

PRELIMINARY PROGRAM



CNS | 2022 ANNUAL MEETING

SAN FRANCISCO, CALIFORNIA • OCTOBER 8-12, 2022



NEUROSURGERY
CONNECTED 

Advance Registration Deadline: September 7, 2022

Register at cns.org/2022prelim



JOIN US

IN THE CITY BY THE BAY AT THE 2022 ANNUAL MEETING, NEUROSURGERY CONNECTED,

where we'll link education, science, and your peers! Be sure to bring a guest with you to enjoy:

- Landmarks like the Golden Gate Bridge/Park, Lombard Street, Alcatraz
- Union Square, North Beach, Fisherman's Wharf, Wine Country
- Views of the Pacific Ocean and San Francisco Bay
- Diverse communities and world-class cuisine



NEW! 2022 MEETING HIGHLIGHTS

LUNCH SEMINARS

- M03: The Economics of an Ambulatory Surgery Center
- M05: Connetomic Approaches to Neuromodulation
- T18: NEUROSURGERY Publications: "Getting Published"
- T21: The Changing Face of Neurosurgery: Navigating Workplace Culture

DINNER SEMINAR

- Know Your Worth: Negotiation, Compensation, and Reimbursement for the Neurosurgeon

SECTION SESSIONS

- CSNS: Neurosurgeons Becoming Hospital and Health System Leaders
- Tumor: Precision Medicine for Primary and Secondary Brain Tumors
- Stereotactic and Functional Neurosurgery: Advances in Epilepsy Treatment

LEARN FROM OTHERS' COMPLICATIONS

- Joint Section Sessions discussing complication management in Spine, Trauma, Pediatrics, Cerebrovascular, and Tumor

WEEKEND SYMPOSIA

- SPECIAL SYMPOSIUM: Frontiers in Skull Base Surgery – A CNS collaboration with the North American Skull Base Society (NASBS)
- SYM10A: Swimming with the Sharks – Succeeding in the Neurosurgery Match and Residency

ABSTRACT SESSIONS

- Sunrise Session and Late Breaking Abstract Session – Data Science
- Sunrise Session and Late Breaking Abstract Session – Medical Education and Training – A CNS collaboration with the Society of Neurological Surgeons (SNS)

Dear Colleagues,

I am very excited to connect with you all in San Francisco, October 8-12, for the 2022 CNS Annual Meeting as we explore “Neurosurgery Connected”! As neurosurgeons, we are all connected through our field of practice; I invite you to bridge the gap with your colleagues in other ways as you explore “The City by the Bay” and join us in person for the most exciting neurosurgical event of the year.

Famous for scenic beauty, cultural attractions, diverse communities and world-class cuisine, San Francisco’s landmarks include the Golden Gate Bridge, cable cars, Fisherman’s Wharf, Alcatraz, Chinatown, Union Square, North Beach, the Castro District and Mission Dolores. Be sure to bring a guest to enjoy all this city has to offer!

While at the CNS Annual Meeting, take opportunities to connect with our Featured Speakers, Honored Guest, and Special Speakers. Keep reading to learn about our speaker line up, along with many other exciting highlights that await you in San Francisco.

I am pleased to once again offer specialty-specific, full-day symposia bundles so you can maximize your opportunity to earn CME! Networking opportunities are plentiful allowing you to connect with our diverse community of neurosurgical members, faculty, and attendees.

Make your plans to head to San Francisco and connect with the CNS. I can’t wait to see you in October!

Sincerely,



Nicholas C. Bambakidis
CNS President

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2022 INTERNATIONAL PARTNER SOCIETIES



2022 PROGRAM AT-A-GLANCE

SATURDAY, OCTOBER 8

8:00 am-4:15 pm	Symposia (SYM01-SYM09)
	Special Symposium: Frontiers in Skull Base Surgery A CNS collaboration with the North American Skull Base Society (NASBS)
5:00-6:30 pm	International Reception Marriott Marquis San Francisco
6:30-8:30 pm	Dinner Seminar 1: Know Your Worth: Negotiation, Compensation, and Reimbursement for the Neurosurgeon at Palio

SUNDAY, OCTOBER 9

8:00 am-4:15 pm	Symposia (SYM10-SYM17)
8:00 am-4:15 pm	ANSPA Fall 2022 CME Meeting
1:00-3:00 pm	Resident SANS Challenge Preliminary Rounds
4:30-6:30 pm	General Scientific Session I
7:00-9:00 pm	Opening Reception Oracle Park



CNS is pleased to partner with the North American Skull Base Society (NASBS) for the Frontiers in Skull Base Surgery Symposium on Saturday, October 8! Special discounts available for registrants!

MONDAY, OCTOBER 10

7:00-8:30 am	Guidelines Sessions
7:00-8:30 am	Sunrise Session and Late Breaking Abstracts Sessions
8:40-9:40 am	General Scientific Session II
9:30 am-4:00 pm	Exhibit Hall open
9:40-10:40 am	Beverage Break in the Exhibit Hall
10:00-10:30 am	Live Surgery in the Exhibit Hall
10:40 am-12:10 pm	General Scientific Session II, continued
12:15-1:45 pm	Luncheon Seminars
12:15-1:45 pm	Non-CME Industry Sponsored Lunch Seminars
1:45-2:45 pm	ABNS Special Session: Guidelines for Boards Preparation and MOC (Non-CME)
1:45-2:45 pm	Beverage Break in the Exhibit Hall
2:45-4:15 pm	Section Sessions and Oral Presentations
4:15-5:45 pm	Operative Techniques and Case-based Discussion Sessions
5:45-7:15 pm	Medical Student Town Hall and Reception
5:45-7:15 pm	CNS Foundation Donor and Awardees Reception
7:30-9:30 pm	Dinner Seminar 2: Enabling Technologies in Spine Surgery: Fad or Future? at Prospect

TUESDAY, OCTOBER 11

7:00-8:30 am	Guidelines Sessions
7:00-8:30 am	Sunrise Session and Late Breaking Abstracts Sessions
8:40-9:40 am	General Scientific Session III
9:30 am-3:00 pm	Exhibit Hall open
9:40-10:40 am	Beverage Break in the Exhibit Hall
10:00-10:30 am	Live Surgery in the Exhibit Hall
10:40 am-12:10 pm	General Scientific Session III, continued
12:15-1:45 pm	Luncheon Seminars
12:15-1:45 pm	Non-CME Industry Sponsored Lunch Seminars
1:45-2:45 pm	Resident SANS Challenge Championship Round
1:45-2:45 pm	Beverage Break in the Exhibit Hall
2:00-2:45 pm	Annual Business Meeting
2:45-4:15 pm	Section Sessions and Oral Presentations
4:15-5:45 pm	Operative Techniques and Case-based Discussion Sessions
5:45-7:15 pm	Interactive Multimedia Research Presentation Session
7:30-9:00 pm	Resident Social

WEDNESDAY, OCTOBER 12

7:00-8:30 am	Guidelines Sessions
7:00-8:30 am	Sunrise Session and Late Breaking Abstracts Sessions
8:40-9:40 am	General Scientific Session IV
9:30-11:00 am	Exhibit Hall open
9:40-10:40 am	Beverage Break in the Exhibit Hall
10:00-10:30 am	Live Surgery in the Exhibit Hall
10:40 am-12:10 pm	General Scientific Session IV, continued
12:15-1:45 pm	Luncheon Seminars



#2022CNS

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

SUBSPECIALTY SESSION HIGHLIGHTS

AP ADVANCE PRACTICE PROVIDER

SATURDAY

- **SYM4A:** Comprehensive Management of Spinal Trauma
- **SYM05A:** Brain Tumor Update-Management of Benign Brain Tumors
- **SYM05B:** Brain Tumor Update-Management of Malignant Brain Tumors
- **SYM07B:** Pain Management in Your Practice

MONDAY

- **Guideline Session I:** The Preoperative Spine
- **Guideline Session II:** Spinal Cord Stimulation

SUNDAY

- **Association of Neurosurgical Physician Assistants (ANSPA) Fall 2022 CME Meeting Presented in Collaboration with the Congress of Neurological Surgeons**

TUESDAY

- **Interactive Multimedia Research Presentation Session**
- **Guideline Session III:** Chiari Malformations
- **Guideline Session IV:** Progressive Glioblastoma

WEDNESDAY

- **Guideline Session V:** Pediatric Hydrocephalus

CV CEREBROVASCULAR

SATURDAY

- **SPECIAL SYMPOSIUM:** Frontiers in Skull Base Surgery
A CNS collaboration with the North American Skull Base Society (NASBS)
- **SYM02A:** Comprehensive Management of Acute Stroke
- **SYM02B:** Multimodal Management of Pediatric Cerebrovascular Disease

SUNDAY

- **SYM12A:** Cerebrovascular Bypass and Management of Complex Vascular Lesions
- **SYM12B:** A Comprehensive and Evidence-based Review of the Treatment of Intracranial Aneurysms
- **SYM17A:** Keyhole Approaches for Treatment of Intracranial Aneurysms
- **SYM17B:** Trigeminal Neuralgia – Latest Trends in Management

MONDAY

- **Sunrise Session and Late Breaking Abstract Session – Cerebrovascular**
- **M02:** Timing and Approaches to Brainstem Cavernous Malformations
- **M07:** Artificial Intelligence in Cerebrovascular Neurosurgery
- **Section on Cerebrovascular Surgery 1:** Evolving Treatment Paradigms for Cerebrovascular Disease
- **Complex Case Discussion – Dural AV Fistula**

TUESDAY

- **Sunrise Session and Late Breaking Abstract Session – Cerebrovascular – Ischemic**
- **T11:** Middle Meningeal Artery Embolization in the Treatment of Subdural Hematoma
- **T17:** Multimodal Treatment of Spinal Vascular Malformations
- **Section on Cerebrovascular Surgery 2:** The Future of Stroke Care
- **Nuances in Multimodal Treatment of AVMs**
- **Interactive Multimedia Research Presentation Session**

WEDNESDAY

- **Sunrise Session and Late Breaking Abstract Session – Cerebrovascular**

GE GENERAL

SATURDAY

- **SYM4A:** Comprehensive Management of Spinal Trauma
- **SYM5A:** Brain Tumor Update-Management of Benign Brain Tumors
- **SYM5B:** Brain Tumor Update-Management of Malignant Brain Tumors
- **SYM7B:** Pain Management in Your Practice
- **SYM8A:** Neurosurgeons as Entrepreneurs
- **SYM8B:** The Value of the Neurosurgeon
- **DIN1:** Know Your Worth: Negotiation, Compensation, and Reimbursement for the Neurosurgeon

SUNDAY

- **SYM13A:** 2022 Coding and CPT Update
- **SYM13B:** Clinical Pathway and Program Development in Neurosurgery

MONDAY

- **Guideline Session I:** The Preoperative Spine
- **Guideline Session II:** Spinal Cord Stimulation
- **M10:** Building your Brand to Build your Practice

TUESDAY

- **Guideline Session III:** Chiari Malformations
- **Guideline Session IV:** Progressive Glioblastoma
- **T21:** The Changing Face of Neurosurgery: Navigating Workplace Culture

WEDNESDAY

- **Guideline Session V:** Pediatric Hydrocephalus
- **W22:** Telemedicine in Neurosurgery – The Future Beyond COVID

MS MEDICAL STUDENTS

SUNDAY

- **SYM10A:** Swimming with the Sharks – Succeeding in the Neurosurgery Match and Residency
- **SYM10B:** How to Get the Most Out of Your Mentor
- **M01:** Honored Guest Lunch: My Journey in Neurosurgery

MONDAY

- Medical Student Town Hall and Reception

TUESDAY

- Sunrise Session and Late Breaking Abstract Session – Medical Education and Training *A CNS collaboration with the Society of Neurological Surgeons (SNS)*
- T18: NEUROSURGERY Publications: “Getting Published”
- Interactive Multimedia Research Presentation Session

PA PAIN

SATURDAY

- SYM07B: Pain Management in Your Practice

SUNDAY

- SYM17B: Trigeminal Neuralgia – Latest Trends in Management

MONDAY

- Guideline Session I: The Preoperative Spine
- Guideline Session II: Spinal Cord Stimulation
- M06: Ablative Neurosurgery for Pain
- Section on Pain: Headache and Migraine Management for the Neurosurgeon
- Debates in Pain Neurosurgery
- Interactive Multimedia Research Presentation Session

WEDNESDAY

- Sunrise Session and Late Breaking Abstract Session – Stereotactic and Functional
- W25 Types of Spinal Cord Stimulators – What to Use When?

PE PEDIATRIC

SATURDAY

- SYM09: Hands-on Surgical Management of Pediatric Scoliosis

SUNDAY

- SYM11: Neurotrauma Across the Lifespan and Around the World
- SYM13A: 2022 Coding and CPT Update
- SYM13B: Clinical Pathway and Program Development in Neurosurgery

MONDAY

- Sunrise Session and Late Breaking Abstract Session – Pediatric
- Section on Pediatric Neurological Surgery 1: Fetal Repair of Myelomeningoceles – What Have We Learned in the Past Decade
- My Worst Complication in Pediatric Neurosurgery
- Section on Pediatric Neurological Surgery Networking Reception

TUESDAY

- Guideline Session III: Chiari Malformations
- T19: Functional Mapping in Pediatric Neurosurgery
- Section on Pediatric Neurological Surgery 2: Surgical Management of Skeletal Dysplasias
- Instrumented Fusion in Chiari Malformation
- Interactive Multimedia Research Presentation Session

WEDNESDAY

- Guideline Session V: Pediatric Hydrocephalus
- W30 Management of Complex Tethered Cord in Transitional and Adult Patients – Spinal Cord Shortening, Spinal Cord Stimulation, or Repeat Intradural Repair?

PN PERIPHERAL NERVES

SATURDAY

- SYM07A: Peripheral Nerve Surgery: Techniques and Exposure
- SYM07B: Pain Management in Your Practice

MONDAY

- Section on Peripheral Nerves 1: The Future of Peripheral Nerve: The Research We Need
- Operative Techniques to Master the Common Peripheral Nerve Conditions

TUESDAY

- T16: Peripheral Nerve Entrapment Versus Radiculopathy
- Section on Peripheral Nerves 2: The Case for Reconstruction: How and When
- Management of Sports-Related Traumatic Spine and Peripheral Nerve Injury
- Interactive Multimedia Research Presentation Session

RE RESIDENT

SATURDAY

- DIN1: Know Your Worth: Negotiation, Compensation, and Reimbursement for the Neurosurgeon

SUNDAY

- SYM10A: Swimming with the Sharks – Succeeding in the Neurosurgery Match and Residency
- SYM10B: How to Get the Most Out of Your Mentor

MONDAY

- M01: Honored Guest Lunch
- Medical Student Town Hall and Reception

TUESDAY

- Sunrise Session and Late Breaking Abstract Session – Medical Education and Training *A CNS collaboration with the Society of Neurological Surgeons (SNS)*
- T18: NEUROSURGERY Publications: “Getting Published”
- Interactive Multimedia Research Presentation Session
- Resident Social

SUBSPECIALTY SESSION HIGHLIGHTS

SE SOCIOECONOMIC

SATURDAY

- SYM08A: Neurosurgeons as Entrepreneurs
- SYM08B: The Value of the Neurosurgeon
- DIN1: Know Your Worth: Negotiation, Compensation, and Reimbursement for the Neurosurgeon

SUNDAY

- SYM13A: 2022 Coding and CPT Update
- SYM13B: Clinical Pathway and Program Development in Neurosurgery

MONDAY

- M03 The Economics of an Ambulatory Surgery Center
- Council of State Neurological Societies Session 1: Neurosurgeons Becoming Hospital and Health System Leaders
- Neurosurgical Contracts – How to Get What You Want

TUESDAY

- Sunrise Session and Late Breaking Abstract Session – CSNS
- T13: The Neurosurgeon as a Student
- T21: The Changing Face of Neurosurgery: Navigating Workplace Culture
- Council of State Neurosurgical Societies Session 2: Quality, Safety, Value and Cost-Containment in Neurosurgery
- Financial Planning for Neurosurgeons
- Interactive Multimedia Research Presentation Session

WEDNESDAY

- W22 Telemedicine in Neurosurgery – The Future Beyond COVID

SF STEREOTACTIC AND FUNCTIONAL

SATURDAY

- SYM06A: Hands on Stereotactic Epilepsy
- SYM06B: Controversies in Movement Disorder Surgery

SUNDAY

- SYM17B: Trigeminal Neuralgia – Latest Trends in Management

MONDAY

- Guideline Session II: Spinal Cord Stimulation
- M05: Connetomic Approaches to Neuromodulation
- Section on Stereotactic and Functional Neurosurgery 1: Advances in Movement Disorders
- Cases in Psychiatric Neurosurgery

TUESDAY

- T20: Robotic Neurosurgery – Choosing and Optimizing the Right System for your Practice
- Section on Stereotactic and Functional Neurosurgery 2: Advances in Epilepsy Treatment
- Thalamic Neuromodulation for Epilepsy
- Interactive Multimedia Research Presentation Session

WEDNESDAY

- Sunrise Session and Late Breaking Abstract Session – Stereotactic and Functional
- W26 Neuromodulation for Emerging Indications

SP SPINE

SATURDAY

- SYM03A: Spinal Biomechanics for the Practicing Neurosurgeon: What I Need to Know for my Practice
- SYM03B: My Worst Spinal Complication: Lessons Learned
- SYM04A: Comprehensive Management of Spinal Trauma
- SYM04B: Cutting-Edge Treatments in Neurotrauma

SUNDAY

- SYM15A: Advanced Minimally Invasive Spine Surgery – Operative Nuances, Indications, and Complication Avoidance
- SYM15B: Different Permutations of Lateral Access: Tips and Tricks
- SYM16A: Spine Surgery at the Ambulatory Surgery Center
- SYM16B: Introduction to Minimally Invasive Spine Surgery

MONDAY

- Guideline Session I: The Preoperative Spine
- Guideline Session II: Spinal Cord Stimulation
- Sunrise Session and Late Breaking Abstract Session – Spine – Minimally Invasive
- M08: Cervical Spondylotic Myelopathy – Anterior Versus Posterior
- M09: SI Joint Fusion: Indications, Technique, and Outcomes
- Section on Disorders of the Spine and Peripheral Nerves 1: Clinical Advances in Spine Surgery
- Misadventures and Bailouts in Spine Surgery
- DIN2: Enabling Technologies in Spine Surgery: Fad or Future?

SUBSPECIALTY SESSION HIGHLIGHTS KEY

AP ADVANCED PRACTICE PROVIDER	PE PEDIATRIC	SP SPINE
CV CEREBROVASCULAR	PN PERIPHERAL NERVES	TR NEUROTRAUMA
GE GENERAL	RE RESIDENT	TU TUMOR
MS MEDICAL STUDENTS	SE SOCIOECONOMIC	WI WOMEN IN NEUROSURGERY
PA PAIN	SF STEREOTACTIC AND FUNCTIONAL	

TUESDAY

- Sunrise Session and Late Breaking Abstract Session – Spine
- T12: Spine Surgical Options and Clearance for the Professional Athlete
- T14: Surgical Management of Primary Spinal Tumors
- Section on Disorders of the Spine and Peripheral Nerves 2: Economic and Practice Trends in Spine Surgery
- Multidisciplinary Treatment of Spine Metastasis
- Interactive Multimedia Research Presentation Session

WEDNESDAY

- Sunrise Session and Late Breaking Abstract Session – Spine and Peripheral Nerve
- W27 Proximal Junctional Kyphosis – Prevention and Management
- W29 Outpatient Versus Inpatient Case Selection in Spine Surgery

TR NEUROTRAUMA

SATURDAY

- SYM04A: Comprehensive Management of Spinal Trauma
- SYM04B: Cutting-Edge Treatments in Neurotrauma

SUNDAY

- SYM11: Neurotrauma Across the Lifespan and Around the World

MONDAY

- Sunrise Session and Late Breaking Abstract Session – Neurotrauma and Critical Care
- Section on Neurotrauma and Critical Care 1: Tator and Miller Distinguished Lectures
- Crossfire Debates in Neurotrauma

TUESDAY

- Section on Neurotrauma and Critical Care 2: Decision Making and Prognosis in the Care of the TBI Patient
- My Worst Complication in Neurosurgery for Trauma
- Interactive Multimedia Research Presentation Session

WEDNESDAY

- Sunrise Session and Late Breaking Abstract Session – Neurotrauma and Critical Care
- W23 Perspectives on Global Neurosurgery: Focus on LMICs (Low/Middle Income Countries)
- W24 Neurotrauma as a Team Sport: Multidisciplinary Management Across Neurosurgical Specialties

TU TUMOR

SATURDAY

- SYM01: International Ultrasound Symposium
- SYM05A: Brain Tumor Update-Management of Benign Brain Tumors
- SYM05B: Brain Tumor Update-Management of Malignant Brain Tumors
- SPECIAL SYMPOSIUM: Frontiers in Skull Base Surgery A CNS collaboration with the North American Skull Base Society (NASBS)

SUNDAY

- SYM14A: Now What? Management of Intracranial Complications
- SYM14B: 3D Surgical Neuroanatomy

MONDAY

- Sunrise Session and Late Breaking Abstract Session – Tumor
- M04: New Concepts in Intra-operative Guidance
- Section on Tumors 1: Intraoperative Delivery of Adjuvant Treatments for Brain and Spine Tumors
- Mapping and Monitoring of Tumors in Eloquent Areas

TUESDAY

- Guideline Session IV: Progressive Glioblastoma
- Sunrise Session and Late Breaking Abstract Session – Tumor
- T14: Surgical Management of Primary Spinal Tumors
- T15: Complex Skull Base Approaches
- Section on Tumors 2: Precision Medicine for Primary and Secondary Brain Tumors
- Multidisciplinary Treatment of Spine Metastasis
- Interactive Multimedia Research Presentation Session

WEDNESDAY

- Sunrise Session and Late Breaking Abstract Session – Tumor
- W28 New Concepts in Brain Radiosurgery and Brachytherapy

WI WOMEN IN NEUROSURGERY

SATURDAY

- SYM08A: Neurosurgeons as Entrepreneurs
- SYM08B: The Value of the Neurosurgeon

MONDAY

- M10: Building your Brand to Build your Practice

TUESDAY

- T21: The Changing Face of Neurosurgery: Navigating Workplace Culture
- Interactive Multimedia Research Presentation Session

CAN'T-MISS EVENTS

NETWORKING, RECEPTIONS, AND MORE!

The Annual Meeting is the perfect time and place to reconnect with friends and colleagues during any of our many ancillary events—there is something for everyone!

INTERNATIONAL RECEPTION

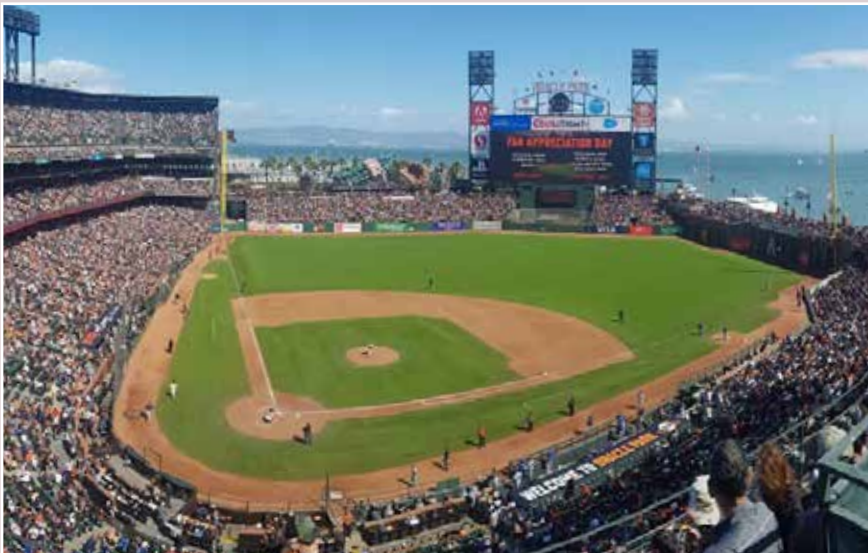
Saturday, October 8 | 5:00-6:30 pm | Marriott Marquis San Francisco

Join your colleagues from around the world at the 2022 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.



OPENING RECEPTION

Sunday, October 9 | 7:00-9:00 pm | Oracle Park



Oracle Park is a Major League Baseball stadium in the SoMa neighborhood and home of the San Francisco Giants. Reconnect with colleagues and friends while enjoying hors d'oeuvres and cocktails on the field.

Buses will depart from Moscone West Convention Center and official CNS hotels starting at 6:30 pm and provide continuous service to the park.

DINNER SEMINAR I

SE

6:30-8:30 pm | Saturday, October 8 | \$225 (includes three-course dinner and beverages)

Advance Registration Recommended | Complimentary shuttle service will depart the Marriott Marquis San Francisco at 6:15 pm.

Know Your Worth: Negotiation, Compensation, and Reimbursement for the Neurosurgeon

MODERATORS: Anthony L. Asher, Clemens M. Schirmer

FACULTY: Maya A. Babu, Joseph S. Cheng, Fredric B. Meyer, L. Madison Michael, Troy D. Payner, Shelly D. Timmons, Alex B. Valadka

SEMINAR DESCRIPTION: This dinner seminar will address a core need of all neurosurgeons; how do we understand our value and negotiate effectively to ensure we are getting what we need from our employers? Compensation can come in many forms, and faculty will discuss ways to achieve appropriate financial remuneration as well as compensation models that also promote academic productivity, appropriate work-life balance, and other necessities for a long and fulfilling career. This discussion promises to offer valuable insights for all neurosurgeons, regardless of age and current practice environment.



LOCATION: Palio | 640 Sacramento Street | San Francisco

DINNER SEMINAR II

SP GE

7:30-9:30 pm | Monday, October 10 | \$225 (includes three-course dinner and beverages)

Advance Registration Recommended | Complimentary shuttle service will depart the Marriott Marquis San Francisco at 7:15 pm.

Enabling Technologies in Spine Surgery: Fad or Future?

MODERATORS: Christopher I. Shaffrey, Corinna C. Zygourakis

FACULTY: Victor W. Chang, Robert E. Isaacs, J. Patrick Johnson, Christopher M. Maulucci, John Pollina, Nicholas Theodore, Michael Y. Wang

SEMINAR DESCRIPTION: This dinner seminar will cover the latest technological advances in the field of spinal surgery including expandable cages, minimally invasive approaches, awake surgery, navigation, and robotics. Attendees will gain a better understanding of the basis for the technology including its clinical applications, evidence, outcomes, and cost, in order to help determine whether these are hype or here to stay.

LOCATION: Prospect | 300 Spear Street | San Francisco



CAN'T-MISS EVENTS

MONDAY

5:45-7:15 pm

MEDICAL STUDENT TOWN HALL AND RECEPTION

All medical students and residents are invited to this event, where a panel of Program Directors will answer audience questions, discuss Residency applications and provide tips for the match. An informal reception will follow where students can network with peers and current residents to learn more about individual training programs.



TUESDAY

1:45-2:45 pm

RESIDENT SANS CHALLENGE CHAMPIONSHIP ROUND

HOST: *A. Samy Youssef*

FACILITATORS: *Angela Downes, Domenico Gattozzi, Elizabeth Hogan*

See the top 3 resident programs from around the country compete for undisputable SANS bragging rights, trophies, and cash prizes!



TUESDAY

5:45-7:45 pm

INTERACTIVE MULTIMEDIA RESEARCH PRESENTATION SESSION

The Interactive Multimedia Research Presentation Poster Session provides vigorous discussion of key neurosurgical advances, complemented by wine and cheese. Selected authors will present 3-minute oral presentations and subspecialty experts will award prizes to top posters.



TUESDAY

7:30-9:00 pm

RESIDENT SOCIAL

Come build relationships at this relaxed and informal networking event.

Residents, if you are within two to three years of completing your residency, this event is perfect for you! Establish a network of contacts with recruiters and practicing physicians who are looking to add to their practice.



CNSF Donor and Awardees Reception

MONDAY | 5:45-7:15 pm

LOCATION: Silent Auction, Moscone Convention Center, Lobby

Come congratulate our 2022 awardees, hear updates from our Co-Chairs, and enjoy a glass of California wine while bidding on your vacation of a lifetime! Learn more about the CNS Foundation's impact on neurosurgeons worldwide while supporting important programs with your bid on fantastic art, sports memorabilia, and fantastic jewelry. This event is open to all CNS event registrants.



CNS

Foundation

The Board of the CNS Foundation thanks supporters around the world who make our awards and programs possible. Please help us thank the following:

The CNS community of neurosurgeons and individuals who generously donate and volunteer every year to the CNS Foundation.

The Congress of Neurological Surgeons

Joint Cerebrovascular Section

**Joint Section on Disorders of the Spine and
Peripheral Nerves**

Joint Pediatric Section

**American Society for Stereotactic and
Functional Neurosurgery**

Joint Women in Neurosurgery Section

Joint Neurotrauma and Critical Care Section

Joint Tumor Section

Trans-Atlantic Education Foundation

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iz.ai



Donate today at
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INDUSTRY HIGHLIGHTS

The **CNS Exhibit Hall** is the best place to discover the cutting-edge technology to enhance your practice. Check out in-booth demonstrations with subspecialty experts and gain hands-on experience with the latest devices – all brought to you by our industry partners. For a complete list of exhibitors, see page 55 or visit cns.org/2022.

EXHIBIT HALL HOURS

Monday	9:30 am-4:00 pm
Tuesday	9:30 am-3:00 pm
Wednesday	9:30-11:00 am

EXHIBIT HALL BEVERAGE BREAKS

Monday-Wednesday	9:40-10:40 am
Monday & Tuesday	1:45-2:45 pm



Don't miss these activities in the Exhibit Hall!

LIVE SURGERY PRESENTATIONS

Join us on Monday through Wednesday from 10:00-10:30 am in the CNS Xperience Lounge during your morning break. Surgeons from top institutions will operate live via telemedicine and you will have the opportunity to observe and ask questions of the operating surgeon.

DEVICE INNOVATION SHOWCASE

These 10-minute sessions will feature an expert showcasing the latest technology from our Industry leaders. Learn more during your afternoon break on Monday and Tuesday in the CNS Xperience Lounge.



Interact Outside of the Exhibit Hall!

SPONSORED LUNCH SYMPOSIA WITH INDUSTRY LEADERS

Choose one of three complimentary non-CME lunch-and-learn sessions covering important clinical topics on Monday and Tuesday from 12:15-1:45 pm in the convention center.



HANDS-ON CADAVERIC EXPERIENCE

These educational surgical cadaveric suites, brought to you by our industry sponsors, give you the opportunity to enhance your experience with the latest and greatest neurosurgical technology.



BREAKOUT SESSIONS DURING THE FULL-DAY SYMPOSIA

These 30-minute non-CME breakout session will be held during the full day symposia on Saturday and Sunday. Take advantage of this opportunity to gain hands-on experience and see demonstrations of the most advanced equipment and techniques.

CNS XPERIENCE LOUNGE

The Xperience Lounge offers many opportunities to connect with others or simply take a break from the hustle and bustle of the Annual Meeting.

- Give your feet a break and relax with ample lounge seating and connect with your colleagues and neurosurgical peers.
- Interact with the 2022 Honored Guest.
- See presentations from the Innovator-of-the-Year finalists and stop by any time to view digital posters.
- Experience CNS Wellness and Resilience offerings and learn how to better balance work and home life.
- Hear Voices of Neurosurgery as your colleagues share personal stories on “Finding Meaning in Neurosurgery”.
- Meet CNS staff and ask questions related to membership or education. We would love to hear what’s on your mind!
- Grab a copy of the journal and engage with the NEUROSURGERY Publications team. Chat with journal staff about the latest developments from the Editorial Office.



CAN'T-MISS EVENTS

General Scientific Session I

Sunday, October 9 | 4:30-6:30 pm

PRESIDING OFFICER: *Elad Levy*

MODERATORS: *Ellen L. Air, Garni Barkhoudarian*

4:30-4:35 pm

Welcome to the 2022 CNS Annual Meeting

Nicholas C. Bambakidis



4:35-4:55 pm
WARREN R. SELMAN LECTURE ON MENTORSHIP Walk This Way:

The CNS and the Evolution of Neurosurgical Mentoring

Warren R. Selman

Introduced by: *Nicholas C. Bambakidis*

4:55-5:05 pm

CNS Resident Award Presentation

5:05-5:13 pm

Neurosurgical Science

5:13-5:20 pm

Neurosurgery Top Paper of the Year Presentation

5:20-5:42 pm

Neurosurgery Connected-The Experience of Neurosurgeons in Ukraine

Igor Kurilets

Introduced by: *Luke Tomycz*

5:42-5:45 pm

CNS Foundation Effort Towards Ukraine

Martina Stippler

5:45-5:57 pm

Neurosurgical Science



5:57-6:30 pm
JOHN THOMPSON HISTORY OF MEDICINE LECTURE

Vernice "FlyGirl" Armour

Introduced by: *Laura A. Snyder*

General Scientific Session II

Monday, October 10 | 8:40 am-12:10 pm

PRESIDING OFFICER: *Martina Stippler*

MODERATORS: *Edjah K. Nduom, Laura A. Snyder*

8:40-8:43 am

Introduction and Disclosures

8:43-8:55 am

Nexus Surgical Advances: Augmented Reality in Spinal Surgery

Daniel M. Sciubba

Introduced by: *Khoi D. Than*



8:55-9:17 am
SPECIAL LECTURE: Healthcare for Tomorrow, Today

Cliff Megerian

Introduced by: *Nicholas C. Bambakidis*



9:17-9:42 am
2022 HONORED GUEST PRESENTATION: WHAT CAVERNOUS MALFORMATIONS HAVE TAUGHT US

MALFORMATIONS HAVE TAUGHT US

Robert F. Spetzler

Introduced by: *Sepideh Amin-Hanjani*

9:40-10:40 am
Morning Beverage Break
Visit the Exhibit Hall

10:00-10:30 am
Live Surgery via Telemedicine in the Exhibit Hall

10:40-10:50 am

Schwann Cell Transplantation

Allan D. Levi



10:50-10:55 am
Distinguished Service Award Presentation

Ralph Dacey

Presented by *Brian L. Hoh*



10:55-11:00 am
Founder's Laurel Award Presentation

Warren Selman

Presented by *Brian L. Hoh*



11:00-11:35 am
2022 Presidential Address

Nicholas C. Bambakidis

Introduced by: *Peter Nakaji*



11:35 am-12:10 pm
WALTER E. DANDY ORATOR Space is not the Final Frontier

William Shatner

Introduced by: *Garni Barkhoudarian*

General Scientific Session III

Tuesday, October 11 | 8:40 am-12:10 pm

PRESIDING OFFICER: *Daniel J. Hoh*

MODERATORS: *Tiffany R. Hodges, Theresa Williamson*

8:40-8:45 am

Introduction and Disclosures

8:45-8:50 am

Washington Committee Update

John K. Ratliff

8:50-8:55 am

SNS Update

E. Sander Connelly

8:55-9:07 am

A Long Farewell

Nelson M. Oyesiku, EIC Emeritus, NEUROSURGERY Publications

9:07-9:10 am

Educator of the Year Award Presentation

Nader Pouratian

9:10-9:15 am

CNS Guidelines and the CNS Foundation Update

Alexander A. Khalessi



9:15-9:40 am

2022 HONORED GUEST PRESENTATION:

Management of Vascular Lesions of the Spinal Cord

Robert F. Spetzler

9:40-10:40 am
Morning Beverage Break
Visit the Exhibit Hall

10:00-10:30 am
Live Surgery via Telemedicine in the Exhibit Hall

10:40-10:45 am

AANS President

Ann R. Stroink

10:45-10:55 am

Nexus Surgical Advances: Keyhole Approach to Aneurysm

Peter Nakaji

10:55-11:00 am

NEUROSURGERY Publications Editor-in-Chief Update

Douglas Kondziolka

11:00-11:19 am

Neurosurgery Connected—The Connectomics Revolution

Hughes Duffau



11:19-11:27 am

JCNS Presidential Address

Akitake Mukasa

11:27-11:37 am

NINDS/CNS K12 Scholar Award Presentation

Nicolas Au Yang

Introduced by: *Brian Nahed*



11:37-12:10 pm

A Moderated Conversation with Troy Aikman

Troy Aikman

Introduced by: *Akash J. Patel*

General Scientific Session IV

Wednesday, October 12 | 8:40 am-12:10 pm

PRESIDING OFFICER: *Alexander A. Khalessi*

MODERATORS: *Jeffrey P. Mullin, Jennifer A. Sweet*

8:40-8:45 am

Introduction and Disclosures



8:45-8:53 am

SBN Presidential Address

Eberval Gadelha Figueiredo

8:53-8:56 am

Announcement of Innovator of the Year

Anand Veeravagu

8:56-9:09 am

Neurosurgical Science

9:09-9:19 am

Nexus Surgical Advances: Endoscopic Hemispherectomy

Sandi Lam

9:19-9:32 am

Neurosurgical Science

9:32-9:40 am

NSI Presidential Address

VP Singh

9:40-10:40 am
Morning Beverage Break
Visit the Exhibit Hall

10:00-10:30 am

Live Surgery via Telemedicine in the Exhibit Hall

10:40-11:00 am

Neurosurgical Science

11:00-11:15 am

Brain/Computer Interface

Jonathan Miller

11:15-11:20 am

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

Clemens M. Schirmer

11:20-11:37 am

Neurosurgical Science



11:37 am-12:10 pm
CNS MICHAEL L.J. APUZZO LECTURER ON CREATIVITY AND INNOVATION

Inspiring Leaders: Inspiring Teams

Dee Caffari

Introduced by: *Mohamad Bydon*

SPEAKER BIOGRAPHIES

2022 HONORED GUEST



Robert F. Spetzler

Emeritus President & CEO

**Emeritus Professor and Chair, Department of Neurosurgery,
Barrow Neurological Institute**

LOOK FOR DR. SPETZLER AT THE FOLLOWING SESSIONS:

MONDAY, OCTOBER 10

9:22-9:42 am

**General Scientific Session II – Honored Guest Presentation:
What Cavernous Malformations Have Taught Us**

12:15-1:45 pm

Honored Guest Luncheon Seminar: My Journey in Neurosurgery
Advance registration recommended

TUESDAY, OCTOBER 11

9:15-9:40 am

**General Scientific Session III – Honored Guest Presentation:
Management of Vascular Lesions of the Spinal Cord**
Meet Dr. Spetzler in the CNS Xperience Lounge in the Exhibit Hall immediately following his Generals Scientific Session presentation!

Robert F. Spetzler, M.D., was born in Stierhoefstetten, Germany, in 1944. In 1953, his family moved to the United States and on July 16, 1965, he was naturalized. He attended Knox College in Galesburg, Illinois, and graduated cum laude with Bachelors of Science degree in Biology and Chemistry in 1967. In 1967, he entered medical school at Northwestern University, where he obtained his M.D. in 1971 and completed his internship in 1972.

In 1972, Dr. Spetzler moved to the University of California at San Francisco where he trained as a resident under Charles B. Wilson, M.D., Professor and Chairman, Department of Neurosurgery. It was there, under the expert tutelage of Dr. Wilson, that his interest in neurovascular surgery developed and his commitment to academic neurosurgery was established. Before finishing his residency, he had already published 15 articles in refereed journals, on eight of which he was first author; had helped edit two books; and had made almost 20 presentations at national and international meetings. During the last year of his residency, he was awarded a Trauma Fellowship from the National Institutes of Health (NIH). He also received the Annual Resident Award at the 27th Annual Meeting of the Congress of Neurological Surgeons.

After his residency, Dr. Spetzler joined the Department of Neurosurgery at Case Western Reserve in Cleveland, Ohio as an Assistant Professor. In 1980, he received his first major grant from NIH, developing a baboon model of stroke that has been particularly generative for testing new therapeutic treatments for stroke and cerebral ischemia. In 1981, he was promoted to Associate Professor, holding that appointment until 1983.

In 1983, Dr. Spetzler was recruited by Dr. John R. Green to assume the J. N. Harber Chair of Neurological Surgery at the Barrow Neurological Institute (BNI) in Phoenix, Arizona. Under Dr. Spetzler's leadership, the BNI has grown from primarily a regional center to an internationally recognized center of excellence that attracts both visiting health care professionals and patient referrals from around the world. The residency program has become the largest and one of the most highly sought programs because of the diversity of clinical experience and the emphasis on developing independent research projects.

Among just a few of Dr. Spetzler's contributions have been the development of the NPPBT and a grading system for cranial and spinal AVMs; cardiac arrest for giant infratentorial aneurysms and the development of innovative approaches for CM's in the brainstem and thalamus. Overall, he has published 856 articles in refereed journals and authored 29 books. He has presented virtually every named lectureship nationally and internationally.

Among countless honors, Dr. Spetzler was awarded an honorary doctoral degree from his undergraduate alma mater, Knox College, and was chosen as the Honored Guest of the Congress of Neurological Surgeons in 1994--the youngest member ever to receive this award. In 2017 he received the AANS highest honor, the Cushing Medal. He is happily married to Nancy, his inspiration and the mother of their two precious children.

SPECIAL SPEAKERS



Cliff A. Megerian

CEO, University Hospitals Health System; Professor, Otolaryngology-Head & Neck Surgery, Case Western Reserve University School of Medicine

MONDAY, OCTOBER 10

8:55-9:17 am General Scientific Session II – HealthCare for Tomorrow, Today

Cliff A. Megerian, MD, is Chief Executive Officer of University Hospitals (UH), a comprehensive health system with annual revenues of \$5.2 billion, 23 hospitals (including five joint ventures), more than 50 health centers and outpatient facilities, and over 200 physician offices located throughout 16 counties. He is also a Professor in the Department of Otolaryngology, Head and Neck Surgery, at Case Western Reserve and co-founder of UH's Cochlear implant program—one of the largest programs in the country, performing more than 1,500 cochlear implant surgeries.

In previous leadership roles within the UH system, Megerian managed the clinical integration strategies, policies, and practice guidelines for more than 2,500 UH employed physicians across 14 UH system institutes. He also raised physician productivity to its highest level and significantly increased physician engagement and research funding.

Megerian's clinical career has been devoted to the management of hearing loss, chronic ear disease, cholesteatoma, otosclerosis, vertigo, and other otology and neurotology issues. He is also an expert in the diagnosis and treatment of acoustic neuroma. He has published over 130 peer-reviewed manuscripts and abstracts and has served as visiting professor at numerous medical schools and institutions throughout the world.

His research interests in the pathogenesis of Meniere's disease have been funded by the NIH and DRF. He sits on the Editorial Board of key journals in his field and has been selected by the FDA to serve as a consultant in the regulation of Ear, Nose and Throat Devices. He has been appointed by the American Academy of Otolaryngology to represent the Academy on the Joint Committee on Infant Hearing (JCHI).



Warren R. Selman

Harvey Huntington Brown Jr Emeritus Chair Neurosurgery; Case Western Reserve University School of Medicine and University Hospitals Cleveland

SUNDAY, OCTOBER 9

4:35-4:55 pm General Scientific Session I – Warren R. Selman Lecture on Mentorship: Walk This Way: The CNS and the Evolution of Neurosurgical Mentoring

Warren R. Selman, MD, is the Harvey Huntington Brown Jr Emeritus Chair and Professor of Neurosurgery at Case Western Reserve University School of Medicine and University Hospitals Cleveland Medical Center. Dr. Selman's clinical specialties and research interests include the surgical management of cerebrovascular and pituitary disorders, and traumatic brain injury. He is also actively involved in the development and application of virtual and augmented reality in

preparation and navigation for neurosurgical procedures, and for resident and medical student education, and patient education and engagement.

Following medical school at Case Western Reserve, Dr. Selman completed two years of research on focal cerebral ischemia under the direction of Dr. Robert Spetzler at University Hospitals and obtained neurosurgical residency training at Case Western Reserve, under the leadership of Dr. Frank Nulsen and Dr. Robert Ratcheson. Prior to the completion of residency, he received specialty training in transsphenoidal surgery at the Mayo Clinic from Dr. Edward Laws.

Dr. Selman was appointed Assistant Professor of Neurological Surgery at University Hospitals Cleveland in 1984 and later promoted to various roles, including Director of the Cerebrovascular Center, before being appointed Chair of Neurosurgery and The Harvey Huntington Brown Jr Professor of Neurosurgery at Case Western Reserve University SOM in 2005, where he served until 2022.

Dr. Selman has been active in organized neurosurgery, holding several leadership and editorial positions at the CNS, AANS and the Section on Cerebrovascular Neurosurgery. He is a Diplomate and former Chairman of the American Board of Neurological Surgery, as well as a member and Past President of the Society of Neurological Surgeons.

SPEAKER BIOGRAPHIES

FEATURED GUEST SPEAKERS



Troy Aikman

TUESDAY, OCTOBER 11

11:37 AM-12:10 PM **General Scientific Session III – A Moderated Conversation with Troy Aikman**

Troy Aikman has harnessed the drive and dedication that formed the foundation of his Hall of Fame football career with the Dallas Cowboys in numerous successful business ventures since retiring from the game following the 2000 season. Through broadcasting, real estate, and The Troy Aikman Foundation, Aikman has quickly discovered numerous ways to keep himself occupied with “retirement.”

After leaving the playing field, Aikman joined the NFL on FOX full-time as a game analyst. He quickly displayed the accuracy and work ethic that marked his playing career and moved up to FOX's No. 1 broadcast crew prior to the 2002 season. Teamed with Emmy Award-winning, play-by-play announcer Joe Buck, Aikman has impressed both critics and fans with the consistently entertaining and informative brand of coverage the duo provides. Aikman has received three nominations for an Emmy for his broadcasting efforts and has broadcast four Super Bowls (XXXIX, XLII, XLV, and LI).

During Aikman's 12-year playing career, he set 45 Cowboys' passing records, including the club's career record for completions (2,898), passing yards (32,942), touchdowns (165), and completion percentage (61.3). Aikman is one of only four quarterbacks to guide his team to victory in three Super Bowls (XXVII, XXVIII, and XXX). In February 2006, Aikman was voted into the Pro Football Hall of Fame. He became just the sixth player in Cowboys history to enter those hallowed halls.



Vernice “FlyGirl” Armour

John Thompson History of Medicine Lecture

SUNDAY, OCTOBER 9

5:57-6:30 PM **General Scientific Session I**

Vernice “FlyGirl” Armour has been tested her whole life. A gutsy trailblazer, her resume is an impressive collection of “firsts,” including America's first Black, female combat pilot. She served two tours of duty in Iraq as a Marine, and was a diversity liaison officer to the Pentagon for Headquarters Marine Corps.

After her military service, FlyGirl revved up her career in the private sector as an entrepreneur, consultant to business, and author of “Zero to Breakthrough, The 7-Step, Battle-Tested Method for Accomplishing Goals that Matter.” As a speaker, FlyGirl unleashes hard-hitting advice and

amazing anecdotes from her adventures on the battlefield and in business. In 2007, she launched VAI Consulting & Training, LLC, helping individuals and organizations make gutsy moves and create breakthrough results by applying her “Zero to Breakthrough™” Success Model—a mindset that helped to propel her career and kept her safe in air combat.

As a Black, gay woman and single mom, FlyGirl brings vital experience to her role as a member of the Forbes School of Business & Technology Board of Advisors and COMCAST/NBCUniversal Joint Diversity Council. She has received two honorary doctorates and has numerous awards as a pioneering pilot, including honors for her commanding role in Science, Technology, Engineering, and Mathematics (STEM).



Dee Caffari

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

WEDNESDAY, OCTOBER 12

11:37 am-12:10 pm **General Scientific Session IV – Inspiring Leaders: Inspiring Teams**

Dee Caffari, MBE, is the first woman to have sailed single-handedly and nonstop around the world in both directions, and the only woman to have sailed nonstop around the world a total of three times. To date, she has sailed around the world on six occasions. A world record-setting yachtswoman, Caffari is continuing to challenge herself; this summer, she will be teaming up with Shirley Robertson, OBE, to take on the nonstop Round Britain and Ireland Race doublehanded in a 33-foot yacht. An inspirational skipper and passionate ocean advocate, Caffari is keen to nurture diversity and inclusion.

Caffari is Chair of the World Sailing Trust, a global charity that aims to safeguard our planet’s waters and the future of the sport of sailing.

Outside of sailing, Caffari continues to showcase her talents as a presenter and on the international motivational speaker circuit. She also values her roles supporting charities including RNLI, UKSA, Sail 4 Cancer, and charities committed to improve marine life and reduce plastic such as Fauna & Flora Int. and A Plastic Planet.

One of Britain’s most inspirational women, Caffari’s warm delivery brings her story alive-the drama, the challenges, and the lessons hard-learned during her world record-setting voyages circumnavigating the planet.



William Shatner

Walter E. Dandy Orator

MONDAY, OCTOBER 10

11:35 am-12:10 pm **General Scientific Session II – Space is not the Final Frontier**

William Shatner has cultivated a career spanning more than 60 years as an award-winning actor, director, producer, writer, recording artist, and horseman. He is one of Hollywood’s most recognizable figures and a major philanthropist.

Perhaps best known for his role “Captain James T. Kirk” in the television series Star Trek and related Star Trek movies, Shatner also won Emmys and his first Golden Globe for his portrayal of eccentric lawyer “Denny Crane” on both The Practice and Boston Legal, along with other Emmy, Golden Globe and SAG Award nods. He is currently the host and executive producer of The

UnXplained on The History Channel, which explores the world’s most fascinating, strange, and inexplicable mysteries.

Off the screen and broadcast waves, Shatner has authored nearly 30 best sellers in both fiction and non-fiction genres, including his autobiography Up Till Now, and Leonard: My Fifty-Year Friendship with a Remarkable Man. William Shatner’s newest book, “Live Long And...What I Might Have Learned Along the Way,” was released in September 2018.

A longtime dedicated breeder of American Quarter horses, Shatner has also had enormous success with the American Saddlebred, developing and riding world champions and has won numerous world championships in several equine events. His passions for horses and philanthropy were united when he started the Hollywood Charity Horse Show, which benefits Southern California children’s and veterans’ charities.

ANNUAL MEETING LEADERSHIP



2022 President **Nicholas C. Bambakidis**

Nicholas C. Bambakidis is the Chair of the Department of Neurological Surgery, Director and Vice President of The Neurological Institute, and Director of Cerebrovascular and Skull Base Surgery at University Hospitals Cleveland Medical Center (UH) and Harvey Huntington Brown Jr. Chair in Neurological Surgery, and Professor in Neurological Surgery at Case Western Reserve University (CWRU) in Cleveland, Ohio.

Dr. Bambakidis is internationally recognized as a leader in the management of cerebrovascular and skull base surgery. He has edited three major textbooks on skull base and cranio-cervical spinal surgery and has published extensively in prestigious medical journals on an array of topics in his field of expertise.

In 2008, following his residency at CWRU and fellowship training at the Barrow Neurological Institute, Dr. Bambakidis was recruited to UH. He has been Director of Cerebrovascular and Skull Base Surgery since 2011 and was Program Director of the Neurosurgery Residency Program from 2011 to 2021. He was appointed as Director and Vice President of the Neurological Institute at UH in 2016 and became the Warren R. Selman Endowed Chair of Neurological Surgery in 2020.

A native of Fairborn, Ohio, Dr. Bambakidis and his wife, Kim, prize their time with family and put that sentiment into action with family sailing trips to Greece and the Caribbean each year. Their daughter, Eva, plays piano and graduated from Northwestern University in June of 2022 with majors in pre-medicine and art history. She will matriculate into the Case Western Reserve University School of Medicine. Their son, Peter, studies pre-medicine and plays varsity baseball at St. Olaf College in Minnesota.



President-Elect **Elad I. Levy**

Elad I. Levy is currently the Professor and Chair of Neurosurgery and the L. Nelson Hopkins Endowed Chair of the Department of Neurosurgery at SUNY Buffalo. He recently was awarded Distinguished Professor at the State University of New York at Buffalo. Dr. Levy graduated from Dartmouth College with a BS in Molecular Biology/Biochemistry in 1993. At Dartmouth, he competed as a varsity heavy weight rower. He graduated with distinction from the George Washington University School of Medicine and Health Sciences in 1997. He completed his resident training in neurosurgery at the University of Pittsburgh in 2004. He also completed a two year Endovascular Neurosurgery Fellowship with Dr. Nick Hopkins at SUNY Buffalo.

Dr. Levy has served on the CNS Executive Committee since 2007 and is the past president for the CNS Foundation. He currently serves as the director of the American Board of Neurological Surgery and as the Endovascular Section Editor for Neurosurgery. His clinical and research interests are focused on treatment of cerebrovascular diseases, specifically aneurysm and stroke. He has co-authored over 500 peer reviewed papers and several books on those and other topics. Dr. Levy has been instrumental in helping to create a paradigm shift advancing stroke technologies and the window for treatment.

Dr. Levy devotes his free time to his wife Cindy and their 3 children, Bennett, Hannon, and Lauren. As a family they enjoy recreational and fitness activities outdoors.



2022 Annual Meeting Chair **Ashok R. Asthagiri**

Ashok Asthagiri was born in Chennai, Tamil Nadu, India, and immigrated to the United States in 1982. He grew up in Ohio, where he completed his undergraduate education at the University of Akron and received his medical degree from Northeastern Ohio Medical University. After graduating from medical school in 2001, Dr. Asthagiri completed a general surgical internship and neurosurgical residency at UVA. During his residency, he completed enfolded fellowships at Auckland City Hospital in Auckland, New Zealand, and neuropathology at UVA. After completing residency training, Dr. Asthagiri joined the Surgical Neurology Branch in the National Institute of Neurological Disorders and Stroke (NINDS) at the National Institutes of Health (NIH) in Bethesda, Maryland. During his six

years at the NIH, he focused his clinical and research efforts on reducing the burden of disease in patients with multiple neoplasia syndromes, such as NF1, NF2 and VHL. The AANS/CNS Joint Section on Tumors recognized his efforts with the Tumor Young Investigator Award in 2011.

In 2013, Dr. Asthagiri rejoined the UVA Department of Neurosurgery, where he is now director of the surgical neuro-oncology and skull base programs. He leads a multidisciplinary effort to treat neurocutaneous disorders, contributes to the basic and clinical research program in the Department of Neurosurgery, and is actively involved in resident physician and medical student education, serving at the director level for both programs. In addition, he is the director of the Microsurgical Anatomy and Skull Base Laboratory at UVA. Dr. Asthagiri is a recognized leader in organized neurosurgery. He has been on the Executive Committee of the Congress of Neurological Surgeons (CNS) since 2010. In supporting the educational mission of the CNS, Dr. Asthagiri has served as the Chair of the Research Committee, Editor-in-Chief of Self-Assessment in Neurological Surgery (SANS), and Chair of the Education Division.

Dr. Asthagiri married Heather Asthagiri, MD, of Columbia, Tennessee, in 2010. She is a physical medicine and rehabilitation physician at UVA. They are the proud parents of Avani Lynn and Arjun James.



2022 Scientific Program Chair **Lola B. Chambless**

Lola B. Chambless is Associate Professor of Neurological Surgery and the Neurosurgery Residency Program Director at Vanderbilt University Medical Center. Born in Birmingham, AL, she grew up between Boston, MA, and Nashville, TN, before earning her B.S. at Stanford University. She graduated with her MD with Alpha Omega Alpha honors from Vanderbilt University School of Medicine in 2005, and completed residency in Neurological Surgery and fellowship in Neurosurgical Oncology at Vanderbilt as well. After a fellowship in Minimally Invasive Neurosurgery at Prince of Wales Hospital in Sydney, Australia, she joined the faculty at Vanderbilt in 2013.

Dr. Chambless has a busy clinical practice in brain tumor and skull base surgery and is the surgical director of the Vanderbilt Pituitary and Radiosurgery centers. She is an expert in endonasal and keyhole approaches to cranial pathology. Her diverse research interests include risk stratification of tumor cells in glioblastoma, computer-based modeling of intraoperative brain shift, and the use of machine learning

techniques to predict outcomes in brain tumor surgery. Much of her energy is devoted to advancing neurosurgical education both locally, as Neurosurgery Program Director, and nationally, through organized neurosurgery and her own educational research.

In 2017, Dr. Chambless joined the Executive Committee of the CNS as the inaugural Chair of the CNS Data Science Committee. Since then, she has also served as Chair of the CNS Leadership Institute and Resident Committee, and Vice-Chair of the Education Division. She believes in scientific collaborations that cross traditional specialty boundaries, and she is focused on improving access to mentorship for future neurosurgeons by removing barriers to promote equity and inclusion within the field. She is also the proud mother of two daughters, Harper (10) and Sims (8) and partner to Dr. Scott Simon, MD, of Penn State Neurosurgery.

ANNUAL MEETING LEADERSHIP



2022 Vice Scientific Program Chair **Garni Barkhoudarian**

Garni Barkhoudarian is associate professor of neuroscience and neurosurgery at the Pacific Neuroscience Institute and Chief of Neurosurgery at Providence Saint John's Health Center. Born outside Detroit, Michigan, Dr. Barkhoudarian grew up in Los Angeles, where he attended college at the University of California, Los Angeles, graduating with honors. He then attended the University of Michigan Medical School, graduating in 2005. He completed his neurosurgical residency at UCLA Health Center and fellowship in Endoscopic and Pituitary Surgery at Brigham and Women's hospital with Dr. Edward Laws.

As Co-director of the Pituitary Disorders Center and chief of radiosurgery, Dr. Barkhoudarian has particular expertise in skull base, pituitary and brain tumors, trigeminal neuralgia, hemifacial spasm and other vascular compression syndromes. For many conditions, he applies the keyhole concept of minimizing collateral damage to the brain using advanced neuroimaging and neuro-navigation techniques along with endoscopy to improve targeting and lesion visualization.

Dr. Barkhoudarian's research interests include evaluating outcomes of pituitary and brain tumor surgery, and biomarker research for pituitary adenomas, meningiomas and metastatic brain tumors. He is the principal investigator of clinical trials evaluating brain and pituitary tumor treatment options. As director of the PNI Multidisciplinary Neuroanatomy and Surgical Skills Laboratory, he conducts skull base and anatomic research to help innovate minimally invasive approaches to intracranial tumors. This laboratory is also central to the education and training of Pacific Neuroscience Institute's clinical and international fellows.

Dr. Barkhoudarian joined the executive committee of the Congress of Neurological Surgeons (CNS) in 2017, where he chaired the Self-Assessment of Neurological Surgery (SANS) team. He expanded his passion of neurosurgical education as vice-chair of the education division, helping develop live and virtual education courses for the CNS membership and helping foster collaboration with the AANS/CNS sections and the Society of Neurooncology. As head of the ACCME program, Dr. Barkhoudarian has helped with CME accreditation and adjudication for the CNS.

Dr. Barkhoudarian focuses on advancing innovation in neurosurgery as well as education future generations to the highest levels of the discipline. He is a loving husband to Dr. Evelyn Baghdasraian-Barkhoudarian and a proud father of two boys, Sevan (9) and Aren (8). On his "off" times, he enjoys chess, skiing, mountain biking and Formula One racing.

BRING YOUR FAMILY TO THE 2022 CNS ANNUAL MEETING!

San Francisco is best known for its scenic beauty, cultural attractions, diverse communities, and world-class cuisine. Measuring 49 square miles, this walkable city includes landmarks like the Golden Gate Bridge, cable cars, Alcatraz and the largest Chinatown in the United States. A stroll of the city's streets can lead from Union Square to North Beach to Fisherman's Wharf, with intriguing neighborhoods to explore. Views of the Pacific Ocean and San Francisco Bay are often laced with fog, creating a romantic mood in this most European of American cities.



CNS

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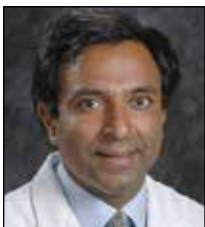
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Eric Oermann
*Data Science Special
Session Liaison*



Dan Orringer
*Data Science Special
Session Liaison*



Parag Patil
Section on Pain



Jeremy Phelps
*Council of State
Neurological Societies*



**Gazanfar
Rahmathulla**
*Section on Neurotrauma
& Critical Care*



Benjamin Rapoport
*Section on
Cerebrovascular
Surgery*



Analiz Rodriguez
Section on Tumors



Charles Sansur
*Section on Disorders of
the Spine and
Peripheral Nerves*



Clemens Schirmer
*Section on
Cerebrovascular
Surgery*



Sameer A. Sheth
*Section on Stereotactic
and Functional
Neurosurgery*



Laura Snyder
*Section on Disorders of
the Spine and
Peripheral Nerves*



Jennifer A. Sweet
Section on Pain



Khoi D. Than
*Section on Disorders of
the Spine and
Peripheral Nerves*



**Stavropoula
Tjounakaris**
*Section on
Cerebrovascular
Surgery*



Luis M. Tumialan
*Council of State
Neurosurgical Societies*



Anand Veeravagu
*Section on Disorders of
the Spine and
Peripheral Nerves*



Ben Waldau
Polling



Sarah Woodrow
*Section on Neurotrauma
& Critical Care Women
in Neurosurgery*



Chengyuan Wu
*Section on Stereotactic
and Functional
Neurosurgery*

SYMPOSIA

8:00 am-4:15 pm



SPECIAL SYMPOSIUM: Frontiers in Skull Base Surgery

A CNS collaboration with the North American Skull Base Society (NASBS)

Registration for the CNS Annual Meeting is not required to attend the Frontiers in Skull Base Surgery Symposium.

PRICE: \$450

Register for this symposium and the CNS Annual meeting and save \$150!

COURSE DIRECTORS: Garni Barkhoudarian, Ivan El-Sayed, Philip V. Theodosopoulos

FACULTY: Siviero Agazzi, Ashok Rajappa Asthagiri, Keith Blackwell, Ricardo Carrau, Franco DeMonte, Amir Dehdashti, James J. Evans, Renata Ferrarotto, Neil Futran, Christine Glastonbury, Constantinos G. Hadjipanayis, Ehab Y Hanna, Daniel F. Kelly, Claudia Kirsch, Donato R. Pacione, Parag G. Patil, Gustavo Pradilla, Daniel M. Prevedello, Pablo F. Recinos, Alejandro Rivas, Ravi Samy, Konstantin V. Slavin, A. Samy K. Youssef, Lee Zimmer

COURSE DESCRIPTION: For the first time, the CNS and North American Skull Base Society (NASBS) team up to offer a full-day symposium dedicated to cutting edge skull base topics. Speakers will include a host of legendary US and International neurosurgeons as well as leaders in complementary fields such as Otolaryngology, Radiation Oncology, and Medical Oncology to provide a robust multidisciplinary environment. Topics will include the incorporation of innovative technology in the OR, personalized approaches to complex skull base pathologies, and honest reflections on complication management. This course is appropriate for trainees and practicing neurosurgeons alike, and a reception following the symposium is included in the ticket price.

Full Day Discounted Bundles (includes lunch): Physician \$400; Nurse/NP/PA \$300; Resident/Medical Student \$175

Half Day: Physician \$250; Nurse/NP/PA \$200; Resident/Medical Student \$125

8:00 am-12:00 pm

TU GE

SYM01: International Ultrasound Symposium

COURSE DIRECTORS: Francesco DiMeco, Brian V. Nahed, Geirmund Unsgård

FACULTY: Alessandro Perin, Aliasgar V. Moiyadi, Llewellyn Padayachy, Vikram C. Prabhu, Francesco Prada

COURSE DESCRIPTION: As Intra-operative ultrasound (ioUS) technology has advanced rapidly over the last decade, there has been a tremendous worldwide increase in its use in routine neurosurgical practice. The symposium will enable neurosurgeons to build the skills they need to incorporate state of the art ioUS technology in their own practice, by learning from experts through lectures and practical hands-on training.

8:00 am-4:15 pm

CV

SYM02: Cerebrovascular Bundle 1

COMPOSED OF TWO SESSIONS: SYM2A & SYM2B. Select this option to take both at a discounted rate.

8:00 am-12:00 pm

CV

SYM02A: Comprehensive Management of Acute Stroke

COURSE DIRECTOR: Peter Kan

FACULTY: Robert L. Dodd, Vernard S. Fennell, Jonathan A. Grossberg, J D. Mocco, Aman B. Patel, Stavropoula I. Tjoumakaris

COURSE DESCRIPTION: This course will cover evidence-based management of acute ischemic stroke from large vessel occlusion. This will include a review of guidelines for intervention, management of tandem lesions, evolving techniques, and the basis for ongoing stroke trials to expand indications for thrombectomy.

CNS | **SANS**
Lifelong Learning

12:45-4:15 pm

CV PE

SYM02B: Multimodal Management of Pediatric Cerebrovascular Disease

COURSE DIRECTORS: Jan-Karl Burkhardt, Sandi Lam

FACULTY: Aaron S. Dumont, Yin C. Hu, Alfred P. See, Edward R. Smith, Phillip Storm

COURSE DESCRIPTION: This course will cover treatment paradigms for pediatric vascular malformations including aneurysms, arteriovenous malformations, Vein-of-Galen Malformations, cavernous malformations, and spinal vascular pathology. Faculty will review comprehensive management of these complex disorders, including open and endovascular approaches.

8:00 am-4:15 pm

SP

SYM03: Spine Bundle 1

COMPOSED OF TWO SESSIONS: SYM3A & SYM3B. Select this option to take both at a discounted rate.

8:00 am-12:00 pm

SP

SYM03A: Spinal Biomechanics for the Practicing Neurosurgeon: What I Need to Know for my Practice

COURSE DIRECTORS: Benjamin D. Elder, Tyler R. Koski

FACULTY: Aruna Ganju, Ajit A. Krishnaney, Christopher M. Maulucci, Zachary A. Smith, Michael S. Virk, Rishi K. Wadhwa

COURSE DESCRIPTION: Spine surgeons increasingly recognize that a firm understanding of biomechanics is required to optimize patient outcomes. In this symposium, faculty teach the audience how to use knowledge of biomechanics for surgical decision making when handling a range of spinal pathology from degenerative disease, to trauma, tumors, and deformity.



12:45-4:15 pm

SP

SYM03B: My Worst Spinal Complication: Lessons Learned

COURSE DIRECTORS: Daniel K. Resnick, Anna R. Terry

FACULTY: Mark H. Bilsky, Mark N. Hadley, Michele M. Johnson, Shekar N. Kurpad, Gerald E. Rodts, Michael P. Steinmetz, Michael Y. Wang, Christopher E. Wolfla

COURSE DESCRIPTION: Sometimes the best lessons are learned the hard way. This symposium will see expert spine surgeons discuss some of their most challenging complications to provide insights into advanced clinical care of patients with spinal disorders.

8:00 am-4:15 pm

SP TR

SYM04: Spine/Trauma Bundle

COMPOSED OF TWO SESSIONS: SYM4A & SYM4B. Select this option to take both at a discounted rate.

8:00 am-12:00 pm

SP TR

SYM04A: Comprehensive Management of Spinal Trauma



COURSE DIRECTORS: Daniel J. Hoh, Yi Lu

FACULTY: Paul M. Arnold, Asdrubal Falavigna, Michael G. Fehlings, Diana H. Jho, Kristen E. Jones, Charles A. Sansur, Vincent C. Traynelis

COURSE DESCRIPTION: During this symposium, participants will learn the latest techniques for management of spine trauma, including cervical, thoracic, and lumbar injuries. Both operative and non-operative treatments will be discussed with an emphasis on evidence-based practice guidelines.

12:45-4:15 PM

TR

SYM04B: Cutting-Edge Treatments in Neurotrauma

COURSE DIRECTORS: Anthony M. DiGiorgio, Emily P. Sieg

FACULTY: Randy S. Bell, Jack Jallo, Brian K. Kwon, Geoffrey T. Manley, Ann M. Parr, Shelly D. Timmons, Jamie S. Ullman

COURSE DESCRIPTION: Management of patients with neurotrauma has become increasingly complex with more attention paid to highly focused therapy targeting neurophysiologic principles. The symposium offers a review of recent clinical advances in cranial and spinal trauma management, with a peek at emerging therapies aimed at improving outcomes in this challenging population.

8:00 am-4:15 pm

TU

SYM05: Tumor Bundle 1

COMPOSED OF TWO SESSIONS: SYM5A & SYM5B. Select this option to take both at a discounted rate.

8:00 am -12:00 pm

TU

SYM05A: Brain Tumor Update-Management of Benign Brain Tumors

COURSE DIRECTORS: Manish K. Aghi, Gelareh Zadeh

FACULTY: Nduka M. Amankulor, Melanie H. Gephart, Andrew S.

Little, Russell R. Lonser, Akash J. Patel, Analiz Rodriguez, Walavan Sivakumar

COURSE DESCRIPTION: This symposium defines the latest evidence-based principles guiding management of benign brain tumors including meningioma, schwannoma, pituitary adenoma, and others. Discussion will include multi-modality treatments and multidisciplinary approaches to these pathologies, with an emphasis on recent advances about which every neurosurgeon needs to know.

12:45 -4:15 pm

TU

SYM05B: Brain Tumor Update-Management of Malignant Brain Tumors

COURSE DIRECTORS: Michael Lim, Andrew E. Sloan

FACULTY: Carolina G. Benjamin, John A. Boockvar, Kaisorn L. Chaichana, Susan M. Chang, Alfredo Quinones-Hinojosa, Steven N. Kalkanis, Edjah K. Nduom, Jeffrey S. Weinberg

COURSE DESCRIPTION: This symposium updates the audience on clinical and scientific advances in the management of malignant brain tumors, including Glioblastoma, Metastasis, Lymphoma and others. Faculty will review evidence-based multidisciplinary approaches to this patient population as well as emerging treatments. This essential update provides the tumor specialist and general neurosurgeon alike with the resources they need to manage these diseases effectively.

8:00 am-4:15 pm

SF

SYM06: Stereotactic and Functional Bundle

COMPOSED OF TWO SESSIONS: SYM6A & SYM6B. Select this option to take both at a discounted rate.

8:00 am-12:00 pm

SF

SYM06A: Hands on Stereotactic Epilepsy

COURSE DIRECTORS: Jorge A. González-Martínez, Lora W. Kahn

FACULTY: Guy M. McKhann, Joseph S. Neimat, Sameer A. Sheth, Chengyuan Wu

COURSE DESCRIPTION: Robotic assisted surgery has been performed for more than many years in different areas as cardiac and general surgery. More recently, advances in microsurgical techniques and surgical instruments, minimally invasive surgery, surgical navigation technology, digitized imaging modalities, increased computational power, and improvements in mechanical and electrical engineering have resulted in the incorporation of robotics into the field of neurosurgery. The debut of robotic neurosurgery was reported by Kwoh and colleagues in 1985. The authors employed an industrial robot for holding and modifying the trajectory of biopsy cannulae. Despite the introduction of robots in neurosurgery more than 25 years ago, the routine use of robots has yet to gain prominence in neurosurgery. Overall, limited number of published manuscripts regarding robot assisted cranial surgery is available in the literature. This is in contrast to other surgical fields in which the robot has gained 'clinical traction', including published studies on robot assisted surgical training. From their experience,



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

SATURDAY, OCTOBER 8

robot assisted surgery has been shown to reduce learning curve compare to laparoscopic surgery. This practical hands-on course is designed to demonstrate the basic applications of robotic surgery in the field of epilepsy surgery and functional neurosurgery, exposing practical technical nuances, advantages and limitations related to the technology.

12:45-4:15 pm

SF

SYM06B: Controversies in Movement Disorder Surgery

COURSE DIRECTOR: *Sharona Ben-Haim, André Machado*

FACULTY: *Kara Beasley, Casey H. Halpern, Erika A. Petersen, Francisco A. Ponce, Tejas Sankar, Jason M. Schwalb*

COURSE DESCRIPTION: Enjoy expert debate on hot topics within the Movement Disorder community. What is the optimal technique: Deep Brain Stimulation (DBS) vs. High Frequency Ultrasound (HIFU)? What is the optimal DBS strategy: awake physiology-guided vs. asleep image-guided? Case presentations and discussion of complication avoidance/management will round out this session.

8:00 am-4:15 pm

PN PA

SYM07: Peripheral Nerve/Pain Bundle

COMPOSED OF TWO SESSIONS: SYM7A & SYM7B. Select this option to take both at a discounted rate.

8:00 am-12:00 pm

PN

SYM07A: Peripheral Nerve Surgery: Techniques and Exposure



COURSE DIRECTORS: *Rajiv Midha, Robert J. Spinner*

FACULTY: *Justin M. Brown, Amgad S. Hanna, Line G. Jacques, Mark A. Mahan, Shaun T. O'Leary, Elias B. Rizk, Mariano Socolovsky, Thomas J. Wilson, Christopher J. Winfree, Eric L. Zager*

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

12:45-4:15 pm

PA SP GE

SYM07B: Pain Management in Your Practice

COURSE DIRECTORS: *Andrew W. Grande, Erika A. Petersen*

FACULTY: *Richard Berkman, Wendell B. Lake, Joshua M. Rosenow, Ashwin Viswanathan*

COURSE DESCRIPTION: Pain management is central to the practice of every neurosurgeon and good pain control is behind every good patient outcome. This course will provide evidence-based principles to apply throughout the spectrum of neurosurgical practice including management of complex postop pain, chronic pain, cancer-related pain, innovative and new techniques with a focus on delivery of integrative care within the healthcare system.

8:00 am-4:15 pm

SE WI

SYM08: CSNS/Women in Neurosurgery Bundle

COMPOSED OF TWO SESSIONS: SYM8A & SYM8B. Select this option to take both at a discounted rate.

8:00 am-12:00 pm

SE WI GE

SYM08A: Neurosurgeons as Entrepreneurs

COURSE DIRECTORS: *Scott D. Simon, Sarah Woodrow*

FACULTY: *John R. Adler, Kevin T. Foley, Michael T. Lawton, Stephen Papadopoulos, Michael E. Sughrue, Richard N. Wohns*

COURSE DESCRIPTION: Innovation and creativity combined with perseverance and resilience are traits commonly seen in both successful neurosurgeons and entrepreneurs. This symposium will provide an overview for those neurosurgeons who are interested in innovation and describe the process of turning a concept into a product or company. Topics include obtaining a patent, protecting intellectual property, creating neurosurgical instruments / equipment, and partnering with industry experts to bring your idea to life.

12:45-4:15 pm

SE GE

SYM08B: The Value of the Neurosurgeon

COURSE DIRECTORS: *Deborah L. Benzil, Ann R. Stroink,*

FACULTY: *Anthony L. Asher, Brian L. Hoh, Steven N. Kalkanis, Nnenna Mbabuikwe, Richard P. Menger, Katie O. Orrico*

COURSE DESCRIPTION: In this era of decreasing reimbursement, increasing regulation, and increasing employed positions, it is crucial that neurosurgeons understand their own value. That value could be to their institution, their hospital, their group or their community. The panel will highlight ways to maximize revenue by not only high productivity but also cost containment. They will instruct on ways to leverage your value in negotiations, and how to remain compliant with regulatory guidelines. Ultimately the audience will develop a better sense of their role in their system and ways to expand that role to meet their ultimate career goals.

12:45-4:15 pm

PE

SYM09: Hands-on Surgical Management of Pediatric Scoliosis

COURSE DIRECTORS: *Christopher M. Bonfield, Rajiv Iyer*

FACULTY: *Richard C.E. Anderson, Mari L. Groves, Steven Wei-Hung Hwang, Andrew H. Jea, Alexander K. Powers*

COURSE DESCRIPTION: Pediatric spinal deformity has emerged as an area of increasing experience and interest amongst neurosurgeons. In this course, we seek to highlight key management principles underlying the treatment of deformities of the pediatric and adolescent spine. In addition, we will discuss and demonstrate surgical techniques for spinal reconstruction in children with these disorders.

5:00-6:30 pm

**INTERNATIONAL RECEPTION
MARRIOTT MARQUIS SAN FRANCISCO**

6:30-8:30 pm

**DINNER SEMINAR I: Know Your Worth: Negotiation,
Compensation, and Reimbursement for the Neurosurgeon**
at PALIO



In an effort to make the best in neurosurgery more accessible to doctors and scientists around the world, the CNS is pleased to offer a discounted registration rate of **\$150** to nonmember attendees from the following countries:

AFGHANISTAN	ETHIOPIA	MICRONESIA, FED. STS.	SOUTH SUDAN
ANGOLA	GAMBIA, THE	MOLDOVA	SRI LANKA
BANGLADESH	GHANA	MONGOLIA	SUDAN
BENIN	GUINEA	MOROCCO	SWAZILAND
BHUTAN	GUINEA-BISSAU	MOZAMBIQUE	SYRIAN ARAB REPUBLIC
BOLIVIA	HAITI	MYANMAR	TAJIKISTAN
BURKINA FASO	HONDURAS	NEPAL	TANZANIA
BURUNDI	INDIA	NICARAGUA	TIMOR-LESTE
CABO VERDE	INDONESIA	NIGER	TOGO
CAMBODIA	KENYA	NIGERIA	TUNISIA
CAMEROON	KIRIBATI	PAKISTAN	UGANDA
CENTRAL AFRICAN REPUBLIC	KOREA, DEM. PEOPLE'S REP.	PALESTINE	UKRAINE
CHAD	KYRGYZ REPUBLIC	PAPUA NEW GUINEA	UZBEKISTAN
COMOROS	LAO PDR	PHILIPPINES	VANUATU
CONGO, DEM. REP.	LESOTHO	RWANDA	VIETNAM
CONGO, REP.	LIBERIA	SÃO TOMÉ AND PRINCIPE	WEST BANK AND GAZA
CÔTE D'IVOIRE	MADAGASCAR	SENEGAL	YEMEN
DJIBOUTI	MALAWI	SIERRA LEONE	ZAMBIA
EGYPT	MALI	SOLOMON ISLANDS	ZIMBABWE
EL SALVADOR	MAURITANIA	SOMALIA	
ERITREA			

SYMPOSIA

Full Day Discounted Bundles (includes lunch): Physician \$400; Nurse/NP/PA \$300; Resident/Medical Student \$175
Half Day: Physician \$250; Nurse/NP/PA \$200; Resident/Medical Student \$125

8:00 am-4:15 pm

Association of Neurosurgical Physician Assistants (ANSPA) Fall 2022 CME Meeting Presented in Collaboration with the Congress of Neurological Surgeons

Complimentary to all Physician Assistants, Nurse Practitioners, Nurses and Affiliate Members! A ticket to this session will automatically be added to your registration when you register.

COURSE DIRECTOR: Alice Edwards

FACULTY: Yazan Alderazi, Vishnu Brahmandam, Alice Edwards, Kevin Hickman, Robert Keating, Jeffrey Mullin

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

AP

12:45-4:15 pm

SYM10B: How to Get the Most Out of Your Mentor

COURSE DIRECTORS: Kimberly M. Hamilton, W. Christopher Newman

FACULTY: Karin M. Muraszko, Maryam Rahman, Nathan R. Selden, Ashwini D. Sharan, Viviane S. Tabar

COURSE DESCRIPTION: A mentor relationship is a two-way street. The most effective relationships develop when both mentor and mentee share a common purpose and understand each other's goals and communication style. In this symposium, experienced mentors from throughout neurosurgery offer their unique perspectives on how to make this critical relationship successful. From how to find a mentor, to how to extract oneself from an ineffective mentorship, topics covered will provide students and residents with the tools they need to connect with neurosurgeons at all levels who can help them reach their goals.

RE

8:00 am-4:15 pm

SYM10: Bundled Symposia

COMPOSED OF TWO SESSIONS: SYM10A & SYM10B. Select this option to take both at a discounted rate.

GE

8:00 am-12:00 pm

SYM10A: Swimming with the Sharks – Succeeding in the Neurosurgery Match and Residency

The First 20 Registered Attendees will receive a complimentary copy of the book "Neurosurgery Fundamentals" as part of their registration! (Books donated by Thieme)

COURSE DIRECTORS: Nitin Agarwal, Wilson Z. Ray

FACULTY: Nima Alan, Vikram Chakravarthy, Lola B. Chambless, E. Antonio Chioocca, Dean Chou, Richard G. Ellenbogen, Galal Elsayed, Chirag D. Gandhi, Ezequiel Goldschmidt, Robert S. Graham, Michael M. Haglund, D. Kojo Hamilton, Alexander A. Khalessi, Bryan Lieber, Melissa Lukehart, Joseph C. Maroon, Gregory J. Murad, Brian V. Nahed, Joshua W. Osbun, Alp Ozpinar, Akash J. Patel, Nader Pouratian, Ganesh Rao, Renee M. Reynolds, Nathan R. Selden, Ashwini D. Sharan, Krystal L. Tomei

COURSE DESCRIPTION: "Nobody wants to swim with sharks" as noted in How to Swim with Sharks: A Primer. As Voltaire Cousteau writes though, some, "by virtue of their occupation, find they must swim." This course highlights lessons learned through the experience of faculty and residents. The goal is to help build resiliency by learning from those who have walked the same path before. This symposium is intended for residents, medical students, and foreign medical graduates. Faculty include chairpersons, program directors, program coordinators, and recent graduates. Topics range from overcoming mistakes in training to creating a pathway for a successful career. Small group sessions will engage in two breakout sessions whereby medical students can prepare for interviews and residents can prepare for job search with cover letter and career proposal review.

GE

8:00 am-4:15 pm

SYM11: Neurotrauma Across the Lifespan and Around the World

COURSE DIRECTORS: Gregory W.J. Hawryluk, Laura B. Ngwenya

FACULTY: Sergio Aguilera, Iype Cherian, Anthony Figaji, Guoyi Gao, Ryan S. Kitagawa, Jeffrey V. Rosenfeld, Andres M. Rubiano, Eve C. Tsai, Neelam K. Venkataramana

COURSE DESCRIPTION: This far-reaching full day symposium brings together international experts to present their unique perspectives on neurotrauma management. Experts in both pediatric and adult neurosurgery will illustrate the challenges they face and the best practices they endorse as they offer insights into the care of patients across borders, through highly varied clinical settings, and throughout the human lifespan.

TR PE

8:00 am-4:15 pm

SYM12: Cerebrovascular Bundle 2

COMPOSED OF TWO SESSIONS: SYM12A & SYM12B. Select this option to take both at a discounted rate.

CV

8:00 am-12:00 pm

SYM12A: Cerebrovascular Bypass and Management of Complex Vascular Lesions

COURSE DIRECTORS: Amir R. Dehdashti, Nima Etminan

FACULTY: Jason Davies, Sepideh Amin-Hanjani, Michael T. Lawton, Laligam N. Sekhar, Stacey Q. Wolfe

COURSE DESCRIPTION: Expert cerebrovascular neurosurgeons will provide a comprehensive review of bypass techniques in treating complex cerebrovascular pathology. They will discuss case selection and technical nuances in the management of EC-IC bypass for anterior and posterior circulation ischemia, complex aneurysms, high and low flow donors, and advanced generation bypass.

CV



12:45-4:15 pm

CV

SYM12B: A Comprehensive and Evidence-based Review of the Treatment of Intracranial Aneurysms

COURSE DIRECTORS: Adib A. Abba, Mandy J. Binning

FACULTY: Emun Abdu, Daniel L. Barrow, Justin R. Mascitelli, Christopher S. Ogilvy, Robert M. Starke, Ben Waldau

COURSE DESCRIPTION: This symposium will provide a review of current management guidelines for ruptured and unruptured intracranial aneurysms. Faculty will review an evidence based approach for selection of device/technique, guidelines for DAPT, management of vasospasm, as well as ongoing trials related to aneurysm and subarachnoid hemorrhage.

8:00 am-4:15 pm

SE PE

SYM13: CSNS Bundle

COMPOSED OF TWO SESSIONS: SYM13A & SYM13B. Select this option to take both at a discounted rate.

8:00 am-12:00 pm

SE GE

SYM13A: 2022 Coding and CPT Update

COURSE DIRECTORS: Joseph S. Cheng, Clemens M. Schirmer

FACULTY: Mark E. Oppenlander, John K. Ratliff, Teri Romano, Khoi D. Than, Cheerag D. Upadhyaya, Anand Veeravagu

COURSE DESCRIPTION: This symposium is focused on what is new in spinal, cranial and E & M coding. Faculty will discuss potential revenue leaks, how to maximize coding for the work you are doing, and documentation pearls. Methods for effective and efficient communication with your coding team will be defined. Early-career neurosurgeons will receive the guidance they need to practice good coding, a critical skill now tested during the ABNS board certification process. This course will be interactive, with audience questions and discussion welcomed.

12:45-4:15 pm

PE GE

SYM13B: Clinical Pathway and Program Development in Neurosurgery

COURSE DIRECTORS: Ann M. Flannery, Manish N. Shah

FACULTY: Aria Fallah, Brian L. Hoh, George Ibrahim, Ricardo J. Komotar, Catherine F. McClung Smith, Howard L. Weiner

COURSE DESCRIPTION: How do you build a successful clinical program? Experienced leaders from a variety of subspecialty backgrounds and practice types review their experiences and present practical considerations for patient recruitment, multidisciplinary care management and optimizing patient outcomes.

8:00 am-4:15 pm

TU

SYM14: Tumor Bundle 2

COMPOSED OF TWO SESSIONS: SYM14A & SYM14B. Select this option to take both at a discounted rate.

8:00 am-12:00 pm

TU

SYM14A: Now What? Management of Intracranial Complications

COURSE DIRECTORS: Maryam Rahman, Brad E. Zacharia

FACULTY: Manish K. Aghi, Jeffrey N. Bruce, Michael J. Link, Jacques J. Morcos, Colin Watts, Gabriel Zada

COURSE DESCRIPTION: Complications happen - even to the experts. In this symposium, faculty will discuss the wide variety of complications that can occur during intracranial surgery, and the lessons they have learned in managing their patients. Topics include open and minimally invasive/endoscopic complications, intraoperative emergencies, technology-related issues and more. Frank discussions and an interactive format will leave the audience better prepared to manage the challenges that await in an intracranial practice.

12:45-4:15 pm

TU

SYM14B: 3D Surgical Neuroanatomy

COURSE DIRECTORS: Juan C. Fernandez-Miranda, Jeffrey M. Sorenson

FACULTY: Mustafa K. Baskaya, Aaron A. Cohen-Gadol, Paul A. Gardner, Pablo A. Rubino, Deanna M. Sasaki-Adams, Necmettin Tanriover, Ugur Ture

COURSE DESCRIPTION: This course - a perennial favorite amongst senior neurosurgeons and trainees alike - will review key cranial neuroanatomy using 3-D stereoscopic projection. The topics will include cortical and white matter anatomy, cerebrovascular, and skull base anatomy. Master surgeons will illustrate the importance of surgical neuroanatomy for clinical practice with surgical cases and HD/3-D video illustrations.

8:00 am-4:15 pm

SP

SYM15: Spine Bundle 2

COMPOSED OF TWO SESSIONS: SYM15A & SYM15B. Select this option to take both at a discounted rate.

8:00 am-12:00 pm

SP

SYM15A: Advanced Minimally Invasive Spine Surgery- Operative Nuances, Indications, and Complication Avoidance

COURSE DIRECTORS: Kai-Ming G. Fu, Praveen V. Mummaneni

FACULTY: Aaron J. Clark, Kevin T. Foley, Roger Hartl, Langston Holly, John Pollina, Catherine M. Simington, Juan S. Uribe

COURSE DESCRIPTION: This symposium is intended for surgeons with an interest and some experience in minimally invasive spinal surgery. Experts in the field will discuss operative nuances, complication avoidance, and patient selection in the context of a case- based course.

12:45-4:15 pm

SYM15B: Different Permutations of Lateral Access: Tips and Tricks

COURSE DIRECTORS: Christopher M. Holland, J. Alex Thomas
FACULTY: Sonia V. Eden, Adam S. Kanter, John E. O'Toole, William R. Taylor, Juan S. Uribe, Jobyna Whiting

COURSE DESCRIPTION: "Lateral spine surgery" has evolved significantly in the past several years. In this symposium, speakers will discuss various approaches including transpsoas, anteropsoas, as well as lateral and prone single position surgical techniques. The faculty will review the indications, technical nuances, and complication avoidance in a case-based format designed to enhance the learner's comfort with these surgical techniques.

SP

COURSE DESCRIPTION: This symposium is intended for trainees and spine surgeons looking to incorporate more minimally invasive techniques in their practice. Topics covered will include minimally invasive approaches for decompression, discectomy, placement of pedicle screws, interbody fusion, and more.

8:00 am-4:15 pm

SYM16: Spine Bundle 3

COMPOSED OF TWO SESSIONS: SYM16A & SYM16B. Select this option to take both at a discounted rate.

SP

8:00 am-4:15 pm

SYM17: Cerebrovascular/Pain Bundle

COMPOSED OF TWO SESSIONS: SYM17A & SYM17B. Select this option to take both at a discounted rate.

CV PA

8:00 am-12:00 pm

SYM16A: Spine Surgery at the Ambulatory Surgery Center

COURSE DIRECTORS: Scott A. Meyer, Laura A. Snyder
FACULTY: Robert Bohinski, Michael Bohl, Victor Chang, Kurt M. Eichholz, Betsy H. Grunch, Paul K. Kim, Douglas B. Moreland
COURSE DESCRIPTION: There is much interest within the healthcare system in expanding the use of the ASC, and spine surgeons are often now practicing in this environment. This symposium will include discussion of how to start an ASC, what types of cases are best suited there, anesthetic and post-operative considerations, and more.

SP

8:00 am-12:00 pm

SYM17A: Keyhole Approaches for Treatment of Intracranial Aneurysms

COURSE DIRECTORS: Dale Ding, Babu G. Welch
FACULTY: Peter Nakaji, Daniel Raper, Walavan Sivakumar
COURSE DESCRIPTION: This course will cover keyhole approaches to aneurysm clipping in a case-based format with a focus on key anatomic considerations of both the approach and cerebrovascular anatomy. Faculty will also discuss incorporating enhanced recovery after surgery (ERAS) protocols as a key component of a "minimally invasive" practice.

CV

12:45-4:15 pm

SYM16B: Introduction to Minimally Invasive Spine Surgery

COURSE DIRECTORS: Rohan R. Lall, Matthew Neal
FACULTY: Tim E. Adamson, Ali A. Baaj, Jake Godzik, Manish K. Kasliwal, Daniel C. Lu, Jeremy Steinberger, Lee A. Tan, Corinna C. Zygorakis

SP

12:45-4:15 pm

SYM17B: Trigeminal Neuralgia - Latest Trends in Management

COURSE DIRECTORS: Parag G. Patil, Raymond F. Sekula
FACULTY: Edward F. Chang, Jenny C. Kienzler, Peter Konrad, Jonathan Miller, Amr O. El-Naggar, Christopher Winfree
COURSE DESCRIPTION: Experts in pain, functional, and vascular neurosurgery will discuss their evidence-based approaches to the management of trigeminal neuralgia and other face pain. Topics will include diagnostic imaging, medical management, lesional therapy, minimally invasive microvascular decompression, and more. Emerging therapies and the neurobiologic principles underlying these approaches will be emphasized.

CV PA

GENERAL SCIENTIFIC SESSION I

4:30-6:30 pm | See page 14 for session details.

OPENING RECEPTION

7:00-9:00 pm | Oracle Park

Buses will depart from Moscone West Convention Center and official CNS hotels starting at 6:30 pm and provide continuous service to the park.



GUIDELINES SESSIONS

7:00-8:30 am

Guideline Session I: The Preoperative Spine **PA SP GE**

MODERATORS: Sanjay S. Dhall, John R. Dimar

SPEAKERS: Daniel J. Hoh, Basma Mohamed, Marjorie C. Wang

SESSION DESCRIPTION: The CNS Guidelines are evidence-based summaries of the scientific literature written by topic experts to provide neurosurgeons with the information they need to provide the best care to patients suffering from common neurosurgical conditions. In the Guidelines Sunrise Sessions, authors discuss the key conclusions of recent Guidelines projects to promote the dissemination of this broadly applicable information around the field. In this session, spinal surgery experts discuss their findings, published in late 2021, regarding the management of opioid medication in the preoperative spine patient.

Guideline Session II: Spinal Cord Stimulation **PA SP**

MODERATORS: Rany Abdallah, Ellen L. Air

SPEAKERS: Mark Malinowski, B. Todd Sitzman, Ashwin Viswanathan

SESSION DESCRIPTION: The CNS Guidelines are evidence-based summaries of the scientific literature written by topic experts to provide neurosurgeons with the information they need to provide the best care to patients suffering from common neurosurgical conditions. In the Guidelines Sunrise Session, authors discuss the key conclusions of recent Guidelines projects to promote the dissemination of this broadly applicable information around the field. In this session, experts discuss their findings, to be published in late 2022, regarding indications for spinal cord stimulation as well as the best management practices and technical nuances of using these devices.

SUNRISE SCIENCE SESSIONS

The Sunrise Science Abstract sessions will be comprised of the top oral abstract presentations submitted in each of the subspecialties presenting the latest scientific research.

7:00-8:30 am

Sunrise Session and Late Breaking Abstract Session – Data Science

Data Science Abstracts Session: 7:00 – 7:55 am

MODERATORS: Linda M. Liau, Daniel A. Orringer

SPEAKERS: Vivek Buch, Eric K. Oermann, Dale Webster

GE Sunrise Session and Late Breaking Abstract Session – Cerebrovascular **CV**

MODERATORS: Cargill H. Alleyne, Rafael de Oliveira Sillero

Sunrise Session and Late Breaking Abstract Session – Pediatric **PE**

MODERATORS: Laura M. Prolo, Kristin J. Weaver

Sunrise Session and Late Breaking Abstract Session – Tumor **TU**

MODERATORS: Nancy A. Oberheim Bush, Daniel P. Cahill

Sunrise Session and Late Breaking Abstract Session - Neurotrauma and Critical Care **TR**

MODERATOR: Tene A. Cage

GENERAL SCIENTIFIC SESSION II

8:40 am-12:10 pm | See page 14 for session details.

SUBSPECIALTY SESSION HIGHLIGHTS KEY

AP ADVANCED PRACTICE PROVIDER	PE PEDIATRIC	SP SPINE
CV CEREBROVASCULAR	PN PERIPHERAL NERVES	TR NEUROTRAUMA
GE GENERAL	RE RESIDENT	TU TUMOR
MS MEDICAL STUDENTS	SE SOCIOECONOMIC	WI WOMEN IN NEUROSURGERY
PA PAIN	SF STEREOTACTIC AND FUNCTIONAL	

LUNCHEON SEMINARS

12:15-1:45 pm

All Luncheon Seminars include a plated lunch served in the seminar room.

Luncheon Seminar fee is \$125 each (\$100 for residents, fellows, medical students, and advance practice providers)

M01: Honored Guest Lunch: My Journey in Neurosurgery

SPEAKER: Robert Spetzler

DESCRIPTION: Dr. Spetzler will share his personal reflection of his successes and failures of his neurosurgical career, and the incredible serendipity that allowed him to follow his dream.

RE

SEMINAR DESCRIPTION: In this session speakers will present methods of network-based targeting for neuromodulation using connectomic approaches, highlighting both structural and functional connectivity.

M02: Timing and Approaches to Brainstem Cavernous Malformations

MODERATORS: Leonardo R. Castilla, Kaan Yagmurlu

FACULTY: Gursant S. Atwal, Oliver Bozinov, M. Yashar S. Kalani, Michael J. Lang, Charles Teo

SEMINAR DESCRIPTION: This seminar will cover the various surgical corridors, approaches, and timing of surgical treatment with respect to brainstem cavernous malformations. Faculty will also discuss the indications for surgery and the role of multidisciplinary approaches.

CV

M06: Ablative Neurosurgery for Pain

MODERATORS: Amr O. El-Naggar, Ahmed M.T. Raslan

FACULTY: Tyler Ball, Haring Nauta, Ashwin Viswanathan

SEMINAR DESCRIPTION: Management of complex pain disorders remains one of the most challenging aspects of neurosurgery, but emerging techniques offer promise for these patients. In this course, experts will detail the indications and pitfalls for procedures including DREZ, cingulotomy, rhizotomy, myelotomy, and more. They will focus on minimally invasive techniques designed to improve quality of life with an emphasis on safety and minimizing complications.

PA

M03: The Economics of an Ambulatory Surgery Center

MODERATORS: Mick J. Perez-Cruet, Betsy H. Grunch

FACULTY: Phil Arbit, Ernest E. Braxton, Douglas B. Moreland, William D. Tobler

SEMINAR DESCRIPTION: Ambulatory surgery centers are allowing practice autonomy at a time when reimbursements are trending downward. This seminar will teach participants some of the socioeconomic factors involved in producing a successful and productive ambulatory spine surgery center. Topics discussed will include patient selection, minimally invasive outpatient spine procedures, complication avoidance, regulatory requirements, coding / reimbursement differences and how to start an ASC.

SE GE

M07: Artificial Intelligence in Cerebrovascular Neurosurgery

MODERATORS: Laura S. McGuire, Eric K. Oermann

FACULTY: Hormuzdiyar H. Dasenbrock, Jason Davies, Adnan H. Siddiqui

SEMINAR DESCRIPTION: Artificial intelligence is mostly theoretical now in daily neurosurgical practice but will no doubt become an important part of practice in the near future. In this seminar, published experts in the field of AI in neurosurgery discuss current and future applications.

CV

M04: New Concepts in Intra-operative Guidance

MODERATORS: Kimberly B. Hoang, Tiffany R. Hodges

FACULTY: Wajd Al-Holou, Francesco DiMeco, Sherise D. Ferguson, Peter Nakaji

SEMINAR DESCRIPTION: In this luncheon seminar, practicing neurosurgeons will learn how to apply new technology to improve extent of resection and outcomes in brain tumor surgery. Topics will include fluorescence, ultrasound, virtual reality, intraoperative MRI, and more.

TU

M08: Cervical Spondylotic Myelopathy--Anterior Versus Posterior

MODERATORS: Erica F. Bisson, Zoher Ghogawala

FACULTY: Nader S. Dahdaleh, Asdrubal Falavigna, Mark N. Hadley, Iain H. Kalfas

SEMINAR DESCRIPTION: This seminar will explore current concepts regarding various surgical approaches for cervical spine disorders. Using a case-based format, faculty will discuss indications, techniques, and outcomes.

SP

M05: Connectomic Approaches to Neuromodulation

MODERATORS: Aviva Abosch, Nicole Bentley

FACULTY: Kelly R Bijanki, Dario J. Englot, Vibhor Krishna, Cameron C. McIntyre, Nicole McLaughlin

SF

M09: SI Joint Fusion: Indications, Technique, and Outcomes

MODERATORS: Yi Lu, Paul Park

FACULTY: Kai-Ming G. Fu, Joshua E. Heller, Charles A. Sansur, Cara L. Sedney

SEMINAR DESCRIPTION: Neurosurgeons are increasingly making the diagnosis of SI joint dysfunction, and the use of operative approaches to this pathology is on the rise. This seminar will offer a review of the approaches to SI dysfunction as well as the surgical indications, techniques, and outcomes.

SP



M10: Building your Brand to Build your Practice WI

MODERATOR: Alexander A. Khalessi

FACULTY: Deborah L. Benzil, Michele M. Johnson, Uzma Samadani, Lauren F. Schwartz, Jamie J. Van Gompel

SEMINAR DESCRIPTION: How do you put your best foot forward? How do you engage with patients and referring physicians in a way that builds a healthy neurosurgical practice? How do you promote yourself effectively, not awkwardly? In this seminar we focus on developing your neurosurgical brand.

1:45-2:45 pm
AFTERNOON BEVERAGE BREAK
Visit the Exhibit Hall

1:45-2:45 pm

ABNS Special Session: Guidelines for Boards Preparation and MOC (Non-CME)

SPEAKERS: Fredrick Boop, Russell Lonser, Betsey Koehnen, Fredric Meyer

The process of board preparation and maintenance of certification will be discussed.

2:00-2:30 pm
DEVICE INNOVATION SHOWCASE
CNS Xperience Lounge

SECTION SESSIONS

2:45-4:15 pm

Section on Cerebrovascular Surgery 1: Evolving Treatment Paradigms for Cerebrovascular Disease CV

MODERATORS: Stephan Munich, Stavropoula I. Tjoumakaris

SESSION DESCRIPTION: This session will cover new or evolving techniques that are in current clinical trials or recently described, highlighting the dynamic nature of approaches to cerebrovascular disease. Topics will include endovascular management of CSF dural fistulae, endovascular shunts, venous sinus stenting for IIH, MMA embolization for subdural hematomas. The *Neurosurgery* Paper of the Year in Cerebrovascular and International Paper of the Year will also be presented, along with top abstracts in this category.

CSF Dural Fistulae

Waleed Brinjikji

Endovascular Shunt

Adel Malek

Venous Stenting for Pseudotumor

Pierre Gobin

MMA Embolization for SDH

David Hasan

Oral Abstract Presentations

Council of State Neurosurgical Societies Session 1:

Neurosurgeons Becoming Hospital and Health System Leaders SE

MODERATORS: John H. Sampson, Michael P. Steinmetz

SPEAKERS: Lawrence Chin, Matthew Ewend, Frederic Meyer, Julie Pilitsis

SESSION DESCRIPTION: Many neurosurgeons have aspirations of becoming leaders in their institutions, hospitals, and health care systems. This session will describe how to make that transition and what is necessary to be prepared / qualified for the step towards institutional leadership and away from clinical practice. Following those presentations, the top abstracts in socioeconomic research will be presented.

Section on Disorders of the Spine and Peripheral Nerves 1: Clinical Advances in Spine Surgery SP

MODERATORS: Richard V. Chua, Eve C. Tsai

SESSION DESCRIPTION: This session will highlight changes and advances in the management of spinal disease. Topics will include spinal endoscopy, nerve grafting after SCI, the potential for overtreatment of metastatic spinal tumors, and implications of the decreased severity of spinal trauma on research. The International Spine Paper of the Year will also be presented, as well as top abstracts in this category.

Spinal Endoscopy: How Much Can it Accomplish?

Decreased Severity of Spinal Trauma: Implications for SCI Surgery and Research

Bizhan Aarabi

Nerve Grafting After Spinal Cord Injury

Metastatic Spine Tumor Treatment: Are We Overtreating?

Dean Chou

Spine International Paper of the Year

Oral Abstract Presentations

Section on Neurotrauma and Critical Care 1: Tator and Miller Distinguished Lectures TR

MODERATORS: Nicholas J. Brandmeir, Enyinna L. Nwachuku

SESSION DESCRIPTION: In this session the Trauma section will highlight the distinguished Miller and Tator lecturers and present top abstracts in neurotrauma and critical care research as well as the *Neurosurgery* Paper of the Year in Neurotrauma & Critical Care.

Tator Lecturer

Ann Parr

Miller Lecturer

David Okonkwo

Oral Abstract Presentations

Section on Pain: Headache and Migraine Management for the Neurosurgeon

MODERATORS: *Rushna Ali, Nandan P. Lad*

SESSION DESCRIPTION: Headache is one of the most common complaints leading to a neurosurgical visit, but many neurosurgeons lack expertise in managing it. In this session, experts from the Section on Pain discuss relevant topics including the medical management of headache, operative management through decompression of peripheral nerves, and both invasive and non-invasive approaches to neuromodulation for headache. In addition, the *Neurosurgery* Paper of the Year in Pain will be presented as well as the top abstracts from the Section on Pain.

Introduction, Diagnosis and Medical Management

Sharona Ben-Heim

Operative Management: PN Decompression

Mark Mahan

Neuromodulation: Invasive & Non-Invasive

Sean Nagel

Oral Abstract Presentations

Section on Pediatric Neurological Surgery 1: Fetal Repair of Myelomeningocele – What Have We Learned in the Past Decade

MODERATORS: *Irene Kim, Heather J. McCrea*

SPEAKERS: *Samer Elbabaa, Juan Gonzalez, Nalin Gupta, Hanmin Lee, William Whitehead*

SESSION DESCRIPTION: Invited speakers from related specialties will discuss the multidisciplinary management of in utero myelomeningocele repair with emphasis on long term outcomes and reducing peri-operative complications. Key conclusions developed since completion of the MOMS trial will be discussed. Top abstracts related to topics of Pediatric Neurosurgery will also be presented.

Section on Peripheral Nerves 1: The Future of Peripheral Nerve: The Research We Need

MODERATORS: *Zarina S. Ali, Holly Gilmer*

SESSION DESCRIPTION: This session will provide an update on the latest scientific advances in the management of disorders of the peripheral nerves, as well as a discussion of the future frontiers of the field. Topics will include brain plasticity for nerve transfer, nerve stimulation for regeneration, and intraoperative nerve monitoring as well as the presentation of the top abstracts in this field.

Brain Plasticity for Nerve Transfer

Mariano Socolovsky

Nerve Stimulation for Regeneration

Zack Ray

Intraoperative Nerve Monitoring

Allan Belzberg

Oral Abstract Presentations

PA

Section on Stereotactic and Functional Neurosurgery 1: Advances in Movement Disorders

MODERATORS: *Andrew L. Ko, Doris D. Wang*

SESSION DESCRIPTION: In this session, experts from the Section on Stereotactic and Functional Neurosurgery will discuss hot topics in movement disorder management including multi-lead DBS, DBS for speech modulation and progress in clinical application of adaptive DBS. Top abstracts from the section will also be presented.

Multi-lead DBS

Kai Miller

Speech Modulation, DBS and Parkinson's Disease

Shervin Rahimpour

Closed Loop DBS: The Next Generation of Neuromodulation

Kelly Foote

Oral Abstract Presentations

Section on Tumors 1: Intraoperative Delivery of Adjuvant Treatments for Brain and Spine Tumors

MODERATORS: *Nancy A. Oberheim Bush, Tiffany R. Hodges*

SESSION DESCRIPTION: Tumor surgeons are becoming increasingly involved with delivery of adjuvant treatment during their procedures. This session will highlight recent advances in this area with topics including Intra-operative Radiation Therapy, Microbubble Ultrasound, and LITT for spinal tumors. The chair of the tumor section will provide a section update, and the *Neurosurgery* Paper of the Year in Tumor and other top abstracts in this category will also be presented.

Tumor Section Update

Isabelle Germano

Intra-operative Radiation Therapy (IORT)

Christopher Cifarelli

Microbubble Ultrasound

Francesco DiMeco

LITT for Spinal Tumors

Claudio Tatsui

Oral Abstract Presentations

PE

PN

SF

TU





AFTERNOON SESSIONS

4:15-5:45 pm

Debates in Pain Neurosurgery

PA

MODERATORS: Richard Rammo, Doris D. Wang

SESSION DESCRIPTION: Closed vs. Open Loop neuromodulation for pain? Ablation vs. decompression for classic Trigeminal Neuralgia? NRS vs. alternative measures of pain outcomes? Watch the experts debate these hot topics in a case-based format.

Closed-Loop and Open Loop Pain Neuromodulation

Julie Pilitsis, Richard Rammo

Ablation vs Decompression for Classic Trigeminal Neuralgia

Ellen Air, Zaman Mirzadeh

NRS vs Alternative Measures of Pain Outcomes

Emily Levin, Jason Schwalb

Complex Case Discussion – Dural AV Fistula

CV

MODERATORS: Adib A. Abla, Bernard R. Bendok

SPEAKERS: Felipe Albuquerque, Sepideh A. Hanjani, Elad I. Levy

SESSION DESCRIPTION: This will be a roundtable session wherein faculty will share personal cases, take comments and suggestions from the other faculty and attendees, and share footage and intraoperative pearls in the management of dural AV fistula.

Misadventures and Bailouts in Spine Surgery

SP

MODERATOR: Clifford Crutcher

SPEAKERS: Thomas Buell, Regis W. Haid, Adam S. Kanter, Cara L. Sedney, Christopher I. Shaffrey

SESSION DESCRIPTION: Everyone needs a plan B. In this session, senior spine surgeons will discuss some of their most difficult surgical situations and what they did to ensure a successful operation.

Neurosurgical Contracts – How to Get What You Want

SE

MODERATORS: John G. Golfinos, Jeremy T. Phelps

SPEAKERS: Adam S. Arthur, Jay Barnes, Troy D. Payner, Justin A. Singer, Sherry L. Taylor

SESSION DESCRIPTION: This session will provide an overview of contract negotiations including what to ask for, how to define your dealbreakers, and how to get what you want in a contract while leaving both sides of the negotiation happy with the outcome. The nuanced differences between a first and second contract will also be discussed.

Mapping and Monitoring of Tumors in Eloquent Areas

TU

MODERATORS: Mitchel S. Berger, Kristen O. Riley

SPEAKERS: Hugues Duffau, Shawn L. Hervey-Jumper, Donald M. O'Rourke, Sujit S. Prabhu, Daniel L. Silbergeld

SESSION DESCRIPTION: Experts will present cases to review their strategies for brain mapping including various imaging-based and physiologic methods for ensuring optimal resections and outcomes.

Operative Techniques to Master the Common Peripheral Nerve Conditions

PN

MODERATOR: Eric L. Zager

SPEAKERS: Allan J. Belzberg, Justin M. Brown, Amgad S. Hanna, Line G. Jacques, Mark A. Mahan

SESSION DESCRIPTION: This session will rely on operative video segments to launch interactive discussion of the common peripheral nerve operative techniques.

Crossfire Debates in Neurotrauma

TR

MODERATORS: Alan S. Hoffer, Christian B. Ricks

SPEAKERS: Bradley Dengler, Anthony M. DiGiorgio, Marcus D. Mazur, Michael McGinity, Laura B. Ngwenya, Emily P. Sieg, Martina Stippler, Alex B. Valadka

SESSION DESCRIPTION: Look out! In this session experts will use their own cases to debate the most controversial topics in the management of neurotrauma.

Cases in Psychiatric Neurosurgery

SF

MODERATORS: Wael Asaad, Michael D. Staudt

SPEAKERS: Darin D. Dougherty, Wayne Goodman, Robert M. Richardson, Sameer A. Sheth

SESSION DESCRIPTION: In this session, multidisciplinary teams - surgeon plus psychiatrist - will discuss their own cases and approaches to the innovative management of psychiatric disorders.

My Worst Complication in Pediatric Neurosurgery

PE

MODERATORS: Irene Kim, Laura M. Prolo

SPEAKERS: Christopher Bonfield, Annie I. Drapeau, Manish N. Shah

SESSION DESCRIPTION: Experts will review complications in a pediatric focused practice and highlight identification, management and areas of practice improvement. They will share advice for navigating early career challenges and obstacles with success. This session will be immediately followed by a complementary reception and networking event for trainees interested in pursuing careers in pediatric neurosurgery.

Please join us for reception and networking event with the Pediatric Section following this session!

SPEAKERS: Allyson L. Alexander, Kimberly M. Hamilton, Dean A. Hertzler, George Ibrahim, Sandi Lam, Heather J. McCrea, Manish N. Shah

5:45-7:15 pm

MEDICAL STUDENT TOWN HALL AND RECEPTION

7:30-9:30 pm

DINNER SEMINAR II:

Enabling Technologies in Spine Surgery: Fad or Future?
at PROSPECT

GUIDELINES SESSIONS

7:00-8:30 am

Guideline Session III: Chiari Malformations

GE

MODERATORS: Laurie L. Ackerman, Eric M. Jackson

SPEAKERS: Libby M. Kosnik Infinger, Sarah Jernigan, Jogi V. Pattisapu

SESSION DESCRIPTION: The CNS Guidelines are evidence-based summaries of the scientific literature written by topic experts to provide neurosurgeons with the information they need to provide the best care to patients suffering from common neurosurgical conditions. In the Guidelines Sunrise Sessions, authors discuss the key conclusions of recent Guidelines projects to promote the dissemination of this broadly applicable information around the field. In this session, Guidelines authors discuss their conclusions regarding the operative and non-operative management of patients with chiari malformation.

Guideline Session IV: Progressive Glioblastoma

TU

MODERATORS: Derek Johnson, Jeffrey Olson

SPEAKERS: Abigail Goodman, David R. Ormond, Evan Winograd

SESSION DESCRIPTION: The CNS Guidelines are evidence-based summaries of the scientific literature written by topic experts to provide neurosurgeons with the information they need to provide the best care to patients suffering from common neurosurgical conditions. In the Guidelines Sunrise Sessions, authors discuss the key conclusions of recent Guidelines projects to promote the dissemination of this broadly applicable information around the field. In this session, expert tumor surgeons discuss the standard of care and latest advances in management of progressive Glioblastoma Multiforme, published in late 2021.

SUNRISE SCIENCE SESSIONS

7:00-8:30 am

The Sunrise Science Abstract sessions will be comprised of the top oral abstract presentations submitted in each of the subspecialties presenting the latest scientific research.

Sunrise Session and Late Breaking Abstract Session – Medical Education and Training – A CNS collaboration with the Society of Neurological Surgeons (SNS)

RE

MODERATORS: Nitin Agarwal, Jason Heth, David D. Limbrick

SPEAKERS: Carolyn Quinsey, Nathan R. Selden, Stacey Q. Wolfe

Sunrise Session and Late Breaking Abstract Session – CSNS

SE

MODERATORS: Gregory J. Murad, Margaret R. Wacker

Sunrise Session and Late Breaking Abstract Session – Tumor

TU

MODERATORS: Sunit Das, Mahua Dey

Sunrise Session and Late Breaking Abstract Session – Spine

SP

MODERATORS: Kee D. Kim, Suzanne A. Tharin

GENERAL SCIENTIFIC SESSION III

8:40 am-12:10 pm | See page 15 for session details.

LUNCHEON SEMINARS

12:15-1:45 pm

All Luncheon Seminars include a plated lunch served in the seminar room.

Luncheon Seminar fee is \$125 each (\$100 for residents, fellows, medical students, and advance practice providers)

T11: Middle Meningeal Artery Embolization in the Treatment of Subdural Hematoma

CV

MODERATOR: Ephraim Church

FACULTY: Adam S. Arthur, David Fiorella, Matthew Fusco, Brian T. Jankowitz

SEMINAR DESCRIPTION: Middle Meningeal Artery embolization shows promise in changing the management of one of the most common yet frustrating diseases that neurosurgeons treat. This luncheon seminar will cover indications, embolic choice, complication avoidance and future directions with respect to middle meningeal artery embolization for subdural hematoma.

T12: Spine Surgical Options and Clearance for the Professional Athlete

SP

MODERATORS: Maya A. Babu, Scott L. Zuckerman

FACULTY: David O. Okonkwo, Joseph C. Maroon, Gabriel A. Smith

SEMINAR DESCRIPTION: Neurosurgeons are often involved in the care of high level athletes. This seminar will detail management nuances, technique selection, and appropriate clearance for athletes with spinal disorders.



T13: The Neurosurgeon as a Student

SE

MODERATOR: *Jeremy T. Phelps*

FACULTY: *Stanley W. Fronczak, Bharat Guthikonda, Christina Notarianni, Alan M. Scarrow*

SEMINAR DESCRIPTION: Neurosurgeons are often respected members of a medical staff or hospital / health system. Leadership roles are often more likely given to those with expertise in business, administration, policy or law. This seminar will highlight the value of pursuing a second degree and describe how to optimize its utility.

T14: Surgical Management of Primary Spinal Tumors

SP TU

MODERATORS: *Paul M. Arnold, John H. Shin*

FACULTY: *Mark H. Bilsky, Ziya L. Gokaslan, C. Rory Goodwin, Alia M. Hdeib, Laurence D. Rhines, Daniel M. Sciubba, Hesham M. Soliman*

SEMINAR DESCRIPTION: This interactive luncheon seminar will review the latest treatment options for primary spinal column tumors from cervical to sacral. Advances in surgical techniques, pre-operative planning, and intra-operative application of enabling technologies for tumor resection will be highlighted. Current multi-modal management strategies for giant cell tumor, chordoma, and chondrosarcoma will be discussed with an emphasis on complication avoidance and management.

T15: Complex Skull Base Approaches

TU

MODERATORS: *Vijay Agarwal, Maria P. Celda*

FACULTY: *James K. Liu, Shaan M. Raza, Pablo F. Recinos, Theodore H. Schwartz, Mario Zuccarello*

SEMINAR DESCRIPTION: This luncheon seminar is a reference session for the management of intracranial lesions necessitating a combined approach. Faculty will discuss in detail appropriate approach selection, technique, nuance, and complication avoidance. Open as well as endoscopic approaches will be described, as well as keyhole techniques and vascular approaches.

T16: Peripheral Nerve Entrapment Versus Radiculopathy

PN

MODERATORS: *Aaron J. Clark, Line G. Jacques*

FACULTY: *Zarina S. Ali, Jason H. Huang, Jonathan Stone, Gabriel C. Tender*

SEMINAR DESCRIPTION: Mistaking peripheral and spinal pathology can lead to unnecessary surgery and patient suffering. The purpose of this seminar is to refine diagnostic skills in differentiating radiculopathy from common peripheral nerve entrapment syndromes .

T17: Multimodal Treatment of Spinal Vascular Malformations

CV

MODERATORS: *Andrew F. Ducruet, Giuseppe Lanzino*

FACULTY: *Ning Lin, Cameron G. McDougall, Stacey Q. Wolfe*

SEMINAR DESCRIPTION: This luncheon seminar will review surgical anatomy and treatment of spinal vascular malformations. Experts will describe various open, endovascular, and radiosurgical approaches with case presentations.

T18: NEUROSURGERY Publications: "Getting Published"

GE

MODERATOR: *Douglas Kondziolka*

FACULTY: *Frederick G. Barker, Praveen V. Mummaneni, Maryam Rahman*

SEMINAR DESCRIPTION: This seminar will focus on the elements of writing, reviewing, and publishing a scientific manuscript in a peer-reviewed journal. The best articles provide a sound scientific message of value to readers and to the public at large. The faculty include individuals involved in all elements of those processes.

T19: Functional Mapping in Pediatric Neurosurgery

PE

MODERATORS: *Aria Fallah, Zulma S. Tovar-Spinoza*

FACULTY: *Jason S. Hauptman, Erin Kiehna, Francesco T. Mangano, Scellig S.D. Stone*

SEMINAR DESCRIPTION: In this session, faculty will survey established techniques in neuromonitoring as well as emerging practices in pediatric cases with a special emphasis on transcranial magnetic stimulation and resting state functional neuroimaging.

T20: Robotic Neurosurgery – Choosing and Optimizing the Right System for your Practice

SF

MODERATOR: *Jonathan Riley*

FACULTY: *P. David Adelson, Jorge A. González-Martínez, Chengyuan Wu*

SEMINAR DESCRIPTION: Robotics are becoming mainstream in neurosurgery, and this course is designed to help you determine if you should incorporate this technology into your practice and to provide a guide in how to do so. Experts will discuss cranial and spinal applications of each of the existing systems. They will help you assess the potential that robotics may offer in your setting and provide insights into how to maximize the gains you can see from these advances. Discussion will include cost justification and business planning in addition to technical aspects of the various systems available so that you return to your practice with a clear understanding of how this technology could be best put to use in your unique setting.

T21: The Changing Face of Neurosurgery: Navigating Workplace Culture

SE WI

Complimentary! Be sure to add this session to your registration!

MODERATORS: *Tene A. Cage, Tiffany R. Hodges, Kimberly P. Kicielinski*

FACULTY: *Henry Brem, Gerald A. Grant, Kimberly B. Hoang, Karin M. Muraszko, Edjah K. Nduom, Maryam Rahman, Theresa Williamson*

SEMINAR DESCRIPTION: Practicing in a high performance field like neurosurgery can feel isolating, even when working within a group practice. Are you hoping to feel more engaged and connected in your practice group or training program? Do you feel like you've lost your voice at the hospital? This lunch seminar will tackle strategies for understanding the balance of power in

the workplace, provide an opportunity to reflect on your own strengths and limitations, and devise concrete strategies for strengthening your position and voice.

1:45-2:45 pm
AFTERNOON BEVERAGE BREAK
<i>Visit the Exhibit Hall</i>

1:45-2:45 pm
CNS Resident SANS Challenge Championship Round
HOST: *A. Samy Youssef*
FACILITATORS: *Angela Downes, Domenico Gattozzi, Elizabeth Hogan*

2:00-2:45 pm
Annual Business Meeting
 Plan to attend the Annual Business Meeting to hear an update on CNS business from the past year. CNS members will have the opportunity to vote on any proposed bylaws amendments.

SECTION SESSIONS

2:45-4:15 pm

Section on Cerebrovascular Surgery 2: The Future of Stroke Care

MODERATORS: *Min S. Park, Justin A Singer*

SESSION DESCRIPTION: This session will highlight ongoing efforts to extend thrombectomy and other stroke therapies to larger populations through new technologies, expanded offering, or improved systems of care. Topics will include the use of stem cells in stroke treatment, robotic thrombectomy, and new paradigms in stroke triage and systems of care. Top cerebrovascular abstracts will also be presented.

Stem Cells in Stroke Treatment

Gary Steinberg

Extending Thrombectomy Offerings Through Robotics

Stavropoula Tjoumakaris

Evolving Stroke Systems of Care

Demetrius Lopes

New Paradigms in Stroke Triage

Joshua Osbun

Oral Abstract Presentations

CV

SESSION DESCRIPTION: In this session, discussion will focus on the socioeconomics and trends within spine surgery practice. Topics will include coding and legislative issues, the competitive landscape of treatment for spinal pain, new concepts in lateral spine surgery and the sustainability of trends in spinal fusion. The *Neurosurgery* Paper of the Year in Spine and top abstracts from the Spine Section will also be presented.

Billing, Coding, and Legislative Issues in Spine Surgery

Luis Tumialan

Current Trends in Spinal Fusion Surgery: Is the Growth Sustainable?

Michael Groff

Novel Concepts in Lateral Spine Surgery

Paul Park

The Spinal Pain Landscape - What is the Competition Offering?

Steven Falowski

Oral Abstract Presentations

Council of State Neurosurgical Societies Session 2: Quality, Safety, Value and Cost-Containment in Neurosurgery

MODERATORS: *Daniel K. Fahim, Matthew A. Hunt*

SPEAKERS: *Rushna Ali, Mohamad Bydon, Bharat Guthikonda, Debraj Mukherjee*

SESSION DESCRIPTION: With reimbursements dropping for the work that we do, there is a trend towards placing a higher priority on maximizing quality and patient safety while minimizing cost. This session will be focused on these topics, teaching you how to become efficient in your practice while still maximizing your revenue. Top socioeconomic abstracts will also be presented as well as the *Neurosurgery* Paper of the Year in Socioeconomics, Health Policy, and Law.

SE

Section on Neurotrauma and Critical Care 2: Decision Making and Prognosis in the Care of the TBI Patient

MODERATORS: *Robert H. Bonow, Patricia B. Raksin*

SPEAKERS: *Kathryn Beauchamp, Geoffrey Manley, Richard Rodgers*

SESSION DESCRIPTION: In this session experts from the section on Neurotrauma will focus on the science that guides their decision making in the management of complex trauma cases. They will review evidence-based strategies for determining prognosis in challenging scenarios. The International Neurotrauma Paper of the Year will also be presented, along with top abstracts in this category.

TR

Section on Disorders of the Spine and Peripheral Nerves 2: Economic and Practice Trends in Spine Surgery

MODERATORS: *Khoi D. Than, Sarah Woodrow*

SP

Section on Pediatric Neurological Surgery 2: Surgical Management of Skeletal Dysplasias

MODERATORS: *Syed H. Akbari, Allyson L. Alexander*

SPEAKERS: *Moise Danielpour, Dean Hertzler, Julie Hoover-Fong, Suken Shah*

SESSION DESCRIPTION: This session will review and discuss screening, surgical indication, techniques and outcomes for modern management of skeletal dysplasia in childhood and

PE



young adults. The *Neurosurgery* Paper of the Year in Pediatrics and International Pediatric Paper of the Year will also be presented, along with top abstracts in this category.

Section on Peripheral Nerves 2: The Case for Reconstruction: How and When

PN

MODERATORS: Kevin Swong, Thomas J. Wilson

SESSION DESCRIPTION: In this session, top peripheral nerve surgeons will describe their approaches to reconstruction with an emphasis on indications, technical nuances, and current management controversies. The *Neurosurgery* Paper of the Year in Peripheral Nerve will also be presented as well as top abstracts in this category.

When Do I Do What?

Robert Spinner

The Graft: Does Size Matter?

Mariano Socolovsky

Controversies in Reconstruction

Rajiv Midha

Oral Abstract Presentations

Section on Stereotactic and Functional Neurosurgery 2: Advances in Epilepsy Treatment

SF

MODERATORS: Robert A. McGovern, Jessica Wilden

SESSION DESCRIPTION: In this session, experts from the Section on Stereotactic and Functional Neurosurgery debate several hot topics in the field. Is thalamic sEEG within the clinical standard of care? Should MRI-negative dominant mesial temporal epilepsy be treated with RNS or DBS? In addition, the *Neurosurgery* Paper of the Year in Stereotactic & Functional will be presented, along with top abstracts in this field.

Thalamic sEEG is Within Clinical Standard of Care

Guy McKhann, Kristen Riley

Debate: RNS vs DBS for MRI Negative Dominant Mesial Temporal Epilepsy

Nicole Bentley, Ryder Gwinn

Oral Abstract Presentations

Section on Tumors 2: Precision Medicine for Primary and Secondary Brain Tumors

TU

MODERATORS: Isabelle M. Germano, Analiz Rodriguez

SESSION DESCRIPTION: Precision medicine is an evolving paradigm changing the management of brain tumors in fundamental ways. In this session, leaders from multidisciplinary backgrounds will discuss topics including CAR-T cell therapy, GBM organoid based treatments, targeted therapy for metastases and new concepts in precision medicine for pediatric brain tumors. Top abstracts in the tumor category will also be presented.

CAR T Cells for GBM

Benham Badie

Targeted Therapy for Brain Metastases

speaker to follow

GBM Organoid Based Therapy

Navid Redjal

Pediatric Tumor Precision Medicine

Amanda Saratsis

Oral Abstract Presentations

AFTERNOON SESSIONS

4:15-5:45 pm

Nuances in Multimodal Treatment of AVMs

CV

MODERATORS: Peter S. Amenta, Michael R. Levitt

SPEAKERS: Yoko Kato, Michael W. McDermott, Akshal S. Patel, Philip E. Stieg

SESSION DESCRIPTION: Faculty will share cases from their personal experience that highlight complementary treatment modalities for management of AVMs. This will also include lessons learned from unsuccessful treatments and how alternative strategies may have been more successful.

Arthroplasty Versus ACDF Versus Foraminotomy: Choosing the Right Procedure for Your Patient

SP

MODERATOR: Tim E. Adamson

SPEAKERS: Michael W. Groff, Thomas Mroz, Ann M. Parr, Gerald ("Rusty") E. Rodts

SESSION DESCRIPTION: It can be a challenge to determine the best approach for a patient's cervical pathology and there are many options available. This case-based session will go over a variety of example presentations as speakers discuss why certain approaches were selected and how they fared.

Financial Planning for Neurosurgeons

SE

MODERATORS: Ciara Harraher, Luis M. Tumialan

SPEAKERS: Holly Gilmer, Gregory R. Trost, Sharon W. Webb

SESSION DESCRIPTION: This session is designed to help young neurosurgeons become more financially aware, responsible and savvy as they begin their practice. This course will hope to fill the knowledge gap of managing money after years of modest pay and often, high debt.

Multidisciplinary Treatment of Spine Metastasis

TU

MODERATOR: Ziya L. Gokaslan

SPEAKERS: Manmeet Ahluwalia, Isabelle M. Germano, Eric Lis, Nicholas J. Szerlip, Claudio E. Tatsui

SESSION DESCRIPTION: Management of metastatic spinal tumors has evolved substantially over the last several decades. Currently, there are multiple options available in treating patients with metastatic spine disease including open and/or minimally invasive surgery, percutaneous procedures including vertebroplasty, kyphoplasty, conventional and stereotactic radio surgery and many others.



The main objectives of this activity are to provide a framework to systematically evaluate these patients, to review the current literature to assess the specific indications and effectiveness of various treatment options available and to learn how to apply this information to individual patient selection for specific treatment to optimize their clinical outcomes.

Management of Sports-Related Traumatic Spine and Peripheral Nerve Injury PN

MODERATOR: Robert J. Spinner

SPEAKERS: Amir H. Faraji, Amgad S. Hanna, Allan D. Levi, Mark Oppenlander, Mariano Socolovsky, Nicholas Theodore

SESSION DESCRIPTION: In this case-based session, experts will present common spine and peripheral nerve injuries seen among athletes with tips for operative and non-operative management as well as return to play guidelines.

My Worst Complication in Neurosurgery for Trauma TR

MODERATOR: Uzma Samadani

SPEAKERS: Shankar P. Gopinath, Odette Harris, Gail L. Rosseau

SESSION DESCRIPTION: Despite the best intentions, complications occur in neurosurgery patients, and particularly so in patients with complex traumatic brain and spinal cord injuries. In this session, speakers will provide a case-based discussion and will discuss their personal perspectives in caring for neurotrauma patients.

Thalamic Neuromodulation for Epilepsy SF

MODERATOR: Mariel Szapitel

SPEAKERS: Saadi Ghatan, Sanjeet S. Grewal, Sanjay E. Patra, Robert M. Richardson

SESSION DESCRIPTION: In this session experts will discuss interesting cases and varied approaches to thalamic neuromodulation in epilepsy.

Instrumented Fusion in Chiari Malformation PE

MODERATORS: Samuel McClugage, Peter P. Sun

SPEAKERS: Brian J. Dlouhy, David D. Gonda, Christina M. Sayama

SESSION DESCRIPTION: Speakers in this session will use standardized case examples to review various management techniques and the literature that defines the role of operative fixation in Chiari patients.

INTERACTIVE MULTIMEDIA RESEARCH PRESENTATION SESSION

5:45-7:15 pm

The Interactive Multimedia Research Presentation Poster Session provides vigorous discussion of key neurosurgical advances, complemented by wine and cheese. Selected authors will present 3-minute oral presentations and subspecialty experts will award prizes to top posters.

POSTER JUDGES:

Council of State Neurosurgical Societies

Tony I. Anene-Maidoh, Kristin Huntoon, Elyne N. Kahn, Jason D. Stacy, Sharon W. Webb

Section on Cerebrovascular Surgery Section

Bradley N. Bonstadt, Ketan R. Bulsara, Paul J. Camarata, Jeremiah N. Johnson, Eric C. Peterson, Abhishek Ray

Section on Disorders of the Spine and Peripheral Nerves

Anthony Frempong-Boadu, Jared Fridley, Juanita Garces, Jian Guan, Ahilan Sivaganesan, Alexander Tuchman

Section on Neurotrauma and Critical Care

Liesel Close, Bradley Dengler, Gazanfar Rahmathulla, James M. Wright

Section on Pain

Emily L. Levin, Parag G. Patil, Jennifer A. Sweet

Section on Pediatric Neurological Surgery

Raheel Ahmed, Kurtis I. Auguste, Winson Ho, Hal S. Meltzer, Matthew Vestal

Peripheral Nerve

Justin Davanzo, Shaun T. O'Leary, Brandon W. Smith, Gabriel C. Tender

Section on Stereotactic and Functional Neurosurgery

Isaac Chen, Benjamin Grannan, Amir H. Faraji, Daniel Kramer, Angela V. Price, Shervin Rahimpour, Ben Shofty, David Weintraub, Brett E. Youngerman

Section on Tumors

Richard W. Byrne, Manuel Ferreira, Michael E. Ivan, Sandeep M. Kunwar, Angela M. Richardson, Timothy R. Smith

SUBSPECIALTY SESSION HIGHLIGHTS KEY

AP ADVANCED PRACTICE PROVIDER

CV CEREBROVASCULAR

GE GENERAL

MS MEDICAL STUDENTS

PA PAIN

PE PEDIATRIC

PN PERIPHERAL NERVES

RE RESIDENT

SE SOCIOECONOMIC

SF STEREOTACTIC AND FUNCTIONAL

SP SPINE

TR NEUROTRAUMA

TU TUMOR

WI WOMEN IN NEUROSURGERY



GUIDELINES SESSION

7:00-8:30 am

Guideline Session V: Pediatric Hydrocephalus

MODERATOR: Mandeep S. Tamber

SPEAKERS: Lissa C. Baird, David F. Bauer, Ann M. Flannery, Dimitrios C. Nikas

SESSION DESCRIPTION: The CNS Guidelines are evidence-based summaries of the scientific literature written by topic experts to provide neurosurgeons with the information they need to provide the best care to patients suffering from common

PE

neurosurgical conditions. In the Guidelines Sunrise Session, authors discuss the key conclusions of recent Guidelines projects to promote the dissemination of this broadly applicable information around the field. In this session, pediatric neurosurgical experts discuss the consensus regarding standard of care approaches for pediatric hydrocephalus, published in late 2020.

SUNRISE SCIENCE SESSIONS

7:00-8:30 am

The Sunrise Science Abstract sessions will be comprised of the top oral abstract presentations submitted in each of the subspecialties presenting the latest scientific research.

Sunrise Session and Late Breaking Abstract Session – Spine and Peripheral Nerve

MODERATORS: J. Patrick Johnson, Martin H. Pham

SP

Sunrise Session and Late Breaking Abstract Session – Cerebrovascular

MODERATORS: R. Webster Crowley, Nnenna Mbabuike

CV

Sunrise Session and Late Breaking Abstract Session – Stereotactic and Functional

MODERATORS: Justin D. Hilliard, Hilarie C. Tomasiewicz

SF PA

GENERAL SCIENTIFIC SESSION IV

8:40 am-12:10 pm | See page 15 for session details.

LUNCHEON SEMINARS

12:15-1:45 pm

All Luncheon Seminars include a plated lunch served in the seminar room.

Luncheon Seminar fee is \$125 each (\$100 for residents, fellows, medical students, and advance practice providers)

W22: Telemedicine in Neurosurgery – The Future Beyond COVID

MODERATORS: Mick J. Perez-Cruet, Ann R. Stroink

FACULTY: Ciara D. Harraher, Elyne N. Kahn, Katie O. Orrico, John K. Ratliff

SEMINAR DESCRIPTION: Since the beginning of the COVID pandemic, the use of telemedicine in neurosurgery has increased significantly. Moving forward, this technology may change access to care for patients in remote settings or otherwise vulnerable communities. This seminar will describe patient selection, how to perform a physical exam, how to review imaging studies with the patient, coding and reimbursement and the current status of insurance coverage and regulatory issues pertaining to telemedicine.

SE GE

FACULTY: Harjinder S. Bhatoo, Tsegazeab Laeke, Kee B. Park, Carolyn Quinsey, Andres M. Rubiano

SEMINAR DESCRIPTION: Neurosurgeons in Low and Middle Income Countries (LMICs) face unique challenges taking care of their patients. The focus of this lunch symposium is to meet with neurosurgical leaders who practice in these LMICs to develop a better understanding of these challenges and to explore unique solutions to address these issues.

W23: Perspectives on Global Neurosurgery: Focus on LMICs (Low/Middle Income Countries)

MODERATORS: Christopher M. Bonfield, Sarah Woodrow

TR

W24: Neurotrauma as a Team Sport: Multidisciplinary Management Across Neurosurgical Specialties

MODERATORS: Ramesh Grandhi, Nathan T. Zwagerman

FACULTY: Michael C. Huang, Mark A. Mahan, Enyinna L. Nwachuku, Russell Payne, Daniel Tonetti

SEMINAR DESCRIPTION: The modern care of neurotrauma patients involves a multidisciplinary teams, even within neurosurgery. The purpose of this lunch seminar is to bring

TR

together leading faculty to offer perspectives on managing these complicated patients from peripheral nerve, cerebrovascular, skull base, and neurocritical care perspectives.

W25: Types of Spinal Cord Stimulators – What to Use When?

MODERATORS: David P. Darrow, Jennifer A. Sweet

FACULTY: Kevin S. Chen, Ahmed M.T. Raslan

SEMINAR DESCRIPTION: Spinal cord stimulation has become a mainstay for the treatment of an expanding list of chronic pain disorders. Accordingly, the spinal cord stimulation market continues to evolve with significant advances in hardware and software technologies. This course will examine the intersection of approved indications and advancing technologies for tailored treatments.

PA

W26: Neuromodulation for Emerging Indications

MODERATOR: Doris D. Wang

FACULTY: Sarah K.B. Bick, Jorge González-Martínez, Vibhor Krishna, Jean-Philippe Langevin, Charles Y. Liu

SEMINAR DESCRIPTION: Applications for neuromodulation have expanded significantly. Experts practicing with these advanced techniques will discuss topics including DBS for dementia, responsive Neurostimulation for PTSD, Vagal Nerve Stimulation for stroke recovery, and neuromodulation for pain and psychiatric disorders.

SF

W27: Proximal Junctional Kyphosis – Prevention and Management

MODERATORS: Lara W. Massie, Jeffrey P. Mullin

FACULTY: Christopher P. Ames, Benjamin D. Elder, Christopher I. Shaffrey, Jay D. Turner

SEMINAR DESCRIPTION: Proximal junctional kyphosis is a common challenge spinal surgeons face, and its treatment and prevention can be approached in a variety of ways. Speakers in this seminar will go over case examples, their preferred techniques, and the data that supports their methods.

SP

W28: New Concepts in Brain Radiosurgery and Brachytherapy

MODERATOR: Mateo Ziu

FACULTY: Lilyana Angelov, Christopher P. Cifarelli, John R. Floyd, Jason Heth, Bruce E. Pollock

SEMINAR DESCRIPTION: Faculty in this luncheon seminar will review and discuss new advances in radiosurgery and brachytherapy, from emerging indications to novel technology. Case-based presentations will facilitate discussion of specific treatment plans, complication avoidance, and evidence-based practice.

TU

W29: Outpatient Versus Inpatient Case Selection in Spine Surgery

MODERATOR: Oren N. Gottfried

FACULTY: Muhammad Abd-El-Barr, Peter D. Angevine, Betsy Grunch, John J. Knightly, Neil Martin, Chester Yarbrough

SEMINAR DESCRIPTION: A variety of spine procedures can be performed safely in the outpatient setting, and there can be advantages to both the patient and the surgeon from this approach. This seminar will educate learners on considerations to make when choosing to perform spine surgery on an outpatient vs. inpatient basis, focusing on both clinical and socioeconomic variables that factor into this decision.

SP

W30: Management of Complex Tethered Cord in Transitional and Adult Patients – Spinal Cord Shortening, Spinal Cord Stimulation, or Repeat Intradural Repair?

MODERATORS: Mari L. Groves, Dean A. Hertzler

FACULTY: Daniel Curry, Andrew H. Jea, Cormac O. Maher, Renee M. Reynolds, Nicholas Theodore

SEMINAR DESCRIPTION: Recurrent tethered cord syndrome is a challenging diagnosis that effects both children and adults. Many management philosophies have been debated without clear consensus. In this session, pediatric and adult content experts will review treatment options as well as the existing literature to suggest both indications and technical nuances of surgical management.

PE GE



Thank you to the faculty on the program from our Partner Societies!



Asdrubal Falavigna
Eberval Figueiredo



Aliasgar Moiyadi
Neelam Venkataramana
Varindera Singh
Harjinder Bhatoe



Koji Yoshimoto
Yoko Kato



Association
of Neurosurgical
Physician
Assistants

ANSPA



CNS

ANSPA ANNUAL FALL CME MEETING

Presented in Collaboration with the CNS

Sunday, October 9 | 7:00 am–4:30 pm

The ANSPA Annual CME Meeting is created specifically for PAs and NPs working in, or interested in, neurosurgery. This session is complimentary with your meeting registration and will automatically be added to your Annual Meeting registration when you register as a Nurse/PA.

CONTINUING MEDICAL EDUCATION

CONGRESS OF NEUROLOGICAL SURGEONS 2022 ANNUAL MEETING OBJECTIVES

The CNS exists to enhance health and improve lives through the advancement of neurosurgical education and scientific exchange. The CNS Continuing Medical Education (CME) program provides participants with various learning formats to keep current in their field as well as improve skills and enhance professional performance to provide the best possible care for their patients.

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

At the conclusion of the 2022 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 case-based complex issues and discuss potential solutions.

- Symposia are offered Saturday, October 8, and Sunday, October 9.

GENERAL SCIENTIFIC SESSION, SECTION SESSIONS, GUIDELINE SESSIONS, LUNCHEON SEMINARS, INTERNATIONAL SESSIONS, OPERATIVE TECHNIQUE SESSIONS, POSTER PRESENTATION SESSIONS, 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 Poster Presentation Sessions are offered Sunday, October 8, through Wednesday, October 12.
- Luncheon Seminars are offered Monday, October 10, through Wednesday, October 12.
- Dinner Seminars are offered on Saturday, October 8 and Monday, October 10.

OPERATIVE TECHNIQUES

During the Case-based Discussion Sessions, the faculty presents cases to be examined, discussed, and debated by both the audience and panel. Registered attendees will have the opportunity to submit their own cases prior to the meeting to be presented at these sessions. Don't miss these interactive sessions designed to encourage participation from everyone.

- Operative Technique Sessions will take place on Monday, October 10, and Tuesday, October 11.
- Live Surgery via telemedicine technology in the Exhibit Hall will take place Monday, October 10, through Wednesday, October 12. **CME is not offered for these sessions.**

ORIGINAL SCIENCE PROGRAM

Scientific abstract presentations offer original science, groundbreaking 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 10, Tuesday, October 11, and Wednesday, October 12.
- Interactive Multimedia Research Presentation Session will take place on Tuesday, October 11
- Sunrise Science Oral Presentations by subspecialty will be presented on Monday, October 10, Tuesday, October 11, and Wednesday, October 12.
- Late-breaking Abstracts will be presented on Monday, October 10, Tuesday, October 11, and Wednesday, October 12.

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 44.00 *AMA PRA Category 1 Credits*[™]. Physicians should only claim credit commensurate with the extent of their participation in the activity.

* A maximum of 21.50 *AMA PRA Category 1 Credits*[™] may be earned for general sessions only.

ADDITIONAL CME CREDITS CAN BE EARNED BY ATTENDING THE FOLLOWING:

SYMPOSIA – (SATURDAY/SUNDAY)

Half Day Sessions

Registered attendees will receive a maximum of 3.75 *AMA PRA Category 1 Credits*[™] for each eligible half-day morning symposia (A) and a maximum of 3.25 *AMA PRA Category 1 Credits*[™] for each half-day afternoon symposia (B).

Full Day Sessions

Registered attendees will receive a maximum of 7.00 *AMA PRA Category 1 Credits*[™] for each full day symposia.

LUNCHEON SEMINARS

Attendees will receive a maximum of 1.50 *AMA PRA Category 1 Credits*[™] for all eligible luncheon seminars.

DINNER SEMINARS

Attendees will receive a maximum of 2.00 *AMA PRA Category 1 Credits*[™] for all eligible dinner seminars.

PREPARING POSTER PRESENTATION(S)

Physicians are eligible to claim up to 5.00 *AMA PRA Category 1 Credits*[™] per poster directly from the AMA. Applicant must be listed as the first author included in the published abstracts for a conference or activity that is certified for *AMA PRA Category 1 Credit*[™].

To claim the credit, physicians must submit to the AMA the completed Direct Credit Application or Resident Credit Application, along with the required documentation and appropriate processing fee. Please visit the AMA web site for details at www.ama-assn.org.

VIEWING POSTERS

Physicians may claim *AMA PRA Category 2 Credits*[™] for viewing scientific posters. Physicians should self-claim credit on their AMA PRA certificate application form. Please visit the AMA web site for details at www.ama-assn.org.

CME CREDIT AND CERTIFICATE OF ATTENDANCE

CME credits can be claimed through the online system at www.cns.org. The CNS CME tracking system allows you claim CME credit or Certificate of Attendance hours for the meeting. All attendees should only claim credit or hours of attendance commensurate with the extent of their participation in the activity.

Upon completion, your CME certificate will be immediately available to print from the convenience of your home or office.

DISCLOSURES

The Accreditation Council for Continuing Medical Education (ACCME[®]) Standards for Integrity and Independence in Accredited Continuing Education requires that anyone in a position to control the content of the educational activity has disclosed all financial relationships with any ACCME[®] defined ineligible company. 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 an ineligible company as those whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients. Additionally, it is 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. New and Evolving topics must be clearly identified as such within the program and individual presentations

A list of financial disclosures relevant to the meeting will be posted prior to the meeting on the meeting's web-page and app.

FDA STATEMENT

Some drugs or medical devices demonstrated at the Annual Meeting have not been cleared by the FDA or have been cleared by the FDA for specific purposes only. The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice. The CNS policy provides that "off label" uses of a drug or medical device may be described at the Annual Meeting so long as the "off label" use of the drug or medical device is also specifically disclosed. Any drug or medical device is "off label" if the described use is not set forth on the products approval label. It is also each speaker's responsibility to include the FDA clearance status of any device or drug requiring FDA approval discussed or described in their presentation or to describe the lack of FDA clearance for any "off label" uses discussed.

GENERAL INFORMATION

AIRLINE DISCOUNTS

The CNS is pleased to offer discounts with the following airlines. Discounts are available for flight dates as noted below by airline to and from San Francisco International Airport (SFO).

American Airlines – www.aa.com

Valid dates: October 2-16, 2022

Enter code 22H2DV.

United Airlines – www.united.com

Valid dates: October 5-14, 2022

Enter code ZKXZ194641.

Delta Airlines – www.delta.com

Valid dates: September 30-October 19, 2022

Enter code NMVPP.

AIRPORT

The 2022 CNS Annual Meeting hotels and the Moscone West Convention Center are located approximately 14 miles from San Francisco International Airport (SFO). Taxicabs are located on the arrival (ground) level of the airport, outside the baggage claim areas. Uber and Lyft are both available in the San Francisco area.

AMERICANS WITH DISABILITIES ACT

Wheelchairs, scooters, information booths, designated parking, TDD telephones, and other services are available for visitors with disabilities. For wheelchair or electric scooter rental, please contact Scoot-Around at 888-441-7575.

It is suggested that you make your reservation in advance of your arrival. Please let us know if, under the ADA, you require special accommodations or services in order to attend the CNS Annual Meeting. We want to ensure that no individual with a disability is excluded because of the absence of auxiliary aids and services. Your requirements should be sent directly to the Annual Meeting Registration and Housing Center at: cns@mcievents.com or by calling 800-931-9543. Please provide any requests at least 30 days prior to the Annual Meeting to allow adequate time to accommodate your request.

ATTIRE

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

CLIMATE

October temperatures in San Francisco average a high of 71°F and a low of 56°F.

COURSE AGENDAS AND FACULTY

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

DIGITAL POSTERS

Digital posters are displayed electronically Monday through Wednesday in the CNS Xperience Lounge located in the Exhibit Hall and can be searched by author, topic, or keyword.

DISCLAIMER

The material presented at the 2022 CNS 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 2022 CNS Annual Meeting. The CNS reserves all of its rights to such material, and commercial reproduction is specifically prohibited.

EXHIBIT HALL HOURS

MONDAY, OCTOBER 10	9:30 am–4:00 pm
TUESDAY, OCTOBER 11	9:30 am–3:00 pm
WEDNESDAY, OCTOBER 12	9:30 am–11:00 am

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

FUTURE MEETINGS

2023: WASHINGTON, D.C.	September 9–13
2024: HOUSTON, TEXAS	September 28–October 2
2025: LOS ANGELES, CALIFORNIA	October 11–15

HEALTH AND SAFETY

Moscone West Convention follows the current orders issued by the city of San Francisco with regards to Coronavirus (COVID-19). In addition, the CNS requires that all attendees, faculty, exhibitors, and vendors participating in live in-person events be fully vaccinated by the first date of the meeting. CNS will follow all local safety protocols and health mandates. The CNS will continue to monitor for changes to requirements.

HOUSING INFORMATION

See pages 51-54 for detailed information.

PRESS ROOM

All media representatives and journalists attending the Annual Meeting are required to register in advance. Registration, Press Room guidelines, and media credentialing policies are available online at cns.org/2022 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
- Scientific Program to include Section Sessions, Oral Abstract Presentations, Sunrise Science and Late Breaking Abstract Sessions, Guidelines Sessions, Operative Technique Sessions, Interactive Multimedia Research Presentation Session and Digital Posters
- CNS Xperience Lounge
- Live Surgeries via Telemedicine
- Exhibit Hall
- Opening Reception on Sunday

SMOKING

The Moscone West Convention Center and all official CNS hotels are non-smoking facilities.

SPOUSE HOSPITALITY SUITE

All registered CNS Annual Meeting spouses and guests are invited to visit the CNS Spouse Hospitality Suite at the Marriott Marquis San Francisco, Monday through Wednesday, from 8:00–10:30 am for continental breakfast. Please note that admittance to the Spouse Hospitality Suite is by spouse/guest badge only. A representative from San Francisco Travel, 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.

VISA INFORMATION

The State Department of the United States encourages international participants to apply for their visas as early as possible—at least several months before the meeting. Some consulates may have backlogs in scheduling visa interviews, so applicants should first contact the consulate to find out how long the wait is for an interview. For information on the visa process, including wait times, please visit <https://travel.state.gov/content/travel/en/us-visas.html>.

MEETING PURPOSE

The purpose of the 2022 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.

ADVANCE REGISTRATION DEADLINE: SEPTEMBER 7, 2022

Save up to \$200!

Register for the meeting and secure housing before the advance registration deadline to save.

Register at cns.org/2022prelim



REGISTRATION INFORMATION

REGISTRATION METHODS

ONLINE

cns.org/2022

PHONE*

800-931-9543 U.S. & Canada

972-349-5539 International

8:00 am–6:30 pm CST

FAX*

972-349-7715

MAIL*

CNS Annual Meeting

CNS Registration and Housing Center

6100 West Plano Parkway

Suite 3500

Plano, TX 75093

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

CREDIT CARD PAYMENTS

U.S. dollars and drawn on a US bank

- Visa
- Mastercard
- American Express

CHECK PAYMENTS

U.S. dollars and drawn on a US bank

- Please note that checks cannot be processed over the phone. Checks should be mailed to the following address and will be processed. Once the check has been cashed, a confirmation will be sent.

CNS ANNUAL MEETING

CNS Registration and Housing Center

6100 West Plano Parkway

Suite 3500

Plano, TX 75093

- Full payment must accompany your registration.
- Any checks received from an overseas bank will be returned.
- Any checks returned for insufficient funds are subject to additional charges.

REGISTRATION RATES

REGISTRATION TYPE	On or Before September 7, 2022	After September 7, 2022
CNS MEMBER REGISTRANT		
Active (Domestic, International), Associate (Non-neurosurgeons with distinction in a neurosurgical-related discipline)	\$ 890	\$ 990
Active Duty Military	\$ 0	\$ 0
Armed Forces (Guard/Reserve/Retiree)	\$ 475	\$ 675
Resident (Domestic)	\$ 150	\$ 250
International Resident	\$ 150	\$ 250
Fellow (Domestic & International)	\$ 200	\$ 300
Emeritus	\$ 450	\$ 650
Medical Student (Enrolled in an accredited medical school in US or Canada)	\$ 0	\$ 200
Affiliate (Allied healthcare professionals involved in neurosurgical-related patient care, teaching, or research)	\$ 350	\$ 550
NON-MEMBER MEDICAL REGISTRANT		
Neurosurgeon, Physician (MD, DO, etc.), Non-physician (Clinical Researcher/Scientist) **	\$ 1,400	\$ 1,600
Neurosurgeon (Faculty)	\$ 890	\$ 990
Resident	\$ 400	\$ 500
Fellow	\$ 450	\$ 550
Medical Student	\$ 250	\$ 450
PA/Physician Extender/Nurse/Nurse Practitioner	\$ 600	\$ 800
Corporate Representative †	\$ 1,250	\$ 1,450
Non-Member Graduate Student/Post-doctoral Scholar	\$ 150	\$ 250
ANSPA Member ††	\$ 500	\$ 600
Developing Nation Rate (See page 29 for complete list of nations)	\$ 150	\$ 250
Program Coordinator	\$ 0	\$ 0
Spouse/Guest/Child 13 & Over	\$ 0	\$ 150

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

† Corporate representatives attend for education only. They must not conduct sales activities in the meeting space, nor influence content in any way. Solicitation of medical attendees is strictly prohibited.

†† Includes one year of CNS Affiliate membership in 2022 for ANSPA Members only.

NOT A CNS MEMBER? THERE'S NO BETTER TIME TO JOIN!

CNS Members have complimentary access to our world-class Neurosurgery journals, discounts on valuable self-assessment tools, access to educational online resources, and so much more!

Plus, you'll see instant savings – select "Active Applicant Fee" when you register for the Annual Meeting and receive an immediate discount on your 2022 Annual Meeting registration fees! See our full list of member benefits and apply at cns.org/membership.

IMPORTANT DATES TO REMEMBER

SEPTEMBER 7 Advance Registration Discount and Housing Deadline

SEPTEMBER 14 Last day to cancel registration in order to receive a full refund, less a \$100 processing fee

SEPTEMBER 23 Last day to make any hotel changes or cancellations through the CNS Housing provider

Email: cns@mcievents.com

Phone: 800-931-9543

International: 972-349-5539

SEPTEMBER 26 Any hotel changes or cancellations must be made directly with the hotel after September 23. Individual hotel cancellation policies can be found on your original housing confirmation.

REGISTRATION CHANGE/CANCELLATION INFORMATION

Full registration refunds, less a \$100 processing fee, will be granted if written requests for cancellation are received by 5:00 pm CT on September 14, 2022. Course and Seminar tickets will be refunded in full until September 14, 2022. No refunds of any kind will be given after this date, regardless of cause. Refunds will not be given for no-shows.

CANCELLATION REQUESTS ACCEPTED VIA:

E-mail: cns@mcievents.com

Fax: 972-349-7715

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

Please contact MCI, the official CNS Annual Meeting Registration and Housing Center, to reserve your guest rooms.

Hotels will not accept reservations from CNS meeting attendees directly. Reservations can be made online or via fax, phone, or mail.

**Visit cns.org/2022 to make your reservation today!
Be sure to complete the entire housing section on the reservation form.**

Hotel reservations are only available to registered CNS attendees. Rooms are subject to availability. Reserve your room by September 7.

DEPOSIT

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

HOTEL CHANGE/CANCELLATION POLICY

The deadline for new reservations is September 7 based on availability. The hotel requires a deposit of one night's room and tax to reserve your room. Please make any changes or cancellations through the CNS housing bureau, MCI, through September 23. Beginning September 26, changes and cancellations must be made directly with your reserved hotel. Please refer to your housing confirmation for your individual hotel's cancellation policy.

BEGINNING SEPTEMBER 26, 2022

- All changes, cancellations, or questions regarding your reservation must be made directly with the hotel.
- If cancellation notice is not received according to the hotel policy, the deposit will be forfeited. Your individual hotel's cancellation policy can be found in your emailed confirmation.

COMPLIMENTARY HOUSING FOR CNS RESIDENT MEMBERS AND INTERNATIONAL RESIDENT MEMBERS

Complimentary housing at the CNS Annual Meeting is available to a limited number of CNS Resident members and International Resident members on a first-come, first-served basis. To be considered for this program, members must:

- Complete and submit the Resident member housing application by Friday, July 15, 2022. Completed applications may be submitted by email: meetings@cns.org, fax: 847-240-0804, or mail: Congress of Neurological Surgeons, 10 North Martingale Rd., Suite 190, Schaumburg, IL 60173.
- Register for the 2022 CNS Annual Meeting by Friday, July 15, 2022.
- All residents enrolled in ACCME-approved programs have been automatically given complimentary CNS Resident membership.
- If you are not a CNS Resident member or International Resident member, complete your application by Friday, July 15, 2022. You may also apply for CNS membership when you register for the Annual Meeting online and will be eligible for the Resident member registration rate.

Residents who choose to reserve a room through the CNS Annual Meeting Registration and Housing Center and are later accepted into the CNS Resident Housing Program are responsible for cancelling their original reservation. For complete resident housing application guidelines, please visit cns.org/2022/residents.

THANK YOU FOR YOUR CONTINUED SUPPORT OF THE CNS!

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

HOTEL INFORMATION

MARRIOTT MARQUIS SAN FRANCISCO HEADQUARTER HOTEL

780 Mission Street, San Francisco

Distance to Convention Center: .2 miles

Single/Double Rate per night

(Excludes state/local tax and fees): \$399

Dining options on property: 3

Room service: No

Pool: No

Fitness Center: Complimentary

Spa: No

WiFi: Complimentary in Guest Rooms

Parking: Valet parking: \$79.99/daily

Description: Marriott Marquis San Francisco welcomes travelers to Northern California with exceptional service, spacious hotel rooms and suites and a prime downtown location. From our towering hotel, guests have easy access to numerous attractions, including the Moscone Center, Chase Center, Oracle Park and the sights of SoMa. Inside, you can relax and recharge in contemporary rooms and suites with plush bedding and 300-thread count sheets, that enjoy impressive views of the city. Every room features plush bedding, Smart TVs, mini-refrigerators, ample workstations and Wi-Fi access.



GRAND HYATT SAN FRANCISCO

345 Stockton Street, San Francisco

Distance to Convention Center: .4 miles

Single/Double Rate per night

(Excludes state/local tax and fees): \$370

Dining options on property: 3

Room service: No

Pool: No

Fitness Center: Complimentary

Spa: No

WiFi: Complimentary

Parking: Valet parking: \$70+//daily

Description: Grand Hyatt San Francisco welcomes you with a sophisticated elegance and refined modern style. Located in the heart of the city, just steps from famous Union Square, immerse yourself in the shopping, dining, area attractions, and nightlife of San Francisco. Then, retreat to your room where you can unwind and enjoy spectacular views with impeccable service.



HILTON SAN FRANCISCO UNION SQUARE

333 O'Farrell Street, San Francisco

Distance to Convention Center: .8 miles

Single/Double Rate per night

(Excludes state/local tax and fees): \$380

Dining options on property: 2

Room service: Yes

Pool: Yes

Fitness Center: Complimentary

Spa: No

WiFi: Complimentary

Parking: Valet parking: \$80/daily; Self park: \$67/daily

Description: Hilton San Francisco Union Square is steps from the Curran and ACT theaters and just two blocks from Union Square and Westfield shopping center. The Powell Street cable car turnaround, San Francisco Museum of Modern Art, Asian Art Museum, San Francisco Ballet Curran Theater, and Moscone Convention Center are within a mile. Enjoy panoramic views from our skybar, the city's highest. We also have an outdoor pool and whirlpool, two restaurants, a lobby bar, and grab-and-go market..



HYATT REGENCY SAN FRANCISCO - DOWNTOWN SOMA (formerly Park Central)

50 Third Street, San Francisco

Distance to Convention Center: .7 miles

Single/Double Rate per night

(Excludes state/local tax and fees): \$359

Dining options on property: 2

Room service: No

Pool: No

Fitness Center: Complimentary

Spa: No

WiFi: Complimentary

Parking: Valet parking: \$63

Description: Stay in the cultural hub of a vibrant city when you stay at Hyatt Regency San Francisco - Downtown SoMa. Discover San Francisco's creative center right outside your door at world-class museums and buzzed-about art galleries. Explore the neighborhood, find SoMa tech hubs, lauded dining, and nearby landmarks like Union Square, the Financial District, and Embarcadero.



INTERCONTINENTAL SAN FRANCISCO

888 Howard Street, San Francisco

Distance to Convention Center: .1 miles
Single/Double Rate per night (Excludes state/local tax and fees): \$389
Dining options on property: 2
Room service: Yes
Pool: Yes
Fitness Center: Complimentary
Spa: No
WiFi: Complimentary

Parking: Valet parking: \$77/daily (with unlimited in/out privileges)

Description: Immerse yourself in the heart of the city at The InterContinental® San Francisco hotel. Our prime location in the heart of San Francisco, near Moscone Center & Union Square, allows you to explore the city's culture & charm while enjoying elegantly appointed rooms & luxurious amenities.



PALACE HOTEL

2 New Montgomery Street, San Francisco

Distance to Convention Center: .6 miles
Single/Double Rate per night (Excludes state/local tax and fees): \$379
Dining options on property: 2
Room service: Yes
Pool: Yes
Fitness Center: Complimentary
Spa: No
WiFi: Complimentary in guest room and public space
Parking: Valet parking: \$72
Description: Encounter the luxury of the Gilded Age, historic architecture and world-class service at Palace Hotel, a Luxury Collection Hotel, San Francisco. Located in downtown San Francisco, our iconic, historic hotel features authentic elements paired with

classically inspired, modern décor. Relish our wealth of hotel services and amenities, from professional concierge assistance and valet parking, to in-room dining, scenic city views, a cutting-edge fitness center, meetings and event services and more. Our legendary hotel showcases two famous restaurants, with a distinctive setting for any occasion. Enjoy a leisurely dip in our heated, indoor pool with a sky-lit ceiling. Step outside our doors and explore downtown San Francisco, including Union Square, cable cars and Chinatown, just blocks away. Let us regale you with five-star service, extraordinary accommodations and deluxe amenities at the first luxury hotel in San Francisco, CA; as grand and trend-setting today as it was when we first opened our doors.



PARC 55 SAN FRANCISCO

55 Cyril Magnin Street, San Francisco

Distance to Convention Center: .6 miles
Single/Double Rate per night (Excludes state/local tax and fees): \$380
Dining options on property: 1
Room service: No
Pool: No
Fitness Center: Complimentary
Spa: No
WiFi: Complimentary
Parking: Valet parking: \$80

Description: We're three blocks from Union Square, and a short walk from Westfield mall, the Powell BART Station, and the cable car turnaround. The San Francisco Museum of Modern Art is a half-mile away and we're five minutes from the Moscone Center. Other nearby attractions include: Asian Art Museum, San Francisco Ballet, The Curran, Golden Gate Theatre and more. Enjoy our fitness center and two onsite restaurants.



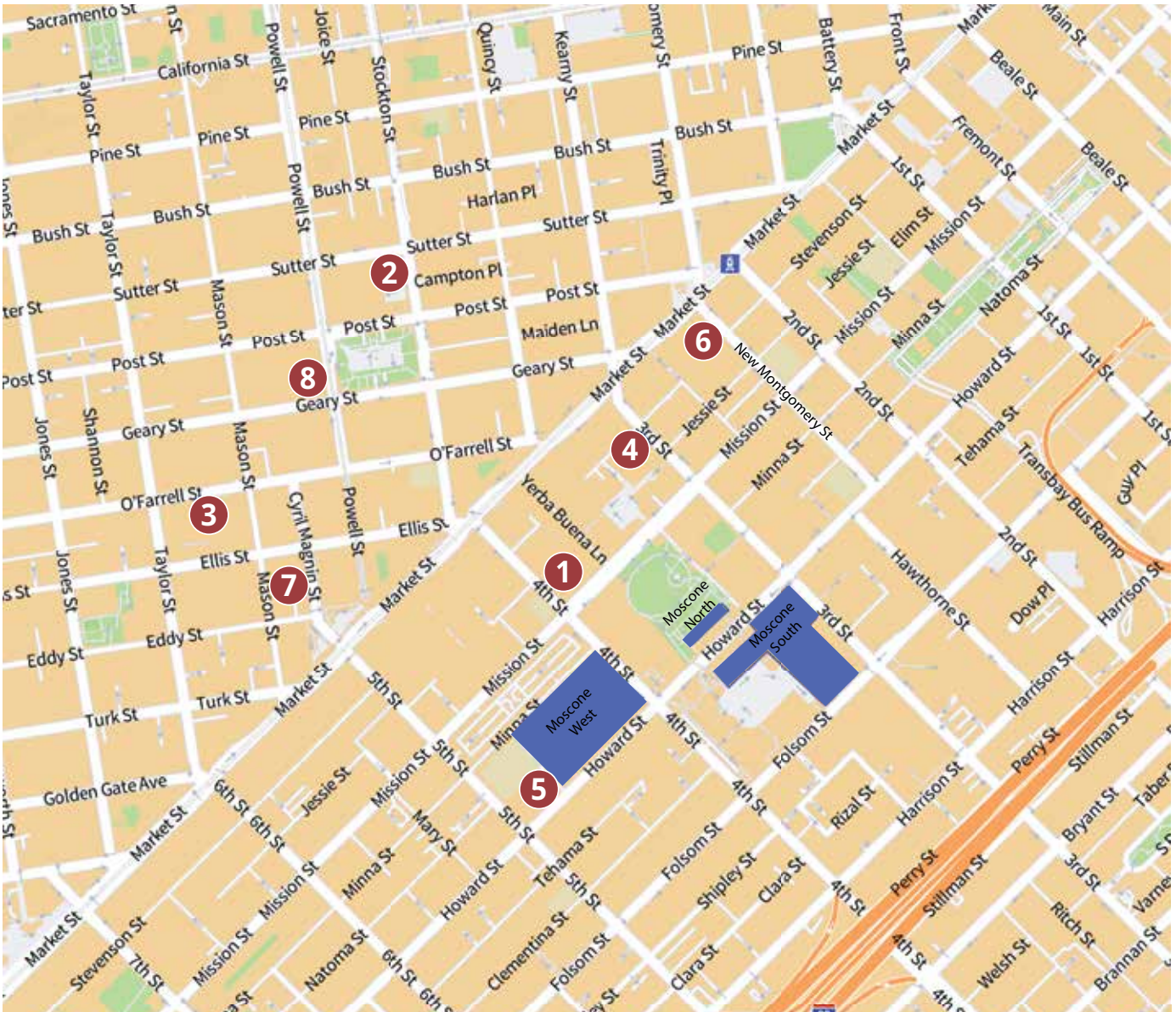
THE WESTIN ST. FRANCIS SAN FRANCISCO ON UNION SQUARE

335 Powell Street, San Francisco

Distance to Convention Center: .7 miles
Single/Double Rate per night (Excludes state/local tax and fees): \$389
Dining options on property: 2
Room service: 6:00-11:00 am
Pool: No
Fitness Center: Complimentary
Spa: No
WiFi: \$4.95/night (Complimentary for BonVoy Members)
Parking: Valet parking: \$79.80
Description: Timeless yet modern, The Westin St. Francis San Francisco on Union Square boasts a vibrant, iconic destination in the city's downtown

district. We are the only hotel directly located on Union Square, with cable cars stopping just outside our doors. All of San Francisco's best shopping, theatre, nightlife and dining options are steps away, and we are only a short walk from the Financial District, Chinatown and Moscone Convention Center. A recent multi-million renewal of the Landmark Building of our hotel includes updated corridors and guest rooms, with new furnishings designed to infuse a brightened and natural relaxing palette. These transformations are truly a breath of fresh air - a welcome rejuvenation of The Westin St. Francis San Francisco on Union Square in its second century.

HOTEL INFORMATION



- 1 Marriott Marquis San Francisco – 780 Mission Street (Headquarter Hotel)
- 2 Grand Hyatt San Francisco – 345 Stockton Street
- 3 Hilton San Francisco Union Square – 333 O'Farrell Street
- 4 Hyatt Regency San Francisco Downtown SoMa – 50 Third Street
- 5 InterContinental San Francisco – 888 Howard Street
- 6 Palace Hotel, A Luxury Collection Hotel – 2 New Montgomery Street
- 7 Parc 55 San Francisco – A Hilton Hotel – 55 Cyril Magnin Street
- 8 The Westin St. Francis San Francisco on Union Square – 335 Powell Street

EXHIBITORS

The following exhibitors have confirmed their participation as of July 2022

3M Health Care
Acumed/OsteoMed
Ad-Tech Medical Instrument Corp.
Aesculap, Inc.
American Association of Neurological Surgeons
Apex Medical, Inc.
Arbor Pharmaceuticals, Inc.
Baylor Scott & White Health
Biocomposites Inc.
Bioplate
Bioventus
BK Medical
Black Forest Medical Group
Boss Instruments Ltd.
Brain Navi Biotechnology Co., Ltd.
C2Dx, Inc
CarboFix Spine
Carlsmed, Inc.
Clarus Medical, LLC
ClearPoint Neuro, Inc.
CMF Medicon Surgical Inc.
CTL Amedica
Designs For Vision, Inc.
DIXI Medical USA
EagleView Imaging, Inc.
Elekta
elliquence
Elsevier, Inc.
Eminent Spine
evonos GmbH & Co. KG
FujiFilm Healthcare of Americas
Gauthier Biomedical
Globus Medical
GT Medical Technologies, Inc.
Hubly Surgical
Hyperfine Inc.
icotec Medical, Inc.
Insightec
Integra LifeSciences
Invenio Imaging Inc
IRRAS
Johnson & Johnson Medical Devices
Joimax
Journal of Neurosurgery
JTS Surgical
Karl Storz Endoscopy
Kelyniam Global Inc.
Kirwan Surgical Products LLC
KLS Martin Group
Leica Microsystems
Life Instrument Corporation
Longevity Neuro Solutions
Medical Education Research Institute (MERI)
Medivis Inc
Medtronic
Merck & Co., Inc.
MicroVention
Mitaka USA, Inc.
Mizuho America, Inc.
Mizuho OSI
Monteris Medical
Mutoh America Co
Nadia International, Inc.
Neurocritical Care Society
NeuroPoint Alliance
Nevro
Nexstim
NICO Corporation
North American Neuromodulation Society (NANS)
Northwell Health
NovaBone Products
Novarad
NSK America Corp.
NuTech Spine
NX Development Corp
Olympus America Inc.
Omniscient Neurotechnology Pty Ltd
Orthofix
OssDsign
Panasonic i-PRO Sensing Solutions Corporation of America
Penumbra, Inc.
Peter Latic US Inc.
Phasor Health LLC
PMT Corporation
Poriferous LLC
RapidAI
REMEX Medical Corp.
Renishaw Healthcare Inc.
Rhaeos
Ronin Surgical Corp.
Rose Micro Solutions
RosmanSearch, Inc.
Scanlan International, Inc.
SeaSpine
Shukla Medical
SI-BONE, Inc.
Silk Road Medical
Sophysa
Spine Wave Inc.
Spineology Inc.
Stryker
Surgeons Capital Management
Surgical Theater
SurgiTel
Sutter Medical Technologies USA
Synaptive Medical
TeDan Surgical Innovations, LLC
The Aneurysm and AVM Foundation (TAAF)
The Brain Aneurysm Foundation
Thieme Publishers
ThinkFirst National Injury Prevention Foundation
Thompson Surgical Instruments, Inc.
Varian, a Siemens Healthineers Company
Viz.ai
Weatherby Healthcare
Wolters Kluwer
Xoran Technologies
ZAP Surgical Systems, Inc.
ZEISS
Zimmer Biomet



Congress of Neurological Surgeons

The CNS delivers the highest-quality online educational programming using trusted, credible resources. We are the top provider of CME and the leader in online education.

Discover more at cns.org/education

ONLINE EDUCATION

**When you need it, where you need it—
and mobile friendly.**

Reliable, targeted online learning content available at your fingertips. Our educational catalog offers hundreds of products searchable by topic, keyword, career stage, or specialty. CNS members receive a discounted rate and most are available complimentary to residents with a code.



CNS SANS ABNS Primary Board Examination Review

Residents can get on the path to success with the CNS SANS ABNS Primary Board Examination Review. Now including three installments for a total of 1,900 questions, you can purchase separately or as a bundle to save! cns.org/sansprimary

CNS SANS Comprehensive Exams

SANS continues to be the most trusted tool in the field of neurosurgical self-assessment. Choose from SANS General with 250 questions for up to 24 CME or SANS Module Bundle with 700 questions worth up to 70 CME credits.

CNS SANS Subspecialty Modules

These seven subspecialty exams help assess your strongest areas of knowledge and identify areas for further growth. Each 100-question exam provides up to 10 CME credits.

CNS SANS: Indications

A 150-question exam that improves diagnostic decision making. Ideal for physicians preparing for the Oral Boards and residents entering practice. Earn up to 15 CME credits.

CNS SANS: NANS

This two-part neuromodulation SANS exam is presented in partnership with NANS. Exam I establishes a baseline of neuromodulation knowledge. Exam II evaluates knowledge gained from the NANS certification curriculum. Each exam provides up to 2.5 CME credits.

CNS SANS: Leadership

This 20-question self-assessment will empower neurosurgeons with the skills needed to shape their careers, improve communication on multidisciplinary teams, and comprehend the business strategies needed to address evolving health systems. Earn up to 2.0 CME credits.

CNS Oral Board Webinars

A series of seven subspecialty webinars on demand to help prepare for the ABNS Oral Board Exam. Earn up to 1.5 CME credits per webinar.

CNS SANS Live Written Board Review Webinars

A series of eight live, interactive webinars to prepare for the ABNS Primary Exam. Free to residents.

MORE EDUCATIONAL OPPORTUNITIES

Explore these other educational opportunities to increase your neurosurgical knowledge and enhance patient care!

CNS Nexus

A comprehensive, case-based compendium of operative techniques and approaches enhanced with intraoperative images, medical illustrations, and operative video. Available at cns.org/nexus

CNS Case of the Month

Provides a forum for discourse regarding the management and treatment of ordinary and extraordinary cases, including feedback and references from the operating doctor. Find it at cns.org/cotm

CNS Spotlight

CNS Spotlight connects one key *Neurosurgery* article each month to related content from the CNS web of knowledge for a focused learning experience. Visit cns.org/spotlight

CNS Podcasts

Complimentary podcasts cover the latest developments in neurosurgery, specifically featuring *Neurosurgery* and *Operative Neurosurgery* articles, as well as CNS guidelines, leadership, controversies. Explore all podcasts at cns.org/cns-podcasts

CNS Neurosurgery Watch & Watch: Classic

Each month, our panel identifies and summarizes key points of selected significant papers from over 50 journals and past journal papers that have changed the landscape of neurosurgical practice. Explore all articles at cns.org/neurosurgerywatch

YouTube: Neurosurgery On the Go

Our YouTube series *Neurosurgery On the Go* includes bite size snippets of dozens of CNS webinars for a quick and easy way to watch. New videos three times a week! **Search Congress of Neurological Surgeons on YouTube.**



CNS

Oral Board Review Course

SEPTEMBER 17-18, 2022

Prepare for the ABNS Oral Board

Let expert faculty guide you in preparing with confidence for the final step in your certification with the CNS Oral Board Review Course.

Register at cns.org/oralboard

This virtual, highly interactive course prepares you for the case-based nature of the ABNS exam with:

- Multiple learning formats
- One-on-one sessions with faculty
- Complimentary post-course quiz sessions

Course Directors



Akash J. Patel



Robert J. Spinner

SAVE THE DATE!



CNS

2023 ANNUAL MEETING

IMAGINE
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WASHINGTON, D.C. • SEPTEMBER 9-13, 2023

