neurosurgery Publishing Group

Peter C. Warnke, MD, Dr.med., FRCS

Associate Editor,
Journal of Neurology, Neurosurgery and Psychiatry

1:45–2:45 pm Room: 2018

RESIDENT SANS CHALLENGE CHAMPIONSHIP ROUND



1:45–2:45 pm

AFTERNOON BEVERAGE BREAK

Visit the Exhibit Hall and enjoy a complimentary beverage. Coffee will be served throughout the Exhibit Hall and fresh fruit smoothies will be served in the CNS Xperience Lounge!

2:00–2:45 pm Room: 3001

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. **All Members Welcome!**

TUESDAY, OCTOBER 22

AFTERNOON SESSIONS

SECTION SESSIONS

(SE) 2:45–4:15 pm Room: 3016
COUNCIL OF STATE NEUROSURGICAL SOCIETIES
What Is Value

Moderators: Joseph S. Cheng, Deborah L. Benzil
Speakers: Deborah L. Benzil, John K. Ratliff

2:45–3:03 pm
Value—An Easily Defined Concept
 Deborah L. Benzil

3:04–3:22 pm
Value-based Care
 John K. Ratliff

3:23–3:27 pm
Questions and Discussion

3:27–4:15 pm
Oral Abstract Presentations
For a listing of Oral Presentations, see page 72.

(CV) 2:45–4:15 pm Room: 2014
SECTION ON CEREBROVASCULAR SURGERY
Future Training of the Cerebrovascular Surgeon

Moderators: Judy Huang, Murat Gunel
Speakers: Daniel L. Barrow, C. Michael Cawley, Brian L. Hoh, Louis J. Kim, Elad I. Levy

2:45–2:55 pm
Modern Open Cerebrovascular Training
 Daniel L. Barrow

2:55–3:05 pm
Modern Endovascular Training
 Elad I. Levy

3:05–3:15 pm
Simultaneous Combined Training
 C. Michael Cawley

3:15–3:27 pm
Questions for the Panel

3:27–4:15 pm
Oral Abstract Presentations
For a listing of Oral Presentations, see pages 72-73.

(PN) (SP) 2:45–4:15 pm Room: 2016
SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES

Spine Update: The Evidence
Moderators: Erica F. Bisson, John H. Chi, Eric A. Potts, John H. Shin

Speakers: Dean Chou, Zoher Ghogawala, Praveen V. Mummaneni, William R. Taylor, Juan S. Uribe

2:45–2:53 pm
Lateral Stand-alone Corrects Stenosis and Does Not Subside: The Evidence
 William R. Taylor

2:54–3:02 pm
Lateral Stand-alone Subsides and Fails to Correct Stenosis: The Evidence
 Juan S. Uribe

3:03–3:11 pm
Discussant: Lateral Stand-alone Versus with Posterior Fixation: The Final Analysis
 Dean Chou

3:12–3:20 pm
Degenerative Adult Scoliosis: Is MIS Ready for Prime Time or Should We Really Just Do These Open?
 Praveen V. Mummaneni

3:21–3:29 pm
L4-5 Degenerative Spondylolisthesis with Stenosis: Decompression Only—Are we Just Avoiding the Inevitable Fusion Later?
 Zoher Ghogawala

3:29–4:15 pm
Oral Abstract Presentations
For a listing of Oral Presentations, see page 73.

(SF) (TR) 2:45–4:15 pm Room: 3022

SECTION ON NEUROTRAUMA AND CRITICAL CARE

Neuromodulation for Spinal Cord Injury

Moderators: Ann M. Parr, Craig H. Rabb

Speaker: V. Reggie Edgerton

2:45–3:14 pm

Epidural Stimulation in Patients with Spinal Cord Injury

V. Reggie Edgerton

3:15–3:27 pm

Questions and Discussion

3:28–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see pages 73-74.

(PA) 2:45–4:15 pm Room: 3024

SECTION ON PAIN

Targets Outside the Dorsal Columns for Pain

Moderators: Nicholas Au Yong, Ashwin Viswanathan

Speakers: Ausaf A. Bari, Nicholas M. Boulis, Sameer A. Sheth, Ido Strauss, Ashwin Viswanathan

2:45–2:53 pm

Cingulotomy & Capsulotomy for Pain

Sameer A. Sheth

2:54–3:02 pm

DBS for Pain

Ausaf A. Bari

3:03–3:11 pm

DRG Stimulation for Pain

Ashwin Viswanathan

3:12–3:20 pm

Peripheral Nerve Stimulation

Nicholas M. Boulis

3:21–3:29 pm

Future Therapies for Pain

Ido Strauss

3:29–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 74.

(PE) 2:45–4:15 pm Room: 3018

SECTION ON PEDIATRIC NEUROLOGICAL SURGERY

Post-hemorrhagic Hydrocephalus in Premature Infants: Time for a Paradigm Shift?

Moderators: Sandi Lam, Brandon G. Rocque

Speakers: Edward S. Ahn, Samuel R. Browd

Post-hemorrhagic Hydrocephalus in Premature Infants: Time for a Paradigm Shift?

2:45–3:02 pm

Samuel R. Browd

3:03–3:20 pm

Edward S. Ahn

3:21–3:27 pm

Questions and Discussion

3:27–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see pages 74-75.

(SF) 2:45–4:15 pm Room: 3020

SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY

Stereotactic and Functional Neurosurgery Update

Moderators: Guy M. McKhann, Doris D. Wang

2:45–3:27 pm

Didactic Session is combined with the Neurotrauma and Critical Care Session in Room 3022

3:27–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentation, see page 75.

(TU) 2:45–4:15 pm Room: 3014

SECTION ON TUMORS

Emerging Concepts in the Management of Brain Metastases

Moderators: Albert H. Kim, Gelareh Zadeh

Speakers: Manmeet Ahluwalia, Steven N. Kalkanis, Teddy Kim, Jennifer A. Moliterno Gunel

2:45–2:59 pm

Surgical Management of Mets: Surgery, SRS, WBRT, Evidence, and Case-based Talk

Steven N. Kalkanis

3:00–3:13 pm

Treatment of Recurrent/Refractory Mets and Radiation Necrosis: Redo RT or SRS?

Jennifer A. Moliterno Gunel

3:14–3:27 pm

How Precision Medicine and Immunotherapy are Changing the Management of Mets

Manmeet Ahluwalia

3:28–3:33 pm

Andrew T. Parsa Research Fellowship Presentation: VSV-LASV as Oncolytic Virus Therapy for Glioblastoma

Teddy Kim

3:33–4:15 pm

Oral Abstract Presentations

For a listing of Oral Presentation, see pages 75-76.

OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION SESSIONS

(SE) 4:15–5:45 pm Room: 3016

CSNS: Patient Safety in Neurosurgical Practice

Moderators: Zarina S. Ali, Kristopher T. Kimmell

Speakers: Kristopher T. Kimmell, Brad E. Zacharia

4:16–4:27 pm

Anti-coagulation Protocols

Kristopher T. Kimmell

4:28 pm–4:39 pm

Wrong Side, Wrong Level Protocols

Brad E. Zacharia

4:40–4:51 pm

Safety in Practice

Kristopher T. Kimmell

4:51–5:15 pm

Oral Abstract Presentations

For a listing of Oral Presentation, see page 76.

5:16–5:45 pm

Case Presentations and Discussion

(TU) 4:15–5:45 pm Room: 3014

Challenging Brain Tumors: Operative Techniques and Case-based Discussions

Moderator: Manish K. Aghi

Case Discussants: Mitchel S. Berger, William T. Curry, Frederick F. Lang, Marie Roguski

Speakers: Akihide Kondo, James K. Liu, Ugur Ture

4:16–4:25 pm

Microneurosurgical Removal of a Posterior Thalamic Glioma Via Posterior Interhemispheric Subsplenic Approach in Lateral Oblique Position: Operative Neurosurgery Video

Ugur Türe

4:26–4:35 pm

Operative Nuances for Complex Tumors of the Skull Base: Operative Neurosurgery Video

James K. Liu

4:36–4:45 pm

Reconsideration of the Dolenc Approach

Akihide Kondo

4:45–5:03 pm

Oral Abstract Presentations

For a listing of Oral Presentation, see page 77.

5:04–5:45 pm

Case Presentations and Discussion

(CV) 4:15–5:45 pm Room: 2014

Treating Cerebral Aneurysms: Operative Techniques and Case-based Discussions

Moderator: Scott D. Simon

Case Discussants: Sepideh Amin-Hanjani, Geoffrey P. Colby, Sean D. Lavine, Stavropoula I. Tjoumakaris, Erol Veznedaroglu

Speakers: Elad I. Levy, Leonardo Rangel-Castilla

4:16–4:25 pm

Novel Endovascular Neck Reconstruction and Coiling Technique for the Treatment of a Large Wide-necked Basilar Apex Aneurysm Through a Radial Artery Approach: 2-Dimensional Operative Neurosurgery Video

Leonardo Rangel-Castilla

4:26–4:43 pm

Novel Endovascular Treatment of a Large Basilar Apex Aneurysm with Neck Reconstruction (Barrel Stent) and Coiling Technique: 2-Dimensional Operative Neurosurgery Video

Elad I. Levy

4:44–5:02 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 76.

5:03–5:45 pm

Case Presentations and Discussion

(SP) 4:15–5:45 pm Room: 2016

Cervical and Thoracolumbar Trauma: Operative Techniques and Case-based Discussions

Moderators: Daniel C. Lu, Justin S. Smith

Discussants: Victor W. Chang, Bradley Jacobs, Rod J. Oskouian, Eric A. Potts, Laura A. Snyder, Cheerag D. Upadhyaya, Todd D. Vogel, Lynda J. Yang

Speakers: Christopher P. Ames, Pravin Salunke

4:16–4:25 pm

Safeguarding the Anomalous Vertebral Artery While Dissecting, Drilling, and Instrumentation of C1-2 Joint for Congenital Atlantoaxial Dislocation: 2-Dimensional Operative Neurosurgery Video

Pravin Salunke

4:26–4:35 pm

Proximal Junctional Kyphosis Prevention Strategies: A Video Technique Guide

Christopher P. Ames

4:36–5:00 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 76.

5:00–5:45 pm

Case Presentations and Discussion

(TR) 4:15–5:45 pm Room: 3022

Timing of Spinal Trauma Surgery: Operative Techniques and Case Based Discussions

Moderators: Ann M. Parr, Craig H. Rabb

Discussants: Maya A. Babu, Randy S. Bell, Alan S. Hoffer, Ryan S. Kitagawa, Patricia B. Raksin

4:15–4:39 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see pages 76-77.

4:40–5:45 pm

Case-based Discussion

(PA) 4:15–5:45 pm Room: 3024

Neurosurgery for Pain: Operative Techniques and Case-based Discussions

Moderator: Julie G. Pilitsis

Discussants: Sharona Ben-Haim, Jason M. Schwalb, Jennifer A. Sweet, Christopher J. Winfree

Speakers: Jason M. Schwalb, Ido Strauss

4:16–4:25 pm

Cordotomy for Pain

Jason M. Schwalb

4:26–4:35 pm

Cingulotomy for Pain

Ido Strauss

4:36–4:54 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 77.

4:55–5:45 pm

Case Presentations and Discussion

(PE) 4:15–5:45 pm Room: 3018

Challenges in Recurrent Pediatric Epilepsy: Operative Techniques and Case-based Discussions

Moderator: Gary W. Mathern

Case Discussants: David F. Bauer, Daniel Curry, David D. Gonda, Jeffrey S. Raskin

4:15–4:39 pm

Oral Abstract Presentations

For a listing of Oral Presentations, see page 77.

4:40–5:45 pm

Case Presentations and Discussion

5:45–7:15 pm

Level 2 Lobby

NEW INTERACTIVE MULTIMEDIA RESEARCH PRESENTATION SESSION

Moderators: Sharona Ben-Haim, Erica F. Bisson, Orin Bloch, Nicholas M. Boulis, Justin M. Brown, Mohamad Bydon, Domenic P. Esposito, Melanie Hayden Gephart, Shawn L. Hervey-Jumper, Alan S. Hoffer, Mark D. Krieger, Sandi Lam, Guy M. McKhann, Scott A. Meyer, Ann M. Parr, Julie G. Pilitsis, Dimitri Sigounas, Scott D. Simon, Robert M. Starke

The Interactive Multimedia Research Presentation Session aims to invigorate scientific presentation and discussion and engage attendees with presenters in exciting and compelling conversations. Enjoy a glass of wine and cheese during this interactive session consisting of both mini-oral presentations and posters.

There will be four podium presentation stages integrated throughout the poster area, and selected poster authors will present “mini-podium talks” during the Interactive Multimedia Research Presentation session, highlighting key advances in neurosurgery. Don’t miss this exciting new session!

For a listing of Mini-Podium Oral Presentations, see pages 77-84.

For a listing of Poster Presentations, see pages 92-108.

DINNER SEMINAR 4 | TUESDAY, OCTOBER 22 | 7:30–9:30 PM

\$190 (includes three-course dinner and beverages)

(SF) (TU) DIN4: Advances in LITT

Moderators: Gene H. Barnett, Shabbar F. Danish

Faculty: Robert E. Gross, Jonathan R. Jagid, Alireza M. Mohammadi, Dimitris G. Placantonakis



HARRIS' THE SAN FRANCISCO STEAKHOUSE

Celebrating their 35th year, Harris' continues the rich tradition of luxurious dining in a warm, comfortable, sophisticated environment. Harris' Steakhouse has become a household name in the Bay Area. Their commitment to the classic traditions of an elegant atmosphere, exceptional service, and extraordinary cuisine have made them the San Francisco Steakhouse.

In 2019, Eater San Francisco recognized Harris' as one of the Top 14 Steakhouses in San Francisco. The San Francisco Chronicle recognized Harris' as one of the most beautiful restaurants in San Francisco in 2018.

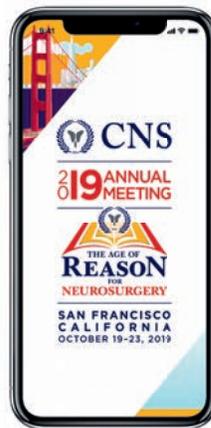
Complimentary shuttle service will depart from the San Francisco Marriott Marquis at 7:15 pm.

STAY CONNECTED

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Visit <https://ativ.me/cns2019>, click on your preferred platform (iOS, Android, or web) and follow the prompts to download.

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GUIDELINES AND SUNRISE SCIENCE

7:00–8:30 am Room: 3024

PAIN SCIENCE AND LATE-BREAKING ABSTRACT SESSION

Moderators: Ausaf A. Bari, Sharona Ben-Haim

For a listing of Sunrise Science and Late-breaking Oral Presentations, please see page 85.

7:00–8:30 am Room: 3020

STEREOTACTIC AND FUNCTIONAL SUNRISE SCIENCE AND LATE-BREAKING ABSTRACT SESSION

Moderators: Emad N. Eskandar, Jon T. Willie

For a listing of Sunrise Science and Late-breaking Oral Presentations, please see page 86.

CV 7:00–8:30 am Room: 2014

Cerebrovascular Guidelines: Aneurysms, Arteriovenous Malformations, and Acute Ischemic Stroke

Moderators: Scott D. Simon, Stavropoula I. Tjoumakaris

Speakers: Sepideh Amin-Hanjani, Mark D. Bain, Kevin M. Cockroft, Aaron S. Dumont, J D. Mocco, Clemens M. Schirmer, Babu G. Welch, Stacey Q. Wolfe

7:00–7:30 am

Guidelines for the Treatment of Cerebral Arteriovenous Malformations

7:00–7:10 am

Natural History and Management of Unruptured AVMs

Sepideh Amin-Hanjani

7:10–7:20 am

Management of Ruptured AVMs

Clemens M. Schirmer

7:20–7:30 am

Management of Dural AVFs

Stacey Q. Wolfe

7:30–8:00 am

Guidelines for the Treatment of Cerebral Aneurysms

7:30–7:40 am

Screening, Natural History, and Medical Management

Aaron S. Dumont

7:40–7:50 am

Indications and Outcomes of Surgery for Cerebral Aneurysms

Kevin M. Cockroft

7:50–8:00 am

Indications and Outcomes of Endovascular Surgery for Cerebral Aneurysms

Babu G. Welch

8:00–8:15 am

Guidelines for the Neurosurgical Treatment of Acute Ischemic Stroke: Update on Trials

J D. Mocco

8:15–8:30 am

Guidelines for the Neurosurgical Treatment of Spontaneous Intraparenchymal Hemorrhage: Update on Trials

Mark D. Bain

TU 7:00–8:30 am Room: 3014

Guidelines for Management of Glioblastoma

Moderators: S. Kathleen Bandt, Ricardo J. Komotar

Speakers: Mitchel S. Berger, Susan M. Chang, Ali Jalali, Eric C. Leuthardt, Taiichi Saito, Adam M. Sonabend

7:00–7:15 am

Active Surgical Clinical Trials

Adam M. Sonabend

7:15–7:30 am

Surgical Update on Glioblastoma Genetics

Ali Jalali

7:30–7:45 am

Re-evaluating the Evidence for Extent of Resection in Glioblastoma

Mitchel S. Berger

7:45–8:00 am

Recommended Practices for Neuro-monitoring in Glioblastoma

Taiichi Saito

8:00–8:15 am

Evidence for LITT in Glioblastoma

Eric C. Leuthardt

8:15–8:30 am

Personalized Medicine and Chemotherapy in the Management of Glioblastoma

Susan M. Chang

TR SP 7:00–8:30 am Room: 2016

Brain and Spine Trauma Guidelines—What you Need to Know

Moderators: Paul M. Arnold, Patricia B. Raksin

Speakers: Randall M. Chestnut, John H. Chi, Sanjay S. Dhall, R. John Hurlbert, Daniel M. Sciubba, Emily P. Sieg, Michael F. Stiefel, Eve C. Tsai

7:00–7:10 am

BTF Guidelines 4: Are They Still Useful? Next steps

Randall M. Chestnut

7:10–7:20 am

ICP and Decompressive Craniectomy According to the 4th Edition Guidelines

Emily P. Sieg

7:20–7:30 am

Guideline for Reversal of Antithrombotics in Intracranial Hemorrhage

Michael F. Stiefel

7:30–7:40 am

Update on NOACs Not in the Guidelines

Eve C. Tsai

7:40–7:50 am

Thoracolumbar Spine Trauma Operative Versus Non-operative Treatment

Daniel M. Sciubba

7:50–8:00 am

Timing of Surgical Intervention in Spine Trauma

John H. Chi

8:00–8:10 am

Hemodynamics and Spinal Cord Perfusion in SC

Sanjay S. Dhall

8:10–8:20 am

Pharmacologic Treatment of Acute Spinal Cord Injury

R. John Hurlbert

8:20–8:30 am

Questions and Discussion



**THANK YOU
PREMIER PARTNER**

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SUBSPECIALTY SESSION HIGHLIGHTS KEY

ⓐ ADVANCED PRACTICE PROVIDER

ⓐ CEREBROVASCULAR

ⓐ NEUROTRAUMA

ⓐ PAIN

ⓐ PEDIATRIC

ⓐ PERIPHERAL NERVES

ⓐ RESIDENT

ⓐ SOCIOECONOMIC

ⓐ SPINE

ⓐ STEREOTACTIC AND FUNCTIONAL

ⓐ TUMOR

ⓐ WINS

THANK YOU
INDUSTRY AMBASSADOR

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GENERAL SCIENTIFIC SESSION IV

Presiding Officer: Elad I. Levy

Moderators: Maya A. Babu, Praveen V. Mummaneni

8:40–8:43 am
Introduction and Disclosures
Elad I. Levy

8:43–8:50 am
**Operative Neurosurgery Highlight:
The Role of Endoscopic Endonasal
Approaches for the Surgical
Management of Anterior Skull Base
Meningiomas**
Daniel M. Prevedello



8:50–9:12 am
**Honored
Guest Presentation:
The Evolving
Landscape and
Management of
Brain Metastases**
Raymond Sawaya

9:12–9:15 am
Introduction of Rebecca Skloot
Brian V. Nahed



9:15–9:40 am
**JOHN THOMPSON
HISTORY OF
MEDICINE LECTURE**
Rebecca Skloot

Rebecca Skloot will be signing copies of the book, “The Immortal Life of Henrietta Lacks,” in the CNS Xperience Lounge during the morning beverage break.

9:40–10:40 am
MORNING BEVERAGE BREAK
Visit the Exhibit Hall and enjoy a complimentary cup of coffee!

10:00–10:30 AM
**LIVE SURGERY
IN THE EXHIBIT HALL**
See page 20 for details.

10:40–10:43 am
**Announcement of SANS Challenge
Winners, Top Posters, and Residency
Program Abstract Competition
Winners**
Maya A. Babu

10:43–10:46 am
**Announcement of Innovator of
the Year**
Lola B. Chambless

10:46–10:49 am
**Preview of 2020 CNS Annual
Meeting in Miami**
Steven N. Kalkanis

10:49–10:51 am
**Introduction of Controversy:
Low-grade Glioma Management**
Manish K. Aghi

10:51–10:59 am
**Controversies: Supramaximal
Resection**
Hugues Duffau

10:59–11:07 am
**Controversies: A Conservative
Approach to Low-grade Gliomas**
Gelareh Zadeh

11:07–11:11 am
**Controversies: Discussion and
Outcomes**
Manish K. Aghi

11:11–11:19 am
**Neurosurgery Update: Cutting Edge
in Stereotactic and Functional:
Dramatic Clinical Improvement on
Children Affected by AADC Mutation
after MR-guided AAV2-AADC Gene
Therapy into the Midbrain**
Krystof S. Bankiewicz

11:19–11:26 am
**Central Atlantoaxial Instability –
Changing Paradigm in
Craniovertebral Junction Surgery**
Atul H. Goel

11:26–11:31 am
Update from the ABNS
Carl B. Heilman

11:31–11:33 am
Introduction of Aaron Carroll
Mohamad Bydon



11:33 am–12:10 pm
**FEATURED
SPEAKER
Healthcare in
the U.S.**
Aaron Carroll

Meet Aaron Carroll in the CNS Xperience Lounge immediately following the conclusion of this session!

LUNCHEON SEMINARS

All Luncheon Seminars include a plated lunch served in the seminar room. Luncheon Seminar fee is \$95 each (\$75 for residents, fellows, graduate students/post-doctoral scholars, medical students, and advance practice providers). Add a Luncheon Seminar to your profile at registration.

Room: 2001

(CV) W21: Middle Meningeal Artery Embolization for Subdural Hematoma Treatment

Moderator: Christopher P. Kellner
Faculty: Bradley N. Bohnstedt, Peter Kan, Jared Knopman, Adnan H. Siddiqui

Room: 2003

(CV) W22: Contemporary and Practical Management of an Enigmatic Process: Cerebral Vasospasm (Delayed Cerebral Ischemia)

Moderator: Brian M. Howard
Faculty: Spiros L. Blackburn, Peng R. Chen, R. Loch Macdonald, Matthew Reynolds, Edgar Samaniego

Room: 2010

(SP) W23: Novel Techniques for Management of Lumbar Spendylolisthesis

Moderators: Noojan Kazemi, Randy Kritzer
Faculty: Deb A. Bhowmick, Nathaniel P. Brooks, John H. Chi, John H. Shin

Room: 2011

(TR) W24: TBI in the Elderly

Moderator: Daniel B. Michael
Faculty: Gary Abrams, Jack Jallo, Emily P. Sieg, Eve C. Tsai

Room: 2005

(SE) W25: Neurosurgeon Entrepreneur

Moderators: John R. Adler, Jeremy T. Phelps
Faculty: Nandan Lad, Ramin Rak, Edie E. Zusman

Room: 2012

(PE) W26: Chiari Malformations

Moderator: David D. Limbrick
Faculty: Ulrich Batzdorf, David M. Frim, Jeffrey R. Leonard, Karin M. Muraszko

Room: 2007

(SF) W27: Clinical Trials in Epilepsy Surgery

Moderator: Aviva Abosch
Faculty: Jorge A. Gonzalez-Martinez, Robert E. Gross, Timothy H. Lucas

Room: 2008

(TU) W28: Update on Diagnosis and Management of Low Grade Gliomas

Moderators: Susan M. Chang, Viviane S. Taber
Faculty: Cameron W. Brennan, Daniel P. Cahill, Jennifer A. Moliterno Gunel, Daniel A. Orringer

Room: 2009

(TU) W29: Advanced Imaging in Brain Tumors

Moderator: Shawn L. Hervey-Jumper
Faculty: S. Kathleen Bandt, Sunit Das, Alexandra J. Golby, Javier E. Villanueva-Meyer, Masahiko Wanibuchi

Room: 2000

(WINS) (GE) (AP) (RE) W30: Branding and Social Media in your Practice

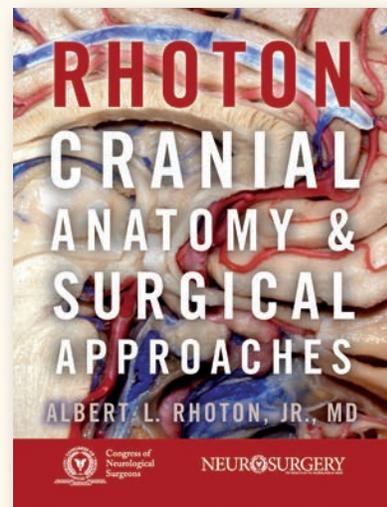
Moderator: Isaac Yang
Faculty: Christopher S. Graffeo, Michael E. Ivan, Carrie R. Muh, Faith C. Robertson, Linda Xu

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1:45–3:15 pm Room: 2016
SPINE AFTERNOON SCIENCE ABSTRACT SESSION
Moderators: Yi Lu, Laura A. Snyder
For a listing of Oral Presentations, please see pages 87-88.

1:45–3:15 pm Room: 3020
CRANIAL AFTERNOON SCIENCE ABSTRACT SESSION
Moderators: Isabelle M. Germano, Sean D. Lavine
For a listing of Oral Presentations, please see pages 86-87.

1:45–3:15 pm Room: 3022
NEUROTRAUMA AFTERNOON SCIENCE ABSTRACT SESSION
Moderators: Ronald A. Torres, Sarah Woodrow
For a listing of Oral Presentations, please see pages 88-89.

1:45–3:15 pm Room: 3024
LATE-BREAKING ABSTRACT SESSION
Moderators: Orin Bloch, Michael S. Virk
For a listing of Oral Presentations, please see pages 89-90.

1:45–4:45 pm Room: 2014
ADVANCED ENDOSCOPIC AND EXOSCOPIC NEUROSURGERY SEMINAR
Course Directors: William T. Curry, Brian V. Nahed
Faculty: John A. Boockvar, Christopher J. Farrell, Juan C. Fernandez-Miranda, Paul A. Gardner, Constantinos G. Hadjipanayis, Peter Nakaji, Shaan M. Raza



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ORAL ABSTRACT PRESENTATIONS MONDAY, OCTOBER 21



SUNRISE SCIENCE ORAL PRESENTATIONS SESSION
Room 2014

7:00–7:06 am

300 Wall Enhancement in Evolving Cerebral Aneurysms on MR Vessel Wall Imaging
Shunsuke Omodaka, Hidenori Endo, Kuniyasu Niizuma, Miki Fujimura, Takashi Inoue, Toshiki Endo, Teiji Tominaga

7:06–7:12 am

301 Lessons Learned from the Initial Experience with Pedicled Temporoparietal Fascial Flap for Combined Revascularization in Moyamoya Angiopathy: A Case Series
Kristine Ravina, Paul Kim, Robert Rennert, Erik M. Wolfswinkel, Ben A. Strickland, Joseph Carey, Jonathan Russin

7:12–7:18 am

302 Cost-Effectiveness Analysis of Active Surveillance for Small Asymptomatic Intracranial Aneurysms
David M. Panczykowski, Clark Veet, Natasha Parekh, Spiros L. Blackburn

7:18–7:24 am

303 Identification of PPIL4 as a Disease Causing Gene in Intracranial Aneurysms and its Role in Vertebrate CNS Specific Angiogenesis
Tanyeri Barak, Adife Gulhan Ercan Sencicek, Danielle F. Miyagishima, Octavian Henegariu, Ketu Mishra Gorur, Kaya Bilguvar, Murat Gunel

7:24–7:30 am

304 Decreased Time to Evacuation Improves Long-term Functional Outcome in Minimally Invasive Endoscopic Intracerebral Hemorrhage Evacuation
Christopher P. Kellner, Rui Song, Dominic A. Nistal, Ian T. McNeill, Hasitha M. Samarage, Jacopo Scaggiante, Neha S. Dangayach, Joshua B. Bederson, J D. Mocco

7:30–7:36 am

305 Metabolite Profiling the Cerebral Spinal Fluid in Subarachnoid Hemorrhage: Insights into Patient Outcomes.
Matthew J. Koch, Zsuzsanna Ament, Christina Hansen, Matthew Bevers, Christopher J. Stapleton, Aman B. Patel, W. Taylor Kimberly

7:36–7:42 am

306 The R2eD AVM Score: A Novel Predictive Tool for Arteriovenous Malformation Presentation with Hemorrhage.
James Feghali, Wuyang Yang, Risheng Xu, Jason Liew, Cameron G. McDougall, Justin M. Caplan, Rafael J. Tamargo, Judy Huang

7:42–7:48 am

307 Frailty Predicts Decreased Survival, More Complications, and Higher Hunt & Hess and Fisher Scores following an Aneurysmal Subarachnoid Hemorrhage
Matthew McIntyre, Vikas Patel, Andrew Long, Alex Vonhoof, Boyi Li, Adil Afridi, Mohamed Halabi, Fawaz Al-Mufti, Chirag D. Gandhi, Justin G. Santarelli, Meic H. Schmidt, Chad D. Cole, Christian A. Bowers

7:48–7:54 am

308 The Efficacy and Safety of Middle Meningeal Artery Embolization in the Management of Chronic Subdural Hematomas: Systematic Review and Meta-analysis
Fareed Jumah, Muhammad Osama, Abdurrahman Islam, Ammar Jumah, Devi Prasad Patra, Vinatak Narayan, Rimal Hanif H. Hanif

7:54–8:00 am

309 Inverse National Trends in Decompressive Craniectomy versus Endovascular Thrombectomy for Stroke
Nicolas K. Khattar, Beatrice Ugiliweneza, Mayur Sharma, Enzo Fortuny, Shawn W. Adams, Kimberly Sue Meyer, Maxwell Boakye, Robert F. James, Dale Ding

8:00–8:06 am

900 Increasing the Utility of Administrative Databases for Clinical Research of Stroke Patients Treated with a Mechanical Thrombectomy
Pious D. Patel, Sanjana Salwi, Campbell Liles, Akshitkumar Mistry, Eva Mistry, Rohan V. Chitale, Matthew Fusco, Chevis N. Shannon

8:06–8:12 am

901 Middle Meningeal Artery Embolization for Chronic Subdural Hematoma: A Multi-center Experience of 160 Consecutive Embolizations
Peter Kan, Georgios Maragkos, Aditya Srivatsan, Visish M. Srinivasan, Jeremiah N. Johnson, Jan-Karl Burkhardt, Stephen Chen, Christopher S. Ogilvy, Justin M. Moore, Howard A. Riina, Omar Tanweer, Elad I. Levy, Alejandro M. Spiotta, Sami A. Kasab, Bradley A. Gross, Brian T. Jankowitz, Jacob Cherian, C. Michael Cawley, Brian M. Howard, Alexander A. Khalessi, Aditya S. Pandey, Andrew J. Ringer, Ricardo A. Hanel, Rafael A. Ortiz, David J. Langer, Michael Levitt, Ajith J. Thomas

8:12–8:18 am

902 Stereotactic Direct-coiling of Intracranial Aneurysms
Arun-Angelo Patil, Sidharta Kumar, Megha Jacob

8:18–8:24 am

903 Utility of CT Angiography of the Head in Patients with Intracerebral Hemorrhage
Richard J. Garling, Bryan Lieber, Catherine Peterson, Shiwei Huang, Ari D. Kappel, Miles Hudson, Hassan A. Fadel, Robert R. Johnson, II

8:24–8:30 am

904 The Flow Redirection Intraluminal Device (FRED) for Cerebral Aneurysms of the Posterior Circulation: A Subgroup Analysis of the EuFRED Registry

Christoph J. Griessenauer, Markus Möhlenbruch, Philipp Hendrix, Christian Ulfert, Naci Kocer, Civan Islak, Michael Sonnberger, Tobias Engelhorn, Erasmia Müller-Thies-Broussalis, Thomas Finkensteller, Markus Holtmannspötter, Jan-Hendrik Buhk, Wolfgang Reith, Andreas Simgen, Hendrik Janssen, Monika Killer-Oberpfalzer



SUNRISE SCIENCE ORAL PRESENTATIONS SESSION

Room 3014

7:00–7:06 am

310 High Sensitivity and Specificity Detection of Protoporphyrin IX Fluorescence in GBM by Means of Simultaneous 2-photon Microscopy and Stimulated Raman Histology

Constantinos G. Hadjipanayis, Alexandros Bouras, Joe Gerald Jesu Raj, Dominique Bozec, Daniel Rivera

7:06–7:12 am

311 Genomic Analysis of Temozolomide-Related Hypermutation in Adult Diffuse Glioma

Anzhela D. Moskalik, Floris P. Barthel, Kevin C. Johnson, Roel Verhaak

7:12–7:18 am

312 Stem Cell Delivery of Oncolytic Adenovirus DNX-2401 Following Surgical Resection for the Treatment of Glioblastoma in a Murine Model

Sricharan Gopakumar, Joy Gumin, Marc Daou, Daniel Ledbetter, Brittany Parker-Kerrigan, Frederick F. Lang

7:18–7:24 am

313 Combination Therapy with Anti-PD-1 and Anti-BTLA Results in a Synergistic Therapeutic Effect Against Murine Glioblastoma

John Choi, Laura Saleh, Ayush Pant, Denis Routkevitch, Luqing Tong, Young-Hoon Kim, Yuanxuan Xia, Christopher M. Jackson, Christina Jackson, Michael Lim

7:24–7:30 am

314 Pro-tumoral Effects of Intra-tumoral Neutrophils in the Glioblastoma Microenvironment

Sumedh S. Shah, Garima Yagnik, Alan T. Nguyen, Harsh Wadhwa, Jordan Spatz, Michael Safaee, Justin Cheng, Manish K. Aghi

7:30–7:36 am

315 Regulation of Amino Acid Transport in Glioma

Stephanie Robert, Robyn Umans, Joelle Martin, Harald Sontheimer

7:36–7:42 am

316 Targeting TIP1 Results in Cytotoxic and Radiosensitizing Effects in Cancer

David Yaw Amoah Dadey

7:42–7:48 am

317 Multiplatform Molecular Profiling of Vestibular Schwannoma Reveals 2 Subgroups of Tumors with Distinct Radiographic Features and a Methylation-based Predictor of Local Recurrence

Jonathan D. Breshears, S. John Liu, Harish Vasudevan, Melike Pekmezci, Maria G. Castro, Ursula Lang, William Chen, Abrar Choudhury, Stephen T. Magill, Steve Braunstein, Chetna Gopinath, Jean L. Nakamura, Penny Sneed, Arie Perry, Michael W. McDermott, Javier E. Villanueva-Meyer, David R. Raleigh, Philip V. Theodosopoulos

7:48–7:54 am

BEST DATA SCIENCE AWARD

318 Predicting Growth Trajectory in Vestibular Schwannoma from Radiomic Data Using Supervised Machine Learning Techniques

Conor Grady, Hesheng Wang, Zane Schnurman, Tanxia Qu, Douglas Kondziolka

7:54–8:00 am

319 The Impact of Insulin-like Growth Factor Index and Biological Effective Dose on Outcomes After Stereotactic Radiosurgery for Acromegaly

Christopher S. Graffeo, Diane Donegan, Dana Erickson, Paul D. Brown, Avital Perry, Michael J. Link, William F. Young, Jr., Bruce E. Pollock

8:00–8:06 am

905 The Natural Growth Rate of Metastatic Cancer to the Brain

Andrew J. Kobets, Phillip C. Cezayirli, Ryan Holland, Rose Fluss, Reid Backus, Patrick A. Lasala

8:06–8:12 am

906 Precision Targeting Therapy of Malignant Brain Tumor by a Local Interstitial Delivery System Loading with a Small Molecule Drug^yFirst in Human Trial

Shinn-Zong (John) Lin, Tsung-Lang Chiu, Sheng-Tzung Tsai, Horng-Jyh Harn, Sheng-Huang Lin, Yi-Fen Wang, Pao-Hui Tseng, Tzyy-Wen Chiou, Pei-Wen Chou, Hsin-I Ma

8:12–8:18 am

907 Brain Tumor Organoid (BTO) Platform as a Unique Tool in Discovery of Novel Therapy Approaches and Stratifying Treatment Regimens

Dorota Lubanska, Swati Kulkarni, Mohamed A.R. Soliman, Abdalla Shamisa, Ana DeCarvalho, Alexander Rodzinka, Adit Nyayachavadi, Simon Rondeau-Gagné, Lisa Porter

8:18–8:24 pm

908 Mini Beam Radiation Treatment- Final Report of a Randomized Phase III Study of Treating Canine De-novo Brain Tumors - New Kid on the Block

Vijayananda Kundapur, Monique Mayer, Andrew Alexander, Sheldon Wiebe, Narinder Sidhu, Gavin C. Sargison, Susan L. Kraft

8:24–8:30 am

909 The CREB-binding Protein Inhibitor ICG-001 Underlying a Promising Therapeutic Strategy in NF2-associated Meningiomas

Hongda Zhu, Jiaojiao Deng, Lingyang Hua, Shuchen Sun, Ye Gong

GENERAL SCIENTIFIC SESSION II

Ballroom

10:53–11:00 am

CNS RESIDENT AWARD

100 Ambulation on POD#0 is Associated with Decreased Adverse Events After Elective Lumbar Spine Surgery: Analysis of the Michigan Spine Surgery Improvement Collaborative (MSSIC)

Hesham M. Zakaria, Rachel J. Hunt, Theresa A. Elder, Michael Bazydlo, Lonni Schultz, Muwaffak Abdulhak, David Nerenz, Victor W. Chang, Jason M. Schwalb

COUNCIL OF STATE NEUROSURGICAL SOCIETIES ORAL PRESENTATIONS

Room 3016

3:33–3:39 pm

101 Patterns of Opioid and Benzodiazepine Use in Opioid-Naïve Patients With Newly Diagnosed Low Back and Lower Extremity Pain

Tej D. Azad, Yi J. Zhang, Martin N. Stienen, Daniel Vail, Jason Bentley, Allen L. Ho, Paras Fatemi, Lily H. Kim, Anand Veeravagu, John K. Ratliff

3:39–3:45 pm

102 Enhanced Peri-operative Care Decreases Cost after Major Spinal Surgery

Daniel A. Carr, Rajiv Saigal, Armagan Dagal

3:45–3:51 pm

103 The Impact of Hospital Safety-Net Burden on Outcomes for Primary Supratentorial Brain Tumor Surgery

Oliver Y. Tang, Anna Kimata, Steven A. Toms

3:51–3:57 pm

104 Medico-legal Implications of Video Recording Patient-provider Communication

Komal Naeem, Malika Bhargava, Randall W. Porter

3:57–4:03 pm

105 Regional Variation in 90-day Postoperative Costs Among Patients Undergoing Posterior Lumbar Fusion (PLF): Insights from the OPTUM Labs Data Warehouse (OLDW)

Panagiotis Kerezoudis, Mohammed A. Alvi, Anshit Goyal, Yagiz U. Yolcu, Stephanie Payne, Lindsey Sangaralingham, Molly Jeffery, Mohamad Bydon

4:03–4:09 pm

106 Impact of CMS Non-Reimbursement on Hospital-Acquired Conditions Following Spine Procedures

Layton Lamsam, Michael Zhang, Marc Carmichael, Hriday Bhambvani, Ian D. Connolly, Tina Hernandez-Boussard, Anand Veeravagu, John K. Ratliff

SECTION ON CEREBROVASCULAR SURGERY ORAL PRESENTATIONS

Room 2014

3:33–3:39 pm

GALBRAITH AWARD

107 Stereotactic Radiosurgery for Pediatric Brain Arteriovenous Malformations: Long-Term Outcomes

Ching-Jen Chen, Cheng-Chia Lee, Kathryn N. Kearns, Dale Ding, Douglas Kondziolka, L. Dade Lunsford, Jason P. Sheehan

3:39–3:45 pm

108 Blockade of the Platelet-driven CXCL7-CXCR1/2 Pathway Prevents Cerebral Aneurysm Formation

Kamil W. Nowicki, Michael P. D'Angelo, Wendy Fellows-Mayle, Michael M. McDowell, Robert M. Friedlander

3:45–3:51 pm

109 Inflammation in Murine Aneurysm Healing: The Role of CXCL1

Devan Patel, Kartik Motwani, Koji Hosaka, Brian L. Hoh

3:51–3:57 pm

110 Treatment of Acutely Ruptured Cerebral Aneurysms with the Woven EndoBridge (WEB) Flow Disruptor: A Multicenter Experience

Fadi Al Saiegh, David M. Hasan, Nikolaos Mouchtouris, Mario Zanaty, Nohra Chalouhi, Ritam Ghosh, Ahmad Sweid, Stavropoula I. Tjoumakaris, M. Reid Gooch, Robert H. Rosenwasser, Pascal Jabbour

3:57–4:03 pm

111 Preventing Microthrombi Formation Improves Function After Subarachnoid Hemorrhage in Mice

Hussein Zeineddine, Spiros L. Blackburn, Remya Veettil, Kanako Matsumura, Devin McBride

4:03–4:09 pm

112 Small Aneurysms with Low Rupture Risk Account for a Majority of Subarachnoid Hemorrhage

Caleb Rutledge, Soren Jonzson, Ethan A. Winkler, Kunal P. Raygor, Michael T. Lawton, Adib A. Abla

SECTION ON DISORDERS OF THE SPINE ORAL PRESENTATIONS

Room 2016

3:29–3:35 pm

113 Addition of Fusion to Decompression for Grade I Degenerative Lumbar Spondylolisthesis is Associated with Greater Patient-Reported Outcome Improvements at 24-Month Follow-Up: A Multicenter Study Using the Quality Outcomes Database

Jian Guan, Erica F. Bisson, Mohamad Bydon, Mohammed A. Alvi, Steven D. Glassman, Kevin T. Foley, Eric A. Potts, Christopher I. Shaffrey, Mark E. Shaffrey, Domagoj Coric, John J. Knightly, Paul Park, Michael Y. Wang, Kai-Ming G. Fu, Jonathan R. Slotkin, Anthony L. Asher, Michael S. Virk, Panagiotis Kerezoudis, Regis W. Haid, Andrew Kai-Hong Chan, Praveen V. Mummaneni

3:35–3:41 pm

114 Trends in Spine Surgery Training During Neurological and Orthopedic Surgery Residency: A Ten-Year Analysis of ACGME Case Log Data

Martin H. Pham, Andre M. Jakoi, Arvin R. Wali, Lawrence Lenke

3:41–3:47 pm

115 Towards Opioid-Free Elective Spine Surgery: A Prospective Cohort Study

Ahilan Sivaganesan, Amanda Wright, Regis W. Haid, Jr., Praveen V. Mummaneni, Richard Berkman

3:47–3:53 pm

116 The Impact of Preoperative Mindfulness-Based Stress Reduction on Postoperative Patient-Reported Pain, Disability, Quality of Life, and Prescription Opioid Use in Lumbar Spine Degenerative Disease: 3- and 12-Month Results

Juneyoung L. Chavez, Christina A. Porucznik, Lisa H. Gren, Jian Guan, Evan Joyce, Darrel S. Brodke, Andrew T. Dailey, Mark A. Mahan, Robert S. Hood, Brandon Lawrence, William R. Spiker, Nicholas T. Spina, Erica F. Bisson

3:53–3:59 pm

117 Changes in the Operative Corridor in Oblique Lumbar Interbody Fusion Between Pre-operative Imaging and Intraoperative Cone-beam Computed Tomography Using Morphometric Analysis

Aqib Zehri, Hector E. Soriano-Baron, Wesley Hsu, Matthew Neal, Jonathan L. Wilson

3:59–4:05 pm

118 Sexual Dysfunction: Prevalence and Prognosis in Patients Operated for Degenerative Lumbar Spondylolisthesis

Andrew K. Chan, Erica F. Bisson, Kai-Ming G. Fu, Paul Park, Leslie Robinson, Mohamad Bydon, Steven D. Glassman, Kevin T. Foley, Christopher I. Shaffrey, Eric A. Potts, Mark E. Shaffrey, Domagoj Coric, John J. Knightly, Michael Y. Wang, Jonathan Slotkin, Anthony L. Asher, Michael S. Virk, Panagiotis Kerezoudis, Mohammed A. Alvi, Jian Guan, Regis W. Haid, Praveen V. Mummaneni

4:05–4:11 pm

119 Complications of Robotic Spine Surgery

Daniel Myers, Gordon Mao, Alexander K. Yu, Donald M. Whiting

SECTION ON NEUROTRAUMA AND CRITICAL CARE ORAL PRESENTATIONS

Room 3022

3:31–3:37 pm

120 Long Term Prognosis of Severe Traumatic Brain Injured Patients Using Acute Phase Neurophysiology Testing

Joshua S. Bauer, David M. Panczykowski, Ava Puccio, David O. Okonkwo, Jeffrey Balzer, Phillip Choi, Benjamin Zusman

3:37–3:43 pm

121 Brain Derived Neurotrophic Factor (BDNF) Val66Met Single Nucleotide Polymorphism (rs6265) is Associated with Decreased Functional Outcome After Traumatic Brain Injury: A Multicenter Cohort Study

John K. Yue, Ethan A. Winkler, Hansen Deng, Ryan R. L. Phelps, Ankush Chandra, Mary J. Vassar, David M. Schnyer, Ava Puccio, Hester F. Lingsma, Esther Yuh, Pratik Mukherjee, Alex B. Valadka, David O. Okonkwo, Geoffrey T. Manley

3:43–3:49 pm

122 Early Versus Late Surgical Decompression for Acute Spinal Cord Injury: An Individual Patient Data Meta-Analysis of 1,548 Patients

Jetan H. Badhiwala, Christopher D. Witiw, Jefferson R. Wilson, Michael G. Fehlings

3:49–3:55 pm

123 MRI Tracking of iPS Cells-Induced Neural Stem Cells in Traumatic Brain Injury Rats

Hailiang Tang

3:55–4:01 pm

124 The Hematoma Evacuation Score: Reducing 30-day Postoperative Mortality in Intracranial Subdural and Epidural Hematomas

Andrew K. Rock, Nora T. Poulos, Matthew T. Carr, Alper Dincer, Charles F. Opalak, William C. Broaddus

4:01–4:07 pm

125 Traumatic Brain Injury as a Risk Factor for Dementia: An 18-Year, Two Institution Clinical Experience

Elisabetta Mezzalana, Brittany M. Stopa, Ajaz Khawaja, Saef Izzy, William B. Gormley

4:07–4:13 pm

THINKFIRST INJURY PREVENTION RESEARCH AWARD

126 Developing an Adjunct to an Electronic Medical Records System in a Developing Country: Establishing the First Electronic Traumatic Brain Injury Database in Yangon, Myanmar

Aung Thurein Win, Su Myat Moe, Nang Saw Myat Hnin Aye, Aye Mya Phyu, Thet Maung Maung, Ei Ei Khaing, Zayya Naung, Karam P. Asmaro, Kyi Hlaing, Win Myaing, Tyler Prentiss, Robert J. Dempsey, Jack P. Rock

SECTION ON PAIN ORAL PRESENTATIONS

Room 3024

3:34–3:40 pm

RONALD R. TASKER YOUNG INVESTIGATOR AWARD

127 Defining the Somatotopy of the Human Spinothalamic Tract: CT Guided Mapping and Physiologic Responses in Patients Undergoing Awake Percutaneous Cervical Cordotomy

Michael Honey, Zurab Ivanishvili, Christopher Honey, Manraj S. Heran

3:40–3:46 pm

128 Randomized, Double-Blind Trial of Evoked Compound Action Potential (ECAP)-Controlled Closed-Loop Spinal Cord Stimulation for Patients with Chronic Trunk and/or Limb Pain

Steven M. Falowski

3:46–3:52 pm

129 The Impact of Preventative Multimodal Analgesia on Postoperative Opioid Requirement and Pain Control in Patients Undergoing Lumbar Fusions

Sharad Rajpal, Steven L. Hobbs, Ewell L. Nelson, Alan T. Villavicencio, Christopher Zielenski, Kara D. Beasley, Vinod Kantha, Jamie Mesenbrink, Sigita Burneikiene

3:52–3:58 pm

130 Prescriber Aimed Intervention to Optimize Opioid Prescribing Patterns After Intracranial Surgery: Addressing the Nation’s Opioid Epidemic and Decreasing the Neurosurgeon’s Narcotic Footprint

Karam P. Asmaro, Sameah A. Haider, Ankush Chandra, Edwin Telemi, Tarek R. Mansour, Hesham M. Zakaria, Adam M. Robin, Ian Y. Lee, Ellen L. Air, Jack P. Rock, Steven N. Kalkanis, Jason M. Schwalb

3:58–4:04 pm

131 Trends in Utilization and Cost of Spinal Cord Stimulation Surgery: Insights from the National Inpatient Sample Database, 2008 to 2014

Anshit Goyal, Archis Bhandarkar, Mohammed A. Alvi, Yagiz U. Yolcu, Mohamad Bydon

4:04–4:10 pm

132 Radiosurgery to the Spinal Dorsal Root Ganglion Induces Fibrosis and Inhibits Peripheral Glial Cell Activation While Preserving Axonal Neurotransmission

Ezequiel Goldschmidt, Wendy Fellows-Mayle, Ajay Niranjani, John Flickinger, L. Dade Lunsford, Peter C. Gerszten

SECTION ON PEDIATRIC NEUROLOGICAL SURGERY ORAL PRESENTATIONS

Room 3018

3:33–3:39 pm

133 Intraoperative Detection of Pediatric Brain Tumor Margins Using Raman Spectroscopy.

Rashad Jabarkheel, Jonathon J. Parker, Chi-Sing Ho, Travis Shaffer, Sanjiv Gambhir, Gerald A. Grant, Derek W. Yecies

3:39–3:45 pm

134 Exome Sequencing Implicates SWI/SNF Chromatin Remodeling Genes in Human Congenital Hydrocephalus.

August A. Allocco, Sheng C. Jin, Weilai Dong, Xue Zeng, Sierra B. Conine, Charuta G. Furey, Priya P. Date, Jonathan Gaillard, Carol Nelson-Williams, Ashley Dunbar, Tyrone DeSpensa, Jr., Engin Deniz, Mustafa K. Khokha, Richard P. Lifton, Kristopher T. Kahle

3:45–3:51 pm

135 Intraventricular Hemorrhage Induces Rapid Calcium Signaling and Transcriptional Changes in the Developing Choroid Plexus

Cameron Sadegh, Huixin Xu, Frederick Shipley, Neil Dani, Maria K. Lehtinen

3:51–3:57 pm

136 Risk of Subsequent Primary Cancers After External Beam Radiotherapy Treatment of Pediatric Low Grade Gliomas: A SEER Analysis 1973-2015

Adrian Rodrigues, Michael C. Jin, Adela Wu, Gordon Li, Gerald A. Grant

3:57–4:03 pm

137 The Effectiveness of Medical and Surgical Treatment for Children with Refractory Epilepsy

Melissa LoPresti, Iwen Pan, Dave Clarke, Sandi Lam

4:03–4:09 pm

138 Pediatric Firearm-related Traumatic Brain Injury in United States Trauma Centers

Hansen Deng, John K. Yue, Ethan A. Winkler, Sanjay S. Dhall, Geoffrey T. Manley, Phiroz E. Tarapore

SECTION ON PERIPHERAL NERVES ORAL PRESENTATIONS

Room 2018

3:26–3:32 pm

139 Integrated Multi-Omics Characterization of Neurofibromatosis Type 1 Related Peripheral Nerve Sheath Tumors Identifies Two Distinct Malignant Peripheral Nerve Sheath Tumors Subtypes with SHH or WNT Pathway Activation

Suganth Suppiah, Jeff Liu, Qingxia Wei, Yasin Mamatjan, Pardeep Heir, Farshad Nassiri, Sheila Mansouri, Kenneth Aldape, Gelareh Zadeh

3:32–3:38 pm

140 Mineral Coated Microparticle Sutures Impregnated with GDNF (Glial Derived Neurotrophic Factor) and NGF (Nerve Growth Factor) Improve Axonal Growth and Functional Recovery in Rat Sciatic Nerve Injuries

Clayton Haldeman, Amgad S. Hanna

3:38–3:44 pm

141 Functional Restoration of Elbow Flexion in Non-Obstetric Brachial Plexus Injuries: A Meta-Analysis of Nerve Transfers Versus Grafts

Pavlos Texakalidis, Nathan Hardcastle, Muhibullah S. Tora, Nicholas M. Boulis

3:44–3:50 pm

142 Imaging Predictors for Significant Lower Motor Neuron Injury in Traumatic Cervical Spinal Cord Injury

Mehrnoosh Gorjian, Justin M. Brown

3:50–3:56 pm

143 Neuralgic Amyotrophy : Clinical and Epidemiological Features from a Spine Neurosurgeon’s Perspective

Yong-Jun Cho, Museung Park, Suk H. Kang

3:56–4:02 pm

144 Fascicle Sparing Capsular Resections of Atypical Neurofibromas in Neurofibromatosis 1

Charlie Nelson, Eva Dombi, Jared S. Rosenblum, Markku Miettinen, Tanya Lehky, Patricia Whitcomb, Christina Hayes, Gretchen Scott, Sarah Benzo, Brigitte Widemann, Prashant Chittiboina

4:02–4:08 pm

145 One Year Follow-Up of a Randomized, Double-Blind, Placebo-Controlled Trial of Percutaneous Peripheral Nerve Stimulation for Chronic Neuropathic Pain Following Amputation

Joshua M. Rosenow, Christopher Gilmore, Brian M. Ilfeld, Sean Li, Mehul J. Desai, Corey Hunter, Richard Rauck, Leonardo Kapural, Antoun Nader, John Mak, Steven P. Cohen, Nate Crosby, Josh W. Boggs

4:08–4:14 pm

146 Functional Recovery via Preregenerated Nerve Graft in Rat Sciatic Nerve Injury Model

Umang Khandpur, Ying Yan, Wilson Z. Ray, Matthew R. MacEwan

SECTION IN STEREOTACTIC AND FUNCTIONAL NEUROSURGERY ORAL PRESENTATIONS

Room 3020

3:34–3:40 pm

147 Early Feasibility Study of a Neurostimulator to Create Artificial Vision

Nader Pouratian, Daniel Yoshor, Soroush Niketeghad, Jessy Dorn, Robert Greenberg

3:40–3:46 pm

148 Distributed Global Functional Connectivity Networks Predict Responsiveness to L-DOPA and Subthalamic Deep Brain Stimulation

Chengyuan Wu, Thomas Foltynie, Patricia Limousin, Ludvic Zrinzo, Harith Akram

3:46–3:52 pm

STEREOTACTIC AND FUNCTIONAL NEUROSURGERY RESIDENT AWARD

149 A Fully Implantable Brain Machine Interface for Volitional Hand Grasp Restoration in Cervical Quadriplegia

Iahn Cajigas, Noeline W. Prins, Sebastian Gallo, Jasim A. Naeem, Santiago Guerra, Brandon Parks, Anne Palermo, Audrey Wilson, Letitia Fisher, Steven Vanni, Michael E. Ivan, Abhishek Prasad, Jonathan R. Jagid

3:52–3:58 pm

150 Tackling Big Data in Human Intracranial EEG Recordings

Patrick J. Karas, John F. Magnotti, Zhengjia Wang, Daniel Yoshor, Michael S. Beauchamp

3:58–4:04 pm

151 Thalamic Arousal Network Disturbances in Temporal Lobe Epilepsy and Improvement After Surgery

Dario J. Englot, Srijata Chakravorti

4:04–4:10 pm

152 Sphenopalatine Ganglion Stimulation Upregulates Transport of Intra-arterial Temozolomide Across the Blood-Brain Barrier

Thana N. Theofanis, Ankit Rochani, Richard F. Schmidt, Michael J. Lang, Geoffrey Stricsek, Gagan Kaushal, Lorraine Iacovitti, Ashwini D. Sharan, Robert H. Rosenwasser

SECTION ON TUMORS ORAL PRESENTATIONS

Room 3014

3:34–3:40 pm

ROSENBLUM-MAHALEY CLINICAL RESEARCH AWARD

153 First in Human Phase I Trial of Dual Vector (HSV1-TK, Flt3L) Immunotherapy for the Treatment of Newly Diagnosed High-Grade Glioma: Initial Results

Daniel A. Orringer, Oren Sagher, Jason Heth, Shawn L.

Hervey-Jumper, Aaron Mammoser, Larry Junck, Denise Leung, Yoshie Umemura, Theodore Lawrence, Michelle Kim, Dan Wahl, Paul McKeever, Sandra Camelo-Piragua, Andrew Lieberman, Sriram Venneti, Kait Verbal, Karen Sagher, Patrick Dunn, Daniel Zamler, Vivek Yadav, Andrea Comba, David Altshuler, L. Zhao, Karin M. Muraszko, Maria G. Castro, Pedro Lowenstein

3:40–3:46 pm

JOINT SECTION ON TUMOR NEURO-ONCOLOGY TRAINEE AWARD

154 Combination Immune Treatment of a Highly Aggressive Orthotopic Murine Glioblastoma with Checkpoint Blockade Inhibition and Neoantigen Vaccination

Connor Liu, Maximilian Schaettler, Jay Bowman-Kirigin, Diane Bender, Dale K. Kobayashi, Chris A. Miller, Tanner M. Johanns, Gavin P. Dunn

3:46–3:52 pm

AMERICAN BRAIN TUMOR ASSOCIATION YOUNG INVESTIGATOR AWARD

155 BiTE-armored CAR T Cells Overcome Antigen Escape from EGFRvIII-Targeted Therapy for Glioblastoma

Bryan D. Choi, Xiaoling Yu, Ana P. Castano, Amanda A. Bouffard, Andrea Schmidts, Rebecca C. Larson, Stefanie R. Bailey, Angela C. Boroughs, Matthew J. Frigault, Mark B. Leick, Irene Scarfo, Curtis L. Cetrulo, Shadmehr Demehri, Brian V. Nahed, Daniel P. Cahill, Hiroaki Wakimoto, William T. Curry, Bob S. Carter, Marcela V. Maus

3:52–3:58 pm

PREUSS RESEARCH AWARD

156 Immuno-stimulatory Effects of Mechanical and Thermal High Intensity Focused Ultrasound

James Wang, Chin-Hsin Huang, Oscar H. Echeagaray, Siamak Amirfakhri, Sarah L. Blair, William C. Trogler, Andrew C. Kummel, Clark C. Chen

3:58–4:04 pm

JOINT SECTION SKULL BASE SURGERY AWARD

157 Dural Venous Sinus Thrombosis After Vestibular Schwannoma Surgery: The Anticoagulation Dilemma

Bledi C. Brahimaj, Andre Beer-Furlan, Fred C. Crawford, Ravi S. Nunna, Matthew Urban, Gary Wu, Eric Abello, Vikrant Chauhan, Mehmet Kocak, Richard M. Wiet, Richard W. Byrne

4:04–4:10 pm

INTEGRA FOUNDATION AWARD

158 Candidate Regulatory Elements in Coding and Noncoding Regions are Associated with Invasive Behavior in Pituitary Tumors

Karam P. Asmaro, Maritza S. Mosella, Michael Wells, Thais Sabedot, Tathiane Malta, Kevin Nelson, James Snyder, Ana DeCarvalho, Abir Mukherjee, Dhananjay Chitale, Todd Aho, Adam M. Robin, Mark L. Rosenblum, Tom Mikkelsen, Laila Poisson, Ian Y. Lee, Tobias Walbert, Arti Bhan, Steven N. Kalkanis, Jack P. Rock, Houtan Noushmehr, Anavaleria Castro

CSNS CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3016

5:16–5:22 pm

400 Disparities in Patient Outcomes After Elective Lumbar Fusions in Single-Level Lumbar Disc Pathologies
Abhinav K. Reddy, Philip B. Ostrov, James S. Ryoo, Soobin Kim, Ankit Indravadan Mehta

5:22–5:28 pm

401 A Multidisciplinary Spine Clinic Model Significantly Reduces Lead Times for Appropriate Specialist Visit and Appropriate Intervention in an Underserved Population: A Case Control Pilot Study
Michael Longo, Yaroslav J. Gelfand, Andrew I. Gitkind, Reza Yassari, Vijay Yanamadala

5:28–5:34 pm

402 The Potential Effect of Racial Disparities on Outcomes After Spine Surgery: A Michigan Spine Surgery Improvement Collaborative (MSSIC) Study
Mohamed Macki, Michael Bazydlo, Hesham M. Zakaria, Lonni Shultz, Jad Khalil, Mick J. Perez-Cruet, Ilyas Aleem, Paul Park, David Nerenz, Jason M. Schwalb, Muwaffak Abdulhak, Victor W. Chang

5:34–5:40 pm

403 Cervical Spine Surgery: Improved Surgical Outcomes Using Enhanced Recovery After Surgery (ERAS) Pathways
Ryan P. Monaghan, Mary K. Robertson, Scott C. Robertson



CEREBROVASCULAR OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 2014

4:36–4:42 pm

404 Use of Virtual Reality Platforms in the Preoperative Planning and Intraoperative Navigation of Deep-seated Cavernomas
Carolina Gesteira-Benjamin, Omar Tanweer, Monica Mureb, Keiji Drysdale, Timothy M. Shepherd, John G. Golfinos, Howard A. Riina

4:42–4:48 pm

405 Direct Access Embolization of Intracranial Vascular Pathology: Preliminary Experience and Technical Notes
Min S. Park, Daniel Raper, Stepan Capek, Jeffrey Hakim, David Asuzu, M. Yashar S. Kalani

4:48–4:54 pm

406 Morphometric Comparison of the Pterional Trans-sylvian and the Pretemporal Trans-clinoidal Approaches to Posterior Communicating Artery Aneurysms: Anatomical Study
Jaafar Basma, Kenneth Moore, Tarek Abuelem, Khaled Krisht, L. Madison Michael, II, Ali F. Krisht

4:54–5:00 pm

407 Accessing the Medial Surface of the Paraclinoid Internal Carotid Artery via the Contralateral Inter-optic Trajectory: An Anatomical Study
Xiaochun Zhao, Ali Tayebi-Meybodi, Mohamed Labib, Evgenii Belykh, Leandro Borba Moreira, Sirin Gandhi, Peter Nakaji, Mark C. Preul, Michael T. Lawton

SPINE OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 2016

4:36–4:42 pm

408 Outcomes of Surgical Treatment for 138 Patients with Severe Sagittal Deformity at a Minimum 2-Year Follow Up

Justin K. Scheer, Lawrence Lenke, Justin S. Smith, Peter G. Passias, Han Jo Kim, Shay Bess, Themistocles Protopsaltis, Douglas C. Burton, Eric Klineberg, Virginie Lafage, Frank Schwab, Christopher I. Shaffrey, Sr., Christopher P. Ames

4:42–4:48 pm

409 C2 versus C3 as the Upper Instrumented Vertebra for Cervicothoracic Posterior Laminectomy and Fusion Demonstrate Equivalent Postoperative Outcomes
Ryan K. Badiee, Andrew Kai-Hong Chan, Joshua Rivera, Chih-Chang Chang, Dean Chou, Praveen V. Mummaneni, Lee A. Tan

4:48–4:54 pm

410 Preoperative SPECT Imaging as a Tool for Surgical Planning in Patients with Axial Neck and Back Pain
G. Damian Brusko, Roberto Perez-Roman, Harold Tampano, Michael Y. Wang

4:54–5:00 pm

411 A Comparison of Minimally Invasive and Open Transforaminal Lumbar Interbody Fusion for Grade 1 Degenerative Lumbar Spondylolisthesis: An Analysis of the Prospective Quality Outcomes Database
Andrew Kai-Hong Chan, Erica F. Bisson, Mohamad Bydon, Steven D. Glassman, Kevin T. Foley, Christopher I. Shaffrey, Eric A. Potts, Mark E. Shaffrey, Domagoj Coric, John J. Knightly, Paul Park, Michael Y. Wang, Kai-Ming G. Fu, Jonathan Slotkin, Anthony L. Asher, Michael S. Virk, Panagiotis Kerezoudis, Mohammed A. Alvi, Jian Guan, Regis W. Haid, Praveen V. Mummaneni

NEUROTRAUMA OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3022

4:15–4:21 pm

412 Important Predictors of In-hospital Mortality in Patients with Acute Subdural Hematomas using Machine Learning
Aaron McPheters, Andrew Donovan, Nicolas K. Khattar, Jacob R. Shpilberg, Kevin John, Quan H. Do, Daniella Patton, Emily P. Sieg

4:21–4:27 pm

413 Prognostic Value of Admission Parameters in a Machine Learning Predictive Model in Patients with Severe Traumatic Brain Injury and Acute Subdural Hematomas

Kevin John, Aaron McPheters, Andrew Donovan, Nicolas K. Khattar, Jacob R. Shpilberg, Quan H. Do, Emily P. Sieg

4:27–4:33 pm

414 Augmented Reality Systems for Improved Operating Room Workflow

Nhu Q. Nguyen, Jillian Cardinell, Joel Ramjist, Yuta Dobashi, Dimitrios Androustos, Victor Xiao Dong Yang

4:33–4:39 pm

415 Segmentation and Measurement of Ventricular and Cranial Vault Volumes in 15,223 Subjects Using Artificial Intelligence

Georgios Maragkos, Sasank Chilamkurthy, Santiago Gomez-Paz, Mohamed M. Salem, Swetha Tanamala, Pooja Rao, David Hackney, Ajith J. Thomas

PAIN OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3024

5:06–5:12 pm

416 Flat Panel Fluoroscopy (O-arm) Guided Percutaneous Radiofrequency Anterolateral Cordotomy.

Zaid Aljuboori, Joseph Samir Neimat

5:12–5:18 pm

417 Bi-Plane Fluoroscopic-Guided Balloon Rhizotomy for Trigeminal Neuralgia: A Technical Note

Awais Vance, Tarek Youssef El Ahmadi, Zachary Christian, Salah G. Aoun, Samuel L. Barnett, Jonathan A. White

5:18–5:24 pm

418 Complex Regional Pain Syndrome and Failed Back Surgery Syndrome with Failed High-Frequency Spinal Cord Stimulation Salvaged with Arthrodesis Revision Surgery and Burst Therapy.

Erin McCormack, Mansour H. Mathkour, Lora Wallis-Kahn, Maged Guirguis, Gassan Chaiban, Reda Tolba, Daniel Denis

5:24–5:30 pm

419 Onyiuke Grading Scale: A Clinical Classification System for the Diagnosis and Management of Bertolotti Syndrome

Joshua Knopf, Subin Lee, Ketan R. Bulsara, Hilary C. Onyiuke, David B. Choi, Isaac Moss

PEDIATRICS OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3018

4:36–4:42 pm

420 True FISP Cardiac Gated CSF Flow Dynamic Imaging of Chiari Malformation

Alon Kashanian, Moise Danielpour

4:42–4:48 PM

421 Autologous Partial Thickness Calvarial Graft Sphenocrianioplasty for Congenital Transsphenoidal Encephalocele

M. Burhan Janjua, Gopi B. Shah, Dale Swift

4:48–4:54 pm

422 Laser and the Tuber: Thermal Dynamic and Volumetric Factors Influencing Seizure Outcomes in Pediatric Subjects with Tuberous Sclerosis Undergoing Stereoecephalography-directed Laser Ablation of Tubers

Michael A. Stellon, Kelsey D. Cobourn, Matthew Whitehead, Nancy Elling, William McClintock, Chima Oluigbo

STEREOTACTIC AND FUNCTIONAL OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3020

4:36–4:42 pm

424 Stereotactic ROBOT-assisted Deep Brain Stimulation Workflow: Incorporating the ROSA-Brain System into the Functional Neurosurgical Practice

Amir H. Faraji, Vasileios Kokkinos, James C. Sweat, Robert M. Richardson

4:42–4:48 pm

425 Vagal Nerve Stimulator Lead Revision Using Needle-Tip Cautery: Case Series, Literature Review, and Technical Note

Vyacheslav I. Makler, Erin D'Agostino, David F. Bauer

4:48–4:54 pm

426 Robotic Orthogonal Implantation of Responsive Neurostimulation (RNS) Depth Electrodes in Patients with Unilateral Mesial Temporal Lobe Seizure Onset

Alvin Y. Chan, Sumeet Vadera

4:54–5:00 pm

427 Accuracy of SEEG Electrodes Implanted in Lateral Position Versus Supine Position

Caio M. Matias, Sandeep Kandregula, Chengyuan Wu, Ashwini D. Sharan

TUMOR OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3014

4:45–4:51 pm

428 Minimally Invasive Endoscopic Keyhole Approach for Meningiomas

Tadashi Watanabe

4:51–4:57 pm

429 Extra-arachnoidal Dissection for Excision of Giant Vestibular Schwannomas: Improved Facial Nerve Preservation

Sunil K. Gupta

4:57–5:03 pm

430 Step-wise Algorithm for Skull Base Reconstruction in Endoscopic Endonasal Surgery: From the Simple to the Complex

Maria Belen Vega, Philippe Lavigne, Vanessa Hernandez-Hernandez, Aldo Eguiluz-Menendez, Eric Wang, Carl H. Snyderman, Paul A. Gardner

5:03–5:09 pm

431 Surgical Nuances of Endoscopic Endonasal Upper Clivectomy for Radical Resection of Central Skull Base Tumors: 2-Dimensional Operative Videos

Alhusain Nagm, Takeo Goto, Kenji Ohata

THE INTERNATIONAL CEREBROVASCULAR SYMPOSIUM ORAL PRESENTATIONS

Room 3003

6:39–6:45 pm

500 Analysis of Gene Expression in Intracranial Aneurysms

Jia Wang

6:45–6:51 pm

501 Comparative Effectiveness of Preventive and Treatment Interventions for Cerebral Hyperperfusion Syndrome Following Bypass Surgery

Georgios P. Skandalakis, Aristotelis Kalyvas, Evgenia Lani, Spyridon Komaitis, Despoina Chatzopoulou, Danai Manolakou, Nikos Pantazis, Georgios A. Zenonos, Constantinos G. Hadjipanayis, George S. Stranjalis, Christos Koutsarnakis

6:51–6:57 pm

BEST INTERNATIONAL BASIC SCIENCE

502 Association of SOX17 Gene Polymorphisms and Intracranial Aneurysm: A Case-Control Study and Meta-analysis

Museung Park, Yong-Jun Cho, Jin Sue Jeon

6:57–7:03 pm

503 Clinical Significance of Conversion from Computational Fluid Dynamics to Morphology for Risk Evaluation of Aneurysm Recurrence After Coiling

Kouichi Misaki, Iku Nambu, Takehiro Uno, Akifumi Yoshikawa, Naoyuki Uchiyama, Mitsutoshi Nakada

7:03–7:09 pm

504 Application of Intraoperative Electrocorticography in Precise Bypass Surgery of Adult Moyamoya Disease: A Preliminary Study

Yu Lei

THE INTERNATIONAL FUNCTIONAL NEUROSURGERY SYMPOSIUM ORAL PRESENTATIONS

Room 3002

6:39–6:45 pm

505 Mesial Temporal Lobe Epilepsy: Role of Reelin Signalling Pathway

Tulika Gupta, Mandeep Kaur, Navneet Singla, Bishan Radotra, Sunil Kumar Gupta, Daisy Sahni

6:45–6:51 pm

506 Asymmetric Deep Brain Stimulation Electrodes for Parkinson's Disease: A Pilot Study of Symptom-tailored Stimulation

Chencheng Zhang, Linbin Wang, Leonardo Almeida, Bomim Sun, Dianyou Li

6:51–6:57 pm

507 Sex Difference in Language Processing in Patients with Malignant Brain Tumors

Shun Yao, Einat Liebenthal, Parikshit Juvekar, Adomas Bunevicius, Matthew Vera, Laura Rigolo, Alexandra J. Golby, Yanmei Tie

6:57–7:03 pm

508 Multi-modal Presurgical Evaluation of Refractory Localization-related Epilepsy Involving Mesial Temporal Lobe Structures

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

7:03 –7:09 pm

509 Language Localisation in Multilingual Patients – Evidence from Direct Electrical Stimulation: A Systematic Review and Single Institution Case Series

Colin Teo Kok Ann, Djaina Satoer, Hui Minn Chan, Marco Rossi, Tseng Tsai Yeo, Yi Ting Emily Guo, Ne Hooi Will Loh, Elke De Witte, Kejia Teo

ORAL ABSTRACT PRESENTATIONS

TUESDAY, OCTOBER 22

SE

SUNRISE SCIENCE ORAL PRESENTATIONS SESSION

Room 3016

7:00–7:06 am

320 Does Hospital For-Profit Status Affect Intracranial Hemorrhage Outcomes and Cost of Care?

Ryan G. Chiu, Blake Murphy, David Rosenberg, Amy Zhu, Ankit I. Mehta

7:06–7:12 am

321 Workplace Violence and Neurosurgical Practice: Insights from the CSNS Workplace Violence Survey

Tyler Schmidt, Samuel Tomlinson, Kristopher T. Kimmell, Joshua M. Rosenow, Jeremy T. Phelps

7:12–7:18 am

322 Factors and Trends Associated with NIH Funding for Neurosurgeons over 25 years

Ankush Chandra, Arman Jahangiri, Patrick M. Flanigan, Maxine Arnush, Jonathan W. Rick, Sarah Choi, Alvin Chou, Mitchel S. Berger, Manish K. Aghi

7:18–7:24 am

323 Variation in 90-day Postoperative Costs Among Patients Undergoing Elective Anterior Cervical Discectomy and Fusion: Insights from the OPTUM Labs Data Warehouse (OLDW)

Panagiotis Kerezoudis, Mohammed A. Alvi, Anshit Goyal, Yagiz U. Yolcu, Stephanie Payne, Lindsey Sangaralingham, Molly Jeffery, Mohamad Bydon

7:24–7:30 am

324 This Is Not Brain Surgery: Increasing Neurosurgical Knowledge and Retention in Medical Students Through Usage of a Video-Based Education Curriculum

Carl Gustaf Stefan Axelsson, William T. Curry, Michael G. Healy, Emil Petrusa, Deborah M. Rooney, Traci Wolbrink, Roy Phitayakorn

7:30–7:36 am

325 Video Recording Patient Visits to Improve Patient Satisfaction and HCAHPS Scores

Malika Bhargava, Komal Naeem, Randall W. Porter

7:36–7:42 am

326 Trends in Neurosurgical Fellowship Training in North America over Two Decades 1997-2016

Ankush Chandra, Michael G. Brandel, John K. Yue, Lauro Avalos, Michael W. McDermott, Mitchel S. Berger, Manish K. Aghi

7:42–7:48 am

327 Surgical Epilepsy Care in a Safety-Net and Private Healthcare System: A Comparative Analysis

Jordan Lam, Vivek Mehta, Daniel R. Kramer, Dudley Fukunaga, Brian Lee, Jonathan Russin, David Millett, Christianne N. Heck, Susan Shaw, Hui Gong, Michelle Armacost, Laura A. Kalayjian, George Nune, Guadalupe Coralle-Leyva, Sandra Oviedo, Joanne Gibbons, Charles Y. Liu

7:48–7:54 am

328 Factors Associated with Cost of 30-day and 90-day Readmissions Following Anterior Cervical Discectomy and Fusion: Insights from the Nationwide Readmissions Database

Anshit Goyal, Archis Bhandarkar, Mohammed A. Alvi, Mohamad Bydon

7:54–8:00 am

329 Socioeconomic Impacts of Opioid Dependence on Spinal Decompression and Fusion at Any Level: Analysis of a Nationwide Database

Andrew J. Caras, William K. Miller, Weikai Qu, Jason L. Schroeder, Azedine Medhkour

8:00–8:06 am

910 Health Literacy Among Surgical Subspecialties: Readability of Online Patient Materials for Surgical Procedures

Rosemary Behmer-Hansen, Meeki Lad, Justin L. Gold, Raghav Gupta, Somnath Ganapa, Antonios Mammis

8:06–8:12 am

911 Cost Variability for Four Common Neurosurgical Procedures in the United States

Hammad A. Khan, Konrad Knusel, Joseph E. Tanenbaum, Thomas E. Mroz, Edward C. Benzel, Deborah L. Benzil, Michael P. Steinmetz, Sebastian Salas-Vega

8:12–8:18 am

912 Analysis of Variables Associated with Number of Neurosurgical Residency Interview Invitations using a Survey Database

Anthony Nguyen, Will Coggins, Elizabeth Nyabuto, Joseph R. McFarland, III, Daniel Branch, Rishi R. Lall

8:18–8:24 pm

913 Reducing Neurosurgery Craniotomy Surgical Site Infections: A Quality Improvement Project

Clifford Crutcher, Adam Podet, Frank Culicchia

8:24–8:30 am

914 Implementation of an Inpatient Neurosurgical Advanced Practice Nursing Role Reduces 30-Day Re-admissions and Post-operative Wound Infections

Adam Podet, Kevin D. Morrow, Anthony M. DiGiorgio, Jessica Shields, Taylor Wapshott-Girolamo, Bonnie Koepp, Gabriel C. Tender, Jason D. Wilson



SUNRISE SCIENCE ORAL PRESENTATIONS SESSION

Room 2016

7:00–7:06 am

330 A Novel Preoperative Radiographic Scoring System to Predict Postoperative Outcomes in Patients Undergoing Cervical Disc Replacement Surgery

Yahya Othman, Todd Albert, Russell Huang, Philip York, Avani Vaishnav, Steven Mcanany, Sravisht Iyer, Catherine Gang, Sheeraz Qureshi

7:06–7:12 am

331 PROMIS-29 Validity and Conversion Equation to Neck Disability Index (NDI) Using a National Sample of Cervical Spine Surgery Patients

Inamullah Khan, Jacquelyn S. Pennings, Claudia Davidson, Mohamad Bydon, Anthony L. Asher, Clinton J. Devin, Kristen Archer-Swygert

7:12–7:18 am

332 Genomic Landscape of Intramedullary Spinal Cord Tumors Suggests Distinct Genetic Origins Compared to Intracranial Histopathologic Counterparts

Tej D. Azad, Ming Zhang, Rajiv Iyer, Qing Wang, Tomas Garzon-Muvdi, Joanna Wang, Ann Liu, Peter C. Burger, Charles G. Eberhart, Fausto J. Rodriguez, Daniel M. Sciubba, Jean-Paul Wolinsky, Ziya L. Gokaslan, Mari L. Groves, George I. Jallo, Chetan Bettegowda

7:18–7:24 am

333 Surgical Treatment of Cervical Spondylotic Myelopathy Leads to Functional Improvement in Hand Strength and Dexterity: A Prospective Quantitative Study

Tyler S. Cole, Kaith K. Almefty, Jakub Godzik, Randall Hlubek, Jay D. Turner

7:24–7:30 am

334 Neuro-Spinal Scaffold™! Implantation in Patients with Acute Traumatic Thoracic Complete Spinal Cord Injury: Twenty-Four Month Results from the INSPIRE Study

Kee D. Kim, K. Stuart Lee, Jason J. Chang, Richard M. Toselli

7:30–7:36 am

335 Does ACR Result in Greater Morbidity than LLIF Alone When Treating Adult Spinal Deformity?

Adam S. Kanter, Robert Eastlack, Juan S. Uribe, Richard G. Fessler, Khoi D. Than, Stacie Tran, Dean Chou, Kaiming Fu, Paul Park, Michael Y. Wang, David O. Okonkwo, Pierce D. Nunley, Neel Anand, Gregory M. Mundis, Jr., Praveen V. Mummaneni, International Spine Study Group

7:36–7:42 am

336 Anterior Lumbar Interbody Fusion (ALIF) Versus Oblique Lateral Interbody Fusion (OLIF) at L5-S1: A Comparison of Two Approaches to the Lumbosacral Junction

Zhuo Xi, Shane Burch, Chih-Chang Chang, Hui-bing Ruan, Charles M. Eichler, Praveen V. Mummaneni, Dean Chou

7:42–7:48 am

337 Treatment of Adult Scoliosis Fractional Curve with Minimally Invasive Surgery: Anterior Versus Posterior Approach?

Robert Eastlack, Juan S. Uribe, Richard G. Fessler, Khoi D. Than, Stacie Tran, Kai-Ming G. Fu, Paul Park, Michael Y. Wang, Adam S. Kanter, David O. Okonkwo, Pierce D. Nunley, Neel Anand, Gregory M. Mundis, Jr., Praveen V. Mummaneni, Dean Chou, International Spine Study Group

7:48–7:54 am

338 The Minimally Invasive Interbody Selection Algorithm (MIISA) for Spinal Deformity

Praveen V. Mummaneni, Christopher I. Shaffrey, Sr., Robert Eastlack, Juan S. Uribe, Richard G. Fessler, Paul Park, Leslie Robinson, Joshua Rivera, Dean Chou, Kai-Ming G. Fu, Adam S. Kanter, David O. Okonkwo, Pierce D. Nunley, Khoi Duc Than

7:54–8:00 am

339 Predictors of the Best Outcomes Following Minimally Invasive Surgery for Grade 1 Lumbar Spondylolisthesis

Andrew Kai-Hong Chan, Erica F. Bisson, Mohamad Bydon, Steven D. Glassman, Kevin T. Foley, Eric A. Potts, Christopher I. Shaffrey, Sr., Mark E. Shaffrey, Domagoj Coric, John J. Knightly, Paul Park, Michael Y. Wang, Kai-Ming G. Fu, Jonathan Slotkin, Anthony L. Asher, Michael S. Virk, Panagiotis Kerezoudis, Mohammed A. Alvi, Jian Guan, Regis W. Haid, Praveen V. Mummaneni

8:00-8:06 am

915 Anterior Approach versus Posterior Approach in the Treatment of Cervical Spondylotic Myelopathy: A Prospective, Randomized Study

Nasser M.F. El-Ghandour, Mohamed A.R. Soliman, Ahmed A.M. Ezzat, Amr Ashraf, Mostafa Z. El-Abdeen

8:06-8:12 am

916 Large Increases in Lumbar Fusions Expected in the United States by 2060

Sean N. Neifert, Jeffrey Gilligan, Robert J. Rothrock, Jeffrey H. Zimering, John M. Caridi, Eric K. Oermann

8:12-8:18 am

917 Evaluation of Single Level Cervical Disc Arthroplasty in Advanced Degenerative Disc Disease

Nathan L. Pratt, Charles A. Sansur, Kenneth M. Crandall, George A. Crabill

8:18-8:24 am

918 Key Drivers of Patient Satisfaction in the Outpatient Spine Surgery Setting

Nicholas M. Rabah, Jay M. Levin, Robert Winkelman, Thomas E. Mroz, Michael P. Steinmetz

8:24-8:30 am

919 The Safety and Efficacy of Riluzole in Enhancing Clinical Outcomes in Patients undergoing Surgery for Cervical Spondylotic Myelopathy: Results of the CSM-Protect Double-blinded, Multi-center Randomized Controlled Trial in 300

Michael G. Fehlings, Jetan H. Badhiwala, Henry Ahn, Francis Farhadi, Christopher I. Shaffrey, Sr., Ahmad Nassr, Praveen V. Mummaneni, Paul M. Arnold, W. Bradley Jacobs, Darrel S. Brodke, K. Daniel Riew, Michael P. Kelly, James S. Harrop, Alexander R. Vaccaro, Jason D. Wilson, Sangwook Yoon, Daryl R. Fournay, Kee Kim, Carlo Santaguida, Branko Kopjar

7:00–7:06 am

340 Firearm Injuries Cause Disproportionate Mortality in Pediatric Traumatic Brain Injury

Saksham Gupta, Blake M. Hauser, Mark M. Zaki, David J. Cote, Saef Izzy, Timothy R. Smith, Ayaz M. Khawaja

7:06–7:12 am

341 Exome Sequencing Defines the Molecular Pathogenesis of Vein of Galen Malformation

Adam Kundishora, Xue Zeng, Daniel Duran, August A. Allocco, Jungmin Choi, Sheng Chih Jin, Sierra B. Conine, Carol Nelson-Williams, Jonathan Gaillard, Charuta G. Furey, Andrew T. Timberlake, Mohammad Mansuri, Michelle Sorscher, Jennifer Klein, Qiongshi Lu, Julio D. Montejo, Alberto Vera, Jason K. Karimy, Shreyas Panchagnula, Mark Youngblood, Michael L. DiLuna, Charles C. Matouk, Shrikant Mane, Seth Alper, Andrew F. Ducruet, Joseph M. Zabramski, Beverly Aagaard-Kienitz, Georges Rodesch, Edward R. Smith, Darren Orbach, Alejandro Berenstein, Kaya Bilguvar, Murat Gunel, Richard P. Lifton, Kristopher T. Kahle

7:12–7:18 am

342 Elbow Flexion in Neonatal Brachial Plexus Palsy: A Meta-Analysis of Graft Versus Transfer

Muhibullah S. Tora, Nathan Hardcastle, Pavlos Texakalidis, Jeremy Wetzel, Joshua J. Chern

7:18–7:24 am

343 Prognostic Value of Leucocytosis in Pediatric Traumatic Brain Injury

Soumya Mukherjee, Gnanamurthy Sivakumar, John Goodden, Atul Tyagi, P.D. Chumas

7:24–7:30 am

344 A Comparison of Parent and Child Evaluations of Quality of Life in Pediatric Neurosurgery

Eric Goethe, Melissa LoPresti, Michelle Yifan Zhao, I-Wen Pan, Sandi Lam

7:30–7:36 am

345 Gene Mutations Related to Pathogenesis and Development of Cerebral Arteriovenous Malformations in Pediatric Populations

Rebecca Y. Du, Melissa LoPresti, Vijay Ravindra, Ionela Iacobas, Katie Bergstrom, Eric A. Goethe, Sandi Lam

7:36–7:42 am

346 Traumatic Spinal Injuries Cause Disproportionate Morbidity in Sports-related Pediatric Trauma

Blake M. Hauser, Saksham Gupta, David J. Cote, Mark M. Zaki, Edward Xu, Ayaz M. Khawaja, Yi Lu, Michael W. Groff, Timothy R. Smith, Hasan A. Zaidi

7:42–7:48 am

347 Early Outcome of Endoscopic Third Ventriculostomy with or without Choroid pPexus Cauterization and Ventriculoperitoneal Shunt as Primary Treatment of Hydrocephalus in Infants with Myelomeningocele

Bamidele Oludele Adebayo, Okezie Kanu, Olufemi B. Bankole, Omotayo Ojo

7:48–7:54 am

348 Complications in Children with Ehlers-Danlos Syndrome Following Spine Surgery: Analysis of the Pediatric National Surgery Quality Improvement Program Database

Abhijith V. Matur, Aria Nouri, Shenwen Huang, Nora C. Elson, William J. Jeong, Karin S. Bierbrauer, Francesco T. Mangano, Joseph S. Cheng

7:54–8:00 am

349 Surgical Management of Tumors Involving the Cerebello-Medullary Angle: Anatomical Classification, Technique and Retrospective Analysis of 90 Pediatric Patients

Jaafar Basma, Paul Klimo, Jr.

8:00–8:06 am

920 Developmental Pleiotropy of PTEN in Congenital Hydrocephalus and Autism Spectrum Disorder

Tyrone DeSpensa, Jr., Maryam Zekavat, Stephanie Getz, Sheng C. Jin, Weilai Dong, Carol Nelson-Williams, Duy Phan, Sierra B. Conine, August A. Allocco, Jason K. Karimy, Murat Gunel, Richard P. Lifton, Bryan Luikart, Kristopher T. Kahle

8:06–8:12 am

921 Damaging Mutations in EphrinB2-EphB4-RASA1 Signaling Underlie Vein of Galen Malformation

Daniel Duran, Xue Zeng, Ava Hunt, Sheng C. Jin, Sierra B. Conine, August A. Allocco, Benjamin Reeves, Carol Nelson-Williams, Michelle Sorscher, Erin Loring, Jennifer Klein, Michael L. DiLuna, Charles C. Matouk, Seth Alper, Masaki Komiyama, Andrew F. Ducruet, Joseph M. Zabramski, Alan Dardik, Brian P. Walcott, Christopher J. Stapleton, Sean Himel, Beverly Aagaard-Kienitz, Georges Rodesch, Eric M. Jackson, Edward R. Smith, Darren Orbach, Alejandro Berenstein, Kaya Bilguvar, Miikka Vikkula, Murat Gunel, Richard P. Lifton, Kristopher T. Kahle

8:12–8:18 am

922 Challenges in Management of Pediatric Fossa Tutors: Indian Experience

Kamlesh S. Bhaisora

8:18–8:24 am

923 Finite Element Optimization of an Intervertebral Disc Replacement for Treating Scoliosis

George R. Vithoulkas, Eric R. Taleghani, Rohit S. Rustagi, Alexander A. Singh, Hasan R. Syed

8:24–8:30 am

924 Management of Infectious Complications in Pediatric ITB; a Meta-analysis

Mohammed Nuru, Benton Maglinger, Ian S. Mutchnick

COUNCIL OF STATE NEUROLOGICAL SOCIETIES ORAL PRESENTATIONS

Room 3016

3:27–3:33 pm

SAMUEL Hassenbusch Young Neurosurgeon Award

159 Simulating Costs for Episode-Based Bundled Payments for Cranial Neurosurgical Procedures

Zachary A. Medress, Beatrice Ugiliweneza, Jonathon J. Parker, Dengzhi Wang, Eric Burton, Shiao Y. Woo, Loren Baker, Maxwell Boakye, Stephen Skirboll

3:33–3:39 pm

160 The Impact of Single-Vendor Procurement of Spinal Implants: An Analysis of Cost Savings and Surgical Quality at an Academic Hospital

Collin Blackburn, Nicolas Thompson, Joseph E. Tanenbaum, Thomas E. Mroz, Michael P. Steinmetz

3:39–3:45 pm

161 Trending Racial and Socioeconomic Inequality in the Surgical Management and Outcome of Traumatic Cervical Spinal Cord Injury With Fracture In the USA from 1998-2009

Alexander Dru, Dan Neal, W. Christopher Fox, Brian L. Hoh, Daniel J. Hoh

3:45–3:51 pm

162 Association Between Interhospital Competition and Hospital Resource Use for Cranial Neurosurgery: Analysis of 513,271 Admissions

Oliver Y. Tang, Krissia M. Rivera-Perla, Steven A. Toms

3:51–3:57 pm

163 Bundle Payment, Health Care Utilization and Outcomes Following Surgery for Anterior, Middle and Posterior Cranial Fossa Skull Base Meningioma: A Market Scan Analysis

Mayur Sharma, Beatrice Ugiliweneza, Maxwell Boakye, Norberto O. Andaluz, Brian J. Williams

3:57–4:03 pm

164 Patient Reported Outcomes Following Surgery for Lumbar Disc Herniation: Comparison of a Universal and Multitier Health Care System

Oliver G.S. Ayling, Tamir T. Ailon, Nicolas Dea, Charles Fisher

4:03–4:09 pm

165 Length of Stay and Disposition of Patients Undergoing Elective Spine Surgery in Maryland: Impact of the Global Budget Revenue Program

Berje H. Shammassian, Andrew Ahn, Debraj Mukherjee

4:09–4:15 pm

166 The Cost-Effectiveness of Epilepsy Surgery and Surgical Evaluation in the United States

Shehryar R. Sheikh, Michael P. Steinmetz, Michael W. Kattan, Mendel Singer, Belinda Udeh, Lara Jehi

SECTION ON CEREBROVASCULAR SURGERY ORAL PRESENTATIONS

Room 2014

3:27–3:33 pm

167 Mechanical Thrombectomy in Acute Ischemic Stroke: A Meta-Analysis of Stent Retrievers Versus Direct Aspiration Versus a Combined Approach

Pavlos Texakalidis, Stefanos Giannopoulos, Theofilos Karasavvidis, Leonardo Rangel-Castilla, Dennis J. Rivet, John F. Reavey-Cantwell

3:33–3:39 pm

168 Percutaneous Trans-carotid Puncture for Mechanical Thrombectomy in Acute Ischemic Stroke Patients is Safe and Effective: A Large, Single-center Case Series

Branden J. Cord, Anson Wang, Fouad Chouairi, Andrew Koo, Carl Porto, Andrew Silverman, Sreeja Kodali, Sumita Strander, Guido Falcone, Kevin Sheth, Ryan M. Hebert, Lauren Sansing, Joseph Schindler, Nils Petersen, Charles C. Matouk

3:39–3:45 pm

169 A Phase I/II, Prospective Multi-Center Study of the Safety and Preliminary Efficacy of Intravenous Allogeneic Mesenchymal Bone Marrow Cells in Chronic Ischemic Stroke

Michael L. Levy, John Crawford, Nabil Dib, Lev Verkh, Nikolai Tankovich, Steven C. Cramer

3:45–3:51 pm

170 MicroRNA-26b/PTEN Signaling Pathway Mediates Glycine-induced Neuroprotection in SAH Injury

Xingping Qin

3:51–3:57 pm

171 Elucidating a Proteomic Signature for the Detection of Intracerebral Aneurysms

Dominic A. Nistal, Michael L. Martini, Trevor Hardigan, Nicolas Fernandez, Seunghee Kim-Schulze, Rui Song, Natalia Romano-Spica, Julianne Kleitsch, J D. Mocco, Christopher P. Kellner

3:57–4:03 pm

172 Bone Marrow T-cell Sequestration and Lymphopenia Accompanying Ischemic Stroke are Mediated by T-cell S1P1 Loss

Pakawat Chongsathidkiet, Cosette Dechant, Daniel Wilkinson, Haichen Wang, Hanna Kemeny, Xiuyu Cui, Selena Lorrey, Daniel T. Laskowitz, Peter E. Fecci

4:03–4:09 pm

173 Vitamin D: A New Perspective in Treatment of Cerebral Vasospasm After Subarachnoid Hemorrhage

Sepide Kashefiolasi, Matthias Leisegang, Valeska Helfinger, Christoph Schürmann, Beatrice Pflüger-Müller, Voahanginirina Randriamboavonjy, Andrea Estefy-Vasconez, Geert Carmeliet, Klaus Badenhoop, Gudrun Hintereder, Volker Seifert, Katrin Schröder, Juergen Konzalla, Ralf Brandes

4:09–4:15 pm

174 Optogenetic Stimulation Reduces Neuronal Nitric Oxide Synthase Expression After Stroke

Arjun V. Pendharkar, Daniel L. Smerin, Lorenzo Gonzales, Eric Wang, Sabrina L. Levy, Stephanie Wang, Shunsuke Ishizaka, Masaki Ito, Michelle Cheng, Gary K. Steinberg

SECTION ON DISORDERS OF THE SPINE AND PERIPHERAL NERVES ORAL PRESENTATION

Room 2016

3:29–3:35 pm

175 Stereotactic Radiation Therapy (SBRT) Versus External Beam (EB) Radiation for Metastatic Spine Disease: Comparing Fracture Rates and Local Control

Enrique Vargas, Steve Braunstein, Matthew Susko, Praveen V. Mummaneni, Dean Chou

3:35–3:41 pm

176 Development of Clinical Prognostic Models for Postoperative Survival and Quality of Life in Patients with Surgically Treated Metastatic Epidural Spinal Cord Compression

Anick Nater, Junior Chuang, Kuan Liu, Nasir A. Quraishi, Dritan Pasku, Jefferson R. Wilson, Michael G. Fehlings

3:41–3:47 pm

177 The Safety of Per Os Naloxone and its Efficacy in Resolving Postoperative Ileus in Patients Undergoing Spine Surgery

Karam P. Asmaro, Eric Klomparens, Jacob A. Pawloski, Sameah A. Haider, Hesham M. Zakaria, Mathew Jones, Beverly C. Walters, Jason M. Schwalb

3:47–3:53 pm

178 Long-term Outcomes of High-dose Single-fraction Radiosurgery for Chordomas of the Spine and Sacrum

Jenny Jin, John Berry-Candelario, Jr., Y. Josh Yamada, Daniel Higginson, Adam Schmitt, Anne Reiner, Eric Lis, Ori Barzilai, Ilya Laufer, Mark H. Bilsky

3:53–3:59 pm

179 The Association of Intraoperative Antibiotic and Surgical Site Infection After Lumbar Spine Surgery: Analysis of the Michigan Spine Surgery Improvement Collaborative

Hesham M. Zakaria, Karam P. Asmaro, Tarek R. Mansour, Rachel J. Hunt, Theresa A. Elder, Michael Bazydlo, Lonni Schultz, David Nerenz, Jason M. Schwalb, Victor W. Chang, Muwaffak Abdulhak

3:59–4:05 pm

180 The Association Between Chronicity of Preoperative Opioid Usage Between Patient Satisfaction, Return to Work, and Achieving ODI MCID up to 2 Years After Lumbar Fusion: Analysis from the Michigan Spine Surgery Improvement Collaborative (MSSIC)

Hesham M. Zakaria, Tarek R. Mansour, Edvin Telemi, Karam P. Asmaro, Theresa A. Elder, Michael Bazydlo, Lonni Schultz, David Nerenz, Muwaffak Abdulhak, Jason M. Schwalb, Victor W. Chang

4:05–4:11 pm

181 Is Obtaining a CT Prior to Offering Anterior Cervical Disc Arthroplasty (ACDA) Necessary? The Results of Surgeons Predicting ACDA Candidacy from MRIs and X-Rays Alone

Joseph A. Osorio, Griffin R. Baum, Simon Morr, Richard P. Menger, Patrick Reid, K. Daniel Riew

4:11–4:17 pm

182 Effect of Cage Type on Immediate Post-operative Radiographic Outcomes in Single-level Minimally Invasive Transforaminal Lumbar Interbody Fusion (MI-TLIF)

Avani Vaishnav, Joshua Wright-Chisem, Michael Steinhaus, Steven Mcanany, Sravisht Iyer, Todd Albert, Catherine Gang, Sheeraz Qureshi

SECTION ON NEUROTRAUMA AND CRITICAL CARE ORAL PRESENTATIONS

Room 3022

3:28–3:34 pm

183 The Effect of Supplementation of Vitamin D in Neurocritical Care Patients with Hypovitaminosis D: A Randomized Controlled Clinical Trial

Andrea Archambault-Brock, Michael Karsy, Jian Guan, Ilyas Eli, Sarah T. Menacho, Min S. Park

3:34–3:40 pm

184 Effects of ISO-alpha-acids on the Hematoma Volume, Inflammation and Neurological Functions in ICH Rats and its Potential Mechanism

Jian-Lan Zhao, Rong Xie, Jin Hu

3:40–3:46 pm

185 Development of a Clinical Prediction Model for Central Cord Syndrome: An Evaluation of Motor Recovery and the Effectiveness of Early Surgery

Jetan H. Badhiwala, Christopher D. Witiw, Jefferson R. Wilson, Michael G. Fehlings

3:46–3:52 pm

186 Same Day Surgical Intervention Dramatically Minimizes Complication Occurrence and Optimizes Peri-operative Outcomes for Central Cord Syndrome

Cole Bortz, Avery Brown, Haddy Alas, Katherine Pierce, M. Burhan Janjua, Paul Park, Dimitrios C. Nikas, Aaron Hockley, Alexandra Soroceanu, Rafael De la Garza-Ramos, Daniel M. Sciubba, Anthony K. Frempong-Boadu, Dennis Vasquez-Montes, Bassel G. Diebo, Michael Gerling, Peter G. Passias

3:52–3:58 pm

187 Deviation from Dynamic and Personalized Optimal Blood Pressure Targets is Associated with Worse Functional Outcomes After Aneurysmal Subarachnoid Hemorrhage

Andrew Silverman, Sreeja Kodali, Sumita Strander, Emily Gilmore, Alexandra Kimmel, Anson Wang, Branden J. Cord, Guido Falcone, Ryan M. Hebert, Charles C. Matouk, Kevin Sheth, Nils Petersen

3:58–4:04 pm

188 PET Imaging of Neurodegeneration with [18F]AV-1451 PET After Repetitive Traumatic Brain Injury
Matthew Mesley, Ross Puffer, Charles Laymon, Brian Lopresti, Kathryn Edelman, Jane Sharpless, Julia Billigen, Tiffany Wilkins, Ava Puccio, Chet Mathis, James Mountz, David O. Okonkwo

4:04–4:10 pm

189 Delayed Restart of Antithrombotic Therapy and Rates of Adverse Events in Subdural Hematomas
Anisse N. Chaker, David Rosenberg, James S. Ryoo, Clayton L. Rosinski, Shashank Patil, Brett Geever, Saavan Patel, Ryan G. Chiu, Nikki Barrington, Andrew Mudreac, Angelica Fuentes, Amy Zhu, Parshva Shah, Ankit I. Mehta

SECTION ON PAIN ORAL PRESENTATIONS

Room 3024

3:29–3:35 pm

190 Sex-specific Transcriptomic Differences from Human Dorsal Root Ganglia Associated with Painful Radiculopathy
Robert Y. North, Yan Li, Pradipta Ray, Laurence D. Rhines, Claudio E. Tatsui, Ganesh Rao, Yeun H. Kim, Bo Zhang, Greg Dussor, Tae H. Kim, Theodore Price, Patrick M. Dougherty

3:35–3:41 pm

191 Protocolized High-Dose (HD) and Low-Dose (LD) Spinal Cord Stimulation (SCS) Workflow Results in Meaningful Pain and Opiate Reduction.
Sarah E. Hodges, Shervin Rahimpour, Luis A. Antezana, Abena A. Ansah-Yeboah, Rajeev Dharmapurikar, John Hatheway, Michael Warrick, Scott Berlin, Benjamin Seeman, Shivanand P. Lad

3:41–3:47 pm

192 Internal Neurolysis With and Without Microvascular Decompression for Trigeminal Neuralgia
Victor Sabourin, Jacob Mazza, Tomas Garzon-Muvdi, Donald Y. Ye, Anthony Stefanelli, Fadi Al Saiegh, Daniel Tzou, James J. Evans

3:47–3:53 pm

193 Earlier Radiosurgery Leads to Better Pain Relief and Less Medication Usage for Trigeminal Neuralgia Patients: An International, Multi-center Study
Monica Mureb, Danielle Golub, Carolina G. Benjamin, Ben A. Strickland, Gabriel Zada, Eric L. Chang, Ronald E. Warnick, Herwin Speckter, Skyler Eastman, Anthony M. Kaufmann, Caleb E. Feliciano, Carlos Carbini, William Leduc, David Mathieu, Yusuke Hori, Sean J. Nagel, Dusan Urgosik, Roman Liscak, Samir Patel, Yi-Chieh Hung, Jason P. Sheehan, Douglas Kondziolka

3:53–3:59 pm

194 Effects of External Focused Ultrasound on Inflammatory Markers in Neuropathic Pain Caused by Common Peroneal Nerve Injury
Adithya Srikanthan, Teresa Maietta, Abigail Hellman, Vraj Patel, Alicia Clum, Paul Neubauer, Emery Williams, Clif Burdette, Jiang Qian, Julie G. Pilitsis

3:59–4:05 pm

195 Defining the Therapeutic Window (TW) for Spinal Cord Stimulation (SCS) Using Evoked Compound Action Potential (ECAP) Recordings: Results from the Evoke Study
Robert M. Levy

4:05–4:11 pm

196 Healthcare Resource Utilization Among Patients with Non-Surgical Refractory Low Back Pain in the United States: A Retrospective Analysis of Health Insurance Claims Data
Charis Spears, Sarah E. Hodges, Musa Kiyani, Zidanyue Yang, Ryan Edwards, Alexis Musick, Christine Park, Beth Parente, Hui-Jie Lee, Shivanand P. Lad

4:11–4:17 pm

197 The Neurosurgeons' Armamentarium for the Management of Refractory Post-Herpetic Neuralgia
Muhibullah S. Tora, Pavlos Texakalidis, Nicholas M. Boulis

SECTION ON PEDIATRIC NEUROLOGICAL SURGERY ORAL PRESENTATIONS

Room 3018

3:27–3:33 pm

198 Developmental Pleiotropy of PTEN in Congenital Hydrocephalus and Autism Spectrum Disorder
Tyrone DeSpenza, Jr.

3:33–3:39 pm

199 Predictors of Posterior Fossa Syndrome: Results from an International Multicenter Cohort Study of Molecularly Characterized Medulloblastoma Patients
Rashad Jabarkheel, Nisreen Amayiri, Derek W. Yecies, Yuhao Huang, Sebastian Toescu, Donald Mabbott, Sniya Sudhakar, Prateek Malik, Suzanne Laughlin, Geeta Chacko, Leni Mathew, Paul Fisher, Michael D. Taylor, Stefan Pfister, Kristian Aquilina, Gerald A. Grant, Kshitij Mankad, Kristen Yeom, Vijay Ramaswamy

3:39–3:45 pm

200 Cost Comparison of Prenatal Myelomeningocele Closure Versus Postnatal Closure for both Mother and Child at 1 year of Life
Brice A. Kessler, Carolyn Quinsey, William Goodnight, Scott Elton

3:45–3:51 pm

201 Intraoperative Injection of Intraventricular Antibiotics Is Associated with a Decreased Incidence of Infection and Revision Surgery in Pediatric Hydrocephalus Patients Undergoing Shunt Placement
Nikita Lakomkin, Constantinos G. Hadjipanayis

3:51–3:57 pm

202 When Does an Incidental Chiari I Malformation Require Surgery? A 10-Year Prospective Study on the Evolution and Natural History
Hepzibha Alexander, Deki Tsering, John S. Myseros, Suresh N. Magge, Chima Oluigbo, Carlos E. Sanchez, Robert F. Keating

3:57–4:03 pm

203 Reduced Fractional Anisotropy of Superior Cerebellar Peduncle Is Associated with Persistent Ataxia in Children Undergoing Resection of Posterior Fossa Tumors
Aditya Vedantam, Katie Stormes, Nisha Gadgil, Stephen F. Kralik, Guillermo Aldave, Sandi Lam

4:03–4:09 pm

204 Opioid Prescribing Patterns for Low Back Pain Among Commercially-Insured Children
Tej D. Azad, Michael D. Harries, Daniel Vail, Yi J. Zhang, John K. Ratliff

4:09–4:15 pm

205 Pediatric Anoxic Brain Injury – A Possible Locked-In Syndrome
Mariam Ishaque, Crystal G. Franklin, Mary D. Woolsey, Peter T. Fox

SECTION ON STEREOTACTIC AND FUNCTIONAL NEUROSURGERY ORAL PRESENTATIONS

Room 3020

3:27–3:33 pm

206 Action Observation and Execution Differentially Modulate Basal Ganglia-cortical Activity in Humans
Mahsa Malekmohammadi, Kathryn Cross, Jeongwoo Choi, Nader Pouratian

3:33–3:39 pm

207 Resting-state SEEG May Help Localize Epileptogenic Brain Regions
Sarah Goodale, Hernan F. J. Gonzalez, Graham W. Johnson, Kanupriya Gupta, William Rodriguez, Robert Shults, John D. Rolston, Benoit M. Dawant, Victoria Morgan, Dario J. Englot

3:39–3:45 pm

208 Direct Targeting of the Ventral Intermediate Nucleus Using High-field Proton Density MR Imaging: Functional Outcomes and Comparison to “Indirect” Targeting
Francisco A. Ponce, Margaret Lambert

3:45–3:51 pm

209 Blood-Brain Barrier Opening in Alzheimer’s Disease Using MR-guided Focused Ultrasound
Ying Meng, Zahra Shirzadi, Bradley MacIntosh, Chris Heyn, Gwen S. Smith, Isabelle Aubert, Clement Hamani, Sandra Black, Kullervo Hynynen, Nir Lipsman

3:51–3:57 pm

210 Neural Control of Individual Finger Movements Using Intracortical Recordings from a Person with Tetraplegia
Ahmed Jorge, Dylan Royston, Elizabeth C. Tyler-Kabara, Michael Boninger, Jennifer Collinger

3:57–4:03 pm

211 Functional Use of Directional Local Field Potentials in Parkinson’s Disease
Ilknur Telkes, Jennifer Durphy, Octavian Adam, Nataly Raviv, Julie G. Pilitsis

4:03–4:09 pm

212 Risk Analysis of Hemorrhages in Stereo-electroencephalography Procedures
Robert A. McGovern, III, Paul Ruggieri, Juan Bulacio, Imad Najm, William E. Bingaman, Jorge A. Gonzalez-Martinez

4:09–4:15 pm

213 A Novel Computational Approach in MATLAB to Characterize Thermal Damage Estimate in Magnetic Resonance-guided Laser Interstitial Thermal Therapy.
Allison Liang, Sean Munier, Shabbar F. Danish

SECTION ON TUMORS ORAL PRESENTATIONS

Room 3014

3:33–3:39 pm

JOURNAL OF NEURO-ONCOLOGY AWARD
214 Decreased Circulating Myeloid Derived Suppressor Cells at First Follow-up Predict Favorable Response to Immunotherapy in a Randomized Trial of Nivolumab and Bevacizumab in Recurrent GBM
Matthew M. Grabowski, Balint Otvos, Tyler J. Alban, Marcella Diaz, Justin D. Lathia, Gene H. Barnett, Manmeet Ahluwalia

3:39–3:45 pm

215 Role of CX3CR1 Signaling in Malignant Transformation of Gliomas
Sungho Lee, Khatri Latha, Ganesh Rao

3:45–3:51 pm

216 The TRIM26-SOX2 Ubiquitin Signaling Axis Regulates the Maintenance and Tumorigenicity of Glioblastoma Stem-like Cells
Tatenda Mahlokozero, Mounica Paturu, Daniel Hafez, Diane Mao, Albert H. Kim

3:51–3:57 pm

COLUMBIA SOFTBALL PEDIATRIC BRAIN TUMOR AWARD
217 Recapitulation of Genetic Predisposition to Medulloblastoma in Human Neuroepithelial Stem Cells
Jignesh Tailor, Miller Huang, Austin Smith, William A. Weiss

3:57–4:03 pm

LEKSELL RADIOSURGERY AWARD
218 Stereotactic Radiosurgery With and Without Checkpoint Inhibition for Patients with Metastatic Non-Small Cell Lung Cancer to the Brain: A Matched Cohort Study
Matthew Shepard, Zhiyuan Xu, Joseph Donahue, Thomas E. Muttikkal, Diogo Codeiro, Leslie Hansen, Nasser Mohammed, Ryan D. Gentsler, James Lerner, Camilo Fadul, Jason P. Sheehan

4:03–4:09 pm

BRAINLAB NEUROSURGERY AWARD
219 A Brain Penetrating HSP90 Inhibitor NXD30001 Inhibits Glioblastoma as a Monotherapy or in Combination with Radiation
Hao Chen, Jialiang Wang, Hengli Tian

4:09–4:15 pm

220 Survival Benefit with Resection of Brain Metastases from Renal Cell Carcinoma in the Setting of Molecular Targeted Therapy and Immune Therapy

Mark A. Damante, Jr, Kristin Huntoon, Thomas Olencki, Bradley Elder

CSNS CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3016

4:51–4:57 pm

432 Safety and Costs Analysis of a “Fast-track Algorithm for Early Hospital Discharge After Brain Tumor Surgery

Danilo Gomes Quadros, Iuri S. Neville, Francisco M. Urena, Davi J. Fontoura Solla, Wellington S. Paiva, Manoel Teixeira

4:57–5:03

433 A Safe Transitions Pathway for Post Craniotomy Neurological Surgery Patients: High Value Care that Bypasses the Intensive Care Unit

Jacob S. Young, Andrew Kai-Hong Chan, Jennifer Viner, Sujatha Sankaran, Alvin Y. Chan, Dominic Amara, Stephen T. Magill, Joseph A. Osorio, Lizbeth Gibson, Peter Sanftner, Mariann Ward, Tracy Ward, Stacy Wong, Manish K. Aghi, Edward F. Chang, Shawn L. Hervey-Jumper, Line G. Jacques, Philip V. Theodosopoulos, Mitchel S. Berger, Michael W. McDermott

5:03–5:09

434 Reducing Preventable Readmissions in a Neurosurgical Patient Population at an Academic Medical Center

Shayan Moosa, Lindsay Bowerman, Ellen Smith, Mindy Bryant, Natalie Krovetz, Melissa Pritchett, Nancy Staton, JoAnne Wilson, Carol Wisinski, Patty Bullock, Kearby Chen, Susan Prather, Lisa Archual, Amy Johnston, Mark E. Shaffrey

5:09–5:15

435 A Novel Protocol for Reducing Intensive Care Utilization after Craniotomy

Arjun V. Pendharkar, Maryam N. Shahin, Allen L. Ho, Eric S. Sussman, Gordon Li, John K. Ratliff, Melanie Hayden Gephart, Amy Lu

CEREBROVASCULAR OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 2014

4:44–4:50 pm

436 Diverse Use of the WEB Device: A Technical Note on WEB Stenting and WEB Coiling of Complex Aneurysms

Jorge A. Roa, Mario Zanaty, Sudeepta Dandapat, Edgar Samaniego, Pascal Jabbour, David M. Hasan

4:50–4:56 pm

438 Microcatheter Shaping for Intracranial Aneurysm Coiling Using Artificial Intelligence Assisted Technique

Wei Ni

4:56–5:02 pm

439 Early Lessons Learned from the WEB Device: Feasibility, Technique and Complications – A Real Life Experience

Nikolaos Mouchtouris, David M. Hasan, Fadi Al Saiegh, Ahmad Sweid, Mario Zanaty, Omaditya Khanna, Nohra Chalouhi, Stavropoula I. Tjoumakaris, M. Reid Gooch, Robert H. Rosenwasser, Pascal Jabbour

SPINE OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 2016

4:36–4:42 pm

BEST INTERNATIONAL OPERATIVE TECHNIQUE

440 Convection-enhanced Delivery of Nimustine Hydrochloride for Recurrent Spinal Cord High-grade Glioma

Toshiki Endo, Ryuta Saito, Teiji Tominaga

4:42–4:48 pm

441 Complication Profile Associated with S1 Pedicle Subtraction Osteotomy Compared To Other Spinal Levels

Darryl Lau, Vedat Deviren, Christopher P. Ames

4:48–4:54 pm

442 4 Year Experience of Robot-Assisted Pedicle Screw Placement: An Australian Prospective Analysis

Jordan Cory, Mohammed A. Awad, Richard G. Bittar

4:54–5:00 pm

443 Single Position Lateral Lumbar Fusion Utilizing Robot Guided Screw Placement

George V. Huffmon III

NEUROTRAUMA OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3022

4:15–4:21 pm

444 Initial Experience of Spinal Cord Perfusion Pressure Goals in Lieu of Mean Arterial Pressure Goals in Acute Traumatic Spinal Cord Injury at a U.S. Level I Trauma Center: A TRACK-SCI Study

John K. Yue, Debra P. Hemmerle, Hansen Deng, Ethan A. Winkler, Leigh H. Thomas, Xuan Duong Fernandez, Pavan S. Upadhyayula, Nikolaos Kyritsis, Lisa U. Pascual, Vineeta Singh, Philip R. Weinstein, Jason Talbott, J. Russell Huie, Adam Ferguson, William Whetstone

4:21–4:27 pm

445 MRI Evidence of Therapeutic Efficacy of Timing of Decompression in AIS Grades A-C Cervical Spinal Cord Injury Patients

Joshua R. Olexa, Bizhan Aarabi, Kathirkamanathan Shanmuganathan, Noori Akhtardanesh, Charles A. Sansur, Gary T. Schwartzbauer, Maureen Scarboro, Nick Caffes, Jeffrey Oliver, Stephen Carbine, Mori Kanami

4:27–4:33 pm

446 Surgery Delay Increases Length of Stay in Thoracolumbar Trauma

Lawrence Zeldin, Sean N. Neifert, Robert J. Rothrock, Ian T. McNeill, Jonathan S. Gal, John M. Caridi

4:33–4:39 pm

447 Early Versus Late Surgical Decompression for Central Cord Syndrome: A Propensity Score-Matched Analysis

Jetan H. Badhiwala, Christopher D. Witiw, Jefferson R. Wilson, Michael G. Fehlings

PAIN OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3024

4:36–4:42 pm

448 Complications of Endoscope-Assisted Microvascular Decompression for Trigeminal Neuralgia- An Evaluation of 300 Consecutive Patients

Alexandra D. Baker, Melvin Field

4:42–4:48 pm

449 C1-C4 Unilateral Dorsal Root Entry Zone Rhizotomy (Drez) for Treatment of Refractory Post-Herpetic Occipital Neuralgia.

Zaid Aljuboori, Joseph S. Neimat

4:48–4:54 pm

450 Surgical Outcomes After Microvascular Decompression with Internal Neurolysis and Partial Neurectomy for Patients with Trigeminal Neuralgia and Negative Neurovascular Compression

Amanda Carpenter, James K. Liu

PEDIATRICS OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3018

4:15–4:21 pm

451 Reduction Cranioplasty Using a Three-dimensional Preoperative Virtual Model for Treatment of Extreme Macrocephaly and Positional Plagiocephaly Secondary to Untreated Hydrocephalus – Case Description and Literature Review

Wilson R. Teixeira, Alexandre Rainha Campos, Mickael Bartikian, Claudia Faria, Lia Lucas-Neto, Maria M. Santos

4:21–4:27 pm

452 Moyamoya Disease in Infancy: Application of a Novel Indirect Revascularization Technique for Bihemispheric Cortical Synangiosis

Danielle DeBacker Dang, John V. Dang, Duaa AbdelHameid, Seth Mansinghani, Leon E. Moores

4:27–4:33 pm

453 Idiopathic Intrasyringal Hemorrhage: A Case Report and Review of the Liter

Shawn S. Rai, Carlos R. Goulart, Mark R. Proctor, R. Michael Scott, Katie P. Fehnel

4:33–4:39 pm

454 Endovascular Super-Selective Intra-arterial Chemotherapy for Retinoblastoma: Systematic Review and Institutional Experience

Simon Menaker, Samir Sur, Anil Mahavadi, Stephanie H. Chen, Eric C. Peterson, Robert M. Starke

PAIN OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3024

4:54–5:00 pm

455 Penetrating Offending Vessel, the Most Surgically Demanding Type During Microvascular Decompression Surgery in Hemifacial Spasm

Seunghoon Lee, Kwan Park

5:00–5:06 pm

456 Improving Accuracy for Optical Navigation in Asleep DBS Electrode Implantation

Kim J. Burchiel, Ann Mitchell, Kevin J. Mansfield

5:06–5:12 pm

457 MRI-guided Stereotactic Laser Ablation of Deep-seated Cerebral Cavernous Malformations

James A. M. Douglas, III, Alex C. M. Greven, Christopher W. Rich, James G. Malcolm, Robert E. Gross, Jon T. Willie

5:12–5:18 pm

458 The Role of Tissue Expansion in Deep Brain Stimulation Surgery for Parkinson's Disease

Nikhil Thakur, Michael Eibach, Shahram Ghanaati, Volker Seifert, Gerhard Marquardt, Johanna Quick

TUMOR OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION ORAL PRESENTATIONS

Room 3014

4:45–4:51 pm

459 Confocal Assisted Fluorescence Resection of Low Grade Gliomas

Cleopatra Charalampaki, Juergen Schlegel

4:51–4:57 pm

460 Intraoperative Near-infrared Fluorescence Imaging with Second-window Indocyanine-green Offers Accurate and Real-time Correction for Brain Shift and Anatomic Inconsistencies in Frameless Neuronavigation

Steve Sungwon Cho, BS, Ashwin G. Ramayya, Clare W. Teng, Steven Brem, Sunil Singhal, John Y.K. Lee

4:57–5:03 pm

461 Laser Interstitial Thermal Therapy to the Posterior Fossa: Challenges and Nuances

Jeffrey I. Traylor, Rajan Patel, Matthew Muir, Ahmed Habib, Dhiego Chaves de Almeida Bastos, Ganesh Rao, Sujit S. Prabhu

INTERACTIVE MULTIMEDIA RESEARCH ORAL PRESENTATIONS

Podium 1, Level 2 Lobby

5:45–5:48 pm

600 A Comparison of Minimally-Invasive Transforaminal Lumbar Interbody Fusion and Decompression Alone for Degenerative Lumbar Spondylolisthesis

Andrew Kai-Hong Chan, M.D., Erica F. Bisson, Mohamad Bydon, Steven D. Glassman, Kevin T. Foley, Christopher I. Shaffrey, Sr., Eric A. Potts, Mark E. Shaffrey, Domagoj Coric, John J. Knightly, Paul Park, Michael Y. Wang, Kai-Ming G. Fu, Jonathan Slotkin, Anthony L. Asher, Michael S. Virk, Panagiotis Kerezoudis, Mohammed A. Alvi, Jian Guan, Regis W. Haid, Praveen V. Mummaneni

5:48–5:51 pm

601 Intra-operative 3D Navigation Versus Fluoroscopy: A Comparison of Time Demand, Radiation Exposure and Outcomes in Minimally Invasive Transforaminal Lumbar Interbody Fusion (MI-TLIF)

Avani Vaishnav, Steven Mcanany, Sravisht Iyer, Todd Albert, Catherine Gang, Sheeraz Qureshi

5:51–5:54 pm

602 Increased Axial Facet Angle Correlates with Poor Percutaneous Pedicle Screw Placement

Guang-Ting Cong, James Dowdell, Avani Vaishnav, Steven Mcanany, Sravisht Iyer, Todd Albert, Catherine Gang, Sheeraz Qureshi

5:54–5:57 pm

603 Anterior Column Reconstruction Versus Pedicle Subtraction Osteotomy for Severe Sagittal Plane Deformity: Early Clinical and Radiographic Outcomes Using a Hyperlordotic Expandable Lateral Interbody Device

Lara Walsh Massie, Mohamed Macki, Hesham M. Zakaria, Michelle Gilmore, Azam Basheer, Victor W. Chang, Frank La Marca

5:57–6:00 pm

604 Characterizing the Risk and Outcome Profiles of Lumbar Fusion Procedures in Patients with Opioid Use Disorders: A Step Towards Improving Enhanced Recovery Protocols for a Unique Patient Population

Michael L. Martini, Dominic A. Nistal, Brian C. Deutsch, Jeffrey Gilligan, Robert J. Rothrock, Sean N. Neifert, John M. Caridi

6:00–6:03 pm

605 Anterior Cervical Arthrodesis with Polyetheretherketone Spacers: What is the Role of the Grafting Material?

Jeffrey Pollock, Donald A. Ross, Jung U. Yoo, Ningcheng P. Li

6:03–6:06 pm

606 Reoperations Following Lumbar Discectomy are Associated with Worse Clinical Outcomes and Greater Socioeconomic Burden 3 Years after the Primary Procedure

Claudius Thomé, Ali Araghi, Jason Inzana, Jonathan Stieber, Joshua M. Ammerman

6:06–6:09 pm

607 DEXA Versus CT: Comparison of Bone Mineral Density Measurements in Predicting Postoperative Spinal Fusion Outcomes

Awais Vance, Alexander Mazal, Salah G. Aoun, Najib El Tecle, Matthew Thomas Davies, Tarek Youssef El Ahmadieh, Kevin C. Morrill, Carlos A. Bagley, Mazin Al Tamimi

6:09–6:12 pm

608 Perioperative Complications in Obese Patients Undergoing Anterior Lumbar Interbody Fusion: Results from 938 Patients

Michael Safaee, Alexander Tenorio, Dominic Amara, Lillian Lai, Annette Molinaro, Serena Hu, Bobby Tay, Shane Burch, Sigurd Berven, Vedat Deviren, Sanjay S. Dhall, Dean Chou, Praveen V. Mummaneni, Charles M. Eichler, Christopher P. Ames, Aaron J. Clark

6:12–6:15 pm

609 Predictors of Patient Satisfaction Following One- or Two-Level Anterior Cervical Discectomy and Fusion: Insights from the Quality Outcomes Database

Panagiotis Kerezoudis, Anthony L. Asher, Clinton J. Devin, Mohammed A. Alvi, Inamullah Khan, Hui Nian, Ahilan Sivaganesan, Frank E. Harell, Kristin Archer, Mohamad Bydon

6:15–6:18 pm

610 Neuroanesthesia Guidelines for Optimizing Transcranial Motor Evoked Potentials Neuromonitoring During Deformity and Complex Spinal Surgery: A Delphi Consensus Study

Corey T. Walker, Han Jo Kim, Paul Park, Lawrence Lenke, Justin S. Smith, Daniel M. Sciubba, Michael Y. Wang, Christopher I. Shaffrey, Sr., Vedat Deviren, Praveen V. Mummaneni, Khoi Duc Than, Robert Eastlack, Gregory M. Mundis, Jr., Adam S. Kanter, David O. Okonkwo, John H. Shin, Tyler R. Koski, Steven D. Glassman, Alan H. Daniels, Jay D. Turner, Juan S. Uribe

6:18–6:21 pm

611 Impact of Dominant Symptom on 12-Month Patient Reported Outcomes for Patients Undergoing Lumbar Spine Surgery: A Quality Outcomes Database Analysis

Clinton J. Devin, Mohamad Bydon, Panagiotis Kerezoudis, Mohammed A. Alvi, Anshit Goyal, Inamullah Khan, Yagiz U. Yolcu, Anthony L. Asher

6:21–6:24 pm

612 Predictors of Non-Routine Discharge Among Patients Undergoing Surgery for Grade I Spondylolisthesis : Insights from the Quality Outcomes Database (QOD)

Mohamad Bydon, Praveen V. Mummaneni, Panagiotis Kerezoudis, Andrew Kai-Hong Chan, Steven D. Glassman, Kevin T. Foley, Jonathan R. Slotkin, Eric A. Potts, Mark E. Shaffrey, Christopher I. Shaffrey, Sr., Domagoj Coric, John J. Knightly, Paul Park, Kai-Ming G. Fu, Clinton J. Devin, Anthony L. Asher, Erica F. Bisson

6:24–6:27 pm

613 Does Positioning of Cervical Disc Arthroplasty Implant Affect Postoperative Outcome?

Yahya Othman, Todd Albert, Russell Huang, Philip York, Avani Vaishnav, Steven Mcanany, Sravisht Iyer, Catherine Gang, Sheeraz Qureshi

6:27–6:30 pm

614 Implementation of an Enhanced Recovery Pathway in Complex Spine Surgery Patients in a Multidisciplinary Center

Kristen M. Hall, Jessica R. Moreno, Luke Dosselman, Carlos A. Bagley

6:30–6:33 pm

615 SCOUT IDE Investigation: One-year Clinical Findings for a Conforming Porous Polymeric Lumbar Interbody Fusion Device

Yi Lu, Kyle Wu, Martin H. Krag, Stephane Lavoie, Mohamad Bydon, Pierce D. Nunley, John H. Chi

6:33–6:36 pm

616 Effect of Myelopathy on Outcomes After Cervical Disc Replacement: A study of a Local Patient Cohort and a Large National Cohort

Sheeraz Qureshi, Andre Samuel, Steven Mcanany, Sravisht Iyer, Todd Albert, Catherine Gang

6:36–6:39 pm

617 Radiographic Accuracy of Percutaneous Pedicle Screw Placement in Fluoroscopic Versus CT Navigation-guided Lumbar Spine Instrumentation

Guang-Ting Cong, Avani Vaishnav, Joseph Barbera, Hiroshi Kumagai, James Dowdell, Catherine Gang, Sheeraz Qureshi

6:39–6:42 pm

618 The Impact of NSAID Use after Lumbar Fusion Surgery on Fusion Rate and Complications: A Meta-Analysis

Yahya Othman, Avani Vaishnav, Steven Mcanany, Sravisht Iyer, Todd Albert, Catherine Gang, Sheeraz Qureshi

6:42–6:45 pm

619 Do We Need Standing Scoliosis Films for One or Two-Level Lumbar Fusions?

Caroline Davidson, Gabriel Claudiu Tender

6:45–6:48 pm

620 Surgical Outcomes of Dysphagia Provoked by Diffuse Idiopathic Skeletal Hyperostosis in Cervical Spine

Young Soo Chung, Ho Yeol Zhang, Yoon Ha, Jeong Yoon Park

6:48–6:51 pm

621 Outcomes and Risks with Age in Spondylolisthesis: A Comparison of the Elderly from the Quality Outcomes Database

Michael Karsy, Andrew Kai-Hong Chan, Michael S. Virk, Praveen V. Mummaneni, Mohamad Bydon, Steven D. Glassman, Kevin T. Foley, Eric A. Potts, Christopher I. Shaffrey, Sr., Mark E. Shaffrey, Domagoj Coric, Anthony L. Asher, John J. Knightly, Paul Park, Kai-Ming G. Fu, Jonathan Slotkin, Regis W. Haid, Michael Y. Wang, Erica F. Bisson

6:51–6:54 pm

622 Multimodal Analgesia in Lumbar Fusion Surgery: Impact Amidst the Opioid Epidemic

Yi Lu, Erica Bertocini

6:54–6:57 pm

623 Incidence and Clinical Risk of Cement Extravasation in Adult Patients Undergoing Prophylactic Vertebroplasty During Surgical Spine Reconstruction

Michael Bohl, Jean-Christophe A. Leveque, Rajiv Sethi

6:57–7:00 pm

624 Factors Associated with 12-month Return to Work Following One-level Posterior Lumbar Fusion for Grade 1 Degenerative Spondylolisthesis: An Analysis of the Quality Outcomes Database

Mohamad Bydon, Praveen V. Mummaneni, Panagiotis Kerezoudis, Andrew Kai-Hong Chan, Steven D. Glassman, Kevin T. Foley, Jonathan R. Slotkin, Eric A. Potts, Mark E. Shaffrey, Christopher I. Shaffrey, Sr., Domagoj Coric, John J. Knightly, Paul Park, Kai-Ming G. Fu, Clinton J. Devin, Anthony L. Asher, Erica F. Bisson

7:00–7:03 pm

625 Prevalence of Cervical Stenosis and Myelopathy in Patients with Idiopathic Normal Pressure Hydrocephalus

Ryan M. Naylor, Karina Lenartowicz, Jonathan Graff-Radford, Jeremy Cutsforth-Gregory, Benjamin D. Elder

7:03–7:06 pm

626 The Association Between PHQ-2 Screening and Patient Satisfaction and Return to Work up to 2 Years after Lumbar Fusion: Analysis from the Michigan Spine Surgery Improvement Collaborative (MSSIC)

Hesham M. Zakaria, Tarek R. Mansour, Edvin Telemi, Rachel J. Hunt, Karam P. Asmaro, Mohamed Macki, Michael Bazdlo, Lonni Schultz, David Nerenz, Muwaffak Abdulhak, Jason M. Schwalb, Victor W. Chang

7:06–7:09 pm

627 Postoperative Stereotactic Radiosurgery for Spinal Metastases: Clinical Outcomes, Failures, and Analysis of Local Control

Muhamed Hadzipasic, Laura Van Beaver, Caroline M. Ayinon, Robert Koffie, Brian Winey, Thomas Botticello, Ganesh Shankar, Joseph H. Schwab, Kevin S. Oh, John H. Shin

7:09–7:12 pm

628 Assessing the Impact of Epidural Analgesia Early Pain Management and Functional Outcomes Following Deformity Surgery: A Retrospective Review

Emmanuel Adeyemo, Umaru Barrie, Madelina Nguyen, Mahmoud Elguindy, Luke Dosselman, Kristen M. Hall, Jessica R. Moreno, Carlos A. Bagley

7:12–7:15 pm

629 Differences in 30- and 90-day Readmission Rates After Surgical Treatment for Lumbar Degenerative Disc Disease in Elderly Patients (≥65 years): A National Readmission Database Study

Aladine A. Elsamadicy, Andrew B. Koo, Megan Lee, Adam Kundishora, Joaquin Q. Camara-Quintana, Tariq Qureshi, Luis Kolb, Maxwell S.H. Laurans, Khalid M. Abbed

INTERACTIVE MULTIMEDIA RESEARCH ORAL PRESENTATIONS

Podium 2, Level 2 Lobby

5:45–5:48 pm

630 Detection of Glioma and Prognostic Subtypes by Non-invasive Circulating Cell-free DNA Methylation Markers

Ian Yu Lee, Thais Sabedot, Tathiane Malta, James Snyder, Michael Wells, Ana DeCarvalho, Abir Mukherjee, Dhananjay Chitale, Karam P. Asmaro, Adam M. Robin, Mark L. Rosenblum, Tom Mikkelsen, Jack P. Rock, Laila Poisson, Tobias Walbert, Steven N. Kalkanis, Anavaleria Castro, Houtan Noushmehr

5:48–5:51 pm

631 Cerebrospinal Fluid Biomarkers of Brain Metastasis

Stephanie Cheok, Anna Arnal-Estape, Azeet Narayan, Maheen Zakaria, Sarah Goldberg, Abhijit Patel, Don Nguyen, Veronica Chiang

5:51–5:54 pm

BEST INTERNATIONAL CLINICAL RESEARCH

632 The Efficacy of Pure Navigation-system Guided Biopsy with 5-ALA Induced Photodynamic Diagnosis for Malignant Brain Tumors

Naokado Ikeda, Shinji Kawabata, Yoshihide Katayama, Motomasa Furuse, Ryokichi Yagi, Naosuke Nonoguchi, Ryo Hiramatsu, Toshihiko Kuroiwa, Masahiko Wanibuchi

5:54–5:57 pm

633 Passive Distribution of Indocyanine-Green via the Enhanced Permeability and Retention Effect Demonstrates Similar Tumor Sensitivity and Specificity Compared to Tumor-Targeting 5-Aminolevulinic Acid in Rodent Allograft and Human Brain Tumors

Steve Sungwon Cho, Saad Sheikh, Joseph F. Georges, Clare W. Teng, Jay F. Dorsey, Sunil Singhal, John Y.K. Lee

5:57–6:00 pm

634 Near Real-time Intraoperative Brain Tumor Diagnosis Using Stimulated Raman Histology and Deep Neural Networks

Todd C. Hollon, Balaji Pandian, Siri Sahib Singh Khalsa, Randy D'Amico, Michael B. Sisti, Jeffrey N. Bruce, Karin M. Muraszko, B. Gregory Thompson, Christian Freudiger, Shawn L. Hervey-Jumper, Guy M. McKhann, II, Sandra Camelo-Piragua, Peter D. Canol

6:00–6:03 pm

635 Laser Therapy Enhances Blood-Brain Barrier and Blood-Tumor Barrier Permeability in a Mouse Model of Glioblastoma

Afshin Salehi, Mounica Paturu, Matthew Caine, Robyn Klein, Albert H. Kim

6:03–6:06 pm

636 Genome Wide DNA Methylation Landscape Reveals Glioblastoma Mediated Epigenetic Modification in Tumor Infiltrating CD4+ T-cells.

Sreenivasulu Chintala, Kaleigh Fetcko, Mario Henriquez, Sheng Liu, Jun Wan, Xiaoling Xuei, Yunlong Liu, Adam T. Leibold, Atique Ahmed, Mahua Dey

6:06–6:09 pm

637 Enhanced B7-H4 Expression in Gliomas with Low PD-L1 Expression Identifies Cold Tumors

Di Chen, Gaopeng Li, Chunxia Ji, Qiqi Lu, Ying Qi, Chao Tang, Ji Xiong, Jian Hu, Dave S.B. Hoon, Yan Zhang, Yu Yao, Liangfu Zhou

6:09–6:12 pm

638 Identification of Tumor Specific Lymphocytes Cells in a Murine Glioma Model

David Shin, Catherine Flores, Bayli Divita, Brandon Fernandez, Tyler Wildes, Adam Grippin, Kyle Dyson, Duane Mitchell

6:15–6:18 pm

640 A Patient-derived Glioblastoma Organoid Model Maintains Intertumoral and Intratumoral Heterogeneity for Therapeutic Testing

Ryan Salinas, Daniel Zhang, Fadi Jacob, Phuong Nguyen, Saad Sheikh, Stefan Prokop, Jay F. Dorsey, MacLean Nasrallah, Steven Brem, Donald M. O'Rourke, Guo-li Ming, Hongjun Song

6:18–6:21 pm

641 Local Delivery of the PARP-inhibitor Olaparib from a Biodegradable Paste Potentiates Radiotherapy and Prolongs Survival

Riccardo Serra, Stuart J. Smith, Jonathan Rowlinson, Noah L. Gorelick, Gareth J. Veal, Kevin Shakesheff, Richard Grundy, Henry Brem, Ruman Rahman, Betty Tyler

6:21–6:24 pm

642 NRG Oncology CC001 Neurocognitive Final Analysis: A Phase III Trial of Hippocampal Avoidance (HA) in Addition to Whole-brain Radiotherapy (WBRT) Plus Memantine to Preserve Neurocognitive Function (NCF) in Patients with Brain Metastases (BM)

Jeffrey S. Wefel, Stephanie Pugh, Vinai Gondi, Paul D. Brown, Wolfgang Tome, Terri S. Armstrong, Deborah Bruner, Joseph Bovi, Cliff Robinson, Deepak Khuntia, David Grosshans, Andre Konski, David Roberge, Vijayananda Kundapur, Kiran Devisetty, Sunjay Shah, Kenneth Usuki, Bethany Anderson, Minesh P. Mehta, Lisa Kachnic

6:24–6:27 pm

643 Intracranial Response of Brain Metastases to Osimertinib With or without Upfront Stereotactic Radiosurgery in TKI-Naïve Non-small Cell Lung Cancer Patients

Michael Chuwei Jin, Elisa K. Liu, Charles W. Macaulay, Amanda Gian, Siyu Shi, Julie Koenig, Gordon Li, Scott G. Soltys, Erqi Pollom L

6:27–6:30 pm

644 Melatonin Disrupts Glioblastoma Metabolism and Enhances Temozolomide Cytotoxic Effects

Beatriz Irene Fernandez Gil, Carla A. Vazquez-Ramos, Paula Schiapparelli, Rachel Sarabia-Estrada, Germaine Escames, Alfredo Quinones-Hinoja

6:30–6:33 pm

645 Stereotactic Radiosurgery Versus Stereotactic Radiotherapy in the Management of Intracranial Meningiomas: A Systematic Review and Meta-analysis

Nida Fatima, Antonio Meola, Erqi Pollom, Scott G. Soltys, Steven D. Chang

6:33–6:36 pm

646 Outcome Analysis Among Meningioma Genomic Subgroups Identifies Decreased Recurrence Free Survival in PI3K Activated Tumors

Mark W. Youngblood, Amar Sheth, Amy Zhao, Julio D. Montejo, Jr., Daniel Duran, Chang Li, Evgeniya Tyrtova, Koray Ozduman, Danielle F. Miyagishima, Julien Boetto, Matthieu Peyre, Sacit Bulent Omay, Michel Kalamarides, Zeynep E. Omay, Murat Gunel, Jennifer A. Moliterno

6:36–6:39 pm

647 Outcomes of Single-institution Retrospective Case Series on Observation Alone Following Atypical Meningioma Resection

Lauren Stone, Hugh D. Moulding, Nimisha Deb, Charles T. Lee

6:39–6:42 pm

648 Tumor Control Rates in Patients Undergoing Stereotactic Radiosurgery for Cystic Vestibular Schwannomas: A Systematic Review and Meta-analysis

Kevin Ding, Edwin Ng, Prasanth Romiyo, Dillon Dejam, Courtney Duong, Matthew Z. Sun, Quinton Gopen, Isaac Yang

6:42–6:45 pm

The International Neurooncology Fellowship at The University of Miami – My Experience

Alexis A. Morell

6:45–6:48 pm

649 Trim71 Links an Ancient MicroRNA Pathway to Neural Stem Cell Development and Human Congenital Hydrocephalus

Duy Phan, Daniel Foster, Bettina Jux, Evelyn Lake, Todd Constable, Waldemar Kolanus, Frank Slack, Kristopher Thomas Kahle

6:48–6:51 pm

650 Cerebrospinal Fluid Access Devices in Pediatric Diffuse Midline Glioma Patients: Literature Review and Evaluation of Institutional Practices

Daphne Li, Wendy Stellpflug, Amanda Muhs Saratsis

6:51–6:54 pm

651 Patterns of Care and Age Specific Impact of Resection Extent and Adjuvant Radiotherapy in Pediatric Pineoblastoma

Michael Chuwei Jin, Laura M. Prolo, Adela Wu, Tej D. Azad, Siyu Shi, Adrian Rodrigues, Scott G. Soltys, Erqi Pollom, Gordon Li, Susan Hiniker, Gerald A. Grant

6:54–6:57 pm

652 Multimodality Language Mapping Using Cortical Stimulation in Pediatric Patients with Epilepsy

Sneha Sharma, Carrie R. Muh, Sandra Serafini, Naomi D. Chou, Tracy G. Spears, Sarah E. Hodges, Gregory B. Cogan, Jordan Komisarow, Gerald A. Grant

6:57–7:00 pm

653 Split Cord Malformation – Spectrum of Associated Anomalies.

Natarajan Muthukumar

7:00–7:03 pm

654 Endoscopic Third Ventriculostomy Versus Shunt for Pediatric Hydrocephalus: A Systematic Literature Review and Meta-analysis

Pavlos Texakalidis, Muhibullah S. Tora, Jeremy Wetzel, Joshua J. Chern

7:03–7:06 pm

655 Automated Evaluation of Intracranial Vessel Morphology in Normal Versus Pediatric Moyamoya Disease

Jennifer L. Quon, Lily H. Kim, Pauline Mouches, Rashad Jabarkheel, Yi Zhang, Gary K. Steinberg, Gerald A. Grant, Michael S. B. Edwards, Kristen Yeom, Nils Forkert

7:06–7:09 pm

656 Global and Intertuberal Epileptic Networks in Tuberos Sclerosis Based on Stereoelectroencephalographic (sEEG) Findings: A Quantitative EEG Analysis in Pediatric Subjects and Surgical Implications

Hepzibha Alexander, Rathinaswamy B. Govindan, Coleman T. Garrett, Tayyba Anwar, Islam Fayed, Robert F. Keating, William Gaillard, Chima Oluigbo

7:09–7:12 pm

657 Characteristics and Outcomes of Pediatric Glioblastoma in the Post-Temozolomide Era

Ankush Chandra, Taemin Oh, Harsh Wadhwa, Sumedh Subodh Shah, Nalin Gupta, Michael W. McDermott, Mitchel S. Berger, Manish K. Aghi

7:12–7:15 pm

658 Clinical and Imaging Outcomes After Combined Direct and Indirect Bypass for Pediatric Moyamoya Disease: A Single Center Retrospective Series

Ramin A. Morshed, Daniel Murph, Jasmin Dao, Kathleen Colao, Lauro Avalos, Steven Hetts, Adib A. Abla, Christine Fox, Michael T. Lawton, Nalin Gupta

INTERACTIVE MULTIMEDIA RESEARCH ORAL PRESENTATIONS

Podium 3, Level 2 Lobby

5:45–5:48 pm

659 Unruptured Intracranial Aneurysm Initial Treatment and Follow-up Cost Analysis: Pipeline Flow Diverters Versus Coiling

Herschel Wilde, Spencer Twitchell, Michael Karsy, Philipp Tausky, Ramesh Grandhi

5:51–5:54 pm

661 Healthcare Resource Utilization of Complications of Intracerebral Hemorrhage

Lefko T. Charalambous, Syed M. Adil, Zidanyue Yang, Christine Park, Sarah E. Hodges, Laura Zitella Verbick, Aaron McCabe, Beth Parente, Hui-Jie Lee, Shivanand P. Lad

5:54–5:57 pm

662 Treatment Trends and Outcome of Aneurysmal Subarachnoid Hemorrhage by Hospital Volume

Victor Lopez-Rivera, Songmi Lee, Peng R. Chen, Spiros L. Blackburn, David Rosenbaum-Halevi, Arvind Bambhroliya, Farhaan Vahidy, Sean Savitz, Sunil Sheth

5:57–6:00 pm

663 Persistent Hydrocephalus and Activated Microglia Drive the Spatial Memory Decline after Intraventricular Hemorrhage in Rodents

Kimia Kamal, Tamar Binyamin, Janet A. Keiter, Audrey R. Vergara, Ali Izadi, Katelynn Ondek, Robert Berman, Frank Sharp, Gene G. Gurkoff, Ben Waldau

6:00–6:03 pm

664 What Size Cerebral Aneurysms Rupture? A Systematic Review and Meta-analysis of Literature

Maxim Mokin, Muhammad Waqas, Andrew Gong, Felix Chin, Hamid Rai, Kunal Vakharia, Hamidreza Rajabzadeh Oghaz, Kenneth V. Snyder, Jason Davies, Elad I. Levy, Hui Meng, Adnan H. Siddiqui

6:03–6:06 pm

665 Location of Intracerebral Hemorrhage Affects Outcome after Minimally Invasive Endoscopic Hematoma Evacuation

Rui Song, Dominic A. Nistal, Jacopo Scaggiante, Alexander G. Chartrain, Natalia Romano Spica, Julianne Kleitsch, John Liang, J D. Mocco, Christopher P. Kellner

6:09–6:12 pm

667 Repeat Flow Diversion for Previously Failed Flow Diversion in a Multicenter Cohort

Mohamed M. Salem, Ahmad Sweid, Anna L. Kuhn, Adam A. Dmytriw, Muhammad Waqas, Nimer Adeeb, Peter Kan, Ajit S. Puri, Tom R. Marotta, Elad I. Levy, Justin M. Moore, Christopher S. Ogilvy, Pascal Jabbour, Ajith J. Thomas

6:12–6:15 pm

668 Stent-assisted Coiling of Cerebral Aneurysms: A Multi-center Analysis

Maxim Mokin, Christopher T. Primiani, Keaton Piper, David Fiorella, Ansaar Rai, Kirill Orlov, Dmitry Kislitsin, Anton Gorbatykh, J D. Mocco, Reade DeLeacy, Joyce Lee, Alejandro M. Spiotta, Raymond D. Turner, IV, Imran Chaudry, Aquilla S. Turk

6:15–6:18 pm

669 Management of Tandem Cervical Internal Carotid Artery Stenosis and Large Vessel Occlusion During Acute Stroke: A Single Institution's Initial Experience

Nicolas W. Vilelli, Andrew DeNardo, John Scott, Daniel Sahlein, Troy D. Payner, Jesse J. Savage, Mitesh Vipin Shah, Charles Glen Kulwin

6:18–6:21 pm

670 Implications of Achieving TIC1 2b Versus TIC1 3 Reperfusion in Patients with Ischemic Stroke: A Cost-Effectiveness Analysis

Xiao Wu, Dheeraj Gandhi, Charles C. Matouk, Joseph Schindler, Danny Hughes, Howard Forman, Pina C. Sanelli, Ajay Malhotra

6:21–6:24 pm

671 Neurosurgical Management in Left Ventricular Assist Device (LVAD) Patients with Intracerebral Hemorrhage (ICH)

Kyle Mueller, Matthew R. D'Antuono, David Zhao, Jeffrey C. Mai, Edward F. Aulisi, Daniel Felbaum, Michael Hockstein, Rocco Armonda

6:24–6:27 pm

672 Surgical Outcomes in Brainstem AVM: A Systematic Review and Meta-analysis

Anadjeet Singh Khahera, Oludotun Ogunsola, Justin Sim, Alison Clarke, E. Sander Connolly, Jr.

6:27–6:30 pm

673 Managing Anterior Communicating Artery Aneurysms – Are We Doing it Right?

Lauren Harris, Ciaran S. Hill, Matthew Elliot, Teresa Fitzpatrick, Alejandro Feria, Anthony Ghosh, Raghu Vindlacheruvu

6:30–6:33 pm

674 Abdominal Aortic Aneurysm Is an Independent Risk Factor for Subarachnoid Hemorrhage

D. Andrew Wilkinson, Jeffrey L. Nadel, Neeraj Chaudhary, Joseph J. Gemmete, Byron G. Thompson, Jr., Aditya S. Pandey

6:33–6:36 pm

675 Preliminary Experience with Proximal Flow Reversal During Intracranial Balloon Angioplasty and Stenting for Symptomatic, Severe Intracranial Stenosis

Branden J. Cord, Corrado Santarosa, Nanthiya Sujjantararat, Adam Kundishora, Guido Falcone, Kevin Sheth, Lauren Sansing, Joseph Schindler, Nils Petersen, Charles C. Matouk

6:36–6:39 pm

676 Vasa Vasorum Formation Is Associated with Rupture of Intracranial Aneurysms

Haruka Miyata, Hirokazu Koseki, Kampei Shimizu, Yu Abekura, Mieko Oka, Tomohiro Aoki, Kazuhiko Nozaki

6:39–6:42 pm

677 Somatic PDGFRB Activating Variants in Fusiform Cerebral Aneurysms

Joshua W. Osbun, Yigit Karasozen, Carolina Parada, Tina Busald, Philip Tatman, Luis Gonzalez-Cuyar, Christopher Hale, Diana Alcantra, Mark O'Driscoll, William Dobyns, Mitzi Murray, Louis J. Kim, Peter Byers, Michael Dorschner, Manuel Ferreira

6:42–6:45 pm

678 Optical Coherence Tomography Imaging in Acute Ischemic Stroke: Preliminary Animal and Human Results

Christopher R. Pasarikovski, Leo da Costa, Joel Ramjist, Yuta Dobashi, Victor Xiao Dong Yang

6:45–6:48 pm

679 Toward Optimal VTE Prophylaxis in Neurosurgery

H. Westley Phillips, TJ Florence, Nicholas Macaluso, Diana Babayan, Nader Pouratian, Won Kim

6:48–6:51 pm

680 Acute Brain Injury Is Associated with Prolonged Suppression of Cerebral Blood Flow Oscillations

Ryan M. Jamiolkowski, Wesley Baker, W. Andrew Kofke, Ramani Balu

6:51–6:54 pm

681 Higher Volume Predicts Improved Outcomes for Severe Pediatric Traumatic Brain Injury Patients at Level 1 and 2 Trauma Centers

Anna Kimata, Oliver Young Tang, Wael Asaad

6:54–6:57 pm

682 Effect of ACS Level 1 - Trauma Center Designation on Management of Adult Severe TBI Patients

Matthew Helton, Austin Porter, Kevin Thomas, Jeffrey C. Henson, Mason Sifford, Hayden Scott, Analiz Rodriguez, Kevin Sexton

6:57–7:00 pm

683 Methylene Blue Attenuates Significant Shifts in the Gut Microbiome following Traumatic Brain Injury in Rodents

Matthew McIntyre, David M. Burmeister, Shannon Scroggins, Michael O'Boyle, Zhao Lai, Martin Schwacha, Lora Watts, Susannah Nicholson.

7:00–7:03 pm

684 Self-reported Knowledge Levels of Critical Care Nurses in Managing Neuroemergencies: A Survey Based Study

Karan Amlani, Sonia Nelson, Elka Riley, Zachary L. Hickman, Christopher P. Kellner, Nirit Weiss, Fawaz Almufti, Golda Bohaene, Joshua B. Bederson, J D. Mocco, Neha Dangayach

7:03–7:06 pm

685 Factors Associated with Worsened Neurologic Outcomes in Traumatic Subarachnoid Hemorrhage

Risheng Xu, Yuanxuan Xia, Chau D. Vo, Wuyang Yang, Jason A. Liew, Ted Alban, James Feghali, Justin M. Caplan, Rafael J. Tamargo, Judy Huang

7:06–7:09 pm

686 The Protective Role of Heme Oxygenase-1 (HO-1) in Chronic Subdural Hematoma

Hui-Tzung Luh

7:09–7:12 pm

687 Incidence and Risk Factors for Developing Post Traumatic Hydrocephalus, Analysis of a Prospective Cohort of 402 Patients

Ezequiel Goldschmidt, Federico Angriman, Ruchira Menka Jha, Benjamin Zusman, Ava Puccio, David O. Okonkwo

7:12–7:15 pm

688 The Utility of Thromboelastography for Predicting the Risk of Posttraumatic Cerebral Infarction in Traumatic Brain Injury

Hao Chen, Hengli Tian

INTERACTIVE MULTIMEDIA RESEARCH PRESENTATION ORAL PRESENTATIONS

Podium 4, Level 2 Lobby

5:45–5:48 pm

689 Is Biological Effective Dose (BED) Predictive of Outcomes after Radiosurgery for Cerebral Arteriovenous Malformations?

Cody L. Nesvick, Christopher S. Graffeo, Michael J. Link, Bruce E. Pollock

5:48–5:51 pm

690 Pre-operative Epilepsy Network Distribution Correlates with Seizure Recurrence Following Epilepsy Surgery

Long Di, Elliot G. Neal, Stephanie Maciver, Fernando L. Vale

5:51–5:54 pm

691 Skull Density Ratio and Treatment Outcomes in Essential Tremor Patients Treated with Transcranial MR-guided Focused Ultrasound Thalamotomy

Abdul-Kareem Ahmed, Jiachen Zhuo, Howard M. Eisenberg, Timothy R. Miller, Rao Gullapalli, Dheeraj Gandhi

5:54–5:57 pm

692 Pallidal Thermoablation Unleashes Gamma Oscillations in the Motor Cortex in Parkinson's Disease

Doris D. Wang, Coralie de Hemptinne, Svjetlana Miocinovic, Witney Chen, Jill L. Ostrem, Philip A. Starr

5:57–6:00 pm

693 Glomus Jugulare: Is Gammaknife Radiosurgery the Ideal Treatment?

Jaskaran Singh, Manmohan Singh

6:00–6:03 pm

694 Combination Targeting of Subthalamic Nucleus and Ventral Intermediate Thalamic Nucleus in Deep Brain Stimulation for Tremor-dominant Parkinson's Disease: Experience and Outcomes

Islam Fayed, Kelsey Diva Cobourn, Gnel Pivazyan, Fernando Pagan, Steven Lo, Yasar Torres-Yaghi, Allen S. Mandir, Christopher G. Kalthorn

6:03–6:06 pm

695 Audiovisual Speech Enhancement via Cross-modal Suppression of Auditory Association Cortex by Visual Speech

Patrick J. Karas, John F. Magnotti, Zhengjia Wang, Brian A. Metzger, Daniel Yoshor, Michael S. Beauchamp

6:06–6:09 pm

696 Use of Functional MRI to Assess How Motor Phenotypes of Parkinson's Disease Respond to DBS

Marisa D. DiMarzio, Radhika Madhavan, Suresh Joel, Ileana Hancu, Eric Fiveland, Julia Prusik, Michael Gillogly, Tanweer Rashid, Jeffrey Ashe, Ilknur Telkes, Paul Feustel, Damian Shin, Jennifer Durphy, Roy S. Hwang, Era Hanspal, Julie G. Pilitsis

6:09–6:12 pm

697 The Positive Allosteric Modulator of Alpha-2/3-Containing GABA A Receptors, KRM-II-81, Is Active in Pharmaco-resistant Models of Epilepsy and in Human Epileptic Tissue

Jodi L. Smith, Xingie Ping, Xiaoming Jin, Lalit K. Golani, Guanguan Li, Farjana Rashid, Rajwana Jahan, James M. Cook, Jeffrey M. Witkin

6:12–6:15 pm

698 Interneuron Transplantation Creates New Network States and Rescues Social Behavior Deficits in a Mouse Model of Autism

Derek Southwell, Helia Seifikar, Ruchi Malik, Karen Lavi, Daniel Vogt, John Rubenstein, Vikaas Sohal

6:15–6:18 pm

699 The Durability of Pain Relief Following Endoscope-assisted MVD for Trigeminal Neuralgia

Alexandra D Baker, Melvin Field

6:24–6:27 pm

702 Management of Non-Surgical Refractory Low Back Pain in the United States: A Retrospective Analysis

Charis Spears, Sarah E. Hodges, Musa Kiyani, Zidanyue Yang, Beth Parente, Hui-Jie Lee, Shivanand P. Lad

6:27–6:30 pm

703 Central Neuropathic Pain And Complex Regional Pain Syndrome Following Brachial Plexus Injury Treated Successfully with Dorsal Root Entry Zone Lesioning

Erin McCormack, Mansour H. Mathkour, Lora Wallis Kahn, Reda Tolba, Maged Guirguis, Gassan Chaiban, Daniel Denis

6:30–6:33 pm

704 Clinical Diagnosis Scale for Pain Lumbar of Facet Origin: Systematic Review of Literature and Pilot Study

Juan C. Gomez Vega, Juan C. Acevedo Gonzalez

6:36–6:39 pm

706 The Impact of Pre-Operative Opioids on Outcomes in Craniotomy Patients

Varun Shah, Nguyen Hoang, Brandon Rodgers, David L. Dornbos III, Ryan Eaton, Dante Pezzutti, Erin Hoover, Helen Duenas, Santino Cua, Shahid Mehdi Nimjee

6:39–6:42 pm

707 20 Years of Opioids Prescriptions in Spine Patients: The Experience of Two Academic Hospitals in Massachusetts

Elisabetta Mezzalira, Paola Prieto Calvachi, Brittany M. Stopa, Jordan Muse, Ahmad Kareem Almekkawi, Hassan Zaidi, Linda S. Aglio, Timothy R. Smith, William B. Gormley

6:42–6:45 pm

708 Sex Disparities in Outpatient Management of Post-laminectomy Syndrome

Amy Zhu, Ryan Guan Chiu, Jeffery Zhao, Ankit Indravadan Mehta

6:45–6:48 pm

709 Late Week Surgery Is Associated with Longer Length of Stay in Patients Undergoing Laminectomy for Degenerative Lumbar Stenosis

Robert Winkelman, Vikram Chakravarthy, Matthew M. Grabowski, Ghaith Habboub, Sebastian Salas-Vega, Thomas E. Mroz

6:48–6:51 pm

710 Disparities in Rates of Fusions in Single-Level Lumbar Disc Pathologies

Soobin Kim, James S. Ryoo, Philip B. Ostrov, Abhinav K Reddy, Ankit Indravadan Mehta

6:51–6:54 pm

711 Global Burden of Neurosurgical Disease

Alex Jacob, Christopher Carr, Cassidy Werner, Aaron S. Dumont

6:54–6:57 pm

712 Postoperative Admission of Adult Craniotomy Patients to Neuroscience Floor Unit Reduces Cost and Length of Stay

Matthew Z. Sun, Diana Babayan, Jia-Shu Chen, Maxwell Wang, Priyanka Naik, Kara Reitz, Won Kim

6:57–7:00 pm

713 Socioeconomic Barriers Affecting Neurologic Recovery Facing the Aneurysmal Subarachnoid Population

Ben A. Strickland, Kristine Ravina, Alexander G. Chartrain, Robert Rennert, Arun P. Amar, Jonathan Russin, Steven L. Giannotta

7:00–7:03 pm

714 Analysis of Neurosurgery Resident Operative Experience: Training Tomorrow's Neurosurgeon

Shahjehan Ahmad, Bledi C. Brahimaj

7:03–7:06 pm

715 The Neurosurgeon-Scientists NIH Funding Trends

Karim ReFaey, Shashwat Tripathi, William D. Freeman, Hugo Guerrero-Cazares, James Meschia, Leonard Petrucci, Fredric B. Meyer, Alfredo Quinones-Hinojosa

7:06–7:09 pm

716 A Single-Institution's Experience with the CMS Non-Cervical Spine Fusion Bundle Payments

Abraham Schlauderaff, Neel T. Patel, G. Timothy Reiter

7:09–7:12 pm

717 Neurosurgery Elective for Preclinical Medical Students With and Without a Home Neurosurgery Program

Jonathan Dallas, Nishit Mummareddy, Aaron M. Yengo-Kahn, Robert J. Dambrino, IV, Alexander M. Lopez, Lola Blackwell Chambless, Richard Berkman, Rohan V. Chitale, Christopher M. Bonfield, Regina S. Offodile, John C. Wellons, III, Reid C. Thompson, Scott L. Zuckerman

7:12–7:15 pm

718 Causes of Hospital Readmissions Within Seven Days from the Neurosurgical Service of a Quaternary Referral Hospital

Enyinna L. Nwachuku

CNS Wellness Afternoon

Tuesday 1:45–2:45 pm

Meet Dr. Gary Simonds, author of “The Thriving Physician: How to Avoid Burnout by Choosing Resilience Throughout Your Medical Career”

Voices of Neurosurgery: The Unforgettable Moments

CNS sweatpants giveaway (limited quantity)

Create Your Own Smoothie on the Blender Bike

ORAL ABSTRACT PRESENTATIONS WEDNESDAY, OCTOBER 23



SUNRISE SCIENCE ORAL PRESENTATIONS SESSION

Room 3024

7:00–7:06 am

350 Evoked Compound Action Potentials to Guide Lead Placement: A Neuromonitoring Technique Case Series
Steven M. Falowski

7:06–7:12 am

351 Development and Validation of a Clinical Prediction Score for Poor Postoperative Pain Control Following Elective Spine Surgery
Michael M.H. Yang, Jay Riva-Cambrin, Jonathan Cunningham, Nathalie Jette, Tolulope T. Sajobi, Steven Casha

7:12–7:18 am

352 Pre-operative Radiological Finding at the Lumbar Spinal Level is a Novel Predictive Factor for Post-operative Outcome After Spinal Cord Stimulation in Patients with Failed Back Surgery Syndrome
Yusuke Hori, Andre Machado, Sean J. Nagel

7:18–7:24 am

353 Spontaneous Intracranial Hypotension and the Durability of Epidural Blood Patch
Ali Hazama, Lori John, Alexander E. Braley, Lawrence S. Chin, Satish Krishnamurthy

7:24–7:30 am

354 Stim Salvage: Case Series Reporting on the Effectiveness of SCS Salvage
Patrick Paullus, Erika A. Petersen

7:30–7:36 am

355 Spinal Cord Stimulation with Non-linear Burst Stimulation Design Improves Psychosocial Function Through the Medial Spinothalamic Tract
Steven M. Falowski

7:36–7:42 am

356 Impact of Predominant Arm Pain Versus Neck Pain on 12-Month Outcomes Following Elective Cervical Spine Surgery: Analysis from the Quality Outcomes Database (QOD)
Clinton J. Devin, Mohamad Bydon, Mohammed A. Alvi, Anshit Goyal, Panagiotis Kerezoudis, Inamullah Khan, Yagiz U. Yolcu, Anthony L. Asher

7:42–7:48 am

357 Factors Contributing Spinal Cord Stimulator Explantation
Francisco A. Ponce, Dakota Graham, Margaret Lambert, Zaman Mirzadeh

7:48–7:54 am

358 Utility of a Mobile Clinical Decision Support Application in Patients Undergoing Spinal Cord Stimulation

Shervin Rahimpour, Sarah E. Hodges, Luis A. Antezana, Abena A. Ansah-Yeboah, Rajeev Dharmapurikar, John Hatheway, Michael Warrick, Scott Berlin, Benjamin Seeman, Shivanand P. Lad

7:54–8:00 am

359 Direct Anterior Insular Cortex Stimulation Increases Heat Pain Threshold: A Case Report
Chang-Chia Liu, Shayan Moosa, Mark Quigg, W. Jeffrey Elias

8:00–8:06 am

925 Risk Factors for Wound-related Complications after Microvascular Decompression: A Case Control Study
Elizabeth N. Alford, Gustavo Chagoya, Galal Elsayed, Joshua Bernstock, Nicole Bentley, Andrew K. Romeo, Barton L. Guthrie

8:06–8:12 am

926 CT Guided Percutaneous Glycerol Rhizotomy for Trigeminal Neuralgia - A Standardized Protocol to Reduce Radiation Dose and Procedure Time
Bradley T. Schmidt, Conrad Pun, Scott Hetzel, Wendell B. Lake, Daniel K. Resnick

8:12–8:18 am

927 A Retrospective Analysis of High Opioid use Patients undergoing a Preoperative Pain Program Prior to Spine Surgery
Karl Wittnebel, Lindsey Ross, Jeanne Black, Keith Siegel, Terrence T. Kim, Sang D. Kim, Eli M. Baron, Tiffany G. Perry, Alexander Tuchman, Mark Vrahas, J. Patrick Johnson

8:18–8:24 am

928 A Multidisciplinary Spinal Fusion Pathway to Discharge: Improved Standardization of Care Reduces Hospital Length of Stay, Enhances Pain Control and Optimizes Disposition after Lumbar Spine Surgery
Corey T. Walker, Virginia Prendergast, Jakub Godzik, Alex Whiting, Juan S. Uribe, Jay D. Turner, Laura A. Snyder

8:24–8:30 am

929 Minimally Invasive Versus Open Surgical Treatment of Thoracolumbar Metastatic Epidural Spinal Cord Compression (MESCC): Meta-analysis and Systematic Review
Ali R. Tafreshi, Elwood Siagian, Guofang Shen, Wei-Xing Shi

(SF)

SUNRISE SCIENCE ORAL PRESENTATIONS SESSION

Room 3020

7:00–7:06 am

360 Rates of Post Procedure Hemorrhage in Brain Tumor Patients on Therapeutic Anticoagulation Undergoing Gamma Knife Radiosurgery

Carlos R. Goulart, Michelle Dewitt, Gaddum D. Reddy

7:06–7:12 am

361 Real-World Outcomes Using a Novel Directional Lead From a Deep Brain Stimulation Registry for Parkinson's Disease

Jan Vesper, Roshini Jain, Alex Wang, Heleen Scholtes, Michael T. Barbe, Steffen Paschen, Andrea Kuhn, Jens Volkmann, Monika Potter-Nerger, Günther Deuschl

7:12–7:18 am

362 Neuroanatomical Correlates of Response to Focused Ultrasound Thalamotomy in Essential Tremor

Robert Gramer, Stanley Xiangyu Li, Gavin Elias, Alexandre Boutet, Jurgen Germann, Michael Schwartz, Alfonso Fasano, Andres M. Lozano

7:18–7:24 am

363 The Predictive Value of Interictal Scalp EEG Findings in Aiding the Detection of Malformations of Cortical Development in Temporal Lobe Epilepsy

Jeffrey W. Fuchs, Nathan A. Shlobin, Benjamin Hopkins, Zehra Husain, Michael Cloney, Evgeniya Tyrtova, Pue Farooque, Jessica W. Templer, S. Kathleen Bandt

7:24–7:30 am

364 Clinically weighted Probabilistic Tractography Mapping of Therapeutic Thalamic Deep Brain Stimulation for Essential Tremor

Evangelia Tsolaki, Alon Kashanian, Nader Pouratian

7:30–7:36 am

365 Interstitial Laser Capsulotomy for Refractory Obsessive-Compulsive Disorder – Lesion Size and Energy Deposition Determine Outcome

Peter C. Warnke, Anil Mahavadi, Jon Grant

7:36–7:42 am

366 A Feedforward Mechanism for Epileptogenesis Regulated by Lactate Dehydrogenase A

Marcelle Altshuler, Alexander Ksendzovsky, Muznbanu Bachani, Stuart Walbridge, Sara Inati, Islam Fayed, John D. Heiss, Jaideep Kapur, Kareem A. Zaghoul

7:48–7:54 am

368 Evaluation of Predictive Models of Postoperative Seizure Freedom in Patients with Medically-refractory Epilepsy

Alireza Mansouri, Jerry C. Ku, Shervin Taslimi, James M. Drake, Abhaya Vivek Kulkarni, James T. Rutka, Taufik Valiante

7:54–8:00 am

369 Cortical Basal Ganglia Network Interactions During Sequence Learning in Parkinson's Disease

Doris D. Wang, Coralie de Hemptinne, Roege Gilron, Philip A. Starr

8:00–8:06 am

930 Prefrontal Cortex Regulation of Nigral DA and Non-DA Neurons: An in Vivo Optogenetics Study in Rats

Ali R. Tafreshi, Elwood Siagian, Guofang Shen, Wei-Xing Shi

8:06–8:12 am

931 Multi-modal Presurgical Evaluation of Refractory Localization-related Epilepsy involving Mesial Temporal Lobe Structures

Rui Feng, Jie Hu, Zhen Fan, Liqin Lang, Li Pan

8:12–8:18 am

932 Post-operative MRI Is Associated with Increased Radiographic Hemorrhage Detection after Stereotactic Encephalography Depth Electrode Placement

Victor Sabourin, Anthony Stefanelli, Fadi Al Saiegh, Caio M. Matias, Ashwini D. Sharan, Chengyuan Wu

8:18–8:24 am

933 Laser Interstitial Thermal Therapy for Epilepsy with Periventricular Nodular Heterotopia

Alex Whiting, Justin Bingaman, Joshua Catapano, Benjamin B. Whiting, Jakub Godzik, Corey T. Walker, Kris A. Smith

8:24–8:30 am

934 Does Bilingualism Prognosticate a Favorable Outcome after Awake Surgery?

Karim ReFaey, Sanjeet S. Grewal, Shashwat Tripathi, Adip G. Bhargav, Erik H. Middlebrooks, David S. Sabsevitz, Adela Wu, Kaisorn L. Chaichana, Alfredo Quinones-Hinojosa

CRANIAL AFTERNOON ABSTRACT ORAL PRESENTATIONS

Room 2020

1:45–1:51 pm

800 Pregnancy after Cerebral Bypass for Moyamoya Disease

Ephraim W. Church, Rabia Qaiser, Theresa E. Bell-Stephens, Eric Chow, Summer Han, Yasser Y. El-Sayed, Gary K. Steinberg

1:51–1:57 pm

801 Multiplex Profiling of Secreted Factors in the Cerebrospinal Fluid of Moyamoya Disease Patients

Kumar Abhinav, Alex G. Lee, Arjun Vivek Pendharkar, Yael Rosenberg-Hasson, Haruto Uchino, Michelle Cheng, Gary K. Steinberg

1:57–2:03 pm

802 Cerebral Aqueduct CSF Stroke Volume Hydrodynamics in Chronic Communicating Hydrocephalus: Exploration of the Initial and Late Phases in an Animal Model

Tito G.M. Vivas-Buitrago, Ignacio Jusue Torres, Gabriel D. Pinilla-Monsalve, Armelle Lokossou, Jiadi Xu, Hugo Guerrero Cazares, Susumu Mori, Alfredo Quinones-Hinoja, Olivier Baledent, Daniele Rigamonti

2:09–2:15 pm

804 Seizure Presentation in Patients with Brain Arteriovenous Malformations Treated with Stereotactic Radiosurgery: A Multicenter Study

Ching-Jen Chen, Leah Shabo, Dale Ding, Natasha Ironside, Douglas Kondziolka, L. Dade Lunsford, Jason P. Sheehan

2:15–2:21 pm

805 Technical Note: Endoscopic Evacuation of Intraventricular Hemorrhage During Minimally Invasive Endoscopic Intracerebral Hemorrhage Evacuation

Jacque J. Lara-Reyna, Rui Song, Dominic A Nistal, Neha S. Dangayach, J D. Mocco, Christopher Paul Kellner

2:21–2:27 pm

806 Dynamic Structural Modeling Revealed that Nilotinib Inhibits Smoothed Signaling

Kirti Kandhwal Chahal, Jie Li, Irina Kufareva, Donald Durden, Robert Wechsler Reya, Ruben Abagyan, Clark C. Chen

2:27–2:33 pm

807 Functional Characterization of Brain Tumor-initiating Cells: Implications for Preclinical Models and Drug Development

Cesar A. Garcia, Adip Guruprasad Bhargav, Sujan K. Mondal, Karim ReFaey, Natanael Zarco, Paula Schiapparelli, Rachel Sarabia-Estrada, Hugo Guerrero-Cazares, Alfredo Quiñones-Hinojosa

2:33–2:39 pm

808 Preoperative MRI-based Predictive Modeling of Brain Tumor Laser Ablation

Anil Mahavadi, Walter J. Jermakowicz, Iahn Cajigas, Lia Dan, Santiago Guerra, Ghulam Farooq, Ashish H. Shah, Michael E. Ivan, Jonathan R. Jagid, Ricardo J. Komotar

2:39–2:45 pm

809 Decorin Expression Is Associated with Diffusion MR Phenotypes in Glioblastoma

Kunal S. Patel, Catalina Raymond, Jingwen Yao, Joseph Tsung, Linda M. Liau, Richard Everson, Timothy F. Cloughesy, Benjamin Ellingson

2:45–2:51 pm

810 Captopril as an Adjuvant to Temozolomide Prolongs Survival in a Rat Intracranial Gliosarcoma Model via Downregulation of Matrix Metalloproteinase-2

Leon Pinheiro, Alexander Perdomo-Pantoja, Joshua Casaos, Iddo Paldor, Veronica Vigilar, Antonella Mangraviti, Yuan Wang, Henry Brem, Betty Tyler

2:51–2:57 pm

811 Possibilities of Photodynamic Therapy in the Complex Treatment of Malignant Gliomas

Artemii Y Rynda

2:57–3:03 pm

812 The Luciferase Expressing Glioma-261 Murine Models Elicit an Immune-mediated Anti-tumor Response

Victoria E. Sanchez, John Lynes, Stuart Walbridge, Xiang Wang, Nancy A. Edwards, Anthony Nwankwo, Gifty Dominah, Arnold Obungu, Nicholas Adamstein, Pradeep Dagur, Tianxia Wu, Dragan Maric, John D. Heiss, Edjah K. Nduom

3:03–3:09 pm

813 Trends in Management of Cerebrospinal Fluid Leaks Among Pediatric Head Trauma Patients with Skull Base Fractures

Anthony O. Asemota, Eric B. Schneider, Gary L. Gallia

3:09–3:15 pm

814 Volume and Midline Shift as Pre-operative CT Imaging Predictors of Postoperative Chronic Subdural Hematoma Recurrence: Retrospective Review of 345 Patients with 412 Operative Subdural Sides

Laila Malani Mohammad, William H. McKay, Christine Meadows, Jacqueline O'Neill, Howard Yonas, Andrew P. Carlson

**DISORDERS OF THE SPINE AND PERIPHERAL NERVES
ORAL ABSTRACT PRESENTATIONS**

Room 2016

1:45–1:51 pm

815 Independent Patient Risk Factors Associated with Increased Length of Hospital Stay, Unplanned Return to OR and 30-Day Readmission Rates After Posterior Cervical Fusion for Cervical Spondylotic Myelopathy

Aladine A. Elsamadicy, Fouad Chouairi, Megan Lee, Andrew B. Koo, Adam Kundishora, Joaquin Q. Camara-Quintana, Luis Kolb, Maxwell S.H. Laurans, Khalid M. Abbed

1:51–1:57 pm

816 Combined Nucleus Pulposus Augmentation and Annulus Fibrosus Repair Prevents Intervertebral Disc Degeneration After Discectomy

Sertac Kirnaz, Stephen Sloan, Christoph Wipplinger, Franziska Anna Schmidt, Roger Hartl, Lawrence J. Bonassar

1:57–2:03 pm

817 The Impact of Obstructive Sleep Apnea on Clinical, Perioperative, and Cost Outcomes in Patients who Underwent Posterior Cervical Discectomy and Fusion: A Single Center Retrospective Analysis from 2008-2016

Alejandro Carrasquilla, Dominic A. Nistal, John M. Caridi

2:03–2:09 pm

818 Intrathecal Riluzole for the Treatment of Patients with Amyotrophic Lateral Sclerosis

Nicholas M. Boulis

2:09–2:15 pm

819 Body Mass Index Greater than 35 is Associated with Increased Major and Radiographic Complications after Minimally Invasive Adult Spinal Deformity Surgery

Khoi D. Than, Stacie Tran, Dean Chou, Kai-Ming G. Fu, Paul Park, Richard G. Fessler, Michael Y. Wang, Adam S. Kanter, David O. Okonkwo, Pierce D. Nunley, Neel Anand, Juan S. Uribe, Robert Eastlack, Gregory M. Mundis, Jr., Praveen V. Mummaneni

2:15–2:21 pm

820 Complications in Minimally Invasive Versus Open Surgery for Intermediate to High-Grade Spondylolisthesis: A 10-year Retrospective, Multicenter Experience

Asad Mehmood Lak, Abdullah M. Abunimer, Amina Rahimi, Ian Tafel, Hasan Aqdas Zaidi

2:21–2:27 pm

821 Does a Fracture Liaison Service Program Minimize Recurrent Fragility Fractures in the Elderly with Osteoporotic Vertebral Compression Fractures?

Tarik Wasfie, Avery M. Jackson, III

2:27–2:33 pm

822 Comparative Effectiveness of Adjustable Lordotic Expandable Versus Static Lateral Lumbar Interbody Fusion Devices: Two-Year Clinical and Radiographic Outcomes

Yan M. Li, Richard F. Frisch, Zheng Huang, James Towner, Yan Icy Li, Jessica Riggelman, Charles Ledonio

2:33–2:39 pm

823 Comparing Radiographic Parameters for Single-level L5-S1 Interbody Fusion: Anterior Lumbar (ALIF) Versus Transforaminal Lumbar Interbody Fusion (TLIF)

Caleb S. Edwards, Andrew Kai-Hong Chan, Dean Chou, Praveen V. Mummaneni

2:39–2:45 pm

824 Safety of Outpatient Anterior Cervical Discectomy and Fusion: A Systematic Review and Meta-analysis

Ketan Yerneni, John F. Burke, K. Daniel Riew, Vincent C. Traynelis, Lee A. Tan

2:45–2:51 pm

825 Choosing Minimally Invasive Versus Open Surgery in the Treatment of Adult Spinal Deformity (ASD): Analysis of a Prospective, Non-randomized Multi-center Study

Paul Park, Khoi D. Than, Pierce D. Nunley, Robert Eastlack, Juan S. Uribe, Michael Y. Wang, Stacie Tran, Richard G. Fessler, David O. Okonkwo, Adam S. Kanter, Neel Anand, Dean Chou, Kai-Ming G. Fu, Gregory M. Mundis, Jr.

2:51–2:57 pm

826 Fusion and Opioid-sparing with the Use of Ketorolac in Posterior Thoracolumbar Spinal Fusions: A Prospective Double-blinded Randomized Placebo-Controlled Trial

Evan J. Lytle, Chad F. Claus, Doris Tong, Diana Sigler, Dominick Lago, Matthew Bahoura, Amarpal Dosanjh, Michael H. Lawless, II, Dejan Slavnic, Jacob Jasinski, Robert W. McCabe, Karl Kado, Prashant Sudhir Kelkar, Clifford Michael Houseman, Peter L. Bono, Boyd F. Richards, Teck Mun Soo

2:57–3:03 pm

827 Predictive Model for Length of Stay Among Patients Undergoing Surgery for Grade I Spondylolisthesis: Analysis from the Quality Outcomes Database

Praveen V. Mummaneni, Mohamad Bydon, John J. Knightly, Anshit Goyal, Mohammed A. Alvi, Andrew Kai-Hong Chan, Jian Guan, Steven D. Glassman, Kevin T. Foley, Jonathan Slotkin, Eric A. Potts, Mark E. Shaffrey, Christopher I. Shaffrey, Sr., Regis W. Haid, Kai-Ming G. Fu, Michael Y. Wang, Paul Park, Anthony L. Asher, Erica F. Bisson

3:03–3:09 pm

828 Geographic Differences Is Intraoperative Neuromonitoring During Minimally Invasive Lateral Spine Surgery

Sheeraz Qureshi, Luke Ricci, Avani Vaishnav, Steven Mcanany, Sravisht Iyer, Todd Albert, Catherine Gang

3:09–3:15 pm

829 Acute Exacerbation of Symptoms After Lumbar Decompression Surgery: An Analysis Readmissions and Reoperations in 81,365 patients

Andre Samuel, Avani Vaishnav, Steven Mcanany, Sravisht Iyer, Todd Albert, Catherine Gang, Sheeraz Qureshi

NEUROTRAUMA AND CRITICAL CARE ORAL ABSTRACT PRESENTATIONS

Room 2022

1:45–1:51 pm

830 Sports-Related Cervical Spine Fracture and Spinal Cord Injury: A Review of Nationwide Pediatric Trends

Haddy Alas, Avery Brown, Katherine Pierce, Cole Bortz, Michael Moses, Dennis Vasquez-Montes, Bassel G. Diebo, Carl Paulino, Aaron James Buckland, Michael Gerling, Peter G. Passias

1:51–1:57 pm

831 Micro RNA Profiles of Traumatic Brain Injury Isolated from Plasma Extracellular Vesicles

Ross Puffer, Luz Cumba-Garcia, Benjamin T. Himes, David O. Okonkwo, Ian F. Parney

1:57–2:03 pm

832 Meta-Analysis of Functional Outcomes in 5508 Patients Sustaining a Gunshot Wound to the Head

Georgios Maragkos, Efstathios Papavassiliou, Martina Stippler, Aristotelis Filippidis

2:03–2:09 pm

833 Pulmonary Embolism in Neurocritical Care – Introduction of a Novel Grading System for Risk Stratification: The Frankfurt AMBOS Score

Daniel Dubinski

2:09–2:15 pm

834 Detection of Persisting Concussion Effects on Measures of Neuromechanical Responsiveness

Chad J. Prusmack

2:15–2:21 pm

835 Clinical Course of Intracranial Bleeding in Patients Anticoagulated with Factor Xa Inhibitors without the Use of Specific Reversal Agents

Emmalin Nelton, Georgios Maragkos, Sven Richter, Aristotelis Filippidis, Martina Stippler

2:21–2:27 pm

836 Lower Mortality and Morbidity with LMWH for VTE Prophylaxis in Spine Trauma

Emily K. Chapman, Sean N. Neifert, Robert J. Rothrock, Frank Yuk, Ian T. McNeill, Jonathan J. Rasouli, Jonathan S. Gal, John M. Caridi

2:27–2:33 pm

837 Anatomic Factors Affecting Size of Suboccipital Decompression

Courtney Pendleton, Lohit Velagapudi, Jack Jallo

2:33–2:39 pm

838 Potential of Human Neural Stem Cell Transplantation to Treat Acute Subdural Hematoma

Lee Onn Chieng, Shoji Yokobori, Markus Spurlock, Shyam Gajavelli, Tom Hazel, Karl Johe, M. Ross Bullock

2:39–2:45 pm

839 The Accuracy of Glasgow Coma Score Documentation in a Trauma Database: Implications for Patient Care and Performance Metrics

Anthony M. DiGiorgio, Blake E. Wittenberg, Brooke Kennamer, Clifford Crutcher, Adam Podet, Jason D. Wilson, Clarence S. Greene, Jr., Gabriel C. Tender, Frank Culicchia, John Hunt

2:45–2:51 pm

840 Radiological Parameters Predicting Clinical Outcome After Decompressive Hemicraniectomy in Malignant Ischemic Stroke

Nida Fatima

2:51–2:57 pm

841 Multivariate Analysis of Acute Magnetic Resonance Imaging Predicts Neurological Improvements in Patients with Cervical Spinal Cord Injury After Early Surgical Decompression

Tomoo Inoue, Toshiaki Endo, Shinsuke Suzuki, Hiroshi Uenohara, Teiji Tominaga

2:57–3:03 pm

842 Minimally Invasive Endoscopy Versus Craniotomy for Acute Subdural Hematomas: A Retrospective Matched Cohort Study

Enzo Fortuny, Nicolas K. Khattar, Kevin John, Esther Bak, Shawn W. Adams, Kimberly S. Meyer, Emily P. Sieg, Robert F. James, Dale Ding

3:03–3:09 pm

843 Monotherapy Aspirin in Minor Traumatic Head Bleeds does not Worsen Outcome

Nasya Mendoza-Elias, Sandi Mackey, Lisa Jasak, Michael Rosenblatt, Subu N. Magge, Robert G. Whitmore, Zoher Ghogawala

3:09–3:15 pm

844 Mobile Digital Pupillometry for Rapid Triage of Patients with Severe Traumatic Brain Injury

Lynn B. McGrath, Jr., Jessica C. Eaton, Anthony Law, Alex Mariakakis, Shwetak Patel, Michael R. Levitt

LATE-BREAKING ABSTRACT SESSION

Room 3024

1:45–1:51 pm

935 Repurposing rhDNase to Improve Neurological Outcomes after Traumatic Brain Injury

Ayobami L. Ward, Molly Braun, Kumar Vaibhav, Krishnan M. Dhandapani

1:51–1:57 pm

936 Subdural Drain Versus Subdural Evacuating Port System for the Treatment of Non-acute Subdural Hematomas

N. Scott Litofsky, Michael J. Ortiz Torres, Patrick Belton, Matthew Burton, Ruben Ngnitewe

1:57–2:03 pm

937 Mortality Prediction Model for Traumatic Intracranial Hemorrhage: A National Trauma Data Bank Study

Esther Wu, Siddharth Marthi, Wael Asaad

2:03–2:09 pm

938 Neurophysiologic Composition of Fascicles Utilized for Oberlin Transfer: The Rare Presence of the FCU Fascicle

Brandon W. Smith, Nicholas Chulski, Kate Wan-Chu Chang, Ann Little, Lynda J.S. Yang

2:09–2:15 pm

939 Regional Variance in Disability and Quality of Life Outcomes following Surgery for Grade I Degenerative Lumbar Spondylolisthesis: A Quality Outcomes Database Analysis

Brandon Sherrod, Andrew K.H. Chan, Mohamad Bydon, Steven D. Glassman, Kevin T. Foley, Eric A. Potts, Christopher I. Shaffrey, Sr., Domagoj Coric, John J. Knightly, Paul Park, Michael Y. Wang, Kai-Ming G. Fu, Jonathan Slotkin, Anthony L. Asher, Michael S. Virk, Panagiotis Kerezoudis, Silky Chotai, Regis W. Haid, Jr., Praveen V. Mummaneni, Erica F. Bisson

2:15–2:21 pm

940 Repair of Brachial Plexus Injury using Direct Neurotization of the Spinal Accessory Nerve to the Superior Trunk of the Brachial Plexus: A Case Series

Sean Himel, Paul R. Clark, J. Mason Shiflett

2:21–2:27 pm

941 Anterior (ALIF), Oblique (OLIF), and Transforaminal (TLIF) Lumbar Interbody Fusions: A Comparison of Perioperative Morbidity

Caleb S. Edwards, Praveen V. Mummaneni, Anthony M. DiGiorgio, Darryl Lau, Dean Chou

2:27–2:33 pm

942 The Incidence of Adjacent Segment Degeneration after Lumbar Spine Surgery with Transpedicular Stabilization System and PEEK Rods

Luis J.L. Ulloa, Socorro Figueroa Rivera

2:33–2:39 pm

943 Medial Branch Block versus Vertebroplasty for 1-Level Osteoporotic Vertebral Compression Fracture: 2-Year Retrospective Study

Hyoung Joon Chun

2:39–2:45 pm

944 Anterior Lumbar Interbody Fusion Reduces Thecal Sac Compression in the Setting of Degenerative Spondylolisthesis

Hammad A. Khan, Nathan J. Stumpf, Kelsey A. Isbester, Samuel C. Overley, Shaleen Vira, Michael P. Steinmetz, Thomas E. Mroz

2:45–2:51 pm

945 Ultra-early DVT Prophylaxis in Intracerebral Hemorrhage

Dimitri Laurent, Olgert Bardhi, Paul Kubilis, Brian M. Corliss, Stephanie Adamczack, Ndi Geh, Katharina Busl, W. Christopher Fox

2:51–2:57 pm

946 Phase 2 Clinical Trial of Encephaloduroarteriosynangiosis (EDAS) Revascularization for Symptomatic Intracranial Atherosclerosis (ERSIAS)

Nestor R. Gonzalez, Hao Jiang, Patrick Lyden, Shlee Song, Konrad Schlick, Oana Dumitrascu, Lucas Restrepo, Neal Rao, Jason Hinman, David S. Liebeskind, Michael J. Alexander, Wouter I. Schievink, Juan F. Toscano, Raymond Liou, Steven Piantadosi, Miguel Quintero-Consuegra, Jeffrey L. Saver

2:57–3:03 pm

947 Traumatic Subarachnoid Hemorrhage as a Risk Factor for Mortality in Moderate and Severe Traumatic Brain Injury Patients. Hospital Central de Maracay, 2015-2016

Sasha J. Antunez, Ivis J. Graterol, Iran J. Briceño

3:03–3:09 pm

948 High Molecular Weight Amyloid- β Oligomers Level in Cerebrospinal Fluid Distinguish Idiopathic Normal Pressure Hydrocephalus from Other Neurodegenerative Diseases

Kaito Kawamura, Madoka Nakajima, Masakazu Miyajima, Chihiro Akiba, Chihiro Kamohara, Jyo Kanpyo, Wei Meng, Ikuko Ogino, Hajime Arai

3:09–3:15 pm

949 Fiber Tract Anatomy of the Hypothalamus

Pelin Kuzucu, Pinar Çeltikçi, Emrah Çeltikçi, Ahmet Memduh Kaymaz, Ahmet Akbas, Serhat S. Baydin, M. Sakir Eksi, Necmettin Pamir, Abuzer Güngör



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INTERACTIVE MULTIMEDIA RESEARCH PRESENTATION SESSION: POSTER PRESENTATIONS

TUESDAY, OCTOBER 22

5:45-7:15 pm
Level 2 Lobby

SECTION ON CEREBROVASCULAR SURGERY POSTERS

1000 Intra-aneurysmal Signal Dropout on 3D Time-of-flight MRA is Strongly Associated with Wall Enhancement in Unruptured Cerebral Aneurysms: A Novel Biomarker of Aneurysm Instability

Corrado Santarosa, Branden John Cord, Andrew Koo, Aladine A. Elsamadicy, Xiao Wu, Seyedmehdi Payabvash, Kevin Sheth, Nils Petersen, Guido Falcone, Ajay Malhotra, Charles C. Matouk

1001 FMS-like Tyrosine Kinase 3 Ligand (FLT3L) Downregulation in Peripheral Blood Serves as a Biomarker for the Presence of Unruptured Intracranial Aneurysms

Dominic A. Nistal, Michael L. Martini, Trevor Hardigan, Nicolas Fernandez, Seunghee Kim-Schulze, Rui Song, J D. Mocco, Christopher P. Kellner

1002 Genome-wide Association Meta-analysis of Over 30,000 Subjects Reveals Novel Intracranial Aneurysm Risk Genes

Tanyeri Barak, Katsuhito Yasuno, Murat Gunel

1003 Transcirculation Approach in the Endovascular Treatment of Acute Ischemic Stroke, Aneurysms, Dural Arteriovenous Fistulas and Arteriovenous Malformations: A Multicenter Study

Jorge A. Roa, Guilherme Dabus, Alberto Maud, Mario Martinez-Galdamez, Diego Paez-Granda, Vladimir Kalousek, Roger Barranco Pons, Ashkan Mowla, Viktor Szeder, Pascal Jabbour, Santiago Ortega-Gutierrez, David M. Hasan, Edgar Samaniego

1004 Revascularization Versus Clipping in High Hunt & Hess Grade Aneurysmal Subarachnoid Hemorrhage Unamenable to Endovascular Treatment

Jordan Lam, Krista Lamorie-Foote, Shivani Rangwala, Kristine Ravina, Jonathan Russin

1005 Predicting Perioperative Coagulopathy Via Machine Learning in Patients Requiring Emergency Neurosurgical Operations

Yirui Sun, Jinli Yu, Pengfei Fu, Hong Huang, Junyan Chen, Ying Mao

1006 The Risk Factors and Outcomes of Patients with Intra-Operative Aneurysm Rupture During Surgical Clipping

Ryan P. Palsma

1007 Evaluation of Disease Severity and Treatment Intensity as Cost Drivers for Ruptured Intracranial Aneurysms

Herschel Wilde, Spencer Twitchell, Jared C. Reese, Michael Karsy, Jian Guan, Ilyas Eli, Philipp Taussky, Ramesh Grandhi, Richard Schmidt, William T. Couldwell

1008 Pharmacogenetic and Clinical Warfarin Dosing Algorithm Assessments with Predictive Bleeding Risk Stratification

Nicholas Dietz, Elliot Antman

1009 Role of Antiplatelet and Statin Therapy in Patients with Cerebral Cavernous Malformations

Santiago Gomez-Paz, Mohamed M. Salem, Georgios Maragkos, Luis C. Ascanio, Alejandro Enriquez-Marulanda, Kimberly Kicielinski, Justin M. Moore, Ajith J. Thomas, Christopher S. Ogilvy

1010 Dandy's Vein Sacrifice and the Analysis of its Safety Profile in Neurosurgical Procedures

Vinayak Narayan, Amey Savardekar, Lekshmi P. Sateesh, Anil Nanda

1011 A Nationwide Analysis of Unplanned 30- and 90-day Readmissions After Elective Cerebral Aneurysm Clipping: Causes, Predictors, and Trends

Haydn Hoffman, Matthew Protas, Lawrence S. Chin

1012 A Nationwide Analysis of 30- and 90-day Readmissions After Elective Endovascular Embolization of Cerebral Aneurysms: Causes, Predictors, and Trends

Haydn Hoffman, Matthew Protas, Lawrence S. Chin

1013 Laser Interstitial Thermal Therapy for Cerebral Vascular Pathologies

Christopher S. Hong, Branden J. Cord, Charles C. Matouk, Veronica Chiang

1014 Elevated Serum Fibrinogen Degradation Products on Admission Predicts Recurrence of Chronic Subdural Hematoma

Yusuke Hori, Toru Fukuhara

1015 Flow Diversion for the Treatment of Partially Thrombosed Aneurysms: A Multicenter Case Series

Mohamed M. Salem, Paul M. Foreman, Christoph J. Griessenauer, Adam A. Dmytriw, Nicola Limbucci, Anna L. Kuhn, Ajit S. Puri, Kimberly P. Kicielinski, Alejandro Bugarini, Clemens M. Schirmer, Christopher S. Ogilvy, Ajith J. Thomas

1016 Evaluation of a Pharmacy-mediated Antiplatelet Management Protocol in Stent-assisted Coiling of Cerebral Aneurysms

Mirja Wirtz, Clemens M. Schirmer, Oded Goren, Shamsheer Dalal, Gregory Weiner, Paul M. Foreman, Christoph Johannes Griessenauer

1017 A Single Center Medical Quality Evaluation and Factor Analysis of One-staged Hybrid Operation in the Treatment of Brain Arteriovenous Malformations

Mingze Wang, Yong Cao, Shuo Wang, Jizong Zhao

1018 Occlusion Rates of Different Modalities in the Endovascular Treatment of Basilar Tip Aneurysms

Ritam Ghosh, Nikolaos Mouchtouris, Ahmad Sweid, Fadi Al Saiegh, Nohra Chalouhi, M. Reid Gooch, Robert H. Rosenwasser, Pascal Jabbour, Stavropoula I. Tjoumakaris

1019 Rebleeding Drives Poor Outcome in Aneurysmal Subarachnoid Hemorrhage Independent of Delayed Cerebral Ischemia: A Propensity Score Matched Cohort Study

Victor M. Lu, Christopher Salvatore Graffeo, Avital Perry, Lucas P. Carlstrom, Leonardo Rangel-Castilla, Giuseppe Lanzino, Waleed Brinjikji, Eelco F.M. Wijdicks, Alejandro A. Rabinstein

1020 The Impact of Current Generation Anticonvulsant Prophylaxis on Seizure Incidence and Clinical Outcome After Primary Intracerebral Hemorrhage

Neel T. Patel, Carlton W. Christie, Lekhaj C. Daggubati, Erik B. Lehman, Kevin M. Cockroft

1021 Treatment of Cerebral Aneurysms in the Post-ISAT Era: Trends and Outcomes

Evan Luther, David J. McCarthy, Marie-Christine Brunet, Samir Sur, Dileep R. Yavagal, Eric C. Peterson, Robert M. Starke

1022 Quantitative Versus Qualitative Assessment of Aneurysm Wall Enhancement on Magnetic Resonance Vessel Wall Imaging

Corrado Santarosa, Branden J. Cord, Andrew Koo, Aladine A. Elsamadicy, Xiao Wu, Seyedmehdi Payabvash, Kevin Sheth, Nils Petersen, Guido Falcone, Ajay Malhotra, Charles C. Matouk

1023 Predictors of Complications, Functional Outcome, and Mortality in a Large Cohort Treated with Flow Diversion

Ahmad Sweid, Nabeel Herial, Stavropoula I. Tjoumakaris, Sage Rahm, Michael Gooch, Robert H. Rosenwasser, Pascal Jabbour

1024 Flow Diversion for Small Caliber Vessel Aneurysms, Efficacy, Safety, and Functional Outcome

Ahmad Sweid, Robert M. Starke, Nabeel Herial, Robert H. Rosenwasser, Michael Gooch, Stavropoula I. Tjoumakaris, Pascal Jabbour

1025 Radiosurgical Management of Brainstem Arteriovenous Malformations: Treatment Outcomes and Predictors of Outcome

Anadjeet S. Khahera, Oludotun Ogunsola, Justin Sim, Alison Clarke, E. Sander Connolly, Jr.

1028 Virtual Reality as an Immersive 3D Visualization Technique to Improve Surgeon Understanding of Aneurysm Anatomy

Talia L. Weiss, Christine D. Young, Kevin M. Brennan, Cristian Luciano, Laura Stone-McGuire, Fernanda Herrera, Ali Alaraj

1029 Patients Taking an Antithrombotic Medication Less Frequently Present with Ruptured Aneurysms

Peyton L. Nisson, Michael Gaub, Ali Tayebi-Meybodi, Timothy Secomb, Garrett K. Berger, Denise Roe, Michael T. Lawton

1030 Outcomes in Elderly Aneurysmal Subarachnoid Hemorrhage Patients in the Barrow Ruptured Aneurysm Trial (BRAT)

Joshua Catapano, Michael J. Lang, Michael T. Lawton

1031 Variations in the Subventricular Zone Population Overtime in Adult Chronic Communicating Hydrocephalus: Animal Model

Tito G.M. Vivas-Buitrago, Emily Norton, Andres Ramos, Ignacio J. Torres, Pamela Saavedra, Hugo Guerrero-Cazares, Alfredo Quinones-Hinoja, Daniele Rigamonti

1032 Valve Opening Pressure Settings in Relation to The Lumbar Puncture Opening Pressure in Patients with INPH: A Delta Value Correlation to Over-drainage

Tito G.M. Vivas-Buitrago, Johan Heemskerk, Juan P. Herrera, Ricardo Domingo, Sanjeet S. Grewal, Ronald Reimer, Robert E. Wharen, Neil R. Graff-Radford

1033 Causes of Unfavorable Outcome in Good Grade Patients with Aneurysmal Subarachnoid Hemorrhage: Opportunities for Improvement?

Matthew E. Eagles, Madeleine P. de Lotbiniere-Bassett, Oliver Ayling, Michael K. Tso, R. Loch Macdonald

1034 Simultaneous Kissing Stent Deployment for Endovascular Treatment of Wide-necked Intracranial Aneurysms: A Case Series of 14 Patients

Kenichi Sato, Miki Fujimura, Teiji Tominaga

1035 The Fragility Index in Cerebrovascular Randomized Controlled Trials: Analysis of Robustness and Proposal of a Classification System

Nimer Adeeb

1036 Urinary Incontinence and Gait Dysfunction in Intraventricular Hemorrhage: The Role of Acute and Long-Term Cerebral Spinal Fluid Diversion

Tyler P. Behymer, Simone U. Venema, Padmini Sekar, Charles J. Moomaw, Ashby C. Turner, Vaibhav Vagal, Elisheva Coleman, Russell Sawyer, Robert Stanton, Matthew Flaherty, Christopher D. Andereson, Alessandro Biffi, Jonathan Rosand, Daniel Woo, Charles J. Prestigiacomo

1037 The Effect of Mechanical Thrombectomy and TICI Score on the Incidence of Decompressive Hemicraniectomy in Ischemic Stroke Patients

Fadi Al Saiegh, Nikolaos Mouchtouris, Karim Hafazalla, Nohra Chalouhi, Victor Sabourin, Evan M. Fitchett, Pascal Jabbour, Stavropoula I. Tjoumakaris, M. Reid Gooch, Robert H. Rosenwasser, Fred Rincon

1038 Descending Branch of the Lateral Circumflex Femoral Artery: A Favorable Interposition Graft for Extracranial-to-Intracranial Bypass

Kristine Ravina, Ben A. Strickland, Robert Rennert, Erik M. Wolfswinkel, Joseph Carey, Jonathan Russin

1040 Maturing Institutional Experience with the Transradial Approach for Diagnostic Cerebral Arteriography: Overcoming the Learning Curve
Benjamin M. Zussman, Daniel Tonetti, Jeremy G. Stone, Bradley A. Gross, Ashutosh Jadhav, Tudor Jovin, Brian T. Jankowitz

1041 The Impact of Leptomeningeal Collaterals in Acute Ischemic Stroke: A Systematic Review and Meta-analysis
Nida Fatima

1042 Arterial Spin Labeling MR Imaging at Short Post-labeling Delay Reflects CBF/CBV Verified by 15O-PET in Cerebrovascular Steno-occlusive Disease
Hiroshi Itagaki, Yasuaki Kokubo, Yukihiko Sonoda

1043 Radial Artery Catheterization for Neuroendovascular Procedures: Clinical Outcomes and Patient Satisfaction Measures
Omaditya Khanna, Ahmad Sweid, Nikolaos Mouchtouris, Geoffrey Stricsek, M. Reid Gooch, Stavropoula I. Tjoumakaris, Robert H. Rosenwasser, Pascal Jabbour

1044 Downregulation of Signaling Components in the NO-PKG Pathway After Subarachnoid Hemorrhage: Why Current Therapeutics are Ineffective at Treating Cerebral Vasospasm?
Peter J. Morone, Colleen M. Brophy, Reid C. Thompson, Mark Does, Daniel Colvin, Joyce Cheung-Flynn

1045 Intra-arterial ICG Fluorescence Video-angiography: A Feasible Method for Intraoperative Neurosurgical Purposes?
Markus Holling, Benjamin Risse, Christof Duhme, Gregory Arnone, Helena M. Yoder, Walter Stummer, Fady T. Charbel

1046 Transradial Approach is Safe and Effective for Anterior and Posterior Circulation Mechanical Thrombectomy
Stephan Munich, Kunal Vakharia, Matthew J. McPheeters, Muhammad Waqas, Michael K. Tso, Kenneth Vincent Snyder, Elad I. Levy, Adnan H. Siddiqui, Jason Davies

1048 Multimodal Laser Angioscopy: A New Imaging Platform to Shine a Light on Structural and Biological Markers of Carotid Plaque Vulnerability
Luis E. Savastano, Reddy Adhitya, Eric Seibel, David Gordon, Thomas Wang, Jie Xu, Jifeng Zhang, Byron Gregory Thompson, Jr., Aditya S. Pandey

1049 tPA Use During Mechanical Thrombectomy: Success and Complication Rates
Risheng Xu, Jason A. Liew, Sasicha Manupitpatpong, Paul Choi, Sharon Pang, Sophie Roh, Yuanxuan Xia, Justin M. Caplan, Monica Pearl, Philippe Gailloud, Cameron G. McDougall, Ferdinand Hui

1051 Risk Factors for Restenosis Following Carotid Revascularization: A Meta-analysis of Hazard Ratios
Pavlos Texakalidis, Andreas Tzoumas, Stefanos Giannopoulos, Pascal Jabbour, Leonardo Rangel-Castilla, Theofilos Machinis, Dennis J. Rivet, John F. Reavey-Cantwell

1052 Strokenomics - Bending the Cost Curve in Stroke Care
Stephan Munich, Kunal Vakharia, Adnan H. Siddiqui, Kenneth V. Snyder, Jason Davies, Elad I. Levy

1054 Mechanical Thrombectomy is Safe and Effective in Treating Acute Ischemic Stroke of Distal Intracranial Vessels
Jeffery R. Head, Ahmad Sweid, Stavropoula I. Tjoumakaris, Vivian Xu, Kavya Shivashankar, Tyler Alexander, Nabeel Herial, David M. Hasan, Maureen Deprince, Robert H. Rosenwasser, Pascal Jabbour

1055 Exceeding Personalized Blood Pressure Targets After Endovascular Stroke Therapy Is Associated with Hemorrhagic Transformation and Worse Functional Outcome
Nils Petersen, Andrew Silverman, Anson Wang, Sumita Strander, Sreeja Kodali, Lauren Sansing, Joseph Schindler, Brandon J. Cord, Ryan M. Hebert, Charles C. Matouk, Kevin Sheth

1056 Outcomes in Patients with Moyamoya Syndrome and Sickle Cell Disease: A Systematic Review
Sarah Newman, Jason H. Boulter, James G. Malcolm, Gustavo Pradilla

1057 CT Perfusion in Pediatric Moya Moya Disease: Establishing Normative Data and Utility in Surgical Planning
Vijay Ravindra, Sara Hartnett, Melissa LoPresti, Jeffrey M. Treiber, Steven Kralik, Sandi Lam

1058 Antiplatelet Therapy and Operative Risk of Decompressive Craniectomy for Ischemic Stroke
Ryan T. Kellogg, Thomas Larrew, Alejandro Spiotta, Jonathan Leary, Orgeest Lajthia

1059 Higher Number of Mechanical Thrombectomy Passes does not Significantly Lower TICI Score or Neurologic Outcome
Risheng Xu, Jason A. Liew, Paul Choi, Sharon Pang, Sasicha Manupitpatpong, Sophie Roh, Yuanxuan Xia, Justin M. Caplan, Monica Pearl, Philippe Gailloud, Cameron G. McDougall, Ferdinand Hui

1061 From Stroke Onset to Reperfusion: How Much Time Can Interventionalists Save?
Risheng Xu, Yuanxuan Xia, Jason A. Liew, Paul Choi, Sharon Pang, Sophie Roh, Sasicha Manupitpatpong, Justin M. Caplan, Monica Pearl, Philippe Gailloud, Cameron G. McDougall, Ferdinand Hui

1062 Revascularization Surgery Outcomes in a North American Cohort of Moyamoya Disease vs Moyamoya Syndrome
Anadjeet S. Khahera, Justin Sim, Evangeline Reyes-Pastorella, Brandon Christophe, E. Sander Connolly, Jr.

SECTION ON PAIN POSTERS

1064 Systematic Anatomical Study of the Adamkiewicz Artery and the Accessory Thoracic and Lumbar Hairpin Turn Spinal Cord Branches.

Krishnakant Khandelwal, Jorge E. Alvernia, Gustavo G. Luzardo, Eddie Perkins

1065 The Yang-Gopen Scale for Superior Semicircular Canal Dehiscences

Prasanth Romiyo, Kevin Ding, Dillon Dejam, Edwin Ng, Shelby L. Willis, Courtney Duong, Tyler Miao, Taranjit Kaur, Alyssa Franks, H. Westley Phillips, Quinton Gopen, Isaac Yang

1066 Comparison of Traditional Middle Cranial Fossa Craniotomy Versus Minimally Invasive Keyhole Approach for Repair of Superior Semicircular Canal Dehiscence

Matthew Z. Sun, Dillon Dejam, Courtney Duong, Shelby L. Willis, Quinton Gopen, Isaac Yang

1067 Feasibility of Lavender Aromatherapy in an Awake Craniotomy Environment

Kailah Cathey, Nancy Conway, Diane Ames, Nichole Gunyon, Nancy Chung, Maharaj Singh, Amin B. Kassam, Richard A. Rovin

1068 Could DBS Lead Impedance Trends Provide Objective Data on Cyst Resolution

Heather Pinckard-Dover, Patrick Paullus, Rohit Dhall, Erika A. Petersen

SECTION ON PEDIATRIC NEUROLOGICAL SURGERY POSTERS

1070 Pediatric Intracranial Arteriovenous Malformations and Epilepsy: A Case Series and Review of the Literature

Melissa LoPresti, Rebecca Y. Du, Marc Prablek, Eric A. Goethe, Sandi Lam

1071 Rates of In-Hospital Failure for Endoscopic Third Ventriculostomy (ETV) Compared to Shunting in Post-Hemorrhagic Hydrocephalus of Prematurity (PHHP)

Evan Luther, David J. McCarthy, Toba Niazi

1072 Analysis of Pediatric Craniopharyngioma Admissions in the United States and the Effect of Surgical Approaches on Outcomes Utilizing the Kids Inpatient Database (KID)

Mohammed A. Fouda, Coleman Riordan, David Zurakowski, Liliana Goumnerova

1073 Therapeutic Choices for Ventricular Collapse after Ventriculo-peritoneal Shunting for Pseudotumor Cerebri

Riccardo Serra, Giorgia A. Simboli, Smruti Mahapatra, Noah L. Gorelick, Lacie Manthripragada, Mark G. Luciano

1074 Radiological Evidence of a Brain-wide System for Solute Distribution in a Canine Model

Riccardo Serra, Noah L. Gorelick, Wataru Ishida, Alexander Perdomo-Pantoja, Smruti Mahapatra, Ari M. Blitz, Betty Tyler, Amir Manbachi, Mark G. Luciano

1075 Scoliosis in Loey-Dietz Syndrome: A Case Series and Clinical Update

Abdul B. Khan, Melissa LoPresti, Rajan Patel, Rory R. Mayer, Shaine A. Morris, Sandi Lam, Vijay Ravindra

1076 Characterization of Unplanned 90-day Readmission After Pediatric Brain Tumor Resection: Readmission Rates, Reasons, and Destination

Michelle Connor, Neal H. Nathan, Li Ding, William J. Mack, Mark D. Krieger, Frank Attenello, III

1077 Wireless, Noninvasive Thermal Sensors for the Continuous Monitoring of Ventricular Shunt Function in Pediatric and Adult Patients

Amit Ayer, Siddharth R. Krishnan, Gurvinder Kaur, Nikhil Murthy, Matthew Ordon, Constantine L. Karras, Zachary A. Abecassis, Joshua M. Rosenow, Matthew C. Tate, Tord D. Alden, Matthew B. Potts, John A. Rogers

1078 Hydrocephalus and Spina Bifida in Toddlers: 3-month Experience in Angola at the Neurosurgical and Hydrocephalus Treatment Center

Wilson R. Teixeira, Egon E. L. Neto, Sergio Livraghi, Mayanda Inocente

1079 Long-term Parenchyma Changes in Extreme Hydrocephalus after Ventriculoperitoneal Shunting

Jesús Q. Beltrán, Carlos A. Mendoza-García, David Trejo, Jose de Jesus Gutierrez-Cabrera, Elizabeth Ogando-Rivas

1080 Epidemiology of Surgical Traumatic Brain Injury in Patients Younger than 16 Years at a Single Trauma Center in a Low/Middle-income Country Urban Center

Nastassja Cury-Sales, Raphael Bertani, Barbara Pilon, Raphael Machado, Luiz F. Ribeiro, Flavia Abreu, Daniela Von Zuben, Priscila Mendes, Ruy Monteiro

1081 Results of Posterior Fossa Decompression for Patients with Both Chiari I Malformation and Hydrocephalus

Joyce Koueik, Ryan DeSanti, Bermans Iskandar

1082 Laparoscopic Repositioning of Peritoneal Catheter for Treatment of Selected Ventriculoperitoneal Shunt-Associated Abdominal Pseudocysts

Brett A. Whittemore, Dale Swift

1083 Long-term Sequelae of Intervention for Pediatric Intracranial Arteriovenous Malformations: A Metadata Analysis of Functional Outcomes

Victor M. Lu, Waseem Wahood, Lorenzo Rinaldo, Edward S. Ahn, David J. Daniels

1084 Evaluation of Brain Fetal Development Based on the Analysis of Cortical Convolution Pattern in Perinatal Autopsies

Paula A. Barajas, William M. Riveros, Julio C. Mantilla

SECTION ON PERIPHERAL NERVE POSTERS**1085 Combined Radial to Axillary and Spinal Accessory (SA) to Suprascapular Nerve (SSN) Transfers Confer Superior Shoulder Abduction Compared to Single SA to SSN Transfer**

Pavlos Texakalidis, Muhibullah S. Tora, Jason J. Lamanna, Jeremy Wetzel, Nicholas M. Boulis

1086 Surgically Correctable Compressive Neuropathy Overlies Generalized Axonal Disease in Neurofibromatosis 2

Rogelio Medina, Tanya Lehky, Dominic Maggio, Gautam U. Mehta, Joseph P. Antonios, Gregoire Chatain, Gretchen Scott, Sarah Benzo, Christina Hayes, Zhengping Zhuang, John D. Heiss, Prashant Chittiboina

1087 The Masseteric-facial Nerve Anastomosis for Facial Paralysis: Report of 57 Cases

Xuesong Liu

COUNCIL OF STATE NEUROSURGICAL SOCIETIES POSTERS**1088 Investigation of Surgical Variation in Elective Anterior Cervical Decompression and Fusion (ACDF) and the Effect on Hospital Cost**

Ken M. Porche, Sasha Vaziri, Omar Awan, Alan A. Stein, W. Christopher Fox

1089 Association Between Discharge Destination and Length of Hospitalization Following Microvascular Decompression Surgery

Amanallah Montazeripouragha, Anthony M. Kaufmann

1090 Effect of Socioeconomic Status in Patients Undergoing Anterior Lumbar Interbody Fusion

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Kimberly Bojanowski Hoang, Amparo M. Wolf, Sherise D. Ferguson, Ganesh Rao, Ian E. McCutcheon, Jeffrey S. Weinberg, Amy B. Heimberger, Frederick F. Lang, Sujit S. Prabhu

1341 Co-administration of Chemotherapeutic Agents 5-fluorouracil and Temozolomide Enhances 5-aminolevulinic Acid-Based Photodynamic Therapy Killing of Patient-derived Glioma Stem Cells In Vitro

Alexa Semonche, Ashish H. Shah, Daniel Green Eichberg, Ricardo J. Komotar, Michael E. Ivan

1343 Sustained Localized Delivery of Immunotherapy to Lymph Nodes Reverses Immunosuppression and Increases Long-term Survival in Glioblastoma

John Choi, Ayush Pant, Young-Hoon Kim, Denis Routkevitch, Laura Saleh, Yuanxuan Xia, Christopher M. Jackson, Christina Jackson, Michael Lim

1344 Multicoloured-assisted Surgery for Resection of High Grade Gliomas with 5-aminolevulinic acid

Cleopatra Charalampaki, Dimitrios Athanasopoulos, Makoto Nakamura

1345 Resection of Tumors Within the Primary Motor Cortex by Using High-Frequency Stimulation: Oncological and Functional Efficiency of This Versatile Approach Based Upon Clinical Conditions.

Marco Rossi, Marco C. Nibali, Luca Viganò, Guglielmo Puglisi, Henrietta Howells, Lorenzo Gay, Tommaso Sciortino, Antonella Leonetti, Marco Riva, Luca Fornia, Gabriella Cerri, Lorenzo Bello

1346 Effect of Patient Age on Glioblastoma Perioperative Treatment Costs: A Value-Driven Outcome Database Analysis

Brandon Sherrod, Nicholas T. Gamboa, Christopher G. Wilkerson, Herschel Wilde, Mohammed Azab, Michael Karsy, Randy L. Jensen, Sarah T. Menacho

1347 Is Supratotal Resection Doable in Low-grade Gliomas? Feasibility, Putative Factors, Safety and Functional Outcome

Marco Rossi, Federico Ambrogi, Lorenzo Gay, Marcello Gallucci, Marco C. Nibali, Antonella Leonetti, Guglielmo Puglisi, Tommaso Sciortino, Henrietta Howells, Marco Riva, Federico Pessina, Pierina Navarria, Ciro Franzese, Matteo Simonelli, Roberta Rudà, Lorenzo Bello

1348 Treatment and Survival of Primary Intracranial Germ Cell Tumors: A Population-based Study

Abhiraj D. Bhimani, Steven Denyer, Shashank Patil, Andrew Mudreac, Mandana Behbahani, Ankit I. Mehta

1349 Preliminary Identification of Genetic Events Associated with Prognosis and Surgical Treatment Response in Glioblastoma

Albert H. Kim, Peter H. Yang, Mounica Paturu, Sonika Dahiya, Gavin P. Dunn, Yu Tao, Jingqin Luo, Samantha McNulty, Jonathan Heusel

1350 Developing Therapeutic Guidance for Potentially Unstable Spinal Metastases by Evaluating Health-Related Quality of Life Outcomes for Surgery and/or Radiotherapy

Anne Versteeg, Arjun Sahgal, Laurence D. Rhines, Daniel M. Sciubba, James M. Schuster, Michael Weber, Aron Lazary, Stefano Boriani, Chetan Bettegowda, Michael G. Fehlings, Michelle J. Clarke, Paul M. Arnold, Ziya L. Gokaslan, Charles Fisher

1351 Substance P and Neurokinin Type 1 Receptor Immunoexpression in Glioblastomas and Disease Aggressiveness

Allan D. Polverini, Gisele C. de Almeida, Suely Kazue Nagahashi Marie, Carlos Clara

1352 Comparing Language Activation Areas of Movie-watching-fMRI with Task-fMRI in Patients with Brain Tumors

Fuxing Yang, Yanmei Tie

1353 Language and Speech Networks Suggested by Cluster Probabilistic Mapping in Awake Craniotomy for Gliomas

Masashi Kinoshita, Riho Nakajima, Xiaoliang Liu, Mitsutoshi Nakada

1354 Molecular Imaging for Automated Tissue Differentiation in Highly-heterogeneous Primary Brain Tumors

Igor A. Popov, Vsevolod Shurkhay, Stanislav Pekov, Alexander Potapov, Eugene Nikolaev, Evgeny Zhvansky, Pavel Nikitin, Daniil Ivanov

1355 Creating Artificial Tumors with Similar Biomechanical and Imaging Characteristics to Human Brain Tumors

Alexander Winkler-Schwartz, Recai Yilmaz, Binbin Ying, Housseem Gueziri, Vladimir Cherniak, Louis Collins, David Rudko, Jianyu Li, Rolando Del Maestro

1356 Imaging Metastatic Brain Tumors Using Brain Metastasis-initiating Cell Targeting Peptides

Jongmyung Kim, James K. C. Liu

1357 The Predictive Capability of Immunohistochemistry and DNA Sequencing for Determining TP53 Functional Mutation Status: A Comparative Study of 41 Glioblastoma Patients

Christopher Busch, Joshua A. Cuoco, Cara Rogers, Harald Sontheimer

1358 Plasma Exosomal Biomarkers Following 5-ALA Use in Malignant Glioma

Pamela S. Jones, Anudeep Yekula, Elizabeth Lansbury, Julia Small, Caroline M. Ayinon, John Tigges, Bethany Delcuze, Alain Charest, Ionita Ghiran, Leonora Balaj, Bob S. Carter



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CONTINUING MEDICAL EDUCATION

2019 ANNUAL MEETING OBJECTIVES

Our Mission

The CNS exists to enhance health and improve lives through the advancement of neurosurgical education and scientific exchange.

Our Vision

To be the premier educational organization in neurological surgery.

Our Work

Our mission drives us to cultivate great neurosurgeons. We advance the practice of neurosurgery globally by inspiring and facilitating scientific discovery and its translation to clinical practice.

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 2019 CNS Annual Meeting participants will be able to

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

EDUCATIONAL FORMAT DESCRIPTIONS

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

SYMPOSIA

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

- Symposia are offered Saturday, October 19, and Sunday, October 20.

GENERAL SCIENTIFIC SESSION, SECTION SESSIONS, GUIDELINE SESSIONS, LUNCHEON SEMINARS, INTERNATIONAL SESSIONS, OPERATIVE TECHNIQUE SESSIONS, INTERACTIVE MULTIMEDIA RESEARCH PRESENTATION SESSION, 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, Guidelines Session, International Sessions, Operative Technique Sessions, and Interactive Multimedia Research Presentation Session are offered Sunday, October 20, through Wednesday, October 23.
- Luncheon Seminars are offered Monday, October 21, through Wednesday, October 23.
- Dinner Seminars are offered on Saturday, October 19; Monday, October 21; and Tuesday, October 22.

OPERATIVE TECHNIQUES AND CASE-BASED DISCUSSION SESSIONS

During these 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.

- Operative Technique and Case-based Discussion Sessions will take place on Monday, October 21, and Tuesday, October 22.
- Live Surgery via telemedicine technology in the Exhibit Hall will take place Monday, October 21, through Wednesday, October 23. 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 will be presented on Monday, October 21, Tuesday, October 22, and Wednesday, October 23.
- Interactive Multimedia Research Presentation Session will take place on Tuesday, October 22
- Sunrise Science Oral Presentations by subspecialty Oral Presentations will be presented on Monday, October 21, Tuesday, October 22, and Wednesday, October 23.
- Late-breaking Abstracts will be presented on Monday, October 21, Tuesday October 22 and Wednesday, October 23.

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 49.5 *AMA PRA Category 1 Credits*[™]. Physicians should only claim credit commensurate with the extent of their participation in the activity.

*A maximum of 26 *AMA PRA Category 1 Credits*[™] may be earned for general sessions only.

Additional CME Credits can be earned by attending the following:

SYMPOSIA

Attendees will receive a maximum of 3.5 *AMA PRA Category 1 Credits*[™] for each Saturday or Sunday half-day Symposia, a maximum of 6 *AMA PRA Category 1 Credits*[™] for each eligible Saturday or Sunday full-day Symposia.

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.

INTERACTIVE MULTIMEDIA RESEARCH PRESENTATIONS

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 1.5 *AMA PRA Category Credits*[™] for viewing scientific posters. Physicians should selfclaim credit on their AMA PRA certificate application form. Please visit the AMA web site for details at www.ama-assn.org.

NURSING CREDIT

This continuing nursing education activity was approved by the American Association of Neuroscience Nurses, an accredited approver by the American Nurses Credentialing Center's Commission on Accreditation.

Each attendee may only be awarded a maximum of 49.5 nursing contact hours for this educational event.

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 San Francisco, 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 healthcare goods or services consumed by, or used on, patients. It is also each speaker's responsibility to include the FDA clearance status of any device or drug requiring FDA approval discussed or described in their presentation or to describe the lack of FDA clearance for any "off label" uses discussed. Speakers from the audience are also required, therefore, to indicate any relevant personal/professional relationships as they discuss a given topic.

See the addendum for listing of all Annual Meeting disclosures.

FDA STATEMENT

Some drugs or medical devices demonstrated at the Annual Meeting have not been cleared by the FDA or have been cleared by the FDA for specific purposes only. The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical devices he or she wishes to use in clinical practice. The CNS policy provides that "off label" uses of a drug or medical device may be described at the Annual Meeting so long as the "off label" use of the drug or medical device is also specifically disclosed. Any drug or medical device is "off label" if the described use is not set forth on the products approval label. It is also each speaker's responsibility to include the FDA clearance status of any device or drug requiring FDA approval discussed or described in their presentation or to describe the lack of FDA clearance for any "off label" uses discussed. Speakers from the audience are also required, therefore, to indicate any relevant personal/professional relationships as they discuss a given topic.

GENERAL INFORMATION

2019 CNS ANNUAL MEETING APP

Download the 2019 CNS Annual Meeting App to access everything you need to know about the Annual Meeting in the palm of your hand. Search for course details, upcoming events, and exhibitors. You can also save your favorite sessions, send and receive messages with colleagues, take notes on sessions, and more!

Download the app by going to <https://ativ.me/cns2019>.

AMERICANS WITH DISABILITIES ACT

The Moscone West Convention Center and the San Francisco Marriott Marquis are in compliance with the Americans with Disabilities Act (ADA) and prepared to accommodate all visitors. For wheelchair or electric scooter rental, please contact either Scoot Around at 877-484-5482 or www.scootaround.com or Cloud of Goods at 415-621-9757 or www.cloudofgoods.com.

ATTIRE

Professional attire is appropriate at the Annual Meeting and in the Exhibit Hall. Some San Francisco restaurants require coats and ties for men. Please check each restaurant's policy when making reservations. Business/cocktail attire is appropriate for social events, unless otherwise noted.

BADGES

CNS Annual Meeting badge colors represent the registration category of attendees:

- Blue:** Medical attendees including CNS Members and Non-members, Associate Members
- Gray:** Graduate Students/Post-doctoral Scholars, Medical Students, PA/Physician Extenders, Nurses, Nurse Practitioners
- Orange:** Non Member Corporate Representatives
- Clear:** Guests and Spouses
- Yellow:** Exhibitors
- Red:** Staff

BAGGAGE AND COAT CHECK

Baggage and coat check will be available at Moscone West Convention Center.

Tuesday, October 22	6:30 am–7:30 pm
Wednesday, October 23	6:30 am–5:00 pm

CHILDREN

Children may be registered as guests. (Please note that children under the age of 18 are not allowed in the CNS 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 for these services. This information is provided solely to assist participants in identifying possible sources for childcare.

CNS CENTRAL

CNS Central is conveniently located adjacent to the CNS Registration Area, in the lobby of the Moscone West Convention Center. Visit CNS Central with your questions on CNS membership, education, or CME. CNS staff will be available to assist you in navigating our new website, review our case-based Nexus product or download any apps on your mobile device. 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 the featured speakers at their book signings, hear the Innovator of the Year finalists present their innovations, view digital posters, and enjoy the Voices of Neurosurgery presentations by peers while enjoying a fruit smoothie on Tuesday's Wellness Afternoon. The CNS Xperience Lounge is a great place to connect with your colleagues and mentors and enjoy a beverage – be sure to stop by!

COURSE AGENDA AND FACULTY

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

DIGITAL POSTERS

Digital Posters are displayed electronically, Monday through Wednesday, in the CNS Xperience Lounge, located in the Exhibit Hall and can be searched by author, topic or keyword.



DISCLAIMER

The material presented at the 2019 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, procedure or technique 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. The material is not meant to replace independent judgement by a physician for any given issue. 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 by the CNS, or by its committees or affiliates of the views presented; methods, procedures and/or techniques described or discussed; the products used; or the materials exhibited. 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 material, methods, procedures, and/or 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 21	9:30 am–4:00 pm
Tuesday, October 22	9:30 am–3:00 pm
Wednesday, October 23	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.

FACULTY REGISTRATION

All faculty should register at the Faculty Registration counter at Moscone West Convention Center to receive a special gift.

BREAKS AND LIVE SURGERY IN THE EXHIBIT HALL

Join your colleagues and exhibitors for unopposed networking in the Exhibit Hall. Presentation stage schedules will be posted in the Exhibit Hall.

Monday, October 21

Morning Beverage Break	9:40–10:40 am
Live Surgery in Xperience Lounge	10:00–10:30 am
Afternoon Beverage Break	1:45–2:45 pm
Beer and Wine Social Hour in Xperience Lounge	1:45–2:45 pm

Tuesday, October 22

Morning Beverage Break	9:40–10:40 am
Live Surgery in Xperience Lounge	10:00–10:30 am
Afternoon Beverage Break	1:45–2:45 pm
Wellness Afternoon in Xperience Lounge	1:45–2:45 pm

Wednesday, October 23

Morning Beverage Break	9:40–10:40 am
Live Surgery in Xperience Lounge	10:00–10:30 am

FUTURE MEETINGS

2020: Miami, Florida	September 12–16
2021: Austin, Texas	October 16–20

MEMBER SERVICES

Be sure to stop and visit the CNS Member Services staff in CNS Central or the CNS Xperience Lounge for demos of our most popular products, or to answer any of your questions about the CNS, your NEUROSURGERY® Publications subscriptions, and your CNS membership.

POSTERS

The CNS posters will be located on the Level 2 Lobby of the Moscone West Convention Center. Poster viewing and mini podium presentations will take place during the Interactive Multimedia Research Presentation Session on Tuesday, October 22 from 5:45–7:15 pm.

PRESS

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/2019 or by calling 847-240-2500. Once on-site, media are required to check in at the CNS registration area to pick up their press badges and then proceed to the Press Room to pick up their press kits.

REGISTRATION INFORMATION

Items included in registration fee:

- General Scientific Sessions, Sunday through Wednesday
- Scientific Program to include Section Sessions, Oral Abstract Presentations, Sunrise Science/Late-breaking Abstract Sessions, Guideline Sessions, Operative Technique Sessions, International Sessions, Interactive Multimedia Research Presentation Session
- CNS Xperience Lounge
- Live Surgeries
- Exhibit Hall, Monday through Wednesday
- One ticket to the Opening Reception on Sunday, October 20

REGISTRATION HOURS

Registration is located in the Level 1 Lobby of the Moscone West Convention Center.

Saturday, October 19	7:00 am–5:30 pm
Sunday, October 20	7:00 am–7:30 pm
Monday, October 21	6:30 am–6:30 pm
Tuesday, October 22	6:30 am–6:30 pm
Wednesday, October 23	6:30 am–3:15 pm

Registration will also be located in the 2nd Level Atrium at the San Francisco Marriott.

Saturday, October 19	7:00 am–5:00 pm
Sunday, October 20	7:00 am–5:00 pm
Monday, October 21	7:00 am–12:00 pm

RESTAURANT RESERVATIONS

Contact your hotel concierge in advance for assistance in securing popular restaurant reservations.

SMOKING

The Moscone West Convention Center and official CNS hotels are non-smoking facilities.

SPEAKER READY ROOM

All speakers and abstract presenters should check in at the Speaker Ready Room, located in Room 3000 at the Moscone West Convention Center, a minimum of one hour prior to the scheduled start time of their session.

Saturday, October 19	7:00 am–4:30 pm
Sunday, October 20	7:00 am–6:30 pm
Monday, October 21	6:30 am–6:30 pm
Tuesday, October 22	6:30 am–5:30 pm
Wednesday, October 23	6:30 am–3:30 pm

SPOUSE HOSPITALITY

All registered CNS Annual Meeting spouses and guests are invited to visit the spouse hospitality suite, Monday through Wednesday, for daily continental breakfast from 8:00–10:30 am in the 2nd Floor Atrium of the San Francisco Marriott Marquis. (Please note that admittance to spouse hospitality suite is by spouse/guest badge only.) A representative from the San Francisco Convention and Visitors Bureau will be available in the Spouse Hospitality Suite to answer city questions, assist you with dinner reservations, and provide tour and activity recommendations.

WI-FI SERVICE

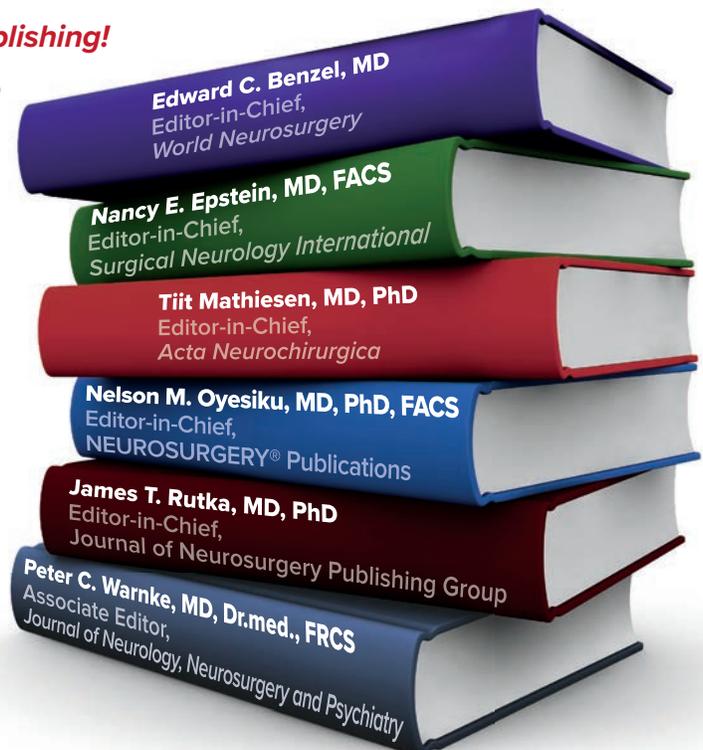
For your convenience, complimentary Wi-Fi service is provided by the CNS throughout the Moscone West Convention Center and the San Francisco Marriott Marquis wherever CNS events are being held. Please use the CNS19 network at both facilities. The password at the Marriott Marquis is sanfran19.

Hear from leading voices in scholarly publishing!

NEUROSURGERY[®] Publications: Meet the Editors

Tuesday, October 22 | 1:00–2:00 pm
Room 3002 at the Moscone West Convention Center

Attendees will be treated to presentations from the Editors-in-Chief of several leading journals in neurosurgery outlining their experiences with the peer review process. Panelists will share their thoughts on how to most effectively contribute to this process and then stay for a Q&A with the audience.



2019 EXHIBITORS

Exhibiting As	Booth Number	Booth Contact URL	Booth Phone
7D Surgical	831	http://www.7dsurgical.com	647-484-0078
ACE Medical Co.	948	http://www.acemedicalco.com	513-321-0055
Ad-Tech Medical Instrument Corp.	712	http://www.adtechmedical.com	262-634-1555
Aesculap, Inc.	209	http://www.aesculapusa.com	800-282-9000
American Association of Neurological Surgeons	348	http://www.aans.org	847-378-0528
Apex Medical, Inc.	329	http://www.apexmed.com	610-240-4905
Arbor Pharmaceuticals, LLC	531	http://www.arborpharma.com	678-334-2420
Arkis BioSciences	431	http://www.arkisbiosciences.com	844-247-5383
Baylor Scott & White Health	428	https://www.bswhealth.com/	254-724-2111
Best Medical International	455	http://www.teambest.com	613-854-7018
Bien-Air Surgery SA	346	http://www.bienair.com	949-477-6050
Biocomposites Inc.	550	http://www.biocomposites.com	910-350-8015
Biologica Technologies	236	http://www.biologicatechnologies.com	800-677-6610
Bioplate, Inc.	849	http://www.bioplate.com	310-815-2100
BK Medical	332	http://bkmedical.com	800-876-7226
Boss Instruments Ltd.	644	http://www.bossinst.com	540-832-5000
Boston Scientific	508	http://www.bostonscientific.com	661-949-4339
Brain Aneurysm Foundation	446	http://www.bafound.org	781-826-5556
Brain Navi Biotechnology Co., Ltd	127	http://www.brainnavi.com	886-937659759
Brown & Brown Insurance	460	http://www.bbphoenix.com	602-494-6762
Carle Physician Group	910	https://carleconnect.com/	217-383-6945
Centinel Spine	328	http://centinelspine.com	484-887-8831
Clarus Medical LLC	836	http://www.clarus-medical.com	763-525-8400
CoreLink	449	http://www.corelinksurgical.com	314-223-8361
CTL Amedica	548	http://www.ctlmed.com	214-545-5820
DePuy Synthes	619	http://www.depuyssynthes.com	508-828-2820
Designs for Vision, Inc.	544	http://www.designsforvision.com	631-585-3300
DIXI Medical USA	342	http://www.diximedus.com	248-845-3494
DJO	629	http://www.djoglobal.com	760-212-8986
elligence, LLC.	633	http://www.elligence.com	516-277-9000
Elsevier, Inc.	401	http://www.elsevierhealth.com	215-239-3900
Essentia Health	946	http://essentiahealth.org	218-786-3908
Fehling Surgical Instruments, Inc.	513	http://www.fehlingsurgical.com	800-334-5464
Gauthier Biomedical Inc.	331	http://www.gauthierbiomedical.com	262-546-0010
GE Healthcare	837	http://www.gehealthcare.com	847-277-4700
Globus Medical	731	http://www.globusmedical.com	610-930-1800
GT Medical Technologies, Inc.	545	http://www.gtmedtech.com	833-662-0044
Hayes Locums	502	http://www.hayeslocums.com	954-617-9033
HCA	245	http://www.hcahealthcare.com	937-235-5890
Hemedex	651	http://www.hemedex.com	617-577-1759
Hitachi Healthcare	925	http://www.hitachihealthcare.com	800-800-3106
IMRIS	812	http://www.imris.com	763-203-6346
Innovasis	660	http://www.innovasis.com	801-261-2236
Integra LifeSciences	700	http://www.integralife.com	609-275-0500
Intrinsic Therapeutics, Inc.	330	www.barricaid.com	781-932-0222

Exhibiting As	Booth Number	Booth Contact URL	Booth Phone
Invenio Imaging Inc	555	http://www.invenio-imaging.com	857-413-9322
IRRAS	662	http://www.iras.com	530-219-4799
JEIL Medical Corporation	737	http://www.jeilmed.co.kr	822-850-3598
joimax, Inc. - Endoscopic Spine Surgery	840	http://www.joimax.com	949-859-3472
Journal of Neurosurgery	349	http://www.thejns.org	847-378-0528
JTS Surgical	944	http://jtssurgical.com	909-799-3900
Kaiser Permanente	340	https://scpmgphysiciancareers.com	800-541-7946
Karl Storz Endoscopy – America, Inc.	709	http://www.karlstorz.com	424-218-8100
Kelyniam Global Inc.	451	http://www.kelyniam.com/	800-280-8192-702
Kirwan Surgical Products	408	http://www.ksp.com	781-834-9500
KLS Martin	800	http://www.klsmartinnorthamerica.com	904-641-7746
Kogent Surgical	813	http://www.kogentneuro.com	636-399-7644
Koros USA, Inc.	409	http://www.korosusa.com	805-529-0825
LeMaitre Vascular, Inc.	847	http://www.lemaitre.com	781-221-2266
Leica Microsystems	745	http://www.leica-microsystems.com	847-405-7039
Life Instrument Corporation	613	http://www.lifeinstruments.com	781-849-0109
MDOCHaus	243	http://www.mdochous.com	866-985-8217
Medical Education & Research Institute	546	http://www.meri.org	901-275-7020
Medivis	244	https://www.medivis.com/	631-747-7887
Medtronic	719	http://www.medtronic.com	763-514-4000
MedWaves, Inc.	338	http://www.medwaves.com	858-946-0015
MicroVention, Inc.	413	http://www.microvention.com	714-247-8000
Misonix, Inc.	115	http://www.misonix.com	631-694-9555
Mizuho America, Inc.	937	http://www.mizuho.com	415-846-5392
Mizuho OSI	936	http://www.mizuhosi.com	510-429-1500
Mobius Imaging	929	http://www.mobiusimaging.com	978-796-5068
Monteris Medical	808	http://www.monteris.com	763-253-4710
MRI Interventions Inc.	238	http://www.mriinterventions.com	949-900-6833
Nadia International, Inc.	741	http://www.ronadro.com	512-301-3888
Natus Neuro	501	https://neuro.natus.com/	847-949-5200
NeuroPace, Inc.	336	http://www.neuropace.com	650-237-2700
NeuroPoint Alliance	351	http://www.aans.org	847-378-0500
NICO Corporation	945	http://www.niconeuro.com	317-660-7118
North American Neuromodulation Society (NANS)	950	http://www.neuromodulation.org	847-375-4714
North American Spine Society	845	http://www.spine.org	630-230-3600
Nova Surgical Innovations, Inc.	612	http://www.nsiweb.com	951-228-0071
NovaBone Products	444	http://www.novabone.com	386-462-7600
Novocure, Inc.	344	http://www.novocure.com	603-436-2809
NSK America Corp.	649	http://www.nsk-surgery.com	800-585-4675
NuTech Spine	430	https://www.nutechspine.com	205-329-7285
NX Development Corp	121	http://www.gleolan.com	833-453-6526
Olympus America, Inc.	354	http://www.olympusamerica.com	484-896-5000
Orthofix	839	http://www.orthofix.com	214-937-2000
OssDsign	912	http://www.ossdsign.com	011-46-18-553993
OsteoMed	509	http://www.osteomed.com	972-677-4600
Oxford University Press	551	http://www.global.oup.com	800-451-7556

Exhibiting As	Booth Number	Booth Contact URL	Booth Phone
Panasonic	645	https://na.panasonic.com/us/industries/healthcare	201-348-5377
Penumbra, Inc.	637	http://www.penumbrainc.com	510-748-3200
Phasor Health LLC	748	http://www.phasorhealth.com	212-729-6161
PMT Corporation	608	http://www.pmtcorp.com	952-470-0866
Portola Pharmaceuticals	561	http://www.portola.com	650-246-7000
pro med instruments, Inc.	648	http://www.pmisurgical.com	239-369-2310
Providence Medical Technology	347	http://www.providencemt.com	415-923-9376
RAPID	229	https://rapid.ai	650-388-9767
Rapid Medical	447	http://www.rapid-medical.com	805-558-2433
Renishaw Inc.	512	http://www.renishaw.com/neuro	847-376-9269
Ronin Surgical Corp.	242	http://www.roninsurgical.com	415-226-9414
Rose Micro Solutions	345	http://www.rosemicrosolutions.com	716-608-0009
RosmanSearch, Inc.	809	http://www.rosmansearch.com	216-287-2302
RTI Surgical	355	http://www.rtx.com	386-418-8888
Scanlan International, Inc.	500	http://www.scanlangroup.com	651-298-0997
Second Sight Medical Products	462	http://www.secondsight.com	818-833-5000
Shukla Medical	333	http://www.shuklamedical.com	727-626-2770
Siemens Industry, Inc.	412	http://usa.siemens.com/Healthineers	914-524-5168
Silk Road Medical	448	http://www.silkroadmedical.com	408-585-2124
Sophysa	612	http://www.sophysa.com	219-663-7711
Spine23	250	https://dimespine.com	408-661-3664
SpineFrontier	549	www.spinefrontier.com	978-232-3990
Spine Wave	728	http://www.spinewave.com	203-944-9494
Spineology Inc.	708	http://www.spineology.com	651-256-8500
Stimwave Technologies	239	www.stimwave.com	800-965-5134
Stryker	419	http://stryker.com	419-345-1465
Surgeons Capital Management	841	http://www.surgeonscapitalmanagement.com	610-660-4526
Surgical Theater	337	http://www.surgicaltheater.net	216-496-7884
SurgiTel	851	http://www.surgitel.com	734-892-7430
Sutter Medical Technologies USA	403	http://www.sutter-usa.com	303-489-1537
Synaptive Medical	318	http://www.synaptivemedical.com	647-925-3435
Takayama Instrument, Inc	445	http://www.takayamamicro.com	508-907-6012
TeDan Surgical Innovations	454	http://www.tedansurgical.com	713-554-1025
Thieme Medical Publishers	609	http://www.thieme.com	212-760-0888
ThinkFirst National Injury Prevention Foundation	547	http://www.thinkfirst.org	630-961-1400
Thompson Surgical Instruments, Inc.	744	http://www.thompsonsurgical.com	231-922-0177
TOBRA MEDICAL INC	838	http://www.tobramedical.com	866-777-1505
Tocagen	233	http://www.tocagen.com	858-412-8400
UFSK International	251	https://www.ufsk-osys.com/en.html	866-491-6243
Weatherby Healthcare	237	http://www.weatherbyhealthcare.com	801-930-4163
WebMD & Vitals.com	908	http://webmdprofiles.com	310-280-4436
Xoran Technologies	313	http://xorantech.com	734-418-5168
Xtant Medical	363	https://xtantmedical.com/	406-388-0480
Zap Surgical Systems, Inc.	109	http://www.zapsurgical.com	415-533-4743
ZEISS	437	http://www.meditec.zeiss.com	925-557-4541
Zimmer Biomet	909	http://www.zimmerbiomet.com	904-741-4400

PRODUCTS & SERVICES

Category	Company	Booth Number
Allografts / Human Tissue	Biologica Technologies	236
	CoreLink	449
	CTL Amedica	548
	DePuy Synthes	619
	LeMaitre Vascular, Inc.	847
	NuTech Spine	430
	Providence Medical Technology	347
	Spineology Inc.	708
	TOBRA MEDICAL INC	838
Anatomical Charts / Models	Takayama Instrument, Inc.	445
Aneurysm Clips and Accessories	Aesculap, Inc.	209
	Apex Medical, Inc.	329
	JTS Surgical	944
	Mizuho America, Inc.	937
	Rapid Medical	447
	Scanlan International, Inc.	500
Bone Growth Stimulators	Biologica Technologies	236
	DJO	629
Bone Substitute	Biocomposites Inc.	550
	Biologica Technologies	236
	CoreLink	449
	DePuy Synthes	619
	NovaBone Products	444
	RTI Surgical	355
	TOBRA MEDICAL INC	838
Business Management Solutions	NeuroPoint Alliance	351
Cervical Collars	DJO	629
	PMT Corporation	608
Computer Hardware	MRI Interventions Inc.	238
Computer Software for Surgical Applications	7D Surgical	831
	Monteris Medical	808
	MRI Interventions Inc.	238
	NeuroPoint Alliance	351
Continuing Medical Education Courses	American Association of Neurological Surgeons	348
	North American Neuromodulation Society (NANS)	950
	North American Spine Society	845
	Synaptive Medical	318
Craniotomes, Drills & Accessories	Aesculap, Inc.	209
	Bien-Air Surgery SA	346
	JTS Surgical	944
	NSK America Corp.	649
	Phasor Health LLC	748
	Sophysa	612
	Stryker	419
CSF Drainage Devices	Arkis BioSciences	431
	Brain Navi Biotechnology Co., Ltd.	127
	IRRAS	662

Category	Company	Booth Number
	Natus Neuro	501
	Phasor Health LLC	748
	Sophysa	612
CT/MRI Magnetic Source Imaging	GE Healthcare	837
	IMRIS	812
	Mobius Imaging	929
Diagnostic Imaging	BK Medical	332
	GE Healthcare	837
	IMRIS	812
	Invenio Imaging Inc	555
	MRI Interventions Inc.	238
	Mobius Imaging	929
Dura Substitute	JTS Surgical	944
	LeMaitre Vascular, Inc.	847
	Natus Neuro	501
Electronics	Nova Surgical Innovations, Inc.w	612
Endoscopes, Neurological	Aesculap, Inc.	209
	Apex Medical, Inc.	329
	Clarus Medical LLC	836
	elliquence, LLC.	633
	Invenio Imaging Inc	555
	joimax, Inc. – Endoscopic Spine Surgery	840
	Karl Storz Endoscopy - America, Inc.	709
	Kirwan Surgical Products	408
	Olympus America, Inc.	354
Endovascular Devices	NICO Corporation	945
	Rapid Medical	447
	Stryker	419
Functional Stereotactic Surgery	7D Surgical	831
	Integra LifeSciences	700
	North American Neuromodulation Society (NANS)	950
	PMT Corporation	608
	Zimmer Biomet	909
Halo Systems / Spinal Orthosis / Spinal Support Systems	Integra LifeSciences	700
	PMT Corporation	608
	pro med instruments, Inc.	648
Headlights, Surgical	Designs for Vision, Inc.	544
	Integra LifeSciences	700
	KLS Martin	800
	Ronin Surgical Corp.	242
	Rose Micro Solutions	345
	SurgiTel	851
Health & Sports Equipment	Phasor Health LLC	748
Hemostats	Scanlan International, Inc.	500
Image-Guided Navigation Systems	7D Surgical	831
	Brain Navi Biotechnology Co., Ltd.	127
	DePuy Synthes	619
	Globus Medical	731
	Invenio Imaging Inc	555

Category	Company	Booth Number
	Medtronic	719
	Mobius Imaging	929
	Monteris Medical	808
	MRI Interventions Inc.	238
	Siemens Industry, Inc.	412
	Stryker	419
	Synaptive Medical	318
Imaging Agents	GE Healthcare	837
	NX Development Corp	121
Lasers	Invenio Imaging Inc	555
	Monteris Medical	808
Medical Devices	7D Surgical	831
	Ad-Tech Medical Instrument Corp.	712
	Apex Medical, Inc.	329
	Arkis BioSciences	431
	BK Medical	332
	Bien-Air Surgery SA	346
	Biocomposites Inc.	550
	Boston Scientific	508
	Brain Navi Biotechnology Co., Ltd.	127
	Clarus Medical LLC	836
	CoreLink	449
	CTL Amedica	548
	DePuy Synthes	619
	DIXI Medical USA	342
	elliquence, LLC.	633
	Gauthier Biomedical Inc.	331
	Globus Medical	731
	GT Medical Technologies, Inc.	545
	Hemedex	651
	Innovasis	660
	IRRAS	662
	JEIL Medical Corporation	737
	Hitachi Healthcare	925
	Innovasis	660
	IRRAS	662
	JEIL Medical Corporation	737
	joimax, Inc. – Endoscopic Spine Surgery	840
	Karl Storz Endoscopy - America, Inc.	709
	Kelyniam Global Inc.	451
	Kirwan Surgical Products	408
	KLS Martin	800
	Kogent Surgical	813
	LeMaitre Vascular, Inc.	847
	Medtronic	719
	Misonix, Inc.	115
	Mizuho America, Inc.	937
	Mizuho OSI	936
	Mobius Imaging	929
	Monteris Medical	808
	Natus Neuro	501
	NeuroPace, Inc.	336
	NICO Corporation	945
	North American Neuromodulation Society (NANS)	950
	Nova Surgical Innovations, Inc.	612
	NovaBone Products	444

Category	Company	Booth Number
	Novocure, Inc.	344
	NSK America Corp.	649
	NuTech Spine	430
	Olympus America, Inc.	354
	OssDsign	912
	OsteoMed	509
	Panasonic	645
	Penumbra, Inc.	637
	Phasor Health LLC	748
	PMT Corporation	608
	pro med instruments, Inc.	648
	Providence Medical Technology	347
	RTI Surgical	355
	Ronin Surgical Corp.	242
	Shukla Medical	333
	Silk Road Medical	448
	Sophysa	612
	Spine Wave	728
	Spineology Inc.	708
	Synaptive Medical	318
	TOBRA MEDICAL INC	838
	UFSK International	251
	Zimmer Biomet	909
Microscope Systems	Aesculap, Inc.	209
	Invenio Imaging Inc	555
	Leica Microsystems	745
	Olympus America, Inc.	354
	Panasonic	645
	Rose Micro Solutions	345
	Synaptive Medical	318
	Takayama Instrument, Inc.	445
Microsurgical Instrumentation	Apex Medical, Inc.	329
	Bien-Air Surgery SA	346
	Boss Instruments Ltd.	644
	Fehling Surgical Instruments, Inc.	513
	Kirwan Surgical Products	408
	KLS Martin	800
	Mizuho America, Inc.	937
	NICO Corporation	945
	NSK America Corp.	649
	Scanlan International, Inc.	500
	Sutter Medical Technologies USA	403
	TOBRA MEDICAL INC	838
Monitoring Systems	Hemedex	651
	IRRAS	662
	Sophysa	612
Operating Tables & Accessories	IMRIS	812
	Mizuho America, Inc.	937
	Mizuho OSI	936
Patient Education Information	American Association of Neurological Surgeons	348
	Brain Aneurysm Foundation	446
	DePuy Synthes	619
	Nadia International, Inc.	741
	North American Neuromodulation Society (NANS)	950
	North American Spine Society	845
	ThinkFirst National Injury Prevention Foundation	547
Pharmaceuticals	Portola Pharmaceuticals	561
	Tocagen	233

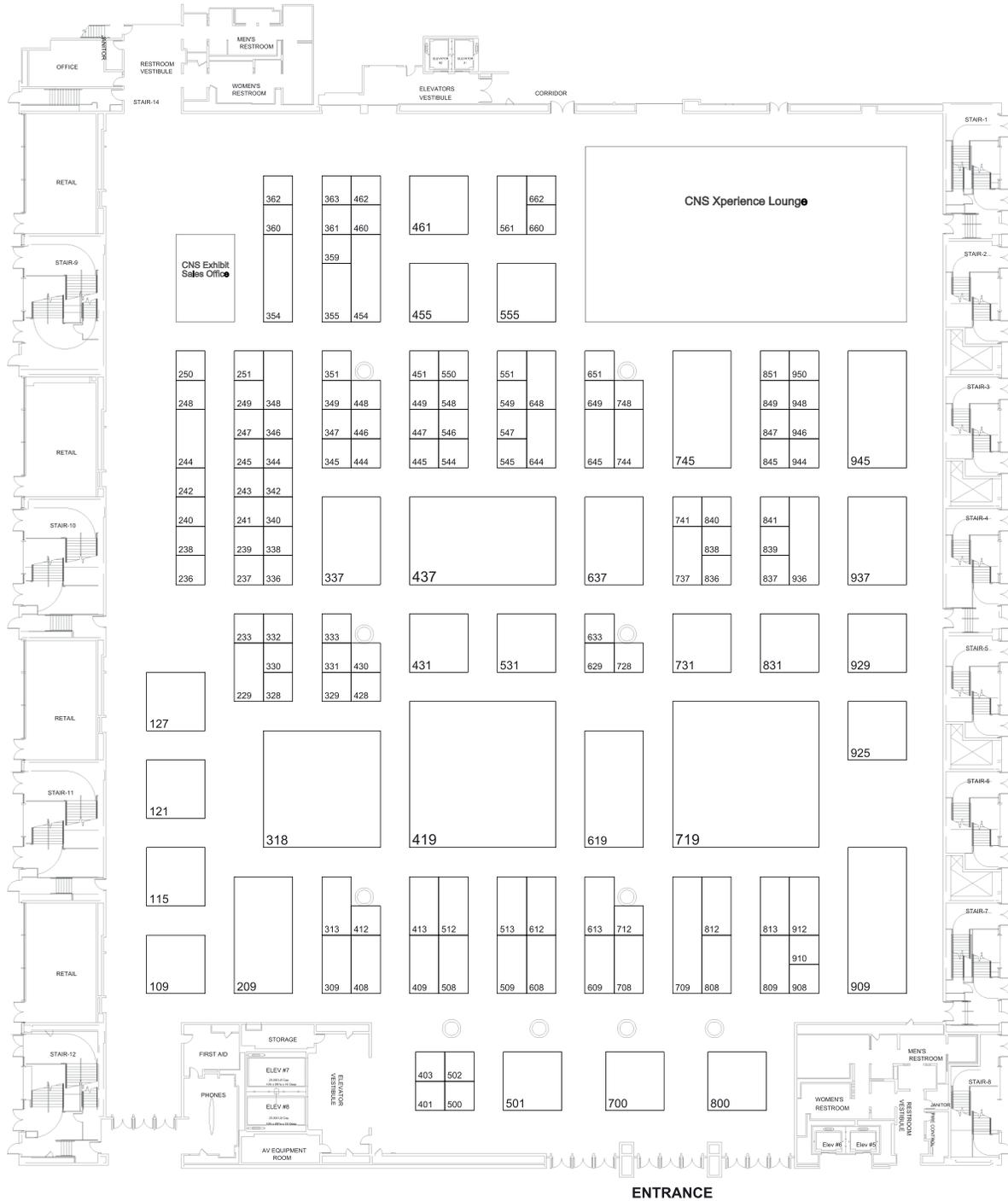
Category	Company	Booth Number
Practice Management	NeuroPoint Alliance	351
	North American Spine Society	845
Publishers, Scientific / Journals	Elsevier, Inc.	401
	Journal of Neurosurgery	349
	North American Spine Society	845
	Oxford University Press	551
	Thieme Medical Publishers	609
Radiation Protection Products	7D Surgical	831
Recruiters	Baylor Scott & White Health	428
	Carle Physician Group	910
	Essentia Health	946
	Hayes Locums	502
	Kaiser Permanente	340
	RosmanSearch, Inc.	809
	Weatherby Healthcare	237
Research, Medical Marketing	Kelyniam Global Inc.	451
	North American Spine Society	845
	WebMD & Vitals.com	908
Rigid Fixation / Plating Systems	Bioplate, Inc.	849
	DePuy Synthes	619
	JTS Surgical	944
	Kelyniam Global Inc.	451
	RTI Surgical	355
	Spineology Inc.	708
	Stryker	419
Robotics	Brain Navi Biotechnology Co., Ltd.	127
	Globus Medical	731
	Hitachi Healthcare	925
	Medtronic	719
	Monteris Medical	808
	Synaptive Medical	318
	Zap Surgical Systems, Inc.	109
	Zimmer Biomet	909
Shunts & Valves	Aesculap, Inc.	209
	Integra LifeSciences	700
	LeMaitre Vascular, Inc.	847
	Natus Neuro	501
	Sophysa	612
Spinal Cord Stimulation Systems	Boston Scientific	508
	Globus Medical	731
	Medtronic	719
	North American Neuromodulation Society (NANS)	950
Spinal Fixation Instrumentation	CoreLink	449
	CTL Amedica	548
	DePuy Synthes	619
	Gauthier Biomedical Inc.	331
	Globus Medical	731
	Medtronic	719
	Phasor Health LLC	748
	pro med instruments, Inc.	648
	Providence Medical Technology	347
	RTI Surgical	355

Category	Company	Booth Number
	Shukla Medical	333
	Spineology Inc.	708
	Stryker	419
Spinal Support Systems	Shukla Medical	333
Stereotactic Radiosurgery Systems	Integra LifeSciences	700
	Zap Surgical Systems, Inc.	109
Sterilization Containers	Fehling Surgical Instruments, Inc.	513
	Kirwan Surgical Products	408
	Scanlan International, Inc.	500
Surgical Instruments / Supplies	Apex Medical, Inc.	329
	Bien-Air Surgery SA	346
	Arkis BioSciences	431
	Boss Instruments Ltd.	644
	Clarus Medical LLC	836
	CoreLink	449
	CTL Amedica	548
	DIXI Medical USA	342
	elligence, LLC	633
	Fehling Surgical Instruments, Inc.	513
	Gauthier Biomedical Inc.	331
	JTS Surgical	944
	Karl Storz Endoscopy - America, Inc.	709
	Kelyniam Global Inc.	451
	Kirwan Surgical Products	408
	KLS Martin	800
	Kogent Surgical	813
	Koros USA, Inc.	409
	Mizuho America, Inc.	937
	Mizuho OSI	936
	Nova Surgical Innovations, Inc.	612
	Olympus America, Inc.	354
	Phasor Health LLC	748
	PMT Corporation	608
	Providence Medical Technology	347
	Rose Micro Solutions	345
	Scanlan International, Inc.	500
	Shukla Medical	333
	Spineology Inc.	708
	Sutter Medical Technologies USA	403
	Takayama Instrument, Inc.	445
	TeDan Surgical Innovations	454
	Thompson Surgical Instruments, Inc.	744
	TOBRA MEDICAL INC.	838
Telescopes, Surgical (Loupes)	Designs for Vision, Inc.	544
	Rose Micro Solutions	345
	SurgiTel	851
Ultrasound Equipment	BK Medical	332
	GE Healthcare	837
	Hitachi Healthcare	925
Video Equipment	Karl Storz Endoscopy - America, Inc.	709
	SurgiTel	851
Web Page Developers	WebMD & Vitals.com	908

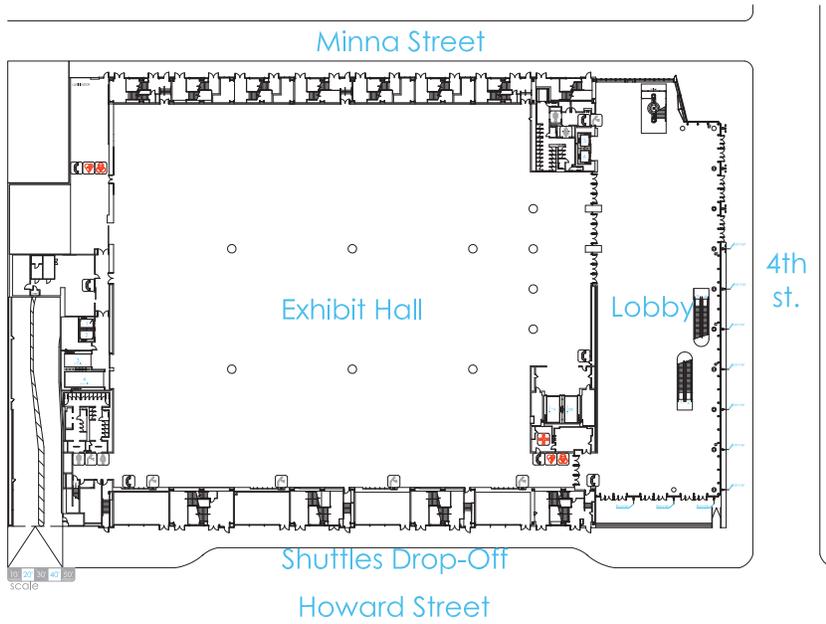
MOSCONE WEST CONVENTION CENTER

HOWARD STREET

MINNA STREET

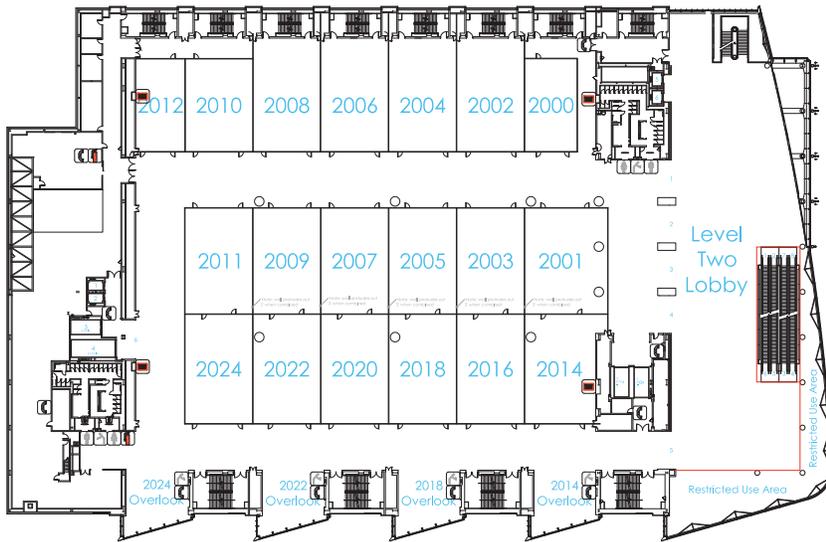


ENTRANCE



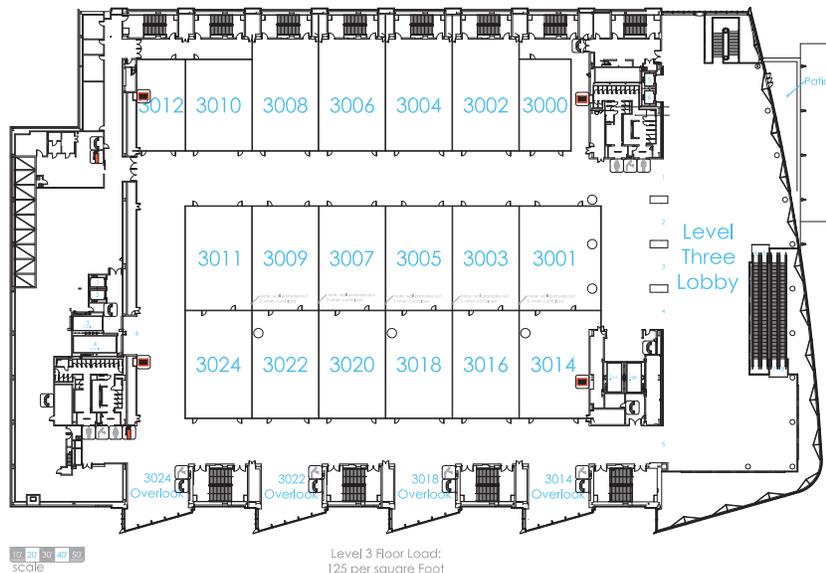
LEVEL ONE

- Registration
- CNS Central
- CNS Foundation Booth – Donate Today!



LEVEL TWO

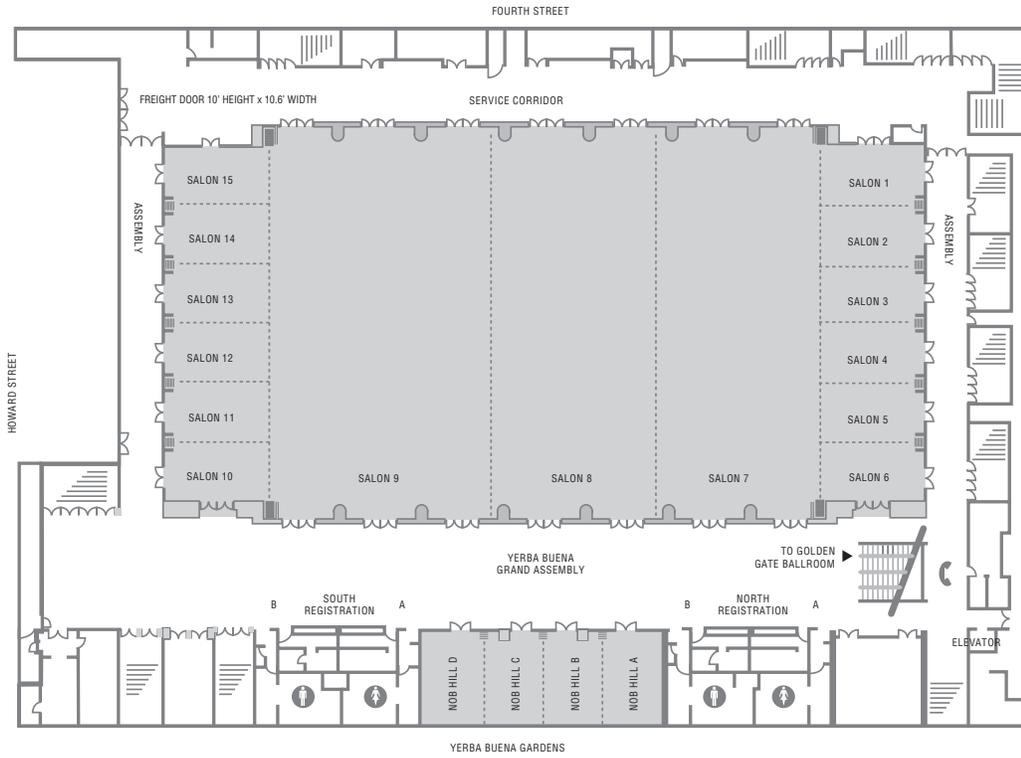
- Sessions
- Sergeant-at-Arms (2022 Overlook)
- Resident SANS Challenge (Room 2018)
- CNS Resident Social and CSNS Young Neurosurgeons Reception (Room 2000)
- Interactive Multimedia Research Presentation Session (Level 2 Lobby)
- Opening Reception (Level Two Lobby)



LEVEL THREE

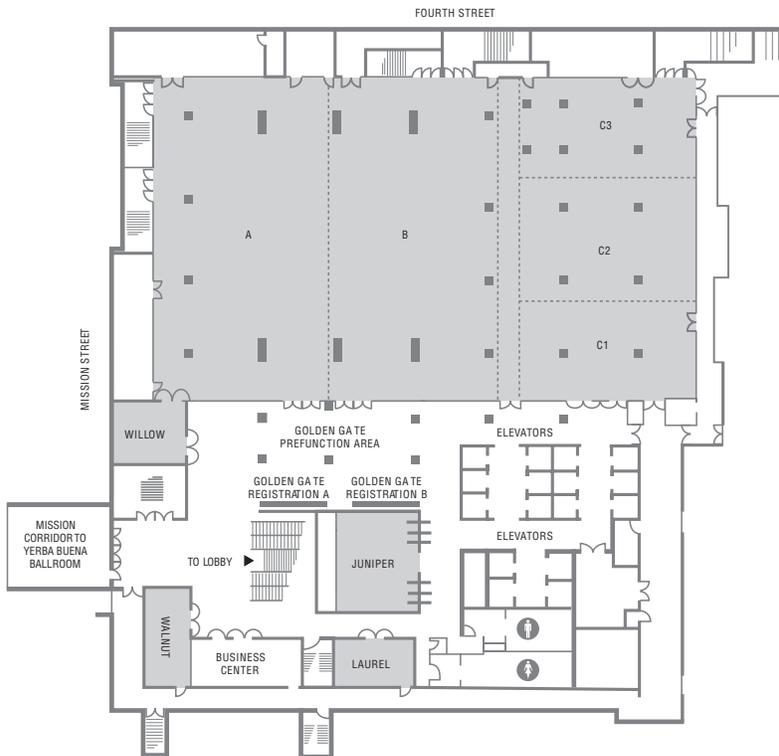
- General Scientific Sessions
- Speaker Ready Room (Room 3000)
- Sessions

SAN FRANCISCO MARRIOTT MARQUIS



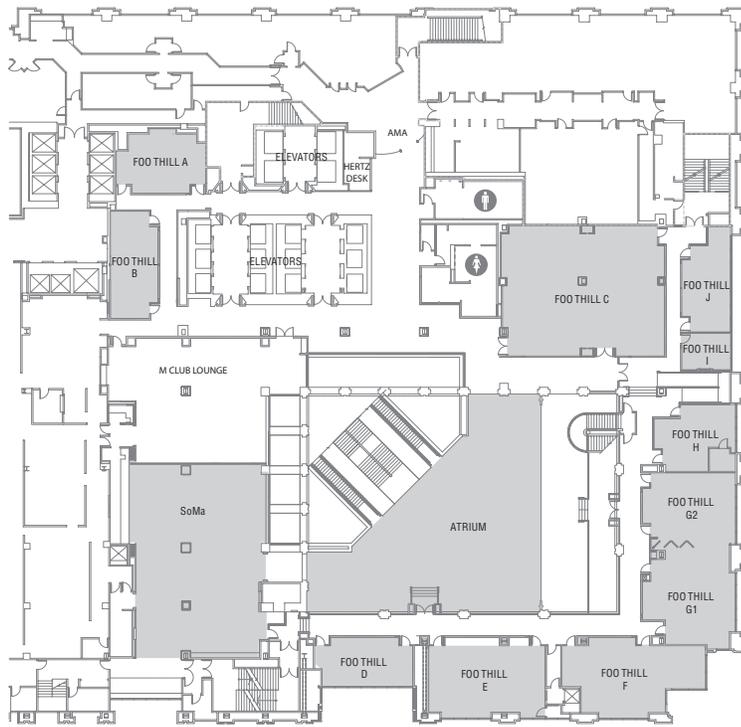
LOWER B2 LEVEL

- Committee Meetings



B2 LEVEL

- Committee Meetings
- Oral Boards Course

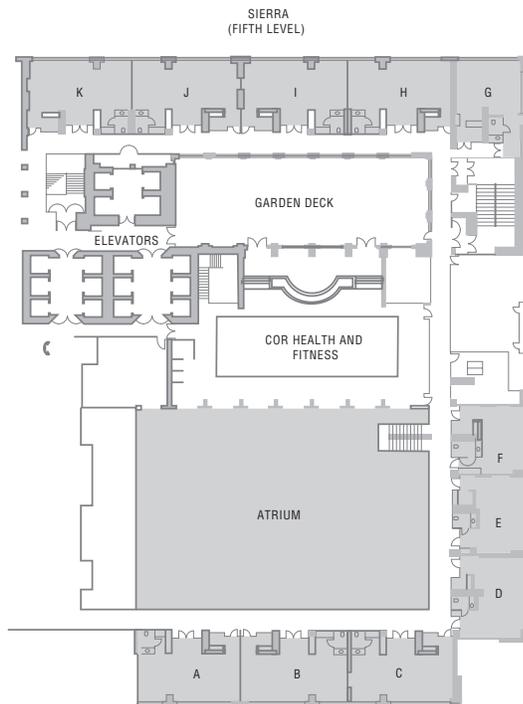
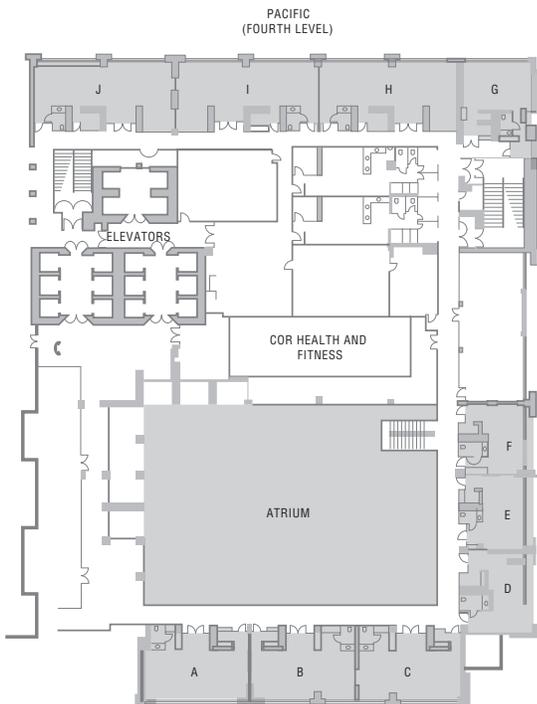


SECOND LEVEL

- Committee Meetings
- Spouse Hospitality (2nd Floor Atrium)

FOURTH AND FIFTH LEVEL

- Committee Meetings

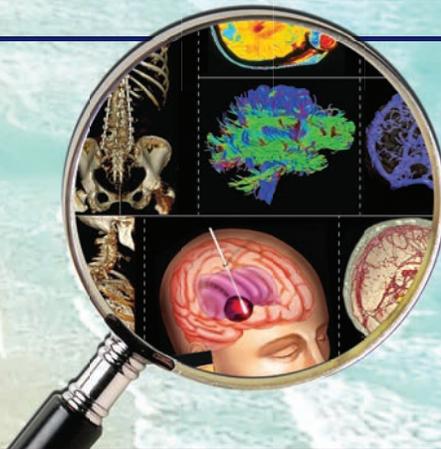


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CNS

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