



CONGRESS OF NEUROLOGICAL SURGEONS



IMAGINE
INNOVATE
INSPIRE

WASHINGTON, DC | SEPTEMBER 9-13, 2023



IMAGINE • INNOVATE • INSPIRE



Congress of
Neurological
Surgeons

CONTENTS

- 1 2023 President's Message
- 3 Membership Committee
- 8 Resident Committee
- 11 DEI Committee
- 16 Practice Based Neurosurgery Committee
- 17 Neurosurgery Publications
- 20 2023 CNS Annual Meeting
- 33 Education Division
- 41 CNS Leadership Institute
- 44 Washington Report
- 49 Guidelines Committee
- 50 Data Science Initiatives
- 51 Strategic Partnerships
- 54 CNS Foundation Update
- 61 Corporate Development Update
- 64 Financial Report
- 66 2024 President's Message
- 67 Message from the CEO



Congress of
Neurological
Surgeons

— 2023 PRESIDENT'S MESSAGE —



Elad I. Levy, MD, MBA
2023 President
Congress of Neurological Surgeons

I was humbled and honored to serve as the President of the Congress of Neurological Surgeons in 2023. My term as President culminated in the Annual Meeting held in Washington D.C., September 9-13. As suggested by the meeting theme "*Imagine, Innovate, Inspire,*" we hoped to reinvigorate and redesign the splendor of the Annual Meeting, continuing to elevate the CNS to the next level. Due to the relentless and stalwart efforts of countless volunteers, we did exactly that! Attracting a larger and more diverse group of neurosurgeons than ever before, together to engage with one another, we imagined and shared new frontiers for our specialty, and inspired one another to explore uncharted future frontiers in neuroscience.

This theme was highlighted not only by our keynote speakers, but throughout the program, which was marked by the highest quality science, thanks to the original contributions from our members. In all, over

2,900 abstracts were presented at the podium, in our multimedia abstracts session, and in our digital poster center, covering clinical and basic science, operative techniques, data science, and medical education.

We were pleased to welcome back our colleagues from our international partner societies—the Japanese Congress of Neurological Surgeons (JCNS), the Neurological Society of India (NSI) and the Sociedade Brasileira de Neurocirurgia (SBN), as well as to partner with SBN and Sociedade Latinoamericana de Neurocirurgia en Estados Unidos y Canada (SLANC) in DC to host a special symposium "Meeting of the Americas" on Saturday, September 9. We also expanded our Medical Student programming at a level never seen before, and added a new "Practical Neurosurgery Symposium" designed by and specifically for surgeons in a variety of practice settings outside of academic teaching hospitals. These additions,

based on YOUR suggestions, ensured that every one of our members could find relevant content and inspiration in D.C.

Record breaking attendance, industry support, and scientific abstract contributions resulted in an outstanding meeting. I am profoundly grateful to our Annual Meeting Chair, Lola Chambless, Scientific Program Chair, Garni Barkhoudarian, Vice Chair, Edjah Nduom, and the entire scientific program committee for their contributions to the legendary #CNS2023 Annual Meeting.

I also owe a great deal to my colleagues on the CNS Executive Committee. We began the year with lofty stretch goals, and TOGETHER surpassed these—achieving record membership numbers and continuing to expand our catalog of educational content. Specifically a significant expansion of our CNS YouTube channel's video content, new podcasts, and a SANS flashcards app have

— 2023 PRESIDENT'S MESSAGE —

continued



modernized our learning content. In addition to this innovative digital content, our team has crafted valuable live and virtual courses our members have come to rely upon.

Lastly, the CNS Foundation saw continued growth this year and awarded an incredible 31 grants and awards in 2023. In partnership with the CNS, the Foundation showcased the Pathway to Neurosurgery program, giving local D.C. high school students from disadvantaged backgrounds an opportunity to connect with neurosurgeons and learn about neurosurgery as a career path, while helping to diversify the neurosurgical candidate pool in the future. Thank you to Katie Orrico and Mayor Muriel Bowser for memorializing the event by proclaiming September 7-13, 2023 Pathway to Neurosurgery Week.

I am honored to pass the torch to my colleague, Alex Khalessi, and I am confident that the CNS will continue to thrive under his leadership. The 2024 Annual Meeting in Houston is already shaping up to be an outstanding program. As I wrap up my tenure on the CNS Executive Committee, I am grateful for the passion and commitment of my colleagues on the CNS EC. It has been such an honor to work alongside these young leaders in our field and I have no doubt that under their watch, this organization will continue to grow and flourish. Thank you for giving me the opportunity to lead this organization and serve you all in 2023. I hope that throughout your personal journey in neurosurgery, you continue to "***imagine, innovate, and inspire.***"

— MEMBERSHIP COMMITTEE —



In 2023 the CNS Membership Committee continued its recruitment and retention efforts, resulting in another year of tremendous growth across key CNS membership categories. With a record membership of 11,340 including 8,120 domestic members and an international membership of 1,140, the CNS has grown its domestic membership year-over-year for 13 consecutive years! We have also maintained our commitment to providing unparalleled service to our members and finding new ways to engage with them and better understand their needs.

Why a CNS Membership?

<p>01</p>  <p>Online Education</p>	<p>02</p>  <p>Publications</p>	<p>01</p> <p>Access \$7,500 worth of content and 150+ CME hours with the CNS Online Education Subscription for \$14.99/month and discounts on other online resources</p>
<p>03</p>  <p>CNS ANNUAL MEETING</p>	<p>04</p>  <p>Educational Courses</p>	<p>02</p> <p>Free and discounted CNS journals and publications</p> <p>03</p> <p>Savings on registration for the CNS Annual Meeting</p> <p>04</p> <p>Save \$100+ on registration for live and virtual courses on a variety of topics</p>

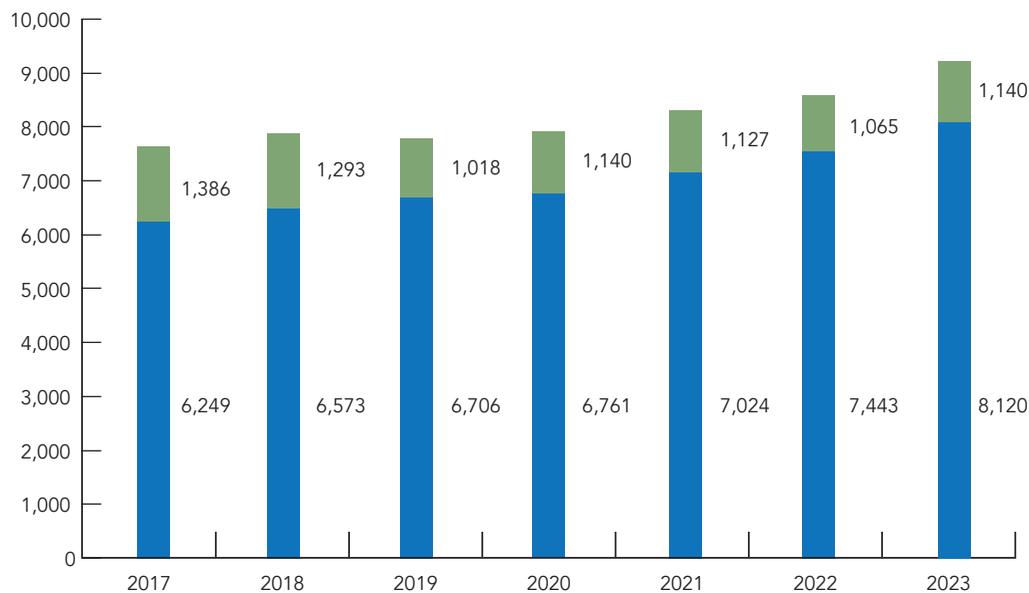
Members Save: \$13,316!

JOIN TODAY!

MEMBERSHIP

continued

CNS MEMBER GROWTH



■ Total International ■ Total Domestic
**Excludes Honorary, Emeritus, and Inactive members*



CNS Membership Spotlight

"I value being a member of CNS as it promotes collaboration and communication with colleagues from around the nation and world, from all subspecialties, and on everything from surgical techniques to basic science advances and surgeon health and wellness. This occurs not only through the website and associated applications but in personal communication and meetings ultimately fostering commitment to providing the most advanced neurosurgical care to my patients. There is no other community that offers such a diverse yet comprehensive support."

Renee Reynolds, MD

— MEMBERSHIP —
continued

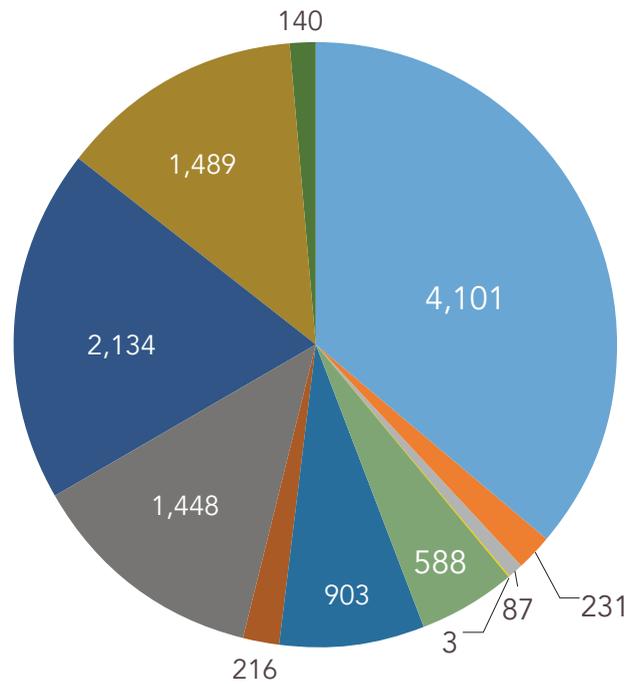
————— CNS Membership Spotlight —————

“The CNS is at the forefront of inspiring and interacting with full members, trainees and even medical students. I have never seen this type of engagement before, and it will undoubtedly lead to more interest in our field, help break down negative stereotypes and attract the brightest minds. Congratulations on a banner year and meeting!”

Alejandro M. Spiotta, MD



————— CNS 2023 MEMBERSHIP —————



- Active
- Honorary
- International Vista Resident
- Emeritus
- Affiliate
- Inactive
- Medical Student
- Transitional
- Associate
- International
- Resident

MEMBERSHIP

continued

CNS MEMBERSHIP BENEFITS:

- Complimentary or discounted subscriptions to CNS portfolio of top-rated journals, including [Neurosurgery](#), [Operative Neurosurgery](#), and [Congress Quarterly](#), covering the latest advances in neurosurgical research and technology, practice management, socioeconomic developments, and more. Extensive educational resources, including our online [education catalog](#) of over 350 CME hours accessible at your convenience, anytime and anywhere, including [SANS Lifelong Learning](#); [Journal Club Podcasts](#); and [Nexus](#) with 600+ cases in all 7 subspecialties.
- Exclusive member rates at in-person events, like our expert-led [courses](#) and the [CNS Annual Meeting](#)
- [CNS Online Education Subscription](#), a resource opportunity that is only available to CNS Members which provides unlimited access to some of CNS's best educational resources, including webinars, SANS Indication, SANS Leadership, Podcast CME and the Neurosurgery Survival Guide App. That's more than \$7,500 worth of online education and more than 150 hours of CME across all clinical and non-clinical areas of neurosurgical practice, for only \$14.99/monthly or \$119/annually!
- [Access to recorded sessions](#) from the CNS Annual Meeting Presidential Address and all four General Scientific Sessions—only CNS members can revisit these sessions or experience them now if you were unable to attend.
- Member only discount on [Open Access Article Processing Charge \(APC\)](#) in Neurosurgery Practice through Wolters Kluwer.
- Exclusive member discounts on legal [contract review and negotiation](#) services through a new collaboration with Resolve that will provide professional guidance to empower our members during transitions in their careers.
- The [CNS+ app](#) providing you information when you need it most, like CNS Guidelines, CNS Neurosurgery Survival Guide, and CNS Education, all in the palm of your hand.
- The convenient [Member Dashboard](#) which includes content curated especially for you through tailored recommendations of articles, courses, and guidelines, based on your selected subspecialties, as well as the ability to track your activities such as meeting participation, donations, and even CME tracking (for certain member types).
- [Volunteer](#) opportunities, where you can make an impact in neurosurgery through your expertise and skills by becoming a leader in the field, an opportunity only available to CNS members.
- Investment through dues support to defend and protect the ability of neurosurgeons to practice medicine freely through neurosur [advocacy and policy development](#). which CNS invests \$1 million annually towards advocating the best interest of our members and the neurosurgical community in Washington DC.

— MEMBERSHIP —
continued



————— CNS Membership Spotlight —————

“Being a CNS member has opened opportunities for me to not only learn about and help advance the field of neurosurgery, but also network with neurosurgeons from across the globe, expand our global initiative through international ambassadors, and get involved in committees and leadership. With CNS, the sky is the limit and the work you put in will determine the results you receive.”

Roxana Beladi, DO



Jeffrey Mullin, MD
2023 Membership Committee Chair



J. Nicole Bentley, MD
Membership Committee Vice-Chair

— RESIDENT COMMITTEE —

The CNS Resident Committee provides neurosurgery residents a unique opportunity to get involved in organized neurosurgery. During their tenure on the committee, Resident Committee members work alongside volunteer leaders in key CNS committees, such as the Education Division and the *Congress Quarterly* Editorial Board, as well as a wide variety of work groups responsible for developing and refining online education. Recent activities include the development of the medical student sub-committee and global neurosurgery resident working group.



THE RESIDENT COMMITTEE CONTINUED WORK ON THESE INITIATIVES IN 2023:

- **Resident Research Forum (CNS RRF)** – The CNS RRF is a resident-led, faculty-mentor supported research forum to promote research among residents and fellows enrolled in neurosurgery residency programs in the US. The primary goal of this alliance is to encourage resident-led multi-institution research initiatives. CNS resident members across all postgraduate years from all US neurosurgery programs will be invited to join the alliance.
- **Social Media Ambassadors** – members of the CNS Resident Committee served in this role for the 2023 CNS Annual Meeting, creating and sharing content from the resident perspective during the CNS Annual Meeting.
- **CNS Medical Student Sub-committee** – Medical students organized to formalize a structured sub-committee that liaisons with the Resident Committee to help with social media, Annual Meeting ambassadors and peer-to-peer mentorship.

— RESIDENT COMMITTEE —

continued

The CNS congratulates our 2022-23 Resident Committee and extends our sincere thanks for their work and contributions to CNS Standing Committees this year:

Oluwaseun Akinduro
Mirade Anokwute
Joseph Antonios
Ahmed Awad
Vin Shen Ban
Evan Bander
Roxana Beladi
Jeffrey Breton
Jessica Campos
Julie Chan
Kevin Chan
Silky Chotai
Ian Connolly

Aurora Cruz
Ehsan Dowlati
Turki Elarjan
Aladine Elsamadicy
Dara Farhadi
Ron Gadot
Tim Gooldy
Chloe Gui
Sabrina Heman-Ackah
Haydn Hoffman
Katherine Holste
Rushikesh Joshi
Kathryn Kearns

A Basit Khan
Sravarithi Koduri
George Koutsouras
Brandon Laing
Thomas Larrew
Emal Lesha
Chuck Mackel
Danielle Terrell
Tristan Mackey
Sarosh Madhani
Alina Mohanty
Rachel Moor
Anzhela Moskalik

Zachary Pennington
Gnel Pivazyran
Elliot Pressman
Miner Ross
Brian Saway
Helen Shi
Megan Still
Jeffrey Traylor
Jorge Uriquia Galvez
Rachel Vaughan
Piiamaria S. Virtanen
Arvin Wali
Mohamed Zaazoue



"As a resident member, the CNS offers a whole host of educational resources, such as SANS and online lectures, as well as leadership and networking opportunities through the Resident Committee, CNS Podcast Committee, Neurosurgery Resident Review Board, etc. There are many opportunities for interested residents to get involved within the CNS community, and the CNS treats them as a valued part of that community even as a resident from a smaller program."

Helen Shi, MD

— RESIDENT COMMITTEE —

continued

CNS Virtual Residency Fair

The CNS hosted the Virtual Residency Fair for our third year on August 2-3. Seventy residency programs presented information on their respective programs to 275 interested medical student prospects, representing growth from our 2022 program. With its tremendous popularity, the CNS plans to make this event an annual program moving forward, offering future neurosurgical residents a valuable, and economical way to learn more about training programs across the country.



Feedback on this program is always favorable from medical students and programs.

"I thought this was an awesome opportunity to hear about different programs, especially because I had a chance to learn about programs I wasn't aware of or didn't know much about. There are several that I will look more closely into, purely because of the talks that were given! It was also helpful to be able to compare and see differences and get a feel for what programs look for but also what I want to get out of a program and what would be important to me and how to articulate that. My only complaint is that I couldn't attend all the talks!"

2023 Virtual Residency Fair participant



J. Nicole Bentley, MD
2023 Resident Committee Chair



Kunal Vakharia, MD
2023 Resident Committee Vice-Chair

— DEI COMMITTEE —

CNS DIVERSITY, EQUITY & INCLUSION COMMITTEE UPDATE

A key focus of the CNS Diversity, Equity and Inclusion (DEI) Committee is to ensure that the CNS, as an organization, reflects the diversity within our field and continues to improve in that area. The CNS DEI Committee worked with several other standing committees throughout the year to ensure a diverse speaker list for courses, webinars, and CNS-sponsored content. The members of the DEI Committee reviewed all courses and provided feedback/recommendations to the planning groups on the diversity of invited faculty—to include representation from different genders, ethnicities, training programs and practices, geographic locations, and career stages.

The CNS DEI Committee led two important initiatives during the 2023 CNS Annual Meeting in Washington, D.C. On Monday, September 11, DEI committee co-chair, Maryam Rahman led a diverse panel of seven speakers at the **DEI Breakfast Seminar: Mentoring 101**. The seminar explored finding and being a good mentor, the importance of sponsorship, and identifying barriers to successful mentorship of underrepresented groups and those without a home program

and models of success. This seminar had an amazing turnout and engagement, with approximately 150 attendees and 67 claims for *AMA PRA Category 1 Credit(s)*TM. We are grateful to those CNS members who participated and shared their experiences and perspectives.

On Tuesday, September 12, Theresa Williamson spearheaded the education and discussion with two speakers and ten abstract presenters at the **Sunrise Science Session—Healthcare Disparities**. Health disparities are preventable differences in disease burden, injury, violence, or opportunities to achieve optimal health, too often experienced by vulnerable populations. Surgical health disparities are well documented in the literature and involve neurosurgical patients from prevention to disease burden to treatment and outcome. The goal of this session on healthcare disparity in neurosurgery was to understand better and spread knowledge related to disparity in neurosurgical disease and to brainstorm solutions to health disparities affecting neurosurgical patients. This session was well attended, with 28 claims for *AMA PRA Category 1 Credit(s)*TM

2023 Pathway to Neurosurgery, Successful Outreach to Youth

The next generation of neurosurgeons is promising, based on the Pathway to Neurosurgery event held at the 2023 CNS Annual Meeting in Washington, D.C. Launched in 2021 in Austin, Texas by the CNS and now led by the CNS Foundation, Pathway to Neurosurgery welcomes local high school students from backgrounds underrepresented in STEM fields, to the CNS Annual Meeting. The program's impact is so significant that the Mayor of Washington, D.C., Muriel Bowser, issued a proclamation designating Sept. 7-13, 2023, as Pathway to Neurosurgery Week!

“African Americans, Hispanic Americans and women are significantly underrepresented in neurosurgery, and the CNS Pathway to Neurosurgery program aims to address this problem by promoting diversity, equity and inclusion in neurosurgery. Our goal is to inspire students to consider neurosurgery as a career option to foster innovations in patient care that can improve outcomes and reduce minority health disparities,”

Tiffany R. Hodges, MD

Co-chair of the CNS DEI Committee and associate professor of neurosurgery at Case Western Reserve School of Medicine.

— DEI COMMITTEE —

CNS DIVERSITY, EQUITY & INCLUSION COMMITTEE UPDATE

Proclamation



PATHWAY TO NEUROSURGERY WEEK

SEPTEMBER 7-13, 2023

WHEREAS, our nation has a long history of health disparities and healthcare inequities among racial and ethnic minority groups; and

WHEREAS, diversity, equity, and inclusion within medical professions foster innovations in patient care that can improve patient outcomes and reduce minority health disparities; and

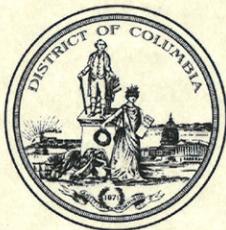
WHEREAS, African Americans, Hispanic Americans, and U.S. women are significantly underrepresented in neurosurgery, the medical field dedicated to the diagnosis, treatment, and surgical management of nervous system disorders; and

WHEREAS, the Congress of Neurological Surgeons (CNS) embraces diversity, equity, and inclusion in order to attract and retain the best and brightest from all demographics; and

WHEREAS, CNS's Pathway to Neurosurgery program seeks to empower individuals from underrepresented communities to pursue and succeed at careers in neurosurgery; and

WHEREAS, during its 2023 annual meeting, CNS will present an immersive neurosurgery experience at E.L. Haynes Public Charter School and offer students opportunities to apply for scholarships;

NOW, THEREFORE, I, THE MAYOR OF WASHINGTON, DC, do hereby proclaim September 7-13, 2023, as "PATHWAY TO NEUROSURGERY WEEK" in Washington, DC.



— DEI COMMITTEE —

continued



“There are persistent racial health disparities in the United States, including in neurosurgical care, and the evidence is clear that diversifying the neurosurgical workforce is an important tool in our fight to end these disparities. The CNS Foundation is working to expand the Pathway to Neurosurgery program nationwide to harness all of the diverse talents of our people to improve health outcomes for everyone.”

Edjah K. Nduom, MD

Co-chair of the CNS DEI Committee and associate professor of neurosurgery at Emory University School of Medicine.

2023 continued to be a productive year for the CNS DEI Committee as they built upon their focus of ensuring diversity and equity in CNS courses and offerings and lowering barriers to early neurosurgical exposure via the Pathway to Neurosurgery program. On September 11, 2023, 20 students from the local high school, E.L. Haynes Public Charter School, enjoyed a day-long symposium designed exclusively for them, enjoying lectures from a diverse group of leading neurosurgeons, including the 2023 CNS Presidential Address by Dr. Elad Levy. DEI committee co-chairs, Drs. Tiffany R. Hodges and Maryam Rahman welcomed the students upon their arrival and presented “A Day in the Life of a Neurosurgeon.” The students spent the day surrounded by neurosurgeons, and got an inside look into what a medical career—possibly even a career in neurosurgery—would look like. “I am passionate about the Pathway to Neurosurgery program because I know how meaningful it is to see someone like me in a STEM field.

I spent my young life being told repeatedly that I would never be a neurosurgeon. Neurosurgery must be a career option for them because we need more neurosurgeons that represent our broad spectrum of patients,” states Dr. Tiffany Hodges, who serves as chair of the CNS Foundation’s Committee for Diversity, Equity, and Inclusion.

The students also rotated through eight hands-on stations generously sponsored by Medtronic, Microvention, as well as the Mobile Lab sponsored by Stryker. During their time at each station, the students learned about the different types of equipment and tools neurosurgeons use in their daily practice, like spine and cranial navigation systems, surgical drills, and pedicle screws. Volunteer neurosurgeons and residents partnered with each student through the stations, giving them feedback on holding surgical instruments and answering their questions.

— DEI COMMITTEE —

continued



Between station rotations, the students listened to speakers from various backgrounds talk about their own pathways to becoming neurosurgeons. Dr. Edjah Nduom, a neurosurgeon at Emory University, spoke about his journey to becoming a neurosurgeon and the importance of several mentors in his life.

During lunch, volunteer neurosurgeons led roundtable discussions with the students and casually answered their questions. Laughter and conversation bubbled throughout the day. Not only were the students enjoying themselves, but volunteer neurosurgeons also said it was one of the highlights of the CNS Annual Meeting.

“One of the most impactful efforts I have had the privilege of being part of is the Pathways Program. It is a unique opportunity to directly interface with young people who are not on a traditional path to medicine. They typically do not have role models in their lives showing them how to pursue a career in something like neurosurgery. Honestly, they probably teach us more than we teach them. But we hope that they walk away from the CNS Annual meeting with a glimpse into what their lives could look like if they invested the work and time to pursue neurosurgery. Most importantly, we hope they walk away knowing that there are people in the world who care about them and want them to succeed.”

Maryam Rahman, MD

Pathway to Neurosurgery and other fine programs supported by donors!

The CNS Foundation wishes to express gratitude to the following people and organizations for making the 2023 Pathway to Neurosurgery event possible:

- **Tiffany Hodges, MD, Maryam Rahman, MD, and Edjah Nduom, MD**, for their outstanding leadership.
- **Medtronic** for their generous financial support and thoughtful leadership.
- **Stryker**, for their generous financial support, and for providing use of their mobile lab to the students the day of the symposium.
- **Microvention** for their donated supplies for stations.
- To the following **practitioners** for giving their time to speak at the event: Rushna Ali, MD; Shawn L. Hervey-Jumper, MD; Edjah Nduom, MD; Tene Cage, MD; Tiffany R. Hodges, MD; W. Christopher Newman, MD; Isabelle Germano, MD; Kim Kicielinkski, MD; Maryam Rahman, MD
- Sincere appreciation to the many **volunteer neurosurgeons** who stopped by and spent time with our guest students.

— DEI COMMITTEE —

continued

PATHWAY THINK TANK PROGRAM

After the Pathways to Neurosurgery program, members of the Pathway Think Tank program met to discuss the goals and objectives of developing a scalable model for the CNSF Pathway to Neurosurgery Program. This model will ultimately be shared with other medical institutions around the country and presented to students from local middle and high schools. A key initiative for the Think Tank is to develop and provide tools, curriculums, templates, resources, and best practices to implement the program in other cities across the country quickly.

CNS DEI COMMITTEE FOCUS 2023 AND BEYOND

In addition to the above, the CNS DEI committee have ongoing efforts to increase diversity in CNS programming.

- Evaluate lists of invited speakers/course faculty/moderators for CNS courses and meetings and recommend changes to increase diversity.
- Ongoing efforts to collaborate with CNS Foundation:
 - Pathways to Neurosurgery
 - Neurosurgery Think Tank
 - Neurosurgery Experience Awards
 - DEI Abstracts
 - DEI Innovation Pilot Project
 - DEI Scholar Award
 - DEI Impact Award
- Ongoing efforts to collaborate with WINS, ASBN, and other sections in increasing and highlighting diversity within our specialty



- Updated website: <https://www.cns.org/about/diversity-equity-and-inclusion-committee>
- Social Media Engagement



Tiffany Hodges, MD
Co-Chair



Edjah K. Nduom, MD
Co-Chair



Maryam Rahman, MD
Co-Chair

— PRACTICE-BASED NEUROSURGERY COMMITTEE —

In 2023, recognizing that neurosurgeons outside of full-time academic practice make up the vast majority of the Congress of Neurological Surgeons' membership, CNS President Elad Levy and the Executive Committee established a new Practice-Based Neurosurgery Committee. The Committee, chaired by Dr. Jason Ellis and comprised of more than 50 neurosurgeons throughout the United States, demonstrates the CNS's continued commitment to attract and create value for all neurosurgeons.



Members of the committee represent a variety of different clinical practice models from private and small group practices to large, multi-specialty group practices, and a wide range of mixed or "privademic" practice settings. In addition to participating in committee calls and sharing their feedback on CNS programs, priorities and initiatives, members of the Practice Based Neurosurgery Committee also have the opportunity to serve as liaisons to other CNS standing committees, helping ensure that their perspectives and concerns are considered in the development of educational products, events and more.

In 2023, members of the committee—including Course Director, Christian Sitkorski—developed a new Special Symposium for the CNS Annual Meeting in Washington D.C. titled "Practical Neurosurgery Symposium." The symposium content was created with practice-based neurosurgeons in mind, showcasing topics relevant for all practicing neurosurgeons, including clinical practice optimization, engagement with administrators, program building, leadership and advocacy, and academic production. These and other topics were designed to help participants forge partnerships with hospital administration and other leaders to broaden the scope of neurosurgical care offered in a community setting. The committee plans to build on the success of this new symposium to bring further educational content and resources to our members in a variety of practice settings.



Jason Ellis, MD
Chair

— NEUROSURGERY PUBLICATIONS —



On behalf of **Neurosurgery Publications**, I am happy to provide the following report to the membership.

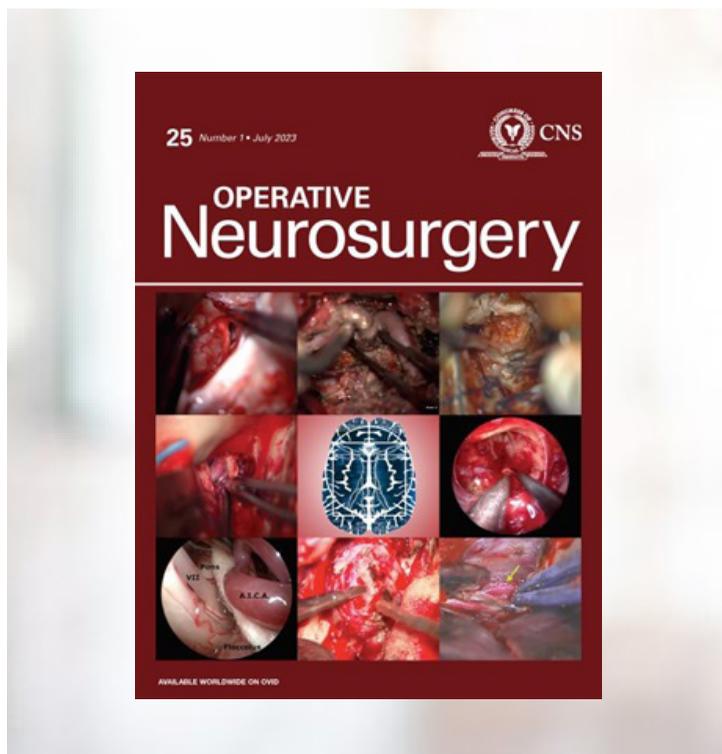
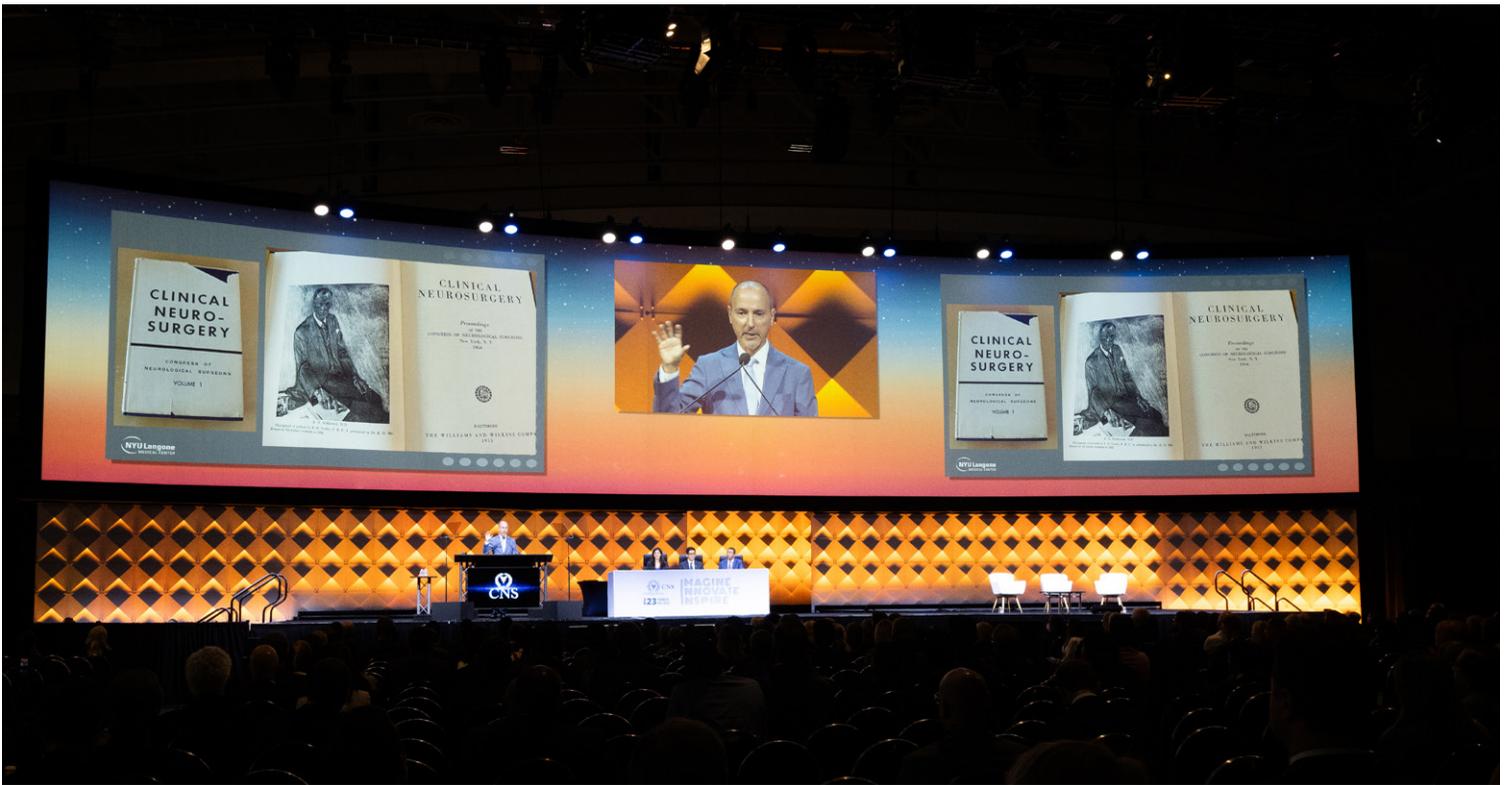
Over the course of 2023 the **Neurosurgery Publications** leadership and staff worked very hard to deliver to the readership, of which CNS members constitute a core constituency, the high-quality science and research which they've come to expect from our journals. I am happy to report that *Neurosurgery*, *Operative Neurosurgery*, and *Neurosurgery Practice* continue to receive an incredibly healthy volume of submissions from a wide, international author base. Submissions are the lifeblood of our journals and we appreciate your continued support.

Those of you who are regular readers of the journal will have no doubt noticed new features this year particularly the Editor's Messages, the "Operative Neurosurgery Technical Lessons Video Series," and the *Neurosurgery Practice* with Code article type.

The first [Editor's Message](#) published in the September 2022 issue of *Neurosurgery*. Subsequent issues of both *Neurosurgery* and *Operative Neurosurgery* have featured Editor's Messages written by myself as well as **Neurosurgery Publications** Associate Editors and have covered a wide range of topics including global neurosurgery, knowledge and measurement, surgical evolution, access, authorship, mentorship and scientific writing, and research. I hope the membership has enjoyed these so far and will continue to do so in the future.

— NEUROSURGERY PUBLICATIONS —

continued



The “[Operative Neurosurgery Technical Lessons Video Series](#)” debuted in the July 2023 issue of *Operative Neurosurgery* as the third edition in our “Masters in Neurosurgery” series, the first two being the Spetzler and Al-Mefty Collections respectively. Under the leadership and energy of Dr. Walter C. Jean, this series of modern cranial neurosurgery is designed “to be a collection of surgical videos, produced by experienced neurosurgeons, each demonstrating their favorite procedure.” We look forward to publishing this series into 2024 and believe it will stand as a valuable collection and resource for years to come.

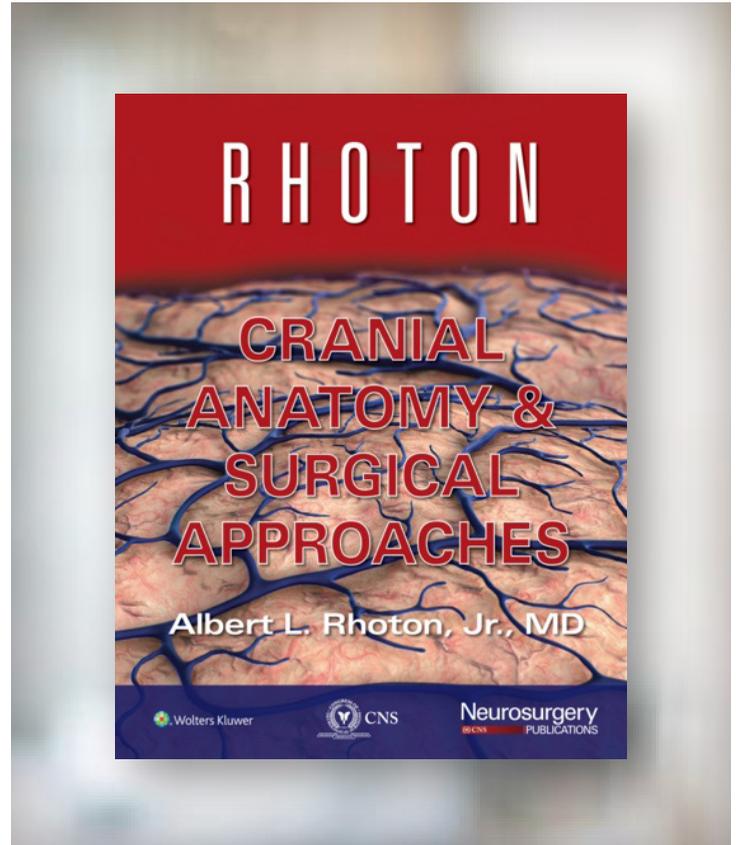
— NEUROSURGERY PUBLICATIONS —

continued

The [Neurosurgery Practice with Code](#) article type was launched in July 2023. *Neurosurgery Practice with Code* articles are Clinical Research articles enhanced with a standardized section that links to the code and datasets underlying the research reported. Our aim with this article type is to make the underlying data accessible and aid reproducibility and further research. Those submitting Clinical Research articles to *Neurosurgery*, *Operative Neurosurgery*, and or *Neurosurgery Practice with Code* article type to supplement the core Clinical Research article. We of course welcome direct *Neurosurgery Practice with Code* submissions as well.

In addition to publishing fresh content, we have made it a priority to improve current methods of *delivering* that content. To this end the membership will have noticed in early 2023 that our publisher began sending Monday weekly digest emails. Each thematic digest presents a list of recently published articles in either cranial, spine, technique, or neuroscience. Each digest is curated by myself and includes articles from *Neurosurgery*, *Operative Neurosurgery*, and *Neurosurgery Practice*. Engagement thus far has been healthy. We hope the membership finds these useful and a welcome supplement to the standard new content and issues alerts.

Perhaps the most noticeable change the membership will have noticed is the transition of *Operative Neurosurgery* from a print/online journal to fully online-only. As a digital heavy journal comprised of a significant volume of online-only articles and content we saw this transition as a natural evolution and one that would have a positive impact on the environment by utilizing less resources than those needed to produce a print journal. Monthly cover art and table of contents will be available in print in the backmatter pages of *Neurosurgery* as an added convenience to our readers. Though online only *Operative Neurosurgery* remains a subscription-based journal and as such a key member benefit. The December 2023 issue marked the last print issue of the journal. I provided an introduction to the journal's evolution in the [October 2023 Editor's Message](#) and additional information was shared by CNS Membership directly.



Rhoton's Cranial Anatomy and Surgical Approaches returned to print in August 2023. CNS Members receive a 30% discount when purchasing on <https://shop.lww.com>. Please use the discount code WPA278AA.

In closing I would like to thank the **Neurosurgery Publications** Editorial Board and Editorial Office staff, CNS Leadership and members, and of course our authors, reviewers, and readers; **Neurosurgery Publication's** success would not be possible without their sustained commitment and support.



Douglas Kondziolka, MD, MSc, FRCS, FACS
Editor-in-Chief, Neurosurgery Publications

— 2023 CNS ANNUAL MEETING —



IMAGINE • INNOVATE • INSPIRE

2023 Congress of Neurological Surgeons Annual Meeting

Washington, DC September 9-13, 2023

The 2023 CNS Annual Meeting gathered more than 3,200 neurosurgeons and neurosurgical team members across practice settings and career stages to share impactful research and scholarly presentations, discuss advances in neurosurgical technology and approaches, and connect with one another.

Our 2023 meeting theme, *Imagine, Innovate, Inspire* challenged attendees to envision a bold future for neurosurgery and to help guide innovation to achieve that vision.

ANNUAL MEETING HIGHLIGHTS



The **CNS 5K** drew 369 registrants and raised more than \$1,100 for charity. lululemon participated in the event as run guides, aka “ambassadors”, and offered warm up stretching sessions after the group run, as well as yoga and stretching demonstrations in the CNS Xperience Lounge.



The Art of Neurosurgery featured “Innovation in Medical Illustration” demonstrations and real-time medical illustration demonstrations by Josh Emerson and Peter Lawrence on Monday, presentations by neurosurgeon artists on Tuesday, and an art display by Dr. Kathryn Ko—all in the CNS Xperience Lounge.



Two new Neurosurgical Medical Student Specialty Sessions on Wednesday afternoon delivered content created by and presented by medical students. Topics included: **“Learning in the Digital Age: Resources for Medical Education and Research,”** **“Advancing Health Equity Through Neurosurgical Research,”** and **“Creating Your Niche as a Diverse Applicant in Neurosurgery.”**



A new **Innovation Special Symposium** “TNT: Transforming Neurosurgery through Technology” allowed direct discussion of unique approaches to innovation that can lead to return on investment for our members and industry partners.



“The Meeting of the Americas” on Saturday, September 9 featured neurosurgeons representing countries from North, Central and South America discussing the great work and research being conducted as well as some of the inherent challenges for healthcare delivery in these areas.



A new Special Symposium **“Practical Neurosurgery: Perspectives by and for General Practice Neurosurgeon Leaders”** featured speakers and topics identified by CNS’ Practice Based Neurosurgery Committee.

ANNUAL MEETING HIGHLIGHTS



A Joint Symposium in partnership with the North American Skull Base Society (NASBS) “**Sellar and Suprasellar Tumors Outside the Box**,” featured a TED-talk style format to highlight practical and clinically relevant concepts.



The “**Hopkins Symposium**” honored one of the pioneers of endovascular neurosurgery, **Dr. L. Nelson Hopkins**, and discussed how his surgical innovations have shaped modern day neurosurgery across all subspecialties.

Annual Meeting by the Numbers

3,256 medical registrants gathered in Washington, D.C. to connect with colleagues and catch up on critical developments in the field.

11358.25 CME hours were claimed

2,967 scientific abstracts were presented

- **535** Oral Presentation & Oral Presentations
- **526** Poster Presentation
- **1,728** Digital Posters

1020 faculty members volunteered their time and expertise!

36 Weekend Symposia presented on topics including

2 Honored Guests: L. Nelson Hopkins and Douglas Kondziolka

30 Luncheon Seminars, including “New Concepts in Intra-operative Guidance,” “The Changing Face of Neurosurgery: Navigating Workplace Culture,” and “Complex Skull Base Approaches.”

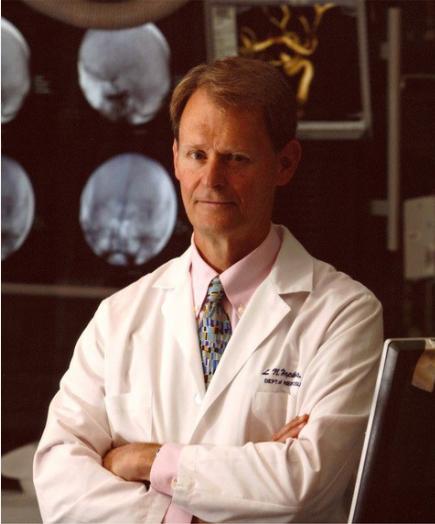
5 Guidelines Sessions packed wall to wall covering essential Practice Guidelines across subspecialties: Perioperative Spine—Intraoperative, Brain Mets Update—Emerging Therapies, Pituitary Adenoma, Occipital Neuralgia, Low Grade Glioma

21 Sunrise Science Sessions

2 Dinner Seminars at popular DC restaurants: “Managing and Preventing Intraoperative Vascular Complications” and “The Importance of Negotiating as a Neurosurgeon”

1 Breakfast Seminar “Mentoring 101”

HONORED GUESTS



L. Nelson "Nick" Hopkins, MD

- SUNY Distinguished Professor
- Distinguished Professor of Neurosurgery
- Professor of Radiology, University at Buffalo, State University of New York
- Founder and Chief Scientific Consultant, Jacobs Institute
- Founder, Gates Vascular Institute, Kaleida Health

Although Dr. Hopkins was unable to attend the meeting in D.C., he delivered an outstanding recorded address on **Sunday, September 10** titled "*Origins of Neurendovascular Surgery: How I Did It...Why I Did It...*". Dr. Hopkins' impact and legacy were also celebrated throughout the Monday Honored Guest Luncheon, where several of his colleagues gave talks on "*What We Can Learn from Failure.*"

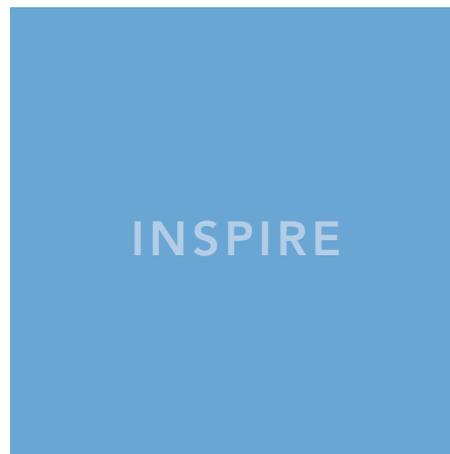
Douglas Kondziolka

- Gray Family Professor of Neurosurgery, NYU Langone Health
- Editor-in-Chief of Neurosurgery Publications

Dr. Kondziolka presented an Honored Guest Lecture titled "*The Nature of Things,*" during the **Tuesday General Scientific Session**, hosted an Honored Guest Lunch on Tuesday entitled "*Learning and Personal Growth Through Organized Neurosurgery - How to Make a Difference*" and hosted a meet and greet in the CNS Xperience Lounge.



FEATURED SPEAKERS



Inaugural Dorothy Nash Lecture – Fireside Chat with Amal Clooney, moderated by Dr. Lola Chambless and Dr. Martina Stippler.



“Keys to Assessing Risk: Knowing When to Push or Pivot” – Chris Cassidy



“Loonshots: Imagining the Impossible” – Safi Bahcall



A Conversation with Martin Eberhard, moderated by Dr. Garni Barkhoudarian and Dr. Juan Uribe



“More than your Hippocampus: Living Beyond Your Wildest Dreams” – Justin Tuck

CONGRATULATIONS!



Distinguished Service Award Recipient

Russell R. Lonser, MD



CNS Founders' Laurel Award Recipient

Volker K.H. Sonntag, MD



CNS Educator of the Year Award Recipient

Damirez T. Fossett, MD

CONGRATULATIONS TO THE 2023 ABSTRACT AWARD WINNERS

Each year, merit-based abstract awards at the CNS Annual Meeting are granted to acknowledge the achievements of residents

CNS Resident Award

What Are We Transfusing? A Prospective Trial Evaluating the Quality of Intraoperatively Salvaged Red Blood Cells in Spinal Deformity Surgery

David B. Kurland, MD, PhD; Daniel Alexander Alber; Darryl Lau, MD

Duke Samson Award

Glymphatic System Impairment Associated with Neurocognitive Dysfunction and Alzheimer's Biomarkers in Moyamoya Disease

Chaofan Zeng; Yuanren Zhai; Peicong Ge; Dong Zhang; Jizong Zhao

Galbraith Award

Safety and Efficacy of Endovascular Versus Microsurgical Treatment of Unruptured Wide-Necked Middle Cerebral Artery Aneurysms: A Propensity-Matched Analysis of the Neurovascular Quality Initiative-Quality Outcomes Database (NVQI-QOD)

Varun Padmanaban; Junjia Zhu; Shouhao Zhou; Sameer Ansari; Jay Howington; Daniel Sahlein; Juan Tejada; D. Andrew Wilkinson, MD MS; Scott Douglas Simon, MD; Kevin M. Cockcroft, MD; Ephraim W. Church, MD

CNS Foundation DEI Abstract Awards

Bridging the Literacy Gap for Surgical Consents: An AI-Human Expert Collaborative Approach

Rohaid Ali; Ian Connolly; Oliver Tang; Fatima Mirza; Benjamin Johnston; Hael Abdulrazeq; Paul Galamaga, JD; Tiffany Libby, MD; Neel Sodha, MD; Michael Groff; Ziya Gokaslan; Albert Telfeian; John Shin; Wael Asaad; James Zou; Curtis Doberstein

Regional Variability in the Management of Aneurysmal Subarachnoid Hemorrhage for Black Patients: An Analysis of Treatment Patterns, Outcomes, and End-of-Life Care

Jean-Luc Kabangu; Adip Bhargav; Lane Fry; Ahmad Masri; Cody Heskett; Momodou Bah; Jeremy Peterson; Koji Ebersole; Sonia Eden; Paul Camarata

Racial and Gender Disparities in Traumatic Brain Injury Clinical Trial Enrollment

Momodou Bah; Anant Naik; Umaru Barrie; Rajiv Dharnipragada; Sonia Eden; Samuel Cramer; Paul Arnold

Julius Goodman Resident Award

Interspinous Process Device Utilization and Reimbursement Vary by Provider Specialty and Care Setting

Jung Ho Gong; Kelly Jiang; Tej D. Azad, MD

Samuel Hassenbusch Young Neurosurgeon Award

Impact of COVID-19 on Neurosurgical Utilization and Reimbursement

Michael Stephen Rallo; Anil Nanda, MD, FACS; Richard P. Menger, MD, MPA

Best Abstract in Medical Education & Training

GPT-4 Artificial Intelligence Model Outperforms ChatGPT, Medical Students, and Neurosurgery Residents on Neurosurgery Written Board-like Questions

Gage Guerra; Hayden Hofmann; Sina Sobhani; Grady Hofmann; David Gomez; Daniel Soroudi; Benjamin Hopkins, MD; Jonathan Dallas, MD; Dhiraj J. Pangal; Stephanie Cheok, MD; Vincent Nguyen, MD; William J. Mack, MD; Gabriel Zada, MD, MS

Best Data Science Award

Deep Learning-Based Image-to-Image Translation to Identify Macrophage Infiltration in High-Grade Glioma Using Label-Free Stimulated Raman Histology

Daniel Alexander Alber; Karl Lee Sangwon; Andrew Smith; Emily Lock; Misha Movah-Ezazi; Todd Charles Hollon, MD; Eric Karl Oermann, MD; Daniel A. Orringer, MD

CONGRATULATIONS TO THE 2023 ABSTRACT AWARD WINNERS

Each year, merit-based abstract awards at the CNS Annual Meeting are granted to acknowledge the achievements of residents

Natus Resident/ Fellow Award for Traumatic Brain Injury (Neurotrauma and Critical Care)

Repetitive Traumatic Brain Injuries Are Associated With Poorer Outcomes At 1-Year and 3-7 Years After Index Injury
John K. Yue, MD; Leila Etemad; Jason Barber; Gabriela Satris; Patrick Belton, MD; Debbie Madhok; Sabah Hamidi; Joye Tracey; Esther Yuh; Pratik Mukherjee; Michael C. Huang, MD; Phiroz E. Tarapore, MD; Ava Puccio; David O. Okonkwo, MD, PhD; Geoffrey T. Manley, MD, PhD; Nancy Temkin; Anthony DiGiorgio



2023 CNS President-Elect, Alex Khalessi, presents the CNS Resident Award to David B. Kurland, MD, PhD

Natus Resident/Fellow Award for Neurocritical

Outcome Related Thresholds of Near Infrared Spectroscopy Based Cerebrovascular Reactivity Metrics in Moderate/Severe TBI: A Canadian High Resolution-TBI (CAHR-TBI) Cohort Study
Alwyn Titus Gomez, MD; Jeanette Tas; Marcel Aries; Donald Griesdale; Logan Froese; Eric Thelin; Rahul Raj; Clare Naomi Gallagher, MD, PhD, FRCS(C); Francis Bernard; Andreas H. Kramer, MD; Frederick Zeiler

Ronald R. Tasker Young Investigator Award (Section on Pain)

Contribution of Sensory Neuron-Associated Macrophages to Neuropathic Pain via Up-Regulation of Calcium Channel in C Fiber Sensory Neurons in Dorsal Root Ganglion: An Animal Model Study
Keonhee Kim; Eunyee Jung; Seungsoo Chung; Dong Ah Shin

Section on Pediatric Neurosurgery Best Basic Science Abstract Award

Neuroimaging Analysis of Bilateral Thalamic Delivery for Gene Therapy
Rrita Daci; Mohammed Shazeeb; Brittany Owusu-Adjei Thomson; Constance Jennifer Mietus; Behroze Vachha; Richard P. Moser, MD; Heather Gray-Edwards; Miguel Sena-Esteves; Terrence Flotte; Oguz Cataltepe, MD

Section on Pediatric Neurosurgery Best Clinical Research Abstract Award

Initial Experience with Sonodynamic Therapy Using Low-intensity Focused Ultrasound and ALA for Pediatric Patients with Diffuse Intrinsic Pontine Glioma
Nirali Patel, MD; Kelsi M Chesney, MD; Jean-Paul Bryant; Kristen Stabingas, MD; Roger Packer; Lindsay Kilburn; Adriana Fonseca Sheridan; Robert F. Keating, MD; Hasan R. Syed, MD

Best Peripheral Nerve Abstract

Initial Clinical Safety and Feasibility from the RESET RA study of a Novel Implantable Neuroimmune Modulation Device for the Treatment of Rheumatoid Arthritis

Daniel L. Peterson, MD; Mark Daniel Van Poppel, MD; Warren Boling; Perry Santos; Jason Schwalb; Howard Eisenberg; Ashesh Mehta; Heather Spader; James Botros; Frank D. Vrionis, MD, PhD; Andrew Ko; P. David Adelson, MD, FACS, FAAP; Bradley Lega; Peter Konrad; Bill Calle; Richard D. Bucholz, MD, FACS; Robert Mark Richardson, MD, PhD

Stereotactic and Functional Neurosurgery Resident Basic Science Award

Human Focal Seizures Induce Wavelike States in Bursts of Neuronal Activity
Joshua M. Diamond, MD; Sara Inati; Kareem A. Zaghoul, MD, PhD

Stereotactic and Functional Neurosurgery Resident Clinical Award

Responsive Neurostimulation Targeting the Centromedian Nucleus of the Thalamus Improves Seizure Control in Idiopathic Generalized Epilepsy and Select Multifocal Disease
Pranav Nanda, MPhil; Ashley Walton; Nathaniel Sirsterson; Robert Mark Richardson, MD, PhD

Stereotactic and Functional Neurosurgery Young Neurosurgeon Basic Science Award

Encoding Brain Dynamics: Neuropsychological Test Scores as Predictors of iEEG Spectral Features in Epilepsy

Tariq Hattab; Jordan Krieg; Sarah Kawtharani; Seth Koenig; Eric Waldron; Alexander Herman; David P. Darrow, MD, MPH

Stereotactic and Functional Neurosurgery Young Neurosurgeon Clinical Award

Spinal Cord Stimulator Promotes Neuroplasticity in Patients with Severe Spinal Cord Injury

Matheus Moreli Porcean; Leonidas Gomes Angelin; Angelica Castilho Alonso; Cristina Prota; Cristante; Christiane Pereira Cavalcante de Abreu; Lucia Helena Storer Ribeiro; Jennifer Grace Barros Santos; Juliana Cristina de Souza; Maria Eugenia Mayr de Biase; Bunpot Sitthinamsuwan; Nasir Majeed; Edelvan Gabana; Ricardo Jose Rodriguez Ferreira; Raphael Martus Marcon; Julia Maria D'Andrea Greve; Alexandre Fogaça Cristante; Guilherme Alves Lepski

Joint Section Tumor Neuro-Oncology Trainee Award

DWI and ADC Changes in Patients with Glioblastoma IDH-Wild Type Following Surgical Tumor Resection
Pavel Pichardo Rojas; Josh Bandopadhyay; Luis C. Nunez; Yoshua Esquenazi, MD; Antonio Gabriel Dono Ostorga, MD; Andres Rodriguez; Nitin Tandon, MD; Roy Riascos

American Brain Tumor Association (ABTA) Young Investigator Award

Clear Cell Meningioma Tumorigenesis is Characterized by Expression of Human Endogenous Retroviruses
Danielle DeBacker Dang, BS, MA, MD; Tara Doucet-O'Hare; Jared S Rosenblum, MD; Sofie Mohlin; Ashish H. Shah, MD; Winson Ho; Alex Vortmeyer; Dorian McGavern; John D. Heiss, MD; Zhengping Zhuang

BrainLab Neurosurgery Award

The Role of Surgical Management for Prolactinoma in the Era of Dopaminergic Agonists: An International Multicenter Report
Matt Findlay; Mohammadmadhi Sabahi; Mohammed Azab; Richard Drexler; Roman Rotermund; Franz Ricklefs; Jörg Flitsch; Timothy Smith; John Kilgallon; John Kilgallon; Jurgen Honegger; Isabella Nasi-Kordhishti; Paul Gardner; Zachary Charles Gersey, MD; Hussein Abdullah; John Jane; Ulrich Knappe; Nesrin Uksul; Henry Schroder; Marton Eordogh; Marco

CONGRATULATIONS TO THE 2023 ABSTRACT AWARD WINNERS

Each year, merit-based abstract awards at the CNS Annual Meeting are granted to acknowledge the achievements of residents

Losa; Pietro Mortini, MD; Rudiger Gerlach; Apio Claudio Antunes; William T. Couldwell, MD, PhD; Karol P. Budohoski, MD; Robert Rennert, MD; Michael Karsy;

Columbia Softball Skull Base Surgery Award Skull Base Surgery Award

Integrated Clinical Genomic Analysis Reveals Xenobiotic Metabolic Genes are Downregulated in Meningiomas of Current Smokers

A. Basit Khan, MD; Rajan Patel, MD; Malcolm F. McDonald; Eric Goethe, MD; Collin English; Ron Gadot; Arya Shetty; Arif Harmanci; Akdes Harmanci; Tiemo Klisch, PhD; Akash J. Patel, MD

Elekta Tumor Section Award

Impact of Navigated Intraoperative Ultrasound on Brain Shift and Gross Tumor Resection

Timothy West; Mercy Mazurek; Shahaan S. Razak; Zsombor Gal; Nicole Perez; Akeive Burrows; Bryan D. Choi, MD; Brian V. Nahed, MD

Gladiator Award - 2023

The Impact of Tumor Mutational Status on Protoporphyrin IX Accumulation in Tumor-Associated Macrophages in Glioblastoma Patients

Emily Lock; Daniel Alexander Alber; Andrew Smith; Karl Lee Sangwon; Misha Movah-Ezazi; Todd Charles Hollon, MD; Eric Karl Oermann, MD; Daniel A. Orringer, MD

Integra Foundation Award

Intraoperative Functional Re-mapping Unveils Evolving Patterns of Cortical Plasticity

Sam Ng; Pablo Andres Valdes, MD; Sylvie Moritz-Gasser; Anne-Laure Lemaître; Hugues Duffau, MD, PhD; Guillaume Herbet

James Rutka Pediatric Tumors Award

Spatial Transcriptomic Profiling of T Cell Exhaustion Markers in Atypical Teratoid/Rhabdoid Tumor Subtypes

Brandon Lucke-Wold, MD

Journal of Neuro-Oncology Award

RNA Polymerase II Meningioma Mutations Activate Forebrain Neurodevelopmental Pathways

Victoria Elizabeth Clark, MD, PhD; Briana Prager; Susana Wilson-Hawken; Richard Young

Leica Proficient Surgical Tumor Award

Supra-maximal Extent of Resection is Associated with Improved Progression-free Survival in Patients with IDH Wild-type

Glioblastoma Once Negative TERT Promoter Molecular Margins are Achieved

William Smith; Elie Massaad; Joseph Bradley; Eric Esposito; William T. Curry, MD; Frederick George Barker, MD, FACS; Bob S. Carter, MD, PhD; Brian V. Nahed, MD; Daniel P. Cahill, MD; Ganesh Shankar, MD, PhD;

Lunsford and Leksell Radiosurgery Award

Elucidating the Immune Landscape of Radiation Necrosis Through Single Cell Analysis of Recurrent Brain Lesions in Patients After Stereotactic Radio Surgery

Stephanie Robert, MD, PhD; Emre Kiziltug; Benjamin Lu; Anna Arnal-Estape, PhD; Don Nguyen; Veronica Chiang, MD;

Mizuho Minimally Invasive Brain Tumor Surgery Award

Laser Interstitial Thermal Therapy for Primary and Recurrent Meningioma: A Prospective and Retrospective Multi-Institutional Study

Sangami Pugazenthi; William Leidig; Veronica Chiang, MD; Analiz Rodriguez, MD, PhD; Sujit S. Prabhu, MD, FRCS; Aden Pepe Haskell-Mendoza; Peter Edward Fecci, MD, PhD; Dimitris G. Placantonakis, MD PhD; Steven R. Abram, MD; Bradley Lega; Albert H. Kim, MD PhD

Rosenblum - Mahaley Clinical Research Award

Exceptional Responders to Base Excision Repair (BER) Inhibition for Recurrent Glioblastoma Display Enrichment for DNA Damage Response Pathways: RNA Sequencing Analysis from a Multicenter Trial

Ahmad Ozair; Jan Drappatz, MD; Xiaobu Ye; Michael Berens; Sen Peng; Sanhita Rath; Harshil Dhruv; Tobias Walbert; Matthias Holdhoff; Glenn Lesser, MD; Timothy F. Cloughesy; Andrew Sloan; Marta Couce; David Peereboom; Burt Nabors; Patrick Wen; Lisa R. Rogers, DO; Stuart Grossman; Manmeet Ahluwalia

Stryker Tumor Award

Towards Nose-to-Brain Inhibition of NFκB: Activity of a Novel p65 Inhibitor in Glioblastoma and Feasibility of Intranasal Delivery with a Near-Infrared Fluorescent HMC-Chitosan Nanoparticle

Miguel Eduardo Tusa Lavieri, BS, BA; Michelot Michel; Sarah Mohyeddinipour; Liron Israel; Hongqiang Wang, PhD; Ken Miyaguchi; Subashni Rajiv; Avradip Chatterjee; Junji Watanabe; Ramachandran Murali; John Yu

Stachstrong Award

Multi-omic Screening of Invasive GBM Cells in Engineered Biomaterials and Patient Biopsies Reveals Targetable Transsulfuration Pathway Alterations

Nikita Choudhary; Joseph Garcia; Erin Akins; Saket Jain; Kayla Wolf; Jason Zhang; Meeki Lad, MPH; Poojan Shukla; Sabraj Gill; Luis Carette; Allison Zheng; Sanjay Kumar; Manish Kumar Aghi, MD, PhD

Southeastern Brain Tumor Foundation (SBTF) Award

Microglia-Mediated Survival Outcomes in Preoperative Radiation for Glioblastoma: Insights from a Preclinical Model

Andrea Otamendi-Lopez; Beatriz Irene Fernandez Gil, PhD; Carla Vazquez-Ramos, BS; Yesesri Cherukuri; Steven Herchko; Mark E. Jentoft, MD; Melissa Murray; Yan Asmann; Daniel Trifiletti; Rachel Sarabia-Estrada, DVM, PhD; Alfredo Quinones-Hinojosa, MD

KLS Martin Tumor Award

Differential Gene Expression Underlying Glioma Related Epilepsy

Armin Mortazavi; Edwin Nieblas-Bedolla; Anas Khan; Ryan Carney; Kory Johnson, PhD; Kareem A. Zaghoul, MD, PhD

Globus Spine Oncology Award

Spinal Meningioma: An Institutional Case Series with Preliminary Results of Molecular Profiling

Khizar Rehan Nandoliya; Mark W. Youngblood, MD, PhD; Rahul Chaliparambil; Jean-Paul Wolinsky, MD

Zeiss Brain Tumor Award

Intraoperative Confocal Laser Endomicroscopy During 5-ALA Guided Glioma Surgery: Significant Considerations for Resection at the Tumor Margins

Irakliy Abramov; Yuan Xu; Giancarlo Mignucci-Jiménez; Joelle Nicole Hartke, MD; Evgenii Belykh; Randall Porter; Nader Sanai, MD; Kris A. Smith, MD; Jennifer Eschbacher; Mark C. Preul, MD

Sherry Apple Resident Travel Scholarship (WINS)

RNA Polymerase II Meningioma Mutations Activate Forebrain Neurodevelopmental Pathways

Victoria Elizabeth Clark, MD, PhD; Briana Prager; Susana Wilson-Hawken; Richard Young

NEUROSURGERY PAPER OF THE YEAR AWARDS

Each year, the CNS and **Neurosurgery Publications** honor the original papers that most significantly contributed to the field with the Neurosurgery Paper of the Year Awards



Medical student and co-author, Gabriela Ruiz Colon accepts the Paper of the Year award on behalf of Dr. John Ratliff.

TOP PAPER OF THE YEAR

The Top Paper of the Year was awarded to *“A Protocol for Reducing Intensive Care Utilization After Craniotomy: A 3-Year Assessment”*

Gabriela D. Ruiz Colón, BA; Rika Ohkuma, MD; Arjun V. Pendharkar, MD, MS; Boris D. Heifets, MD, PhD; Gordon Li, MD; Amy Lu, MD, MPH; Melanie Hayden Gephart, MD, MS; John K. Ratliff, MD

NEUROSURGERY PAPER OF THE YEAR AWARDS *continued*

Paper of the Year: Global

"Loss to Follow-up and Unplanned Readmission After Emergent Surgery for Acute Subdural Hematoma"

Bradley S. Guidry , Alan R. Tang, Harrison Thomas, Rut Thakkar, Anthony Sermarini, Robert J. Dambrino 4th, Aaron Yengo-Kahn, Lola B. Chambless , Peter Morone, Silky Chotai

Paper of the Year: Pediatrics

"Multidimensional Outcomes of Selective Dorsal Rhizotomy for Children With Spastic Cerebral Palsy: Single-Level Laminectomy vs Multiple-Level Laminotomy Techniques"

Zhexi He, Sui-To Wong, Hing Yuen Law, Lai Mio Miko Lao, Kwai Fong Helen Chan, Nerita Chan, Kwong Yui Yam

Paper of the Year: Pain

"High-Resolution Spinal Motor Mapping Using Thoracic Spinal Cord Stimulation in Patients With Chronic Pain"

Ilknur Telkes, Amir Hadanny, Marisa DiMarzio, Girish Chitnis, Steven Panicioli, Katherine O'Connor, Rachael Grey, Kevin McCarthy, Olga Khazen, Bryan McLaughlin, Julie G. Pilitsis

Paper of the Year: Peripheral Nerve

"Evaluation of Selective Tibial Neurotomy for the Spastic Foot Treatment Using a Personal Goal-Centered Approach: A 1-Year Cohort Study"

Corentin Dauleac, Jacques Luaute, Gilles Rode, Afif Afif, Marc P. Sindou, Patrick Mertens

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

"Neurosurgical Utilization, Charges, and Reimbursement After the Affordable Care Act: Trends From 2011 to 2019"

Andrew Hersh, Tara Dedrickson. Jung Ho Gong, Adrian E. Jimenez, Joshua Materi, Anand Veeravagu, John Ratliff, Tej D. Azad

Paper of the Year: Tumor

"Duration of Prophylactic Levetiracetam After Surgery for Brain Tumor: A Prospective Randomized Trial"

Maryam Rahman, Stephan Eisenschenk, Kaitlyn Melnick , Yu Wang, Shelley Heaton, Ashley Ghiaseddin, Marcia Hodik, Nina McGrew, Jessica Smith, Greg Murad, Steven Roper, Jean Cibula

Paper of the Year: Spine

"Acute Implantation of a Bioresorbable Polymer Scaffold in Patients With Complete Thoracic Spinal Cord Injury: 24-Month Follow-up From the INSPIRE Study"

Kee D Kim, K Stuart Lee, Domagoj Coric, James S Harrop, Nicholas Theodore, Richard M Toselli

Paper of the Year: Trauma and Neurocritical Care

"Time to Follow Commands in Severe Traumatic Brain Injury Survivors With Favorable Recovery at 2 Years"

Hansen Deng, Enyinna L. Nwachuku, Tiffany E. Wilkins, John K. Yue, Anita Fetzick, Yue-Fang Chang, Sue R. Beers, David O. Okonkwo, Ava M. Puccio

Paper of the Year: Stereotactic and Functional

"Piriform Cortex Ablation Volume Is Associated With Seizure Outcome in Mesial Temporal Lobe Epilepsy"

Brian Y. Hwang, David Mampre, Yohannes K. Tsehay, Serban Negoita, Min Jae Kim, Christopher Coogan, Alexander Eremiev, Adhith Palla, Carly Weber-Levine, Joon Y. Kang, William S. Anderson

Paper of the Year: Cerebrovascular

"Multinational Genome-Wide Association Study and Functional Genomics Analysis Implicates Decreased SIRT3 Expression Underlying Intracranial Aneurysm Risk"

Andrew T. Hale, Jing He, Jesse Jones

SANS Challenge Winners

Congratulations to these Residents, who beat out 12 teams from around the country to bring SANS Challenge glory to their programs.



1st Place
UNIVERSITY OF CALIFORNIA
SAN DIEGO



2nd Place
WALTER REED NATIONAL MILITARY
MEDICAL CENTER



3rd Place
MASSACHUSETTS
GENERAL HOSPITAL

INNOVATOR OF THE YEAR AWARD

Congratulations to Dr. Recai Yilmaz, who won the 2023 Innovator of the Year award for an AI project entitled: *"Intelligent Operative Surgical Bimanual Skills Monitoring and Feedback"*



IMAGINE

Recai Yilmaz MD
*Intelligent Operative Surgical Bimanual Skills
Monitoring and Feedback*

— CNS EXPERIENCE LOUNGE HIGHLIGHTS —



SPACE TO RELAX
AND CONNECT
WITH COLLEAGUES
AND PEERS

INNOVATE

BOOK SIGNING:

Safi Bahcall - *Loonshots: How to Nurture the Crazy Ideas That Win Wars, Cure Diseases, and Transform Industries*



— **CNS EXPERIENCE LOUNGE** —
continued

TOP 3 INNOVATOR OF THE YEAR FINALIST PRESENTATIONS

- *Provisional Ipsilateral Expandable Rod for Minimally Invasive Transforaminal Lumbar Interbody Fusion*
– Luis M. Tumialan
- *Development of a Percutaneous Endovascular Biomimetic Shunt (eShunt) for Treatment of Communicating Hydrocephalus*
– Adel Malek
- *Intelligent Operative Surgical Bimanual Skill Monitoring and Feedback*
– Recai Yilmaz

LIVE SURGERY PRESENTATIONS



- Microvention – *Complex bifurcation aneurysm treated with the Woven EndoBridge (WEB) Device*
- Synaptive Medical – *The World's First Exoscopic Fluorescence-Guided Live Surgery*
- Microvention – *Case: ICA aneurysm treatment with a novel surface modified flow diverter - FRED X*
- Longeviti Neuro Solutions – *Longeviti ClearFit SonoLucent Implants*
- Integra Lifesciences – *Minimally Invasive Intrinsic Glioma Resection Using Minimally Invasive Surgiscop*



INNOVATION IN MEDICAL ILLUSTRATION DEMONSTRATIONS

- *Josh Emerson*
- *Peter Lawrence*



CHAIR YOGA AND OTHER FITNESS ACTIVITIES WITH lululemon



Elad I. Levy, MD, MBA
President



Lola B. Chambless, MD
Annual Meeting Chair



Garni Barkhoudarian, MD
Scientific Program Chair



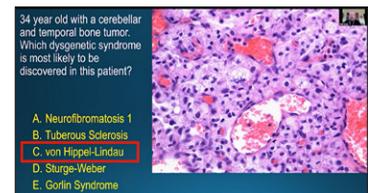
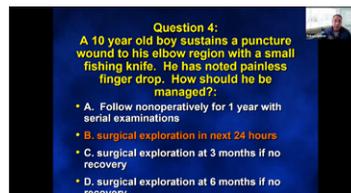
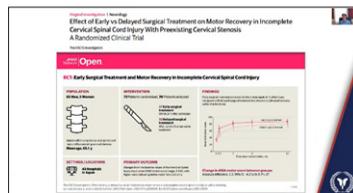
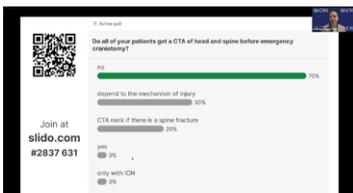
Edjah Nduom, MD
Vice-Scientific Program Chair

— EDUCATION DIVISION —

Under the continued leadership of Chair Nader Pouratian, as well as Co-Vice Chairs Tiffany Hodges and Akash Patel, the CNS Education Division built on the foundation laid in previous years with a focus in 2023 on developing high value, relevant and easily accessible educational content for neurosurgeons across all career stages and practice settings.



We again held four successful live courses, while continuing to deliver essential content to our members at home through four virtual courses, several of which reached record numbers of attendees this year. Additionally our micro-learning platforms saw dramatic growth, with more than 130 new podcasts, YouTube videos and webinars. All of this was accomplished through the efforts of more than 100 volunteer committee and work group members and over 250 faculty members.



Virtual courses, like the Neurosurgical Emergencies Course, Data Science Course, and our Oral Board and Written Board Examination Preparation Courses have proved to be a valuable and convenient way to deliver valuable content to members across the spectrum of neurosurgical practice.

— LIVE COURSES —

2023 Spine Complications Course

January 27 - 29, 2023 • Park City, Utah

In January, the CNS hosted the annual Spine Complications Course in Park City, Utah. One of CNS's longest standing and most popular courses, the Spine Complications Course uses an interactive case-based format to help attendees recognize factors that lead to complications and poor outcomes when treating spine disorders and discuss new and different strategies for how to best resolve spine surgery complications should they arise. Led by course directors, Drs. Daniel J. Hoh, Adam S. Kanter and Praveen V. Mummaneni, this program invited participants to present a complicated case of their own for discussion with peers and expert faculty on management and preventative strategies.

Total CME Claimed: (Hours)

173

2023 Tumor Complications Course

January 28-29, 2023 • Nashville, Tennessee

After a successful course in 2022, the CNS Tumor Complications Course continued for 2023. Providing a peer review forum for the discussion of complications related to brain tumor surgery, this intimate two-day course covered clinical decisions, operative techniques, and equipment-related issues. A team of subspecialty experts, led by Drs. Constantinos G. Hadjipanayis and Daniel M. Prevedello, passed along lessons learned and pointed out safety concerns to help attendees improve the surgical management of patients with brain tumors. Participants also discussed the impact of complications on patients and surgeon's well-being. In 2024 the Tumor Complications Course will be combined with the Spine Complications Course.

Total CME Claimed: (Hours)

66.5

Essentials for a Rewarding Neurosurgical Career

February 25-26, 2023 • Dallas, TX

Led by Drs. Ashok Asthagiri and Mark Hadley, along with nine other neurosurgical faculty, the Essentials Course is part of a comprehensive curriculum to guide participants through the transition period from senior residency to mid-career neurosurgeon. Topics included strategies for establishing a career focus; the value of mentorship and maintaining a peer network; working with your senior partner, chairman and hospital administration; and processes to establish effective physician-patient relationships that translate to an improvement in patient outcomes, patient safety, and patient satisfaction. Thanks to our generous corporate supporters, this course was offered complimentary to participants.

2023 Skull Base Course

September 1, 2023 • Cleveland, Ohio

This fall, the CNS once again gathered early career neurosurgeons in Cleveland, OH for the Skull-Base Fellows Course, led by Dr. Nicholas Bambakidis and a team of nineteen expert faculty. This rigorous two-day course combined lectures, case based discussions, and cadaveric dissections to cover the basic surgical approaches and anatomy required of every skull base neurosurgeon.

Total CME Claimed: (Hours)

83

— VIRTUAL COURSES —

SANS Written Board Review Course

January 21, 2023

In January, the CNS once again hosted the SANS Written Board Course online. Attendees took advantage of this opportunity to study together for the ABNS Primary Exam in an interactive format. The one-day intensive review, led by Drs. Khoi Than and Russell Lonser, provided summative didactic sessions covering the breadth of neuroanatomy, neurobiology, neuropathology, neuroimaging, neurology, neurosurgery, critical care, and core competencies—from synaptic physiology to cranial nerve anatomy to complex spine surgery. Each lecture incorporated live SANS questions to help learners test their knowledge through a combination of interactive polling, verbal questions and written response.

Oral Boards Review Course

March 4-5, 2023 & September 23-24, 2023

In 2023 the CNS continued to host our popular Oral Board Review Courses in a virtual format, to align with the format of the ABSN Exam. Virtual courses were held in March and September, with record attendance for the spring course. These highly interactive courses were designed to prepare surgeons for the case-based nature of the exam with multiple learning formats, including didactic, faculty vs. faculty quiz demonstrations, case presentations, small-group discussions and one-on-one sessions. This year's courses were led by Drs. Akash Patel and Robert Spinner, along with 20 other expert faculty. In addition to the virtual courses, we have continued to host post-course Hot Seat Monday sessions for course attendees with around 30-40 people participating each week. We also offered a registration option for just the Hot Seat Monday sessions for the first time this year.

Total CME Claimed: (Hours)

236.25

Neurosurgical Emergencies Course

March 15, 22, & 29, 2023

The CNS was proud to bring back this important virtual course designed for neurosurgeons, allied health staff and residents who work in neurosurgical emergency situations. This three-day virtual course was led by Drs. Martina Stippler, David Okonkwo, and Phil Taussky, and covered topics including aneurysm rupture, stroke care, anticoagulation reversal, spine stabilization, TBI operative care and hyper intense conversations. This year the course had record attendance, with an especially strong audience of physician extenders. The course featured multiple learning formats including didactic, panel discussions, case presentations and live polling.

Data Science Models for Neurosurgeons Course

June 3, 2023

In June 2023, the CNS once again held its Data Science Virtual Course designed for neurosurgeons and residents who will use data science in their research or hospital administrative duties. Led by Drs. Mohamad Bydon, Matthew Pease, Daniel Donoho and Daniel Sexton, the course provided an overview of various types of data science techniques, and covered organizing a data science project to build a prognostic model from data sets of neurosurgical patients, utilizing cutting edge methods in data science to analyze complex data structures not optimally modelled by standard statistical techniques, and identifying how interpretable artificial intelligence (AI) allows clinicians to understand how data science models prognosticate and assign importance to various model features. The course was presented using didactic and panel discussion.

Total CME Claimed: (Hours)

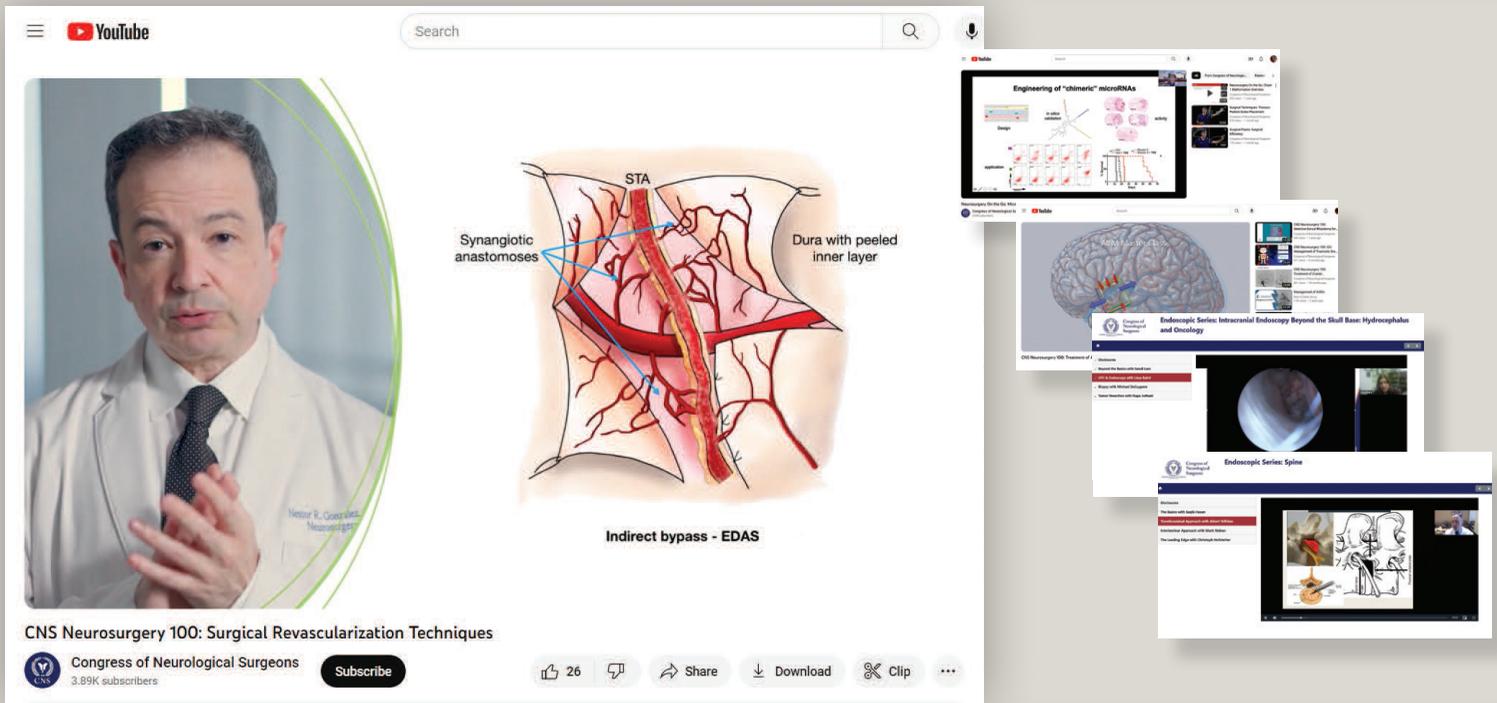
371.5

Total CME Claimed: (Hours)

18

— ONLINE LEARNING —

This year we offered 171 activities in the online catalog, which included podcasts, special series, online courses, and webinars. A total of 592 *AMA PRA Category 1* credits have been claimed to date.



Webinar Series

- The Endoscopic series was updated this year. Two new webinars on Endoscopic Spine and Intracranial Endoscopy Beyond the Skull Base: Hydrocephalus and Oncology were recorded for this series offering 2 and 1.75 CME respectively. These on demand webinars aim to help neurosurgeons expand their knowledge of endoscopic procedures and best clinical practice.
- Once again this year the CNS has offered its Hot Seat Monday Webinars following the Oral Board Review Course. For the first time these webinars were made available to an audience beyond the course attendees for a separate registration fee.
- In late 2023, the CNS began a partner webinar series with RosmanSearch on Career Guidance topics. These webinars will continue into 2024 and will be complimentary for CNS Members.

Podcasts

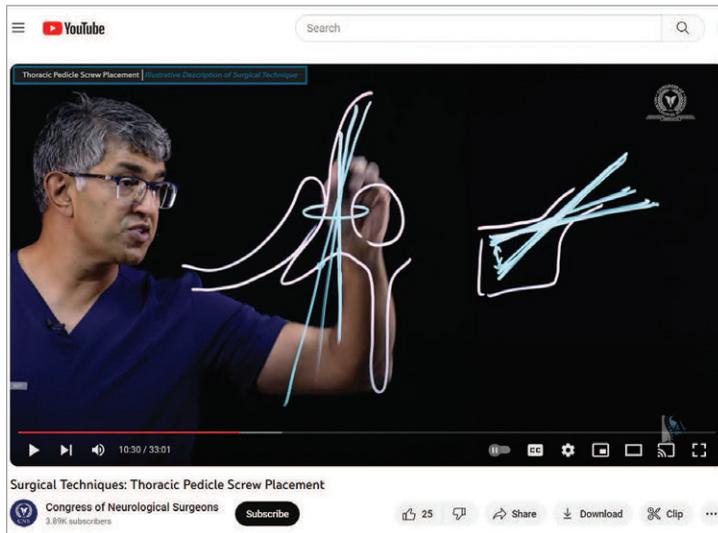
- The CNS recorded 12 monthly Journal Club Podcasts in 2023. These 30-minute podcasts are complimentary to all CNS members and had a combined total of 12,972 plays. Two new resident volunteers joined the committee this year. Thank you to our volunteer committee, led by co-chairs Kimberly Hoang and Rafael Vega for their efforts on this series.
- Controversies in Neurosurgery, led by co-chairs Seth Oliveria and Rushna Ali featured six episodes and had 5,162 total plays this year.
- Optimizing Neurosurgical Practice, led by co-chairs Brian Gantwerker, Amir Vokshoor, Lara Massie and Scott Zuckerman featured five episodes and had 4,231 total plays this year.

These two podcasts will alternate monthly. They are both complimentary and are non-CME.

— ONLINE LEARNING —

continued

YouTube

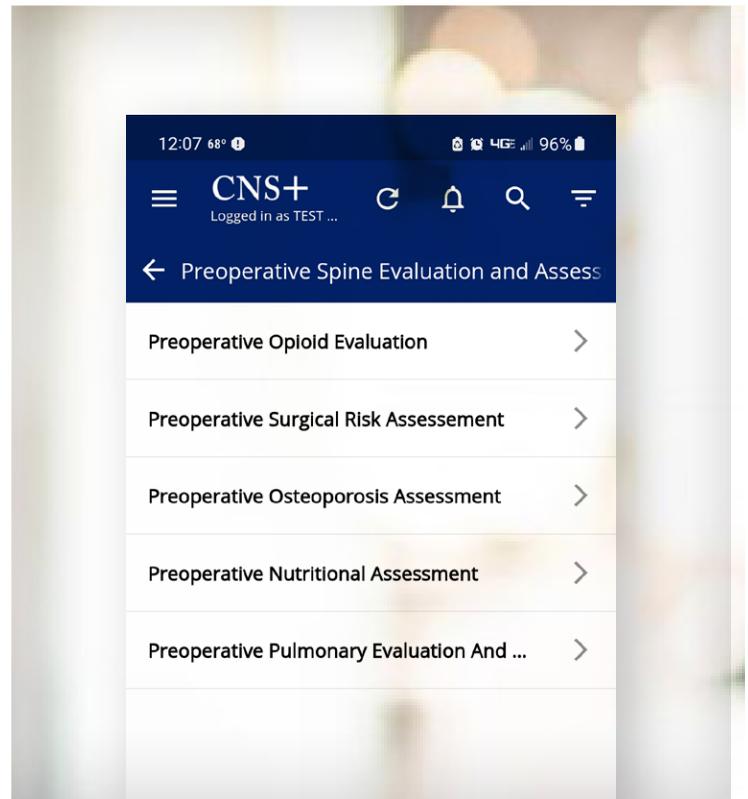


In 2023, we published over 115 videos to the CNS YouTube Channel, added 853 new subscribers to the channel, and increased channel views by 71.5%. The channel now includes the following content:

- **Neurosurgery On the Go** – Features webinar clips from CNS webinars as a teaser to the full product available on the CNS Website. (41 videos)
- **CNS Neurosurgery 100** – Features 10-15 minute lectures on key topics across Neurosurgery subspecialties. This series is scheduled to conclude in late 2023.
- **CNS Podcasts** – Cross posted audio from each CNS Podcast that is released.
- **Prasad Spine Academy** – This partnership mini series of videos highlights content contributed by Dr. Srinivas Prasad from his standalone channel, Prasad Spine Academy.
- **Journal Highlights** – Videos submitted by accepted authors with a manuscript published in *Neurosurgery*. This series expanded dramatically this year, quadrupling in the number of videos originally planned.
- **CNS Promotional Videos** – Course and Meeting promotional videos about upcoming CNS events and initiatives.

Online Education Subscription

Available exclusively to CNS Members, our online education subscription offers unlimited access to more than \$7,500 worth of online education and 150 hours of CME across all clinical and non-clinical areas of neurosurgical practice. \$14.99 per month | \$119 per year (482 subscriptions have been purchased since the subscription launched).



CNS+ App

CNS+ continues to grow and be your one stop mobile reference for Neurosurgery. The app allows members to easily access their purchased educational tools, including the Online Education Subscription, SANS, Flashcards, Neurolingo, and the Neurosurgery Survival Guide. Created by neurosurgeons, for neurosurgeons, the NSG is a quick reference, high-yield guide that encompasses key knowledge and information essential to neurosurgical care—from a rapid reference of protocols to a CPT codes and RVU reference guide.

— ONLINE LEARNING —

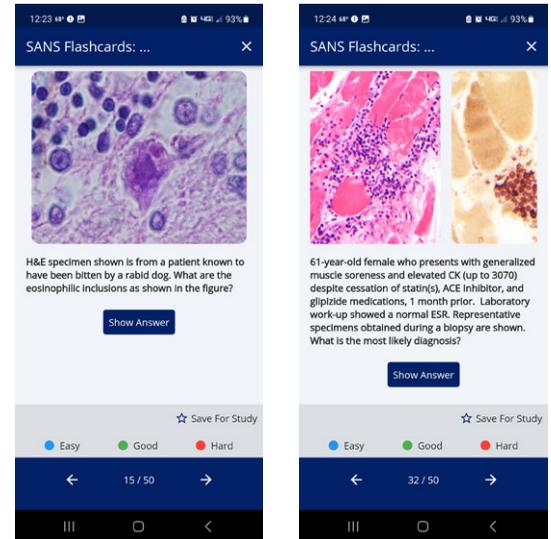
continued

— SANS —

In 2023, the SANS Committee continued to build upon our successful rollout of the CNS SANS ABNS Primary Board Examination Review, growing subscriptions for this essential tool for Primary Examination preparation. In June, we launched CNS SANS Flashcards, allowing for the swift study of Functional, Pain and Peripheral Nerve, Pediatrics, Spine, Trauma, Tumor, Neuropathology, Vascular, and Neuroanatomy topics via questions in a Flashcard format. With over 500 questions, the easy-to-use SANS Flashcards can be used for studying between cases or clinic patients. An additional 500 questions will be available in early 2024.

We also continued to offer a weekly SANS question on social media throughout the past year, expand access to SANS content and encouraging engagement from the membership. And in March, the committee ran a SANS countdown to the primary exam, featuring a question specifically geared to the exam each day for 10 days.

We are, as always, grateful to the volunteer members of the SANS committee who dedicate hundreds of hours every year writing, reviewing and updating questions to ensure all exams stay fresh and relevant to today's practice.



SANS by the numbers:

16

SANS
Exams

62

SANS Microlearning questions
on Social media

1508.25

AMA PRA Category 1 Credits
claimed

88

Programs using CNS SANS
ABNS Review Bundle

— NEXUS —

Thanks to over 250 authors and contributors, in addition to our many volunteers and section editors, the offerings provided by Nexus have continued to grow, building a robust case repository. The overall volume and quality of case vignettes, operative videos, and unique multimedia has steadily increased to 644 cases. This explosion in content has occurred across all domains, largely serving to increase cases in previously scant subspecialties

In addition to building new content, efforts to promote Nexus cases through microlearning educational tutorials have proven to be a resounding success. In these microlearning endeavors, Nexus cases are condensed down to short, edited videos or Tweetorials and then published across all CNS social media platforms. In addition to highlighting Nexus cases and learning pearls in easy to digest “on the go” vignettes, these social media blasts also lead users back to the Nexus platform, increasing traffic to the case repository so

users can benefit from its rich offerings. Altogether, this has substantially increased viewership within Nexus, which now routinely sees approximately 6,000 views per month.

In 2023, we made several improvements to the Nexus platform that will improve both the user experience and the submission process for authors and contributors. A new template for approaches was developed this year, allowing Nexus to showcase a surgical approach and link to cases throughout the platform that use that approach. A new approaches section launched this fall will be a focal point for future case submissions. Additionally, we developed a new oral board template and will be working in 2024 to populate this section with cases. This will provide an opportunity for early career neurosurgeons to walk through cases on their own or with a mentor in a manner that resembles the methodology experienced in the oral board. Earlier in the year, we launched an enhanced mobile view for better viewing and easier navigation, as well as a preview mode for authors submitting cases.

Nearly a decade after its conception, the case repository continues to grow, evolve, and thrive in the neurosurgical educational space. Nexus is a truly democratic effort within the CNS that anyone can volunteer to help build. Users are encouraged to login through the CNS website, review the Nexus content, and follow the “About” link to <https://www.cns.org/nexus/acknowledgements-volunteering> to learn how you can contribute.

The screenshot displays the CNS NEXUS website interface. At the top, there is a navigation bar with 'Cases', 'Approaches', 'About', and 'My Library' tabs, along with a search bar and logos for Medtronic and Stryker. Below the navigation bar, a 'Visual Filter' sidebar on the left lists various categories: Cranial, Fluorescence Guided Surgery, Laser Ablation, Motor Strip, Peripheral Nerve, and Spine. The main content area shows search results for 'Motor Strip'. It includes a search bar, a 'Your Selections' box with 'Motor Strip' selected, and a dropdown for '1 - 3 of 3 results' set to '10'. Three case cards are displayed, each with a thumbnail image, a title, a brief description, and the authors' names.

STAY CONNECTED TO CNS EDUCATION



Nexus Videos

Every month a new case is featured on social media with a video that is one minute or less



SANS Twitter Questions

A SANS question is posted to Twitter very week as an interactive poll

Follow [@CNS_Update](#) on Instagram

Follow [@CNS_Update](#) on Twitter

Follow [@CNS_Update](#) on Facebook

— EDUCATION DIVISION —
continued

EDUCATION DIVISION LEADERSHIP



Nader Pouratian, MD, PhD
Chair



Tiffany Hodges, MD
Co-Vice Chair



Akash Patel, MD
Co-Vice Chair

ONLINE EDUCATION LEADERSHIP



Khoi Than, MD
Chair



Theresa Williamson, MD
Vice Chair

SANS COMMITTEE LEADERSHIP



Laura Snyder, MD
Managing Editor



Theresa Williamson, MD
Co-Chair



Akash Patel, MD
Senior Advisor

NEXUS COMMITTEE LEADERSHIP



Khoi Than, MD
Chair



Theresa Williamson, MD
Vice-Chair

— CNS LEADERSHIP INSTITUTE —

Originally launched as the CNS Leadership in Health Care Course, the Leadership Institute has been expanded and refined over the past eight years into a comprehensive neurosurgical leadership training curriculum designed to empower neurosurgeons with the skills and resources they need to be leaders at each phase of their career. To date, more than 175 CNS Members have participated in the program, developing their leadership skills and business acumen while working on critical projects within their own institutions. We can count among our alumni three Neurosurgery Chairs, 12 Residency Program Directors, 15 current CNS Executive Committee members, and more than 100 members of standing committees, joint committees and editorial boards critical to our specialty.



The Leadership Institute curriculum is uniquely designed to help surgeons understand diverse perspectives, communicate across all levels of the organization, and more effectively lead teams and advance their projects. It covers both health care business content, such as hospital finance and health system alignment, as well as essential leadership skills like change management and communication strategies, in order to prepare neurosurgeons to engage in meaningful dialog with administrators.

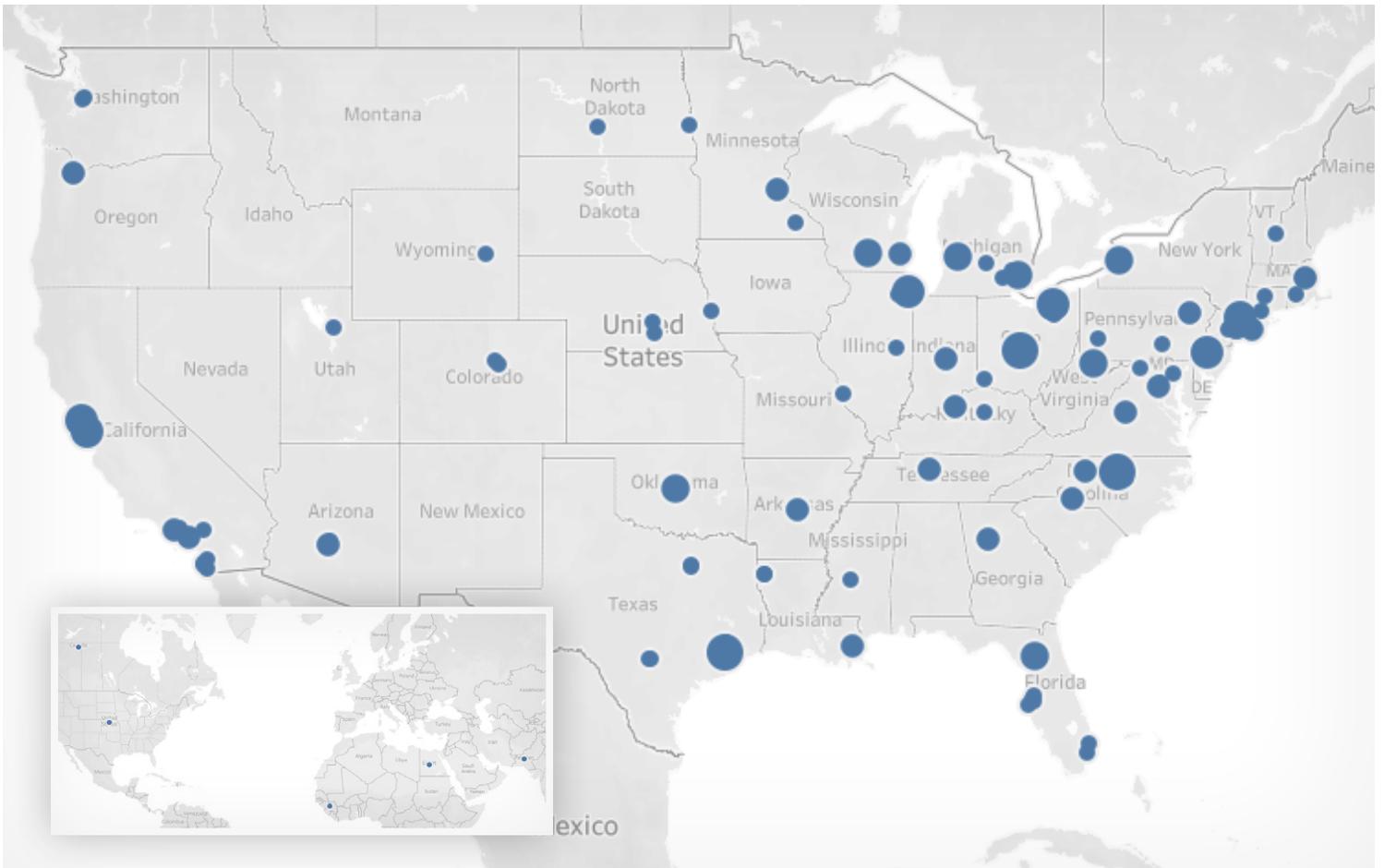
The 2023 CNS Leadership Institute kicked off its yearlong program with two intensive weekend training courses in Chicago—the

CNS Leadership in Health Care Course, designed for surgeons within five years of entering independent practice, as well as the Vanguard CNS Leadership in Health Care Course for those more tenured in their practice who are already in or are moving into formal leadership roles within their home institution. Each course was led by neurosurgeon leaders—Drs. Alan Scarrow and David Langer for the junior attending course, and Drs. Steven Kalkanis, Marjorie Wang and Ashwini Sharan for the Vanguard course—as well as a group of organizational communications and health care finance experts affiliated with the University of Illinois at Chicago, Henry Ford Health and Medtronic.

— CNS LEADERSHIP INSTITUTE —

continued

DISTRIBUTION OF LEADERSHIP FELLOWS THROUGHOUT THE UNITED STATES



More than 175 surgeons have participated in CNS Leadership Institute programs to date. Our alumni come from academic institutions, private practices, community hospitals and other practice settings across the US and around the world.

The learning from our weekend course was prefaced by a series of pre-requisite webinars and a leadership strengths assessment, and then extended through participants' completion of an individual leadership project, which they pursued within their home institutions. Participants applied the concepts learned from the weekend courses to these individual projects, gaining insight from faculty and peer mentors to overcome obstacles while working toward their personal and organizational goals. The in-person workshops in Chicago introduced analytical tools and facilitated small-group

discussion of real-world decision scenarios faced by administrative and neurosurgical leaders. This year's program also included a joint networking dinner where participants and faculty from both courses could connect and discuss their leadership challenges, as well as a shared negotiations session featuring a panel of all neurosurgeon faculty members.

Following the live courses, Leadership Institute fellows returned to their home institutions and practices to continue work on

— CNS LEADERSHIP INSTITUTE —

continued



their individual projects, armed with new knowledge, skills and connections to help them overcome obstacles and effect their desired change. The program concluded in September with a final report-out session during the CNS Annual Meeting where selected participants shared their progress and challenges around the leadership projects they were pursuing and gained feedback from their colleagues. The end result was a dynamic and adaptive learning experience unlike anything available in our specialty, which has been well received by participants and their mentors back home.

In today's health care environment, the role of a modern neurosurgeon includes health care leadership. Change management, communication and negotiation skills are as critical to the role as surgical training and knowledge. The CNS is proud to continue growing this essential program, and grateful for the continued support we have received from Medtronic, who has supported the Leadership Institute since the beginning.

The alignment of vision and synergy between our organizations' resources, have been instrumental in the program's growth and we look forward to expanding the program further in the years ahead.



2023 CNS Leadership Webinars

In early 2023, the CNS Leadership Institute offered current and past fellows an opportunity to participate in a two-part webinar series, presented by the Harvard T.H. Chan School of Public Health on Understanding Your Administrator, as well as a standalone webinar on "Value-Based Health Care Reform in the US: Is It Working?." These webinars were a great opportunity for our alumni at all stages of their leadership journeys to reconnect with their colleagues while continuing to build on their knowledge.

In August 2023, we hosted a Women in Leadership Webinar, offered exclusively to CNS Leadership Institute fellows and alumni, as well as current and past recipients of the CNS Foundation Future Women Leaders in Neurosurgery Scholarship. The session, moderated by Drs. Maryam Rahman and Rushna Ali, featured a panel discussion on various topics relevant to women in the field with Drs. Ellen Air, Marjorie Wang and Lola Chambless.



Ellen Air, MD
Chair



Anand Veeravagu, MD
Co-Chair



Brian V. Nahed, MD
Senior Advisor

— WASHINGTON REPORT —



Washington Report: Neurosurgery's Leap Forward in Health Policy

In a year of unprecedented challenges and opportunities, through its Washington Committee—chaired by past CNS president **Russell R. Lonser, MD**—and Washington Office, the Congress of Neurological Surgeons (CNS), alongside its partner, the American Association of Neurological Surgeons (AANS), has taken significant strides in advocating for the advancement of neurosurgery's [2023 Legislative & Regulatory Agenda](#). Engaging with members of Congress, navigating regulatory landscapes with pivotal agencies such as the Centers for Medicare & Medicaid Services (CMS) and the Food and Drug Administration (FDA), and collaborating with various health care stakeholders, the CNS has made impactful progress in legislative and regulatory realms crucial to neurosurgeons, their patients and the broader specialty.



AANS/CNS Washington
Committee for
Neurological Surgery

— WASHINGTON REPORT —

continued

Streamlining Prior Authorization: A Vision Nearing Reality

Dedicated efforts over the past six years to reform prior authorization culminated in substantial developments in 2023. As a leader of the [Regulatory Relief Coalition](#) (RRC), the CNS championed transparency and oversight, particularly within the Medicare Advantage (MA) program, resulting in legislative advancements like the [Health Care Transparency Act](#), which incorporated the neurosurgery-backed Improving Seniors' Timely Access to Care Act ([S. 3018/H.R. 3173](#) in the 117th Congress). The House Committee on Energy and Commerce Health Subcommittee also discussed the need for this legislation at an October [hearing](#), bringing additional attention to this vital topic.

In addition to legislative action, CMS also advanced two regulations to improve prior authorization in Medicare. The [first regulation](#), effective Jan. 1, 2024, requires MA plans to ensure that prior authorization approvals remain valid for a patient's entire course of treatment and that they follow traditional Medicare's national and local coverage policies. The [second regulation](#) will streamline prior authorization in MA, state Medicaid and Children's Health Insurance Program (CHIP) fee-for-service, Medicaid managed care, CHIP managed care and Qualified Health Plans on the federal exchange. The new rules, which take effect on Jan. 1, 2025, require, among other things, covered plans to:

- Implement an electronic prior authorization process;
- Reduce care delays by responding to prior authorization requests within 72 hours for urgent requests and seven days for standard requests; and
- Report the use of prior authorization, including specific reasons for denials and other prior authorization metrics.

CMS projects this rule could save providers more than \$15 billion by reducing administrative burdens associated with prior authorization.

Beyond prior authorization, the CNS continued to fight to eliminate Medicare's burdensome Appropriate Use Criteria (AUC) program for advanced diagnostic imaging. Under the program, neurosurgeons ordering advanced imaging must demonstrate they consulted with AUC decision support tools before scans can be performed. In the 2024 Medicare Physician Fee Schedule final rule, CMS indefinitely paused the program and rescinded the current regulations.



Championing Fair Reimbursement: A Steady Fight for Equity

The CNS's unwavering commitment to ensuring fair reimbursement for neurosurgeons has yielded positive outcomes, including legislative efforts to prevent Medicare payment cuts and reforming out-of-network payment dispute resolution. Neurosurgeons faced a 3.4% Medicare cut in 2024, necessitating short-term relief. In addition, the CNS continued to champion long-term reform to reform the Medicare physician payment system in line with [principles](#) developed by organized medicine.

Two bills were introduced in the U.S. House of Representatives to provide a more sustainable payment system. One bill, the Strengthening Medicare for Patients and Providers Act ([H.R. 2474](#)), would establish an automatic annual inflation-based payment update based on the Medicare Economic Index. The MEI reflects increases in physician practice costs and would reverse a downward spiral of Medicare physician payments, which have [failed to keep pace](#) with inflation (physician payment declined 30% from 2001 to 2024 when adjusted for inflation), jeopardizing the viability of physician practices and patients' timely access to care. Another bill, the Provider Reimbursement Stability Act ([H.R. 6371](#)), would reform the budget neutrality requirements to add crucial stability and predictability to Medicare physician payments by requiring CMS to, among other things:

- Reconcile inaccurate utilization projections based on actual claims;
- Raise the budget neutrality threshold from \$20 million to \$53 million;
- Update practice expense inputs, such as clinical labor costs, at least every five years; and
- Limit the year-to-year conversion factor variance to no more than 2.5% each year.

The CNS also vigorously advocated for short-term relief to prevent the 3.4% payment cut. Multiple bills were introduced to stave off this cut, but Congress failed to act before the end of 2023, allowing the cut to take effect, at least temporarily. In early 2024, the CNS continued its efforts to reverse the cut, and in early March, Congress passed the Consolidated Appropriations Act, 2024 ([H.R.4366](#)), partially reversing the Medicare payment cut that went into effect on Jan. 1. The legislation reduced the cut by half, providing a 1.68% increase in current payment levels for the remainder of 2024.

Finally, significant victories in federal court regarding ongoing challenges to the rules implementing the [No Surprises Act](#) and CMS's acceptance of CNS-recommended values for neurosurgical codes

— WASHINGTON REPORT —
continued



White House Fellows on Stage



Neurosurgeon resident, **Jordon Xu**, MD, meets with Rep. **Ami Bera**, MD (D-Calif.)



Neurosurgery resident **Alex Tenorio**, MD, with Rep. **Lou Correa** (D-Calif.)

— WASHINGTON REPORT —

continued

mark critical steps toward equitable compensation for the invaluable services provided by neurosurgeons. Examples of the Coding and Reimbursement Committee — chaired by **G. Edward Vates**, MD — resulting in several positive outcomes included:

- Medicare’s adoption of CNS recommended values for several neurosurgical codes for the 2024 Medicare Physician Fee Schedule, including new skull-mounted cranial neurostimulator pulse generator insertion, replacement and removal procedures;
- Expanded indications for Medicare’s coverage of carotid artery stenting;
- Reversal of a Medicare edit prohibiting reporting of spinal fusion CPT codes 22630, 22632, 22633 and 22634 with add-on decompression CPT codes 63052 and 63053;
- Favorable coverage policy for interstitial laser thermal therapy from Highmark Blue Cross Blue Shield and Aetna; and
- Updated coverage policy from Cigna for magnetic resonance (MR)-guided focused ultrasound (MRgFUS) to treat essential tremor.

Fueling Advances in Research and Education: A Foundation for Future Excellence

Recognizing the imperative for increased research funding and support for resident training, the CNS has actively lobbied for legislative backing in areas such as brain aneurysm research and pediatric cancer funding. To this end, the CNS endorsed Ellie’s Law ([S. 895/H.R. 902](#)), which would authorize \$10 million in funding for the National Institute of Neurological Disorders and Stroke to further knowledge and understanding of brain aneurysms and how to manage and treat this condition effectively. Additionally, the CNS advocated for the passage of the Gabriella Miller Kids First Research Act 2.0 ([S. 1624/H.R. 3391](#)), which would increase National Institutes of Health funding for research on pediatric diseases and disorders at the National Institutes of Health (NIH). Both were approved by the Senate Committee on Health, Education, Labor and Pensions and the House Committee on Energy and Commerce Committees.

Moreover, the advocacy for additional Medicare-sponsored residency positions and medical student debt relief highlights the CNS’s role in addressing the looming physician shortage, ensuring the sustainability of quality health care services. To help ease this shortage and support quality resident training and education, the CNS successfully advocated for the re-introduction of bipartisan legislation to add 14,000 Medicare-sponsored residency training positions — the Resident Physician Shortage Reduction Act ([S. 1302/H.R. 2389](#)). The CNS also supported legislation — the Resident Education Deferred

Interest Act ([S. 704/H.R. 1202](#)) — to defer medical student loan interest during a medical internship or residency program.

Navigating Medical Liability Challenges: Limited Progress Made

In the face of ongoing challenges related to medical liability, the CNS has persistently advocated for sensible reforms. While progress on advancing comprehensive medical liability reform stalled, and despite strong headwinds in Congress, the CNS successfully advocated for the introduction of the Good Samaritan Health Professionals Act ([H.R. 2819](#)), which would offer health professionals providing voluntary care in response to a federally declared disaster with medical liability protections.

Pioneering Medical Innovation: Shaping the Future of Neurosurgery

The CNS has continued to foster innovation and access to new technologies, working closely with the FDA and advocating for federal policies that promote excellence in patient care. The Drugs and Devices Committee, headed by **Joshua M. Rosenow**, MD, continued its advocacy by participating in the FDA [Network of Experts](#) program, which provides FDA reviewers with real-world feedback from practicing neurosurgeons. Additionally, the committee partnered with the FDA to launch a new [Total Product Lifecycle Program](#) pilot to provide early neurosurgical guidance for manufacturers of breakthrough devices.

Addressing the Nation’s Firearms Crisis: Improving Safety

The CNS continued to support efforts to improve safety and reduce gun violence. The Washington Committee Firearms Task Force concluded its work, publishing the results from a firearms [survey](#) and updated [position statement](#), which the CNS, AANS and other neurosurgical organizations endorsed. The CNS also continued to participate in the [Gun Violence Prevention Research Roundtable](#), a coalition organized by the American Academy of Pediatrics, whose mission is to obtain federal funding for research on firearms injuries. CNS Executive Committee member **Akash J. Patel**, MD, serves on the coalition’s advisory committee. Congress has appropriated more than \$50 million to the NIH and Centers for Disease Control and Prevention for this research. Finally, the CNS joined the Healthcare Coalition for Firearm Injury Prevention through the Washington Committee. This coalition, led by the American College of Surgeons and others, aims to reduce the rate of firearm injury across the United States via a non-partisan, public health approach. Neurosurgery’s representatives to this group include **Jonathan E. Martin**, MD, **Jason M. Schwalb**, MD and **Krystal L. Tomei**, MD.

— WASHINGTON REPORT —

continued

Taking Neurosurgery's Policy to the Next Level: Advocacy at the AMA

Neurosurgery's delegation to the American Medical Association (AMA) continued to advance health policy ideas through its leadership in the AMA. Led by **Ann R. Stroink**, MD, CNS delegate and chair of the delegation, the team tackled myriad issues — including Medicare physician payment, prior authorization, physician non-competes, hospital transparency and accountability, physician network adequacy and resident interview processes. The CNS and AANS delegates include **Maya A. Babu**, MD; **Michael Feldman**, MD; **Laura Stone McGuire**, M; **Joshua M. Rosenow**, MD, AANS Delegate; **Jason M. Schwalb**, MD, CNS Delegate; **Krystal L. Tomei**, MD, AANS Delegate.

Highlighting the Importance of Health Policy: Resident Fellowships in DC

During a special session at the 2023 Annual Meeting in Washington, DC, the CNS hosted a conversation with neurosurgeons who had served as White House fellows. Former fellows participating in this engaging discussion included **Jeffrey Nadel**, MD (2022-23); **Jeremy Hosein**, MD (2018-2019); **Lindsey B. Ross**, MD (2016-2017); **Anand Veeravagu**, MD (2012-2013) and **Sanjay K. Gupta**, MD (1997-1998). During this prestigious fellowship, these individuals served in the White House, the U.S. Department of Defense, the U.S. Department of Health and Human Services and/or the U.S. Department of Veterans Affairs. The White House Fellows Program was created in 1964 by President **Lyndon B. Johnson** to give promising American leaders “first hand, high-level experience with the workings of the Federal government, and to increase their sense of participation in national affairs.”

The 2022-23 Washington Committee/AMA Fellows class also concluded their outstanding service. Guided by **Laura Stone McGuire**, MD (University of Illinois at Chicago), she and her alternate fellows **Aladine A. Elsamadicy**, MD (Yale University), **Michael J. Feldman**, MD (Vanderbilt University) and **Jordan C. Xu**, MD (University of California, Irvine) made lasting contributions to neurosurgery through their policy and advocacy work.

Amplifying Neurosurgery's Voice: Engaging Broader Audiences

Beyond its direct lobbying and grassroots advocacy, the Washington Committee garners support for neurosurgery's health policy positions by carrying out a nationwide earned media campaign and by providing the media with timely information that can be used for their reporting. These efforts included op-eds, letters to the editor and briefings with reporters, resulting in multiple articles published in such media



Former CNS Executive Committee member, **Maya Babu**, MD, with Rep. **Greg Steube** (R-Fla.)

outlets as *1819 News*, *AL.com*, *The American Spectator*, *Becker's ACS*, *Becker's Spine Review*, *Fierce Healthcare*, *Health Exec*, *The Hill*, *Inside Health Policy*, *Lincoln Star Journal*, *Los Alamos Daily Post*, *Los Angeles Times*, *Medical Economics*, *MedPage Today*, *Medscape*, *News Medical* and *NPR*. This strategic communication underscores the CNS's role as a leading voice in health policy debates, advocating for policies that enhance the practice of neurosurgery and patient care.

In addition, the Washington Office's digital media platforms continued to expand significantly, amassing an audience of more than 120,000. These communication tools include:

- [Neurosurgery Blog: More Than Just Brain Surgery](#), a web-based opinion and perspective column through which the CNS offers insights and perspective on contemporary health issues as they relate to organized neurosurgery; and
- Social media platforms, including [X \(formerly Twitter\)](#), [Facebook](#), [Instagram](#), [LinkedIn](#) and [YouTube](#).

— GUIDELINES PROGRAM —



Since 2012, the CNS has demonstrated its commitment to the development of neurosurgical guidelines by supporting an in-house infrastructure, including robust methodological processes, to produce high-quality evidence-based clinical practice guidelines. The CNS Guidelines Department supports over 200 volunteers in all aspects of the development process, from topic refinement and development of clinical questions to publication and dissemination.

In 2023, the CNS continued to advance the practice of neurosurgery through the development of clinical practice guidelines. Approximately 200 members of the CNS Guidelines Committee and its associated task forces, under the direction of Drs. Mohamad Bydon (Chair) and Anand Veeravagu (Vice Chair), published two guidelines and continued work on eleven guidelines in development as well as four new practice parameters.

The CNS also continues to advance an unprecedented and successful three-year partnership with the Section on Disorders of the Spine and Peripheral Nerves to publish a comprehensive Perioperative Spine Guideline, including three parts (preoperative, intraoperative and postoperative). This initiative, is funded by a generous donation from the Section on Disorders of the Spine and Peripheral Nerves to the CNS Foundation

Program Highlights

- Eleven guideline topics and four practice parameters are currently in development
- CNS Guidelines Podcast Series publishes new episodes monthly.
- New topics to be published in 2023 include:
 - Occipital Neuralgia Update
 - Chiari Malformation
- New Topics anticipated to be published in 2024
 - Brain Metastases: Emerging Therapies Update
 - Perioperative Spine: Intraoperative
 - Functioning Pituitary Adenoma
 - Low Grade Glioma Update
 - Vestibular Schwannoma Update
 - Ulnar Nerve
 - Spinal Cord Stimulation



Mohamad Bydon, MD
Chair



Anand Veeravagu, MD
Vice Chair

— DATA SCIENCE INITIATIVES —

As part of our mission to advance health and improve lives, the CNS is committed to the development and evaluation of novel strategies that improve data science initiatives related to neurosurgery. In keeping with our focus on education, CNS also strives to help educate practicing neurosurgeons to apply these data science tools in their own practice to improve health outcomes.

2023 Program Highlights

Data Science Scholar Program: The CNS and Viz.ai partnered in 2023 to continue the CNS Data Science scholarship, designed to provide residents with structured mentorship in the use of advanced data science techniques, including artificial intelligence, for research and practice improvement in neurosurgery. Dr. Lauren Stone was selected as the 2023-24 recipient for her project focusing on adaptive, AI-driven learning as the next frontier in educational theory.



Dr. Lauren Stone was selected as the 2023-24 recipient for her work studying adaptive, AI-driven learning as the next frontier in educational theory. Dr. Stone will be working with CNS SANS to develop an adaptive learning module for ABNS written boards preparation that will use both a spaced-repetition algorithm and a subject-repetition algorithm, recognizing the patterns in user's answers and targeting questions and resources to bolster understanding in areas of deficiency.

DR.LAUREN STONE

Abstract Award: Congratulations to our 2023 Data Science Abstract award winner, Dr. Daniel Alexander Alber

Deep Learning-Based Image-to-Image Translation to Identify Macrophage Infiltration in High-Grade Glioma Using Label-Free Stimulated Raman Histology Daniel Alexander Alber; Eric Karl Oermann, MD; Karl Lee Sangwon; Todd Charles Hollon, MD; Emily Lock; Daniel A. Orringer, MD; Misha Movah-Ezazi; Andrew Smith



CNS continued to offer a virtual Data Science Course in 2023, **Data Science and Image Analysis for the Neurosurgeon** provided an overview of various types of data science techniques, with a focus on image creating interpretable models to predict clinical outcomes. For more details, see the Education Division report on page 33.



Sharona Ben-Haim, MD
Chair

— STRATEGIC PARTNERSHIPS —

Collaborating with Organized Neurosurgery to Advance Neurosurgical Training and Patient Care

The Congress of Neurological Surgeons is committed to partnering with adjacent specialty and subspecialty societies to develop content and programs that advance neurosurgery and ultimately improve patient care. To that end, we continued to advance our partnership with the Sections and other neurosurgical organizations in 2023.

Section Partnerships

For years, the CNS has partnered with the Sections, leveraging our reputation for relevant content, evidence-based guidelines development, and innovative program delivery with the Sections' subspecialty expertise to deliver unparalleled educational programs and resources and provide outstanding service to members and volunteers

Section on Pediatric Neurological Surgery

2023 Joint Pediatric Section Annual Meeting



November 29-December 2, 2023

Omni Oklahoma City Hotel
OKLAHOMA CITY



NEW FRONTIERS IN PEDIATRIC NEUROSURGERY

The CNS was honored to partner again with the Section on Pediatric Neurological Surgery for their 2023 Annual Meeting held in Oklahoma City, Oklahoma November 28-December 2, 2023. The 2023 Annual Meeting, themed **New Frontiers in Neurosurgery**, welcomed 302 in-person medical attendees and 38 virtual attendees. Under the leadership of

Section Chair, L Matthew Smyth and Annual Meeting Chair/ Local Host, Andrew Jea, the Scientific Program Committee presented two and a half days of plenary sessions, four luncheon seminars and spirited debates on controversial topics. Featured keynote speakers included Coach Patti Gasso, Head Coach, University of Oklahoma Softball; Peter

Hotez, Dean, National School of Medicine, Baylor College of Medicine. Over 70 abstracts were presented during the general session. In addition to the scientific program, the Section hosted valuable networking events where many members connected with their colleagues.

— STRATEGIC PARTNERSHIPS —

*Collaborating with Organized Neurosurgery to Advance Neurosurgical Training and Patient Care
continued*

2023 Tumor Section Symposium

September 8-9, 2023 | Washington, D.C.

After a successful symposium in Austin, TX in 2021, the CNS was excited to partner again with the Tumor Section, for their 2023 Tumor Section Symposium, focused on neurosurgeons as clinical scientists and managing recurrence in neuro-oncology. A team of subspecialty experts, led by Section Chair, Dr. Isabelle M. Germano and Dr. Gelareh Zadeh, explained the application of innovative treatment strategies for patients with brain and spine tumors at diagnosis and recurrence. There was discussion on new advancements in technology and brain tumor science and their relevance to treatment approaches and outcomes, as well as on advances in the evaluation and management of pituitary disease and opportunities to develop as clinician-scientists.



Section on Disorders of Spine & Peripheral Nerves

The CNS also continues an unprecedented and successful three-year partnership with the Spine Section to publish a comprehensive Perioperative Spine Guideline, including three parts (preoperative, intraoperative and postoperative). Through this initiative, funded by a generous donation from the Spine Section to the CNS Foundation, the CNS published the first guideline on perioperative spine in 2021 and developed the second, Perioperative Spine: Intraoperative, in 2023 with plans to publish it in 2024.



SpineSection.org

AANS/CNS Section on Disorders
of the Spine and Peripheral Nerves

Cerebrovascular Section



volunteers receive outstanding service and support.

In 2023, the CNS also partnered with the CV Section to deliver three webinars and two online town halls.

The CNS continues to manage the Section on Cerebrovascular Neurosurgery's administrative and Executive Committee business. This partnership has proven extremely valuable over recent years, helping the CNS better understand and anticipate the needs of cerebrovascular surgeons, and ensuring that CV Section members and

- **CV Section Town Halls**

- **February 21:** Young Investigators Award.
- **October 24:** SNIS and AANS Annual Meeting Updates From the CV Section Chair and Discussion with the DEI Committee.

- **CV Section Webinars**

- **March 21:** Distal Atypical Aneurysms: Open & Endovascular Reconstructive vs. Deconstructive Treatment Options.
- **May 30:** Management of Acute Tandem Occlusions
- **July 25:** Management of Small Ruptured Aneurysms

— STRATEGIC PARTNERSHIPS —

Collaborating with Organized Neurosurgery to Advance Neurosurgical Training and Patient Care
continued

Neurosurgical Society Partnerships

In 2023, the CNS continued to extend its impact throughout neurosurgery by partnering with two key neurosurgical societies.

American Academy of Neurological Surgery (AAcNS)

The CNS also had the privilege of partnering again with the American Academy of Neurological Surgery (AAcNS) in 2023, administering membership dues, and managing the organization's website and abstract center. New this year, the CNS was the provider of CME for the 2023 Academy Meeting, October 4-7, 2023 in Sea Island, Georgia at the Cloister at Sea Island.

The Academy focuses on promoting, sponsoring and mentoring laboratory, translational, and clinical research in the neurological sciences, and CNS's expertise in abstract management is sure to enhance their success over the course of the partnership.

americanacademyns.org



American Academy
of Neurological Surgery

Society of Neurological Surgeons

The CNS was honored to continue to grow its partnership with the Society of Neurological Surgeons (SNS) in 2023, managing the Society's administrative, membership and website support.

The CNS once again managed the Society's Annual Meeting, held May 20 – 22, 2023. The meeting was titled Next Generation Neurosurgery and was hosted by UT Southwestern, attracting 315 attendees to Dallas, Texas. General Session topics included "What Residency Program Directors Need to Know," "Training the Next Generation: Career Development for Neurosurgical Educators," and "Facilitating the Next Generation: Leading Neurosurgery Departments via Productive Collaborations." The Keynote Speech was a Fireside Chat with Mark Cuban, moderated by Drs. Nader Pouratian and Jonathan A. White, and the Winn Prize Lecture: Deciphering the Neural Code of Speech was delivered by Dr. Edward F. Chang.

In addition, the CNS partnered with the Society on a series of seven new webinars over the course of the year, as well as managing the Society's entire suite of trainee programs. The Intern Boot Camp, hosted as a virtual course on July 14, 2023, is a basic skills course designed to prepare PGY1 Residents for their first year of training. Each course includes cranial skills training as well as neurosurgical bedside procedures. Incoming PGY1 neurosurgical residents in ACGME accredited programs (227 interns) participated in cranial skills training as well as neurosurgical bedside procedures. along with invited faculty members. The Junior and Senior Resident courses were also hosted virtually. The Junior course on

March 31 was designed for current PGY1 Residents and covered topics ranging from Risk Management and Professionalism to Quality Improvement Project/Work Group, and How to Get Published. While two Senior courses on March 4 and November 11 covered topics like Job Optimization and Practice Building, Contracts and Negotiations, Personal Finance, and Medical Legal. Finally, the CNS partnered with the society to manage the RUNN Course for PGY-3 and PGY-4 residents October 21 – 28, 2023 at the Marine Biology Laboratory in Woods Hole, Massachusetts. The Mission of the course is to provide an introduction to and update of the latest concepts, hypotheses and methods of neurobiology and neuroscience relevant to neurological surgery.

The SNS, which comprises US academic department chairs, residency program directors, and other educational leaders, serves as the representative body for neurosurgery to the Accreditation Council for Graduate Medical Education, and plays a critical role in graduate and post-graduate education of Neurosurgical Residents and Fellows, making it a natural partner for the CNS and our commitment to providing educational and career development support for neurosurgeons at all career stages.

societyns.org



The Society of
Neurological Surgeons

SNS Webinars

- **February 15:** The New Economics of Academic Medical Centers

SNS Medical Student Committee Webinars

- **January 18:** Navigating Campus Visits and the Rank List (*For Neurosurgery Residency Applicants*)
- **May 25:** What Makes a Great Sub-I (*For Neurosurgery Residency Applicants*)
- **May 31:** Neurosurgery Program Directors Town Hall - Preference Signaling and Interview Processes for 2024
- **July 12:** Neurosurgery Applications and Signaling - What You Need to Know (*For Neurosurgery Residency Applicants*)
- **August 16:** Best Practices for Residency Interviews: Guidelines for Programs
- **November 6:** Presenting Your Best Self in Interviews

— THE CNS FOUNDATION REPORT —



CNS Foundation Board of Directors

Front Row (L to R): Brian Nahed, Tiffany Hodges, Akash Patel, Martina Stippler (Chair), Daniel Hoh, Sarah Woodrow

Second Row (L to R): Regina Shupak (CEO), Brian Crawford, Jeremy Phelps, David Berg, Khoi Than, Ellen Air, Nick Bajema, Scott Simon, Paul Gardner, Laura Snyder

Not pictured: Nicholas Bambakidis, Ruth Bristol, Alexander Khalessi, Elad I. Levy, James (Jim) Marucci, Nathan Rowland, Usma Samadani, Clemens M. Schirmer, Anand Veeravagu, Ashwin Viswanathan, Ray (Zach) Wilson

Dear supporters of the CNS Foundation,

It has been a great honor to serve as your Chairs of the CNS Foundation. As well, we are profoundly humbled by your generous support of the philanthropic work done by our mighty team of Board members. You will see below that 2023 was a major year of giving back more than \$728,000 in awards and programs that truly and positively impact the careers of our future neurosurgeons and the well-being of patients around the world. The CNS Foundation Board expresses sincere appreciation to Medtronic, Stryker, MicroVention, and many generous donors, for making these awards possible. Please give your attention and your thanks to the long list of our donors on pages 58-59. We also wish to thank the many volunteer mentors who have given their time to educate our growing number of awardees. Together, we are making profound contributions to neurosurgery and improving patient care around the world.

This incredible impact requires a commitment to what we have created and I ask you to continue your support in 2024. Our awardees and the future of neurosurgery depend on you, me, and every volunteer who has given time to the CNS Foundation.



Sincerely,

Martina Stippler, MD

CNS Foundation Chair

CNS Secretary

— THE CNS FOUNDATION REPORT —
continued



2023 CNS Foundation award recipients.

— International Pillar Awards —

OBSERVERSHIPS

Arnold Bhebhe – Zambia

Mentored by Brian Nahed at
Harvard University

Yunus Kuntawi Aji – Indonesia

Mentored by Khoi Than at
Duke University

Ken Njau Mwangi – Kenya

Mentored by Isabelle Germano at
Mount Sinai

Guido Caffaratti – Argentina

Mentored by Riccardo Komotar at
Miami University

Muhammad Arifianto – Indonesia

Mentored by Juan Fernandez-
Miranda at Stanford

VISITORSHIP

**Mission Brain:
HIDRA Study**

Andre Monteiro – UBNS

— THE CNS FOUNDATION REPORT —

continued

— Diversity, Equity, and Inclusion Pillar Awards —

DEI SCHOLAR AWARD

Jacob Greenberg

Washington University School of Medicine

William Ashley

Sinai Hospital of Baltimore

Nicholas Laskay

University of Alabama at Birmingham



DEI Impact Award

C. Rory Goodwin

Duke University

DEI PILOT PROJECT

Alankrita Raghavan – *Duke University*

Alexandra G. Larsen – *New York Presbyterian Hospital – Weill Cornell Medical Center*

DEI THINK TANK

Matthew Anderson – *Brown University*

Sonia Eden – *Semmes Murphey Clinic and UTHSC*

Damirez Fosset – *Howard University*

Tessa Harland – *Albany Medical College*

Cleresa Roberts – *UVA Health*

2023 CNS FOUNDATION ABSTRACTS IN DEI: HEALTHCARE DISPARITIES

Rohaid Ali – *Brown University*

Jean-Luc Kabangu – *University of Kansas*

Momodou Bah – *Michigan State University*

2023 FUTURE WOMEN LEADERS IN NEUROSURGERY SCHOLARSHIPS

Tracy Flanders – *University of Pennsylvania Perelman School of Medicine/Children's Hospital of Philadelphia*

Maya Bhattachan – *Department of Neurological Surgery at the Nepal Medical College Teaching Hospital*

— THE CNS FOUNDATION REPORT —
continued

CNS GUIDELINES PILLAR AWARDS

George Koutsouras - SUNY Upstate, 2023 CNSF Quality Guidelines Scholar

CLINICAL SCIENTIST CAREER DEVELOPMENT PILLAR AWARDS



Iahn Cajigas Gonzales



Rosalind Lai



Ethan Winkler

NINDS/CNS GETCH K12 SCHOLAR AWARD

Iahn Cajigas Gonzales, *Penn Medicine* / NINDS/CNS Getch K12 Scholar Award

CV SECTION / CNS FOUNDATION YOUNG INVESTIGATOR'S AWARD

Rosalind Lai, CV Section / CNS Foundation Young Investigator's Award
Sponsored by the Cerebrovascular Section

Ethan Winkler, CV Section / CNS Foundation Young Investigator's Award
Sponsored by the Cerebrovascular Section

AWARD STEWARDSHIP PROVIDED BY

William Mack, *CV Section Chair*

Scott Simon, *CV Section Liaison to CNSF*

Michael Levitt, *CV Research Chair*

Clemens Schirmer, *Past CV Section Chair, CNSF Board*

Council of State Neurosurgical Societies/CNS Foundation Medical Student Summer Fellowship

Immaculate Christie, *Diversity, Equity, and Inclusion Research*

Edwin Owolo, *Policy Research*

Sangami Pugazenthi, *Wellness Research*

Alan Gordillo, *Social Determinates of Care Research*



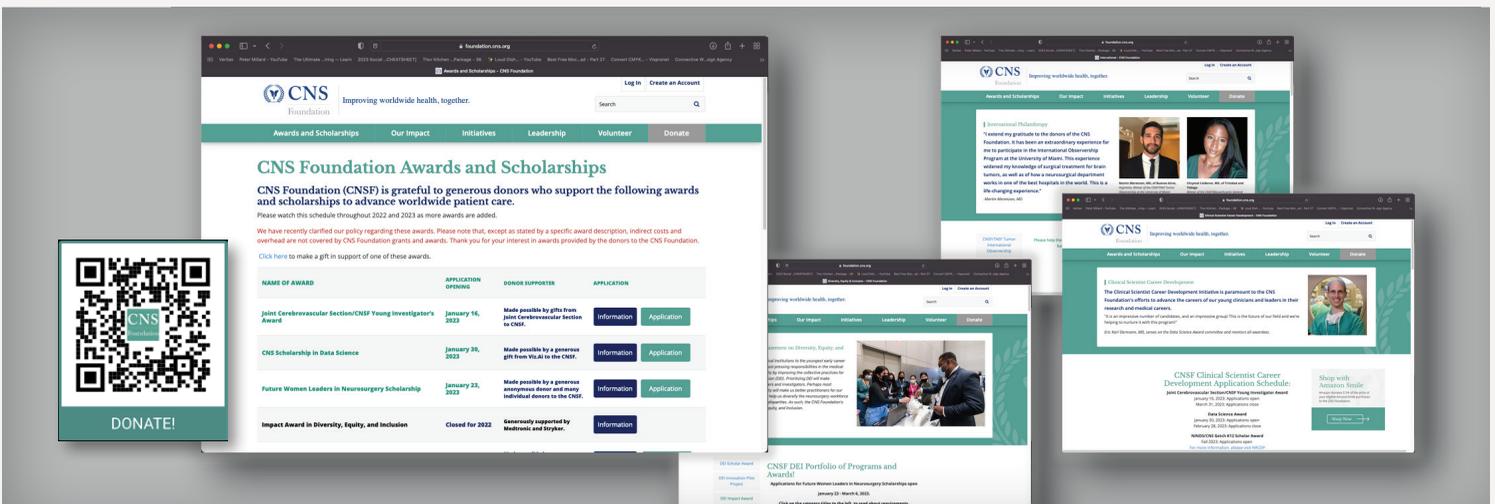
— THE CNS FOUNDATION REPORT —

continued

Applications are open for the 2024 awards cycle

DEADLINE: JANUARY 19, 2024

All applications may be accessed at [Foundation.cns.org/awards](https://foundation.cns.org/awards).
For more information on specific applications, please refer to initiative website pages.



INTERNATIONAL OBSERVERSHIPS AND VISITORSHIPS:

CNSF/International Spine Observership at Duke University

CNSF/Miami University Tumor International Observership

CNSF/International Observership Brain Tumors at Icahn School of Medicine at Mount Sinai

CNSF/MGH Harvard Observership in Global Neurosurgery

CNSF/Stanford International Visitorship

CNSF/International Visitorship at UPMC, Neurosurgery Pittsburgh

CNSF/International Visitorship at Penn State

Call for an Institutional Mentorship for a new Endovascular Observership

Diversity, Equity, and Inclusion Awards

Impact Award

Innovation Pilot Project Award

Scholar Award on Disparities in Healthcare Services

Future Women Leaders in Neurosurgery Scholarship

Domestic Award

International Award

Please contact us for further information or to donate today. foundation@cns.org or (847) 240-2500.

— THE CNS FOUNDATION REPORT —
continued

Thank you, CNS Foundation Donors 2023

Samy Abdou
Bamidele Adebayo
Joseph Adel
Nitin Agarwal
Ellen Air
Taiwo Akindahunsi
Albert Alan
Hanna Aliashkevich
Amirreza Alijanpourotagsara
Javier Amadeo
Alan Appley
James Arthur
Ashok Asthagiri
Rebekah Austin
Jose Avila-Ramirez
Nicholas Bambakidis
Dickson Bandoh
Garni Barkhoudarian
Andrea Becerril-Gaitan
Brooke Belanger
Mohsen Benam
Sharona Ben-Haim
Nicole Bentley
David Berg
Rover Borba
Ernest Braxton
Henry Brem
Marina Buryak
Mohamad Bydon

Preston Carey
Andrew Carlson
Daniel Carr
Larry Carson
John Caruso
Sergio Cavalheiro
Luis Cervantes
Andrea Chamczuk
Kyril Cole
Jared Cooper
Kelli Crabtree-Wilson
David Crawford
Dawn Davis
Andre de Fonseca
Fernando De Nigris Vasconcellos
Vassilios Dimopoulos
William Dobkin
Angela Downes
Idara Edem
Eldan Eichbaum
Rei Enatsu
Hassan Fadel
Rassoul Faki
Saman Farr
Lora Fogam
Hart Garner
Grant Gauger
Frank Genovese
Ernesto Antonio Gutierrez Herrera

Douglas Hardesty
Ales Hejcl
Mary Angeline Luz Hernandez
Kimberly Hoang
Tiffany Hodges
Daniel Hoh
Karl Janich
Sam Javedan
Robert Johnson
Szymon Kaczor
Tsutomu Kadekaru
Loukas Kalpouzou
Kenji Kanamaru
Brandon Kaye
Majid Khan
Emre Kiziltug
Dean Kostov
Mark Krinock
Bradley Kurzawa
James LaVoy
Zachary Levine
Elad Levy
SzuYuan Liu
Aloysius Llaguno,
Bendik Lund
André Machado
Pratheek Makineni
Lloyd Maliner
Grant Mallory

— THE CNS FOUNDATION REPORT —
continued

Thank you, CNS Foundation Donors 2023 *continued*

Erwin Mangubat
Kevin Mansfield
Neelan Marianayagam
Roberto Martinez Alvarez
William McAllister
Robert Miller
Gorgan Mircea
Ganpati Prasad Mishra
Brooklyn Morgia
Jeffrey Mullin
Brian Nahed
Hiroshi Nakagawa
Hidemitsu Nakagawa
Peter Nakaji
Edjah Nduom
Pedro dos Santos Neto
Leonardo Vieira Neto
Candi Nguyen
Misao Nishikawa
Anthony Nwankwo
Jesús Enrique Ortiz
Gaston Oumarou
Edward Overfield
Akash Patel
Jogi Pattisapu
Pamela Perrin
Nicolas Phan
Jeremy Phelps
Deborah Pleasants

Nader Pouratian
Reza Ramazankhani
Juan Ramos-Acevedo
George Raque
Patrick Reid
Daniel Resnick
Howard Riina
Maria Cielito Robles
Rafael Rodriguez-Mercado
Gail Rosseau
FNU Ruchika
Henry Ruiz
Nicolas Ruiz
Prakash Sampath
Clemens Schirmer
Warren Selman
Chandra Sen
Vikram Seshadri
Manav Shah
Regina Shupak
Justin Singer
Prakash Singh
Rohin Singh
Laura Snyder
Grant Sorkin
Deanne Starr
John Steck
Philip Stieg
Martina Stippler

Arno Sungarian
Jennifer Sweet
Charles Taylon
Khoi Than
Jakov Tiefenbach
D. Roxanne Todor
Ryan Trombly
Eve Tsai
Jamie Ullman
Daniel Umansky
Kunal Vakharia
Anand Veeravagu
Ilse Fuentes Virgen
Rand Voorhies
Ayesha Waheed
Jeremy Wang
Jingyi Wang
Marjorie Wang
Arthur Williams
Theresa Williamson
Teresa Withers
Sarah Woodrow
Bennett Wythe
Cherylon Yarosh
Lucia Zamorano

— CORPORATE DEVELOPMENT UPDATE —

In 2023, the CNS Corporate Development initiatives focused on partnering with companies across all neurosurgical specialties with a revised benefits program that listened to their needs and allowed companies to support the vast educational offerings CNS provides throughout the year. This continued focus on relationships resulted in another successful year.

We would like to thank the following companies for their support of our 2023 Non-Annual Meeting Activities.

In-Person Courses

- **Spine Complications Course:** Medtronic, Globus Medical, NuVasive, SI-BONE, DePuy Synthes, Brainlab Inc., Cerapedics, and Novarad
- **Tumor Complications Course:** Stryker, Merck, Integra LifeSciences, Carl Zeiss Meditec Inc., GammaTile (GT Medical), Medexus, Medtronic, and SPIWay
- **Essentials for a Rewarding Neurosurgical Career Course:** Medtronic, DePuy Synthes, Globus Medical, Providence Medical Technology, Penumbra, Phasor Health, Sunstone Wealth Strategies, and GT Medical Technologies Inc.
- **Leadership Institute:** Exclusive Supporter, Medtronic
- **Skull Base Fellows Course:** Medtronic, Stryker, KLS Martin, Integra LifeSciences, Aesculap, Karl Storz Endoscopy, Olympus, Mizuho America, Inc. Apex Medical Inc., Sophysa USA Inc., and SPIWay LLC.

Virtual Courses, Sessions, and other Online Education

- **Neurosurgical Emergencies Course:** Globus Medical, AstraZeneca, Balt USA, Phasor Health, Sophysa, and Medtronic
- **Data Science Models for Neurosurgeons:** Medtronic and Stryker
- **CNS Neurosurgery 100 Series:** Medtronic and Karl Storz
- **Podcasts:** Medtronic
- **Nexus:** Imperative Care

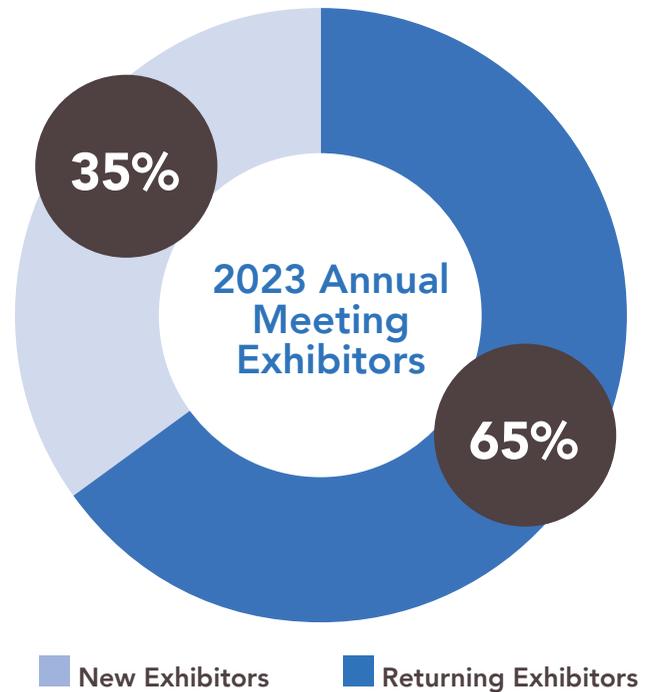
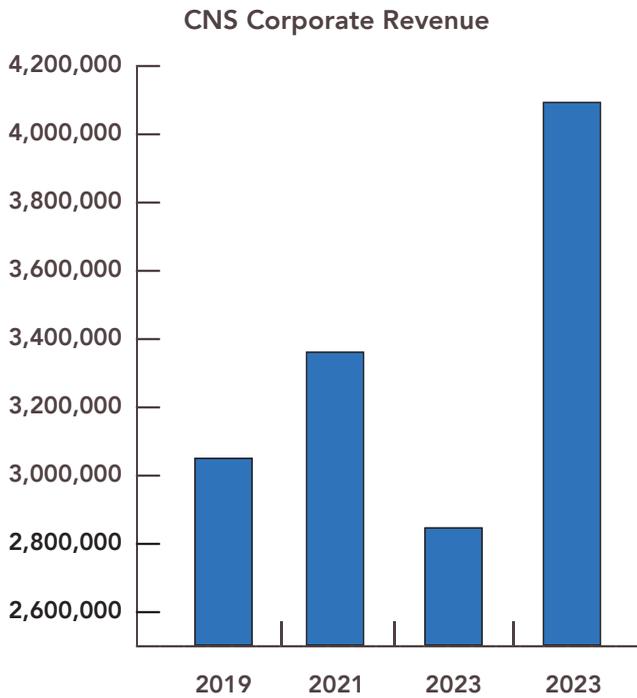


Annual Meeting Supporters: Medtronic, Stryker, Integra LifeSciences, MicroVention, Aesculap Inc, Penumbra Inc, Globus Medical, Siemens Healthineers, Varian, Johnson & Johnson Medtech, Viz.ai, Brainlab, Synaptive Medical, Leica Microsystems, Longeviti Neuro Solutions, Carl ZEISS Meditec, Merck & Co., Imperative Care, GT Medical Technologies Inc, RapidAI, Medexus Pharma (Gleolan™), SI-BONE, BK Medical, NuVasive, Phasor Health LLC, Canon Medical, NICO Corporation, Elekta, AstraZeneca, Karl Storz Endoscopy, Q'Apel Medical, Mizuho America Inc, Neuropace, Olympus America Inc, Cerapedics, KLS Martin Group, Rosman Search, CNS Foundation, Insightec, Novarad, Monteris Medical, Sophysa, Abbott, IRRAS, Cerevasc, Clearpoint Neuro, Natus, ATEC Spine, Carlsmed, John J. Fromen Law, LivaNova, PMT Corporation, Synchron, Thieme, Renishaw Healthcare Inc., Vastrax, Viseon, Apex Medical Inc., Carboxif Spine, Boston Scientific, SPIWay, Balt, Maverick Medical, Providence Medical Technology, Rapid Medical, Elliquence, Raumedica, Sunstone Wealth Strategies

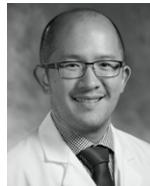
— CORPORATE DEVELOPMENT —

Remarkably, a total of 68 companies supported the CNS programs and products in 2023, representing a more than 38% increase over the prior year!

We continue to be both proud and grateful for the collaboration with companies in the field. Our partnerships allow the CNS to provide products and solutions that help achieve our mission of enhancing health and improving lives through innovative neurosurgical education, advancement of clinical practice and scientific exchange.



Ashok Asthagiri, MD
Co-Chair



Khoi Than, MD
Co-Chair



Laura Snyder, MD
Vice Chair



Clemens Schirmer, MD
Advisor



Adnan Siddiqui, MD
Advisor



Congress of Neurological Surgeons

Thank You

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

TRANSFORMATIONAL PARTNER

Medtronic

PREMIER PARTNER

stryker

PARTNER



COLLABORATOR



ASSOCIATE



— FINANCIAL REPORT —

Statement of Financial Position

December 31, 2023

2023 Assets

	Current	Prior Year	Increase/ (Decrease)
Cash	\$1,763,400	\$2,312,067	(\$548,667)
Accounts Receivable	396,640	1,276,825	(880,185)
Pre-Paid Expenses & Deposits	557,490	946,836	(389,346)
Beneficial Interest	348,000	348,000	0
Investments	25,276,579	22,589,762	2,686,817
Equipment & Software	983,241	1,277,012	(293,771)
Other Assets	780,343	851,300	(70,957)
Joint Section Assets (Net)	4,612,524	4,612,524	0
Total Assets	34,718,217	34,214,326	503,891

2023 Liabilities

Accounts Payables	230,601	521,328	(290,727)
Capital Lease	1,259,501	1,310,170	(50,669)
Accrued Expenses	1,118,670	1,034,097	84,573
Deferred Revenue-Dues	1,632,122	1,293,451	338,671
Deferred Revenue-Annual Meeting	265,539	271,900	(6,361)
Deferred Revenue-Journal	1,428,571	1,714,286	(285,715)
Deferred Revenue-Other	329,385	104,994	224,391
Net Payable - Foundation	95,661	211,813	(116,152)
Total Liabilities	6,360,050	6,462,039	-101,989

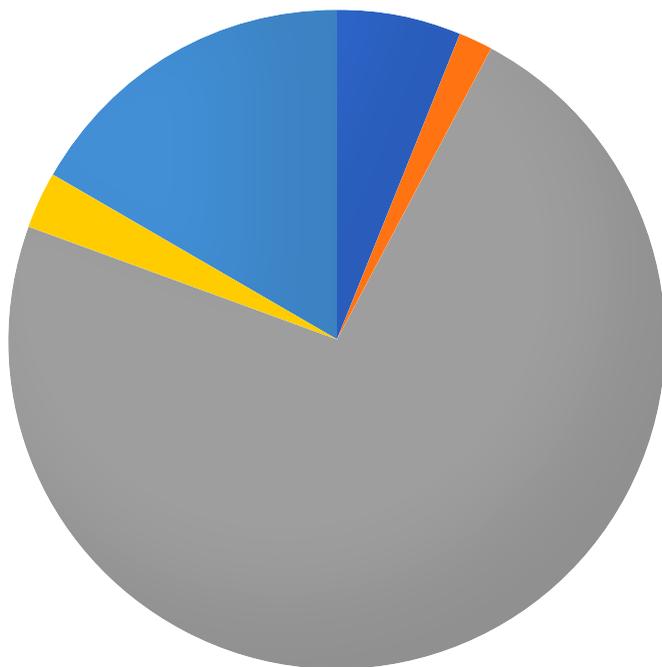
Net Assets

Unrestricted	28,010,167	27,404,287	605,880
Permanently Restricted	348,000	348,000	0
Total Net Assets	28,358,167	27,752,287	605,880
Total Assets	34,718,217	34,214,326	503,891

— FINANCIAL REPORT —

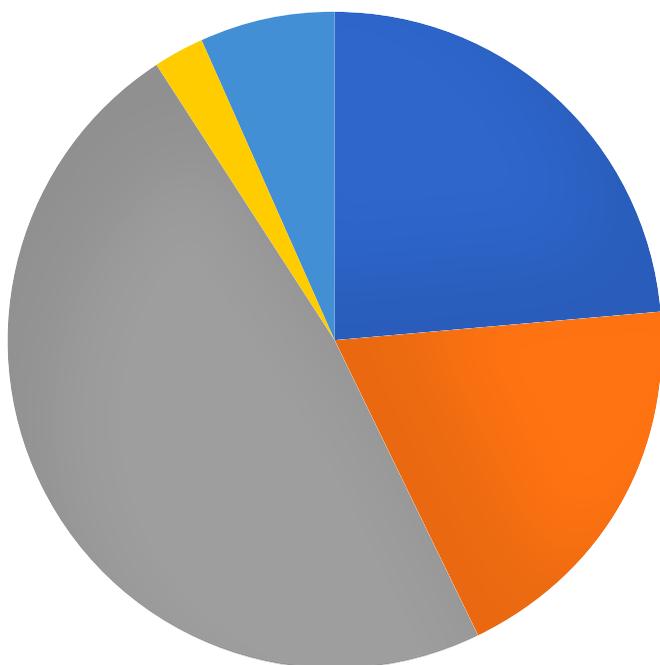
continued

Assets as of December 31, 2023



- Cash & AR.....\$2,160,040
- Prepays.....\$557,490
- Investments.....\$25,276,579
- Fixed assets, etc.....\$983,241
- Other.....\$5,740,867

FY23 Revenue



- Membership Dues.....\$3,268,080
- Publications and Journal...\$2,683,708
- Annual Meeting.....\$6,613,940
- Online Products.....\$643,905
- Other.....\$920,791

— 2024 PRESIDENT —



Alexander A. Khalessi, MD, MBA

2024 President

Congress of Neurological Surgeons

It is my great honor and privilege to lead the Congress of Neurological Surgeons (CNS) in the year ahead. My predecessor, Dr. Elad Levy, brought his unique energy and vision to our flourishing organization. I am grateful for his leadership this past year and for his support throughout my tenure on the CNS Executive Committee. Congratulations Elad on an outstanding year!

The 2023 Annual Meeting in Washington D.C. was exceptional thanks to the energy and engagement of our members. Our specialty responded to the impactful content presented across sessions and symposia with the record attendance and abstract submissions. Your science drives the future of neurological surgery. Annual Meeting Chair Lola Chambless, Scientific Program Chair Garni Barkhoudarian, Vice Chair Edjah Nduom and many others deserve congratulations and thanks for this historic effort.

Not to be outdone, our Education Division continues to build a robust catalog of online, virtual and in-person learning opportunities

as a complement to your favorite live courses and our Annual Meeting. Nader Pouratian, Akash Patel, Clemens Schirmer, and Tiffany Hodges spearheaded these efforts. Laura Snyder, Theresa Williamson and the members of the SANS Committee successfully launched SANS Flashcards to expand the curriculum offered by our successful CNS SANS Primary ABNS Board Examination Review Course. Khoi Than and Theresa Williamson continued to expand our popular Nexus platform and build deeper engagement with our online education catalog and microlearning offerings.

As a Past Chair of the CNS Foundation, I am especially proud of the accomplishments of Martina Stippler and the CNS Foundation Board of Directors over the last year—granting more than \$725,000 in awards and programs. These investments will have a major future impact upon the careers of our neurosurgeon awardees, their patients, and our treatment of neurological disease.

Looking ahead to 2024, the future of the CNS is bright. Our Executive Committee members and volunteers are already hard at work refining and expanding our educational products and courses to meet the needs of our members across career phases and practice settings

As we head into the year, Education Division Co-Chairs, Akash Patel and Clemens Schirmer have already invested a great deal of time into reviewing our entire educational portfolio to ensure that our offerings remain relevant and valuable to your practice. Each of these educational offerings throughout the year will complement the unique content at our CNS Annual Meeting.

Our 2024 Annual Meeting committee, under the leadership of Chair Garni Barkhoudarian, Scientific Program Chair Edjah K. Nduom and Vice Chair, Khoi D. Than have invested countless hours in building an incredible scientific program, sure to both inspire and provide practical solutions for advancing your practice.

Emerging technologies offer our specialty unique opportunities to advance the treatment of neurologic disease. Our 2024 meeting theme, Neurosurgery Origins, challenges us to chart a course back to the fundamentals of our specialty, and re-examine our origins through the lens of our modern capabilities, while building a shared vision of our future. I hope you will join us in Space City for data-driven science, interactive learning opportunities, and unparalleled networking in an inclusive welcoming environment.

I am especially excited about the work our **Neurosurgery Publications** team and Editor-in-Chief, Douglas Kondziolka leadership in generative AI. The Neurosurgery Language Model promises to be the first of its kind—an LLM trained specifically for neurosurgeons using the unique content of NEUROSURGERY and CNS educational products. We anticipate that generative language models will not openly be used for writing, but in the conduct of research and of review. Numerous applications in development will further improve the quality of the scientific process. Proper oversight will be central to the deployment of these powerful new tools.

Our collective progress is only possible because of our team of talented and dedicated volunteers and staff. I am especially grateful for the support of our CEO Regina Shupak, whose leadership helps make our vision a reality. I remain deeply honored and humbled by the trust you have placed in me to serve as CNS President, and to lead this organization in 2024. See you in Houston!

— MESSAGE FROM THE CEO —



Regina Shupak

CEO, Congress of Neurological Surgeons

It is a great honor and privilege to prepare this annual report and to serve the Congress of Neurological Surgeons and our members every day. I am proud to share these 2023 highlights with you.

I must acknowledge that none of these accomplishments would have been possible without the leadership of our 2023 CNS President, Dr. Elad Levy, whose vision and passion paved the way for a truly remarkable year. Congratulations to Dr. Levy on meeting—or surpassing—every goal you set for the CNS this past year. I am grateful for the opportunity to work with you and the dedicated, hardworking members of the 2023 Executive Committee, and I am so proud of all we have achieved. Thank you to each one of you for your contributions.

2023 was an incredible year of energy, growth, and deep engagement. At the beginning of the year, we set out to truly connect with our members across the specialty and deliver high impact content addressing practice challenges, while continuing to provide the unparalleled experiences the CNS is known for.

The 2023 CNS Annual Meeting in Washington D.C. delivered on that promise and exceeded our expectations. From record abstract submissions to record medical attendance, the Annual Meeting shone a bright light on the strength and vibrancy of the CNS. Thank you to all of you who joined us in D.C. and especially to the hundreds of volunteer faculty members who dedicated their time and expertise to bring value to our members. Your participation and commitment to neurosurgery makes us the resilient and thriving organization we are.

Our Education Division significantly expanded our educational offerings in 2023, not only in volume, but also in accessibility. With the expansion of CNS Neurosurgery 100, podcast series, and our YouTube channel, as well as the introduction of SANS Flashcards, these dedicated volunteers have made sure that members can access CNS-quality educational content any time and from anywhere. At the same time, Dr. Nader Pouratian and his team continued to cultivate our catalog of live courses, offering course attendees deep meaningful engagement with their colleagues.

Our Editor in Chief, Dr. Doug Kondziolka, also lead the Neurosurgery Publications to a transformative year. By reimagining the Editorial Board, Dr. Kondziolka has brought new voices and perspectives to the table, ensuring that our Journal remains focused on representing the rapidly evolving breadth, diversity, and internationalism of our specialty. Through his work raising the profile of Neurosurgery Practice and introducing new article types like Neurosurgery Practice with Code, he has kept the **Neurosurgery Publications** portfolio at the forefront, and I am grateful for his vision and leadership this year.

The CNS Foundation (CNSF) had another strong year, awarding more than \$700,000 in awards and grants! The impact these awards will have, not only on these surgeons' practice and careers, but also on their patients and

global health cannot be overstated. The Foundation also brought back the successful Pathway to Neurosurgery program, giving another 24 high school students an immersive look at the field of neurosurgery. Congratulations to Foundation Chair, Dr. Martina Stippler.

We are grateful for our corporate partners and sponsors, and especially to our member companies of the CNS Industry Allies Council for the ongoing support of the CNS and its educational mission. These partnerships are critical in helping the CNS expand our educational offerings and develop the tools and services our members need at every stage of their careers.

The CNS Executive Committee, the CNS Committee member volunteers, and I would like to extend a sincere thanks to our dedicated and professional staff. We are all very excited about the future of the Congress of Neurological Surgeons and honored to continue serving the CNS, our members and our many volunteers in 2024.

I am personally looking forward to working with our 2024 CNS Executive Committee and CNS President, Dr. Alex Khalessi—a dedicated and driven leader.

As always, I encourage you to reach out to me and the CNS Officers with your ideas and suggestions for how we can better serve you this year.

— 2023 EXECUTIVE COMMITTEE —



FRONT ROW (L TO R): Garni Barkhoudarian, Akash Patel, Martina Stippler, Daniel Hoh, Alexander Khalessi, Elad I. Levy, Nicholas Bambakidis, Jennifer Sweet, Regina Shupak, Ashok Asthagiri, Lola B. Chambless

BACK ROW (L TO R): Theresa Williamson, J. Nicole Bentley, Brian Nahed, Sharon Ben-Haim, Khoi Than, Ellen Air, Peter Nakaji, Clemens Schirmer, Tiffany Hodges, Jeffery P. Mullin, Edjah Nduom, Laura Snyder, Mohamad Bydon, Jason Ellis, Kunal Vakharia, Adnan Siddiqui

NOT PICTURED: Anand Veeravagu, Nader Pouratian

Officers

President

Elad I. Levy, MD, MBA

President-Elect

Alexander A. Khalessi, MD, MBA

Vice-President

Jennifer A. Sweet, MD

Secretary (21-24)

Martina Stippler, MD

Treasurer (20-23)

Daniel J. Hoh, MD, MBA

Past President

Nicholas C. Bambakidis, MD

Members-at-Large

Sharon Ben-Haim (22–24)

Edjah K. Nduom (22–24)

Laura A. Snyder (21–23)

Khoi D. Than (21–23)

Anand Veeravagu (21–23)

Theresa Williamson (22–24)

Ex-Officio Members

Ellen L. Air

Ashok R. Asthagiri

Garni Barkhoudarian

J. Nicole Bentley

Mohamad Bydon

Lola B. Chambless

Jason Ellis

Tiffany Hodges

Jeffery P. Mullin

Brian V. Nahed

Peter Nakaji

Akash Patel

Nader Pouratian

Clemens M. Schirmer

Adnan Siddiqui

Kunal Vakharia

Historian

Christopher E. Wolfla, MD

CNS Executive

CEO

Regina Shupak

CNS Executive Office

10 N. Martingale Road
Suite 190

Schaumburg, IL 60173

TEL: 847.240.2500

FAX: 847.240.0804

Toll-free: 877.517.1CNS

Email: info@cns.org

www.cns.org

— 2024 EXECUTIVE COMMITTEE —



FRONT ROW (L TO R): *Nader Pouratian, Ashok R. Asthagiri, Elad I. Levy, Alexander A. Khalessi, Martina Stippler, Regina Shupak, Daniel J. Hoh*
SECOND ROW (L TO R): *Khoi D. Than, Garni Barkhoudarian, Edjah K. Nduom, Akash Patel, Laura A. Snyder, Clemens M. Schirmer*
THRID ROW (L TO R): *Theresa Williamson, Sharona Ben-Haim, J. Nicole Bentley, Brian V. Nahed, Mohamad Bydon, Jason Ellis, Jeffrey P. Mullin,*
BACK ROW (L TO R): *Eric Oermann, Kunal Vakharia, David Berg, Ellen L. Air, Anand Veeravagu, Lola B. Chambless, Joseph Osorio, Tiffany Hodges*
NOT PICTURED: *Peter Nakaji*

Officers

President

Alexander A. Khalessi, MD, MBA

President-Elect

Daniel J. Hoh, MD, MBA

Vice-President

Nader Pouratian

Secretary (21-24)

Martina Stippler, MD

Treasurer (23-26)

Ashok R. Asthagiri

Past President

Elad I. Levy, MD, MBA

Members-at-Large

Sharona Ben-Haim (22–24)

J. Nicole Bentley (23–25)

Jason Ellis (23–25)

Jeffrey P. Mullin (23–25)

Edjah K. Nduom (22–24)

Theresa Williamson (22–24)

Laura A. Snyder (21-23)

Khoi Than (21-23)

Anand Veeravagu (21-23)

Ex-Officio Members

Ellen L. Air

Garni Barkhoudarian

Mohamad Bydon

Lola B. Chambless

Tiffany Hodges

Brian V. Nahed

Peter Nakaji

Eric Oermann

Joseph Osorio

Akash Patel

Clemens M. Schirmer

Khoi D. Than

Anand Veeravagu

Kunal Vakharia

Historian

Christopher E. Wolfla, MD

CNS Executive

CEO

Regina Shupak

CNS Executive Office

10 N. Martingale Road
Suite 190

Schaumburg, IL 60173

TEL: 847.240.2500

FAX: 847.240.0804

Toll-free: 877.517.1CNS

Email: info@cns.org

www.cns.org



CONGRESS OF NEUROLOGICAL SURGEONS
— 2023 ANNUAL REPORT —



Congress of
Neurological
Surgeons