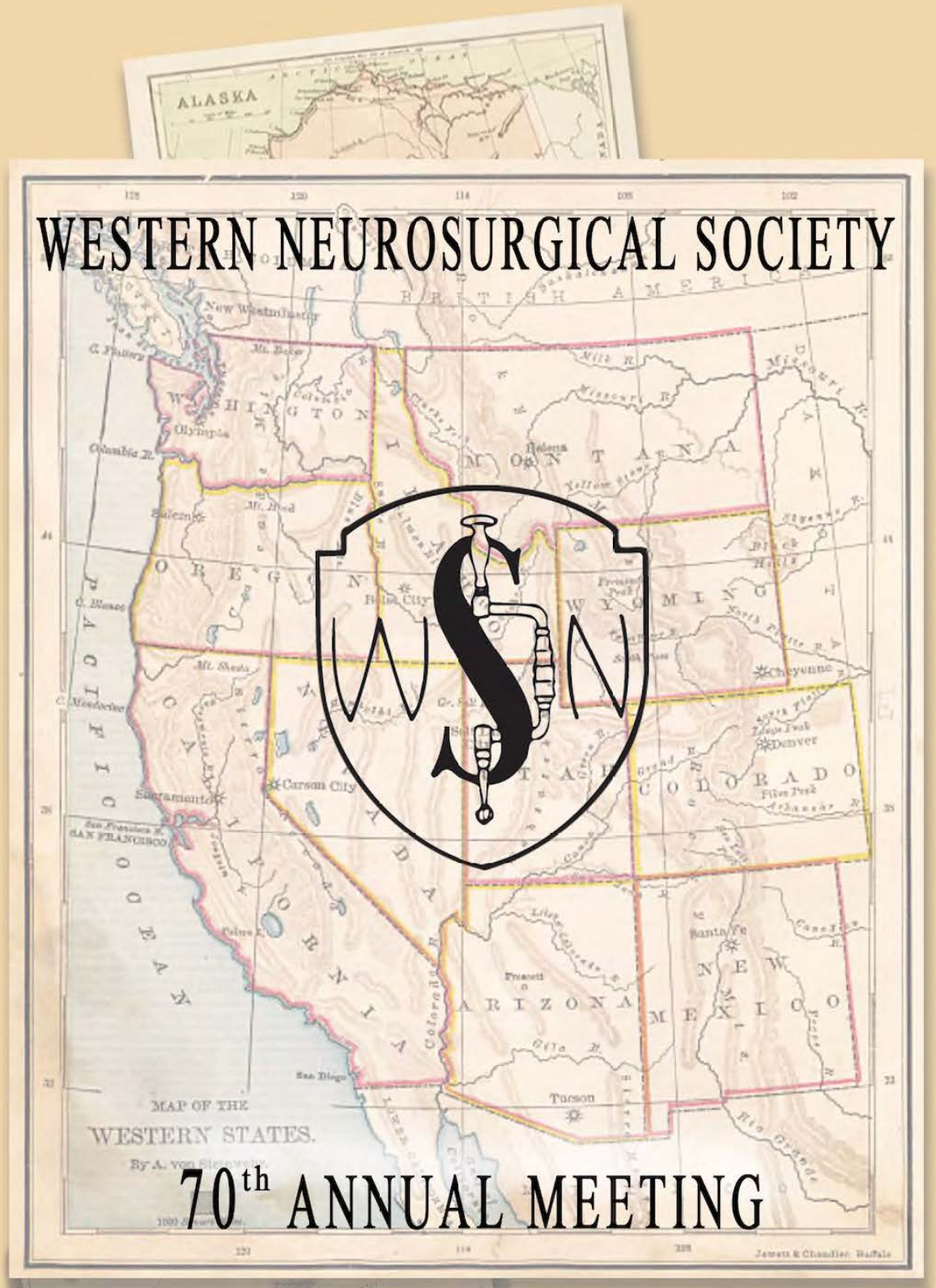

70th ANNUAL MEETING

Dear WNS members and guests,

Welcome to the 70th Annual Western Neurosurgical Society Meeting, a celebration marking our Platinum Jubilee! This milestone is a testament to the enduring dedication, innovation, excellence and friendship that define our community.

We are honored to host an exceptional lineup of speakers who continue to push the boundaries of our field. This year is particularly momentous as we celebrate a historic achievement: Dr. Linda Liau is the first-ever woman recipient of the prestigious Cloward's Award. This landmark moment not only honors her outstanding contributions to neurosurgery but also symbolizes the growing diversity and inclusion within our profession and the WNS.

We are also excited to present a unique armchair session with two WNS past presidents and senior neurosurgeons, Drs. Steve Giannotta and Larry Shuer, who will take us on a journey through the evolution of neurosurgery and the WNS over recent decades. This session promises to be a thought-provoking exploration of the advances, challenges, and milestones that have defined our field and society, and will provide a fascinating look at how far we've come.

In addition, we are privileged to have Dr. Gerry Grant to deliver the Prolo Lecture, which will delve into the often-overlooked but critical value of non-technical skills in neurosurgery. We are also honored to welcome Maestro Nuvi Metha, virtuoso violinist and director of special projects at the San Diego Symphony, who will deliver the Smith Lecture. This unique presentation will explore the profound relationship between music and the mind, offering a fascinating perspective on how these two worlds intersect and influence each other.

We are proud to honor two exceptional residents who have been recognized for their outstanding contributions to our field. Dr. Lily Kim's paper on anti-glioma effects and metabolic modulation and Dr. Silvia Vaca's paper on disparities in post-operative care, stand as exemplary works that push the boundaries of our knowledge and set new standards for excellence in neurosurgery.

We are thrilled to welcome our newest members and candidates, whose fresh energy and ideas will undoubtedly contribute to the future of the WNS. Your presence here signifies the ongoing growth and evolution of our community, and we are excited to see how you will help drive our field forward.

Finally, this year's meeting is made possible by the generous support of our sponsors, whose commitment to neurosurgery helps fuel our progress and innovation. Their partnership is invaluable, and we extend our deepest gratitude for their continued support.

As we celebrate this Platinum Jubilee, let us honor the past, embrace the present, and look ahead to a future filled with promise and discovery. Welcome to the Western Neurosurgical Society's 70th Anniversary Meeting—let's make it a celebration to remember!

Marco Lee MD PhD

Schedule of Events

Thursday, September 5th		
12:00pm - 4:00pm	Executive Committee Meeting	Burgundy
12:00pm - 5:30pm	Registration	West Foyer
6:00pm - 7:00pm	Opening Reception	Reflection Courtyard
7:00pm - 10:00pm	Dinner Buffet	Aria Lawn & Pavilion
	Friday, September 6th	
6:30am - 7:30am	**Breakfast with Exhibitors**	Ballroom B
6:30am - 12:00pm	Registration	West Foyer
7:30am - 8:00am	Welcome - WNS President, Dr. Marco B. Lee	Ballroom C
8:00am - 8:45am	Scientific Session I - Neurosurgery Practice	Ballroom C
8:45am - 9:45am	Prolo Lecture - Gerald Grant, MD	Ballroom C
8:00am - 10:30am	Spouses/Companion Breakfast	Reflection Courtyard
9:45am - 10:15am	**Coffee Break with Exhibitors**	Ballroom B
10:15am - 11:15am	Local Interest Lecture - LT Matthew Carter	Ballroom C
11:15am - 12:00pm	Changing Landscape of Neurosurgery	Ballroom C
12:00pm	**Adjourn for the day**	
12:30 - 4:45pm	Del Mar Thoroughbred Club	Meet in Hotel Lobby
12:30pm - 4:30pm	La Jolla Cove Kayak & Snorkel Tour	Meet in Hotel Lobby
6:30pm - 10:00pm	Local Night Dinner - San Diego Maritime Museum Bus departs 5:15pm Front of Hotel	Meet in Hotel Lobby
	Saturday, September 7th	
6:00am - 7:55am	Business Meeting (WNS Members Only)	Manchester
6:30am - 7:55am	**Breakfast with Exhibitors** (non-members)	Ballroom B
7:00am - 12:00pm	Registration	West Foyer
8:00am - 8:30am	Scientific Session II - Basic Science / Clinical Trials	Ballroom C
8:00am -10:30am	Spouses/Companion Breakfast	Reflection Courtyard
8:30am - 9:30am	Cloward Medal Award Lecture - Linda Liau, MD, PhD	Ballroom C
9:30am - 10:00am	**Coffee Break with Exhibitors**	Ballroom B
10:00am - 11:00am	Randy Smith Lecture - Nuvi Mehta, San Diego Symphony	Ballroom C
11:00am - 12:00pm	Presidential Address - Dr. Marco B. Lee	Ballroom C
12:00pm	**Adjourn for the day**	
12:30 - 4:45pm	Craft Brewery Tour	Meet in Hotel Lobby
12:30pm - 4:30pm	Slot Canyon - Annie's Canyon Trail	Meet in Hotel Lobby
6:00pm - 10:00pm	Children's Social Night	Ballroom A2
6:00pm - 6:30pm	New Member's Welcome Reception	Capella Courtyard
6:30pm - 7:30pm	Formal Reception	North Foyer
7:30pm - 10:30pm	Black Tie Optional Banquet/Dance	Capella
	Sunday, September 8th	
6:30am - 7:30am	**Breakfast with Exhibitors**	Ballroom B
7:30am - 7:45am	Introduction of New Members	Ballroom C
7:45am - 8:30am	Scientific Session III - Pediatric Neurosurgery	Ballroom C
8:00am - 10:30am	Spouses/Companion Breakfast	Reflection Courtyard
8:30am - 9:00am	Scientific Session IV - Cerebrovascular	Ballroom C
9:00am-9:30am	Resident Award Presentation	Ballroom C
9:30am - 10:00am	**Coffee Break with Exhibitors**	Ballroom B
10:00am - 11:00am	Scientific Session V - Functional / Pain	Ballroom C
11:00am - 12:00pm	Scientific Session VI- Spine	Ballroom C
12:00pm - 12:15pm	**Closing Remarks. Meeting Adjourns**	See you in 2025

Western Neurosurgical Society
70th Annual Meeting

2024 LEARNING OBJECTIVES

The purpose of this meeting is to provide an update in the basic and clinical Sciences underlying neurosurgical practice through lectures, discussions, interactive sessions with neurological surgeons, neurologists, neuroradiologists, and other allied health personnel.

Upon completion of this program, participants should be able to:

- Increase their confidence in the neurosurgical care of pediatric intracranial pathology
- Increase their confidence in the neurosurgical care of adult spinal pathology
- Increase their understanding of the challenges facing neurosurgeons with an ever-changing landscape
- Increase their confidence in the execution of neurosurgical clinical trials
- Improve their understanding of functional neurosurgery and the management of chronic pain

2024 Officers & Committees

EXECUTIVE COMMITTEE

Marco Lee, President
Andrew Little, Vice-President
Odette Harris, President-Elect
Jay K. Morgan, Past-President
Justin Dye, Secretary Treasurer
Charles Nussbaum, Historian

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Sharona Ben-Heim
Maziyar Kalani
Praveen Mummaneni
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Tom Scully
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Estrada Bernard
Samer Ghostine
Linda Liau
Laura Snyder

MENTORSHIP COMMITTEE(ad hoc)
Marvin Bergsneider, Co-Chair
Mark Sedrak, Co-Chair
Arjun Pendharka
Tom Scully
Amir Vookshoor

INTERNET & SOCIAL MEDIA (ad hoc)
Isaac Yang, Chair

CME COMMITTEE (ad hoc)
Laura Prolo,Chair

2024 WNS Annual Meeting Guests

Linda Liau	Cloward Medalist	WNS
Gerald A. Grant	Prolo Lecturer	WNS
Matthew Carter	Local Interest Lecturer	WNS
Nuvi Mehta	Randy Smith Lecturer	WNS
Lily H. Kim	Basic Science Resident Award	WNS
Silvia Vaca	Clinical Science Resident Award	WNS

Geoff Colby	Member Nominee	Linda Liau
Anthony DiGiorgio	Member Nominee	Tom Scully
Allen Ho	Member Nominee	Marco Lee
Rudolph Schrot	Member Nominee	J. Paul Muizelaar
Jeffery Steinberg	Member Nominee	Alex Khalessi
Daniel Nagasawa	Member Nominee	Justin Dye

David Bonda	Member Candidate	Laura Prolo
Brian Gantwerker	Member Candidate	Adair Prall
Abhijeet Gummadavelli	Member Candidate	Adair Prall
Natalie Limoges	Member Candidate	Laura Prolo
Victor Lo	Member Candidate	Gregory Gerras
Michelle Paff	Member Candidate	Mark Linskey
Martin Pham	Member Candidate	Alex Khalessi
Shervin Rahimpour	Member Candidate	Adair Prall
Vijay Ravindra	Member Candidate	Justin Dye

Colleen Carter	Guest	WNS
Tom Beaumont	Guest	Alex Khalessi
Lucas Carlstrom	Guest	Greg Gerras
Ioannis Fouyas	Guest	Marco Lee
Dustin Hatefi	Guest	Alex Khalessi
Jeffrey Tomlin	Guest	Alex Khalessi
Joseph Ciacci	Guest	Alex Khalessi
Najla Kfoury-Beaumont	Guest	Alex Khalessi
Andrew Nguyen	Guest	Alex Khalessi
Joseph Osorio	Guest	Alex Khalessi
Jeffrey Scott Pannel	Guest	Alex Khalessi
David Santiago-Dieppa	Guest	Alex Khalessi
Marc Schwartz	Guest	Alex Khalessi
Bob Shafa, MD	Guest	Austin Colohan
Florence Smith	Guest	WNS
William Taylor	Guest	Alex Khalessi
Howard Tung	Guest	Alex Khalessi
Monique Lee	Guest	Marco Lee
Pascal Lee	Guest	Marco Lee

JOINT PROVIDERSHIP ACCREDITATION STATEMENT:

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the AANS and Western Neurosurgical Society. The AANS is accredited by the ACCME to provide continuing medical education for physicians.

DESIGNATION STATEMENT

The AANS designates this live activity for a maximum of 9.75 *AMA PRA Category 1 Credits*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

JOINT PROVIDERSHIP DISCLAIMER

Before the program, anyone in control of the educational content of this activity will disclose the existence of any financial interest and/or the relationship they or their significant other have with the manufacturer(s) of any commercial product(s) to be discussed during their presentation. Disclosures will be included in the final program.

The material presented at the Western Neurosurgical Society, 70th Annual Meeting has been made available by the Western Neurosurgical Society and the AANS for educational purposes only. The material is not intended to represent the only, nor necessarily the best, method or procedure appropriate for the medical situations discussed, but rather it is intended to present an approach, view, statement, or opinion of the faculty, which may be helpful to others who face similar situations.

Neither the content, whether written or oral of any course, seminar or other presentation in the program, nor the use of a specific product in conjunction therewith, nor the exhibition of any materials by any parties coincident with the program, should be construed as indicating endorsement or approval of the views presented, the products used, or the materials exhibited by the Western Neurosurgical Society and jointly provided by the AANS, or its Committees, Commissions, or Affiliates.

Neither the AANS nor the Western Neurosurgical Society makes any statements, representations or warranties, whether written or oral, regarding the Food and Drug Administration (FDA) status of any product used or referred to in conjunction with any course, seminar or other presentation being made available as part of Western Neurosurgical Society 70th Annual Meeting. Faculty members shall have sole responsibility to inform attendees of the FDA status of each product that is used in conjunction with any course, seminar or presentation and whether such use of the product is in compliance with FDA regulations.

Disclosure Statement:
The AANS and Western Neurosurgical Society control the content and production of this CME activity and attempt to ensure the presentation of balanced, objective information. In accordance with the Standards for Integrity and Independence in Accredited Continuing Education established by the Accreditation Council for Continuing Medical Education (ACCME), faculty, abstract reviews, paper presenters/authors, planning committee members, staff and others involved in the planning of the educational content must disclose all financial relationship they or their co-authors have with ineligible companies in the past 24 months. All relevant financial relationships have been mitigated.

NAME	DISCLOSURE	TYPE OF RELATIONSHIP
Richard B. Chua	Yes	Medtronic Spine (Consultant)
Brian Gantwerker	Yes	BrainLab (consultant), Raydiant Oximetry (Investor), Eyedaptive (Investor)
Gerald Grant	Yes	Aesculap (Course speaker), Medtronic (Consultant), NeuroOne (Consultant)
Melanie Hayden Gephart	Yes	Quadriga (Funded Research), SmartLens (Patent/Stock), Midatech Biodexa Pharmaceutical (Consultant), SensoBrain (Patent, Scientific Advisory Board), Telix (Consulting)
Marco Lee	Yes	Johnson and Johnson (Consultant), Stryker (Consultant)
Linda Liau	Yes	ClearPoint Neuro, Inc (Board of Directors), Northwest Biotherapeutics Inc (Scientific Advisory Board)
Praveen Mummaneni	Yes	Globus (Consultant), Depuy Synthes (Consultant), BK Medical (Consultant), BrainLab (Speaker), SI Bone (Speaker), Pacira (Grant)
Martin Pham	Yes	Medtronic (Consultant), Globus (Consultant), Carlsmed (Consultant), NovApproach (Consultant)
Shervin Rahimpour	Yes	Boston Scientific (Consultant), Abbott Consultant)
Gary Steinberg	Yes	SanBio (Consultant), Surgical Theater (Consultant), Zeiss (Consultant), Peter Lazic, US (Royalties)

Speakers, paper presenters/authors and staff (and the significant others of those mentioned) who have reported they do not have any relationships with commercial interests:

David Bonda, Justin Dye, Farrokh Farrokhi, Abhijeet Gummadavelli, Lily Kim, Natalie Limoges, Mark Linskey, Andrew Little, Victor Lo, Michelle Paff, Laura Prolo, Vijay Ravindra, Silvia Vaca

Donald J. Prolo, MD

Donald Prolo has been a member of the WNS since 1974 and an almost constant attendee at our annual meeting.

To anyone who has known Don Prolo over the past few decades, his love of classical thinking and values stands out as a real weathervane for who he is and what he stands for.

Don has been a champion of physician control of patient care as compared to what has become control by government and insurance companies. He gallantly tried, where no others ever went, to get a California based Sherman antitrust exemption so docs could gather together and bargain with the government and the insurance companies for their services. He has continued to work on maintaining physician independence and loudly laments the erosion of private practice with now half of physicians employed by commercial interests.

As he said in his WNS Presidential address in 2002, it is *". . . a citizen's natural right to rebel against unjust positive laws and determinations not made with respect to antecedent principles of natural justice. Coercive threats of fines, sanctions, incarcerations are forces against American medicine without moral authority."* He went on to say, *"In the first two books of the Republic, Plato raised the question why should one be just in his actions toward others or in relation to the community in which he or she lives? The answer lies in the fact that the moral virtues of prudence, temperance, courage and justice underlie happiness, the primary good we desire for ourselves and others."*

In the pursuit of the above values, Don and his wife Joanne have endowed an annual lecture, the Prolo Lecture, to be delivered by diverse speakers addressing professionalism and ethics in medicine.

Prior Prolo Lecturers

2021 Robert Phillips, Jr., M.D., MSPH
Executive Director, Center for Professionalism & Value in Health Care of the American Board of Family Medicine
"Professional Autoimmune Disorder and the State of the Social Contract"

2022 Nigel Nicholson, PhD
Walter Mintz Professor of Greek, Latin and Mediterranean Studies at Reed College, Portland, OR.
"Thinking of Yourself as a Doctor"

2023 Kelley Skeff, MD, PhD
George DeForest Barnett Professor, Department of Internal Medicine, Stanford University
"ACrisis in Medicine: Time for Reflection"

Prolo Lecturer - 2024

Gerald A. Grant, MD

Gerald A. Grant, MD, is a neurosurgeon, scientist, and chair of the Department of Neurosurgery at Duke University.

Clinically, Grant specializes in treating brain tumors, medically refractory epilepsy, Chiari malformation, and concussion in children and young adults. His research focuses on innovative ways to open the blood-brain barrier to improve the delivery of novel drugs and immunotherapy to target brain tumors.

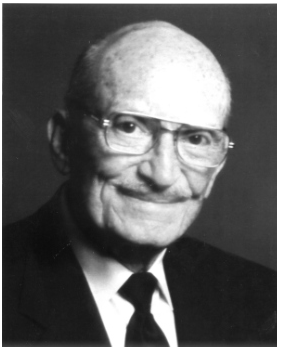
Grant is an investigator on several initiatives funded by the National Institutes of Health (NIH) relating to brain tumors, focused ultrasound, brain tumor immunotherapy and concussion. He is an author on 365 peer-reviewed journal articles, holds several leadership positions nationally, and serves on multiple editorial boards in neurosurgery.

Grant received his undergraduate degree in neurosciences at Duke University and his medical degree from Stanford University. He completed his residency in neurosurgery at the University of Washington in Seattle and fellowship in pediatric neurosurgery at Seattle Children's Hospital.

After residency, Grant fulfilled his commitment to the United States Air Force. He was chief of neurosurgery at Wilford Hall Medical Center, Lackland Air Force Base in Texas and the USAF Neurosurgical Consultant for Aerospace Medicine from 2002-2006. He deployed to Landstuhl Regional Medical Center in Germany and Balad Air Base in Iraq as Chief of Neurosurgery, in support of Operation Iraqi Freedom. He attained the rank of Lieutenant Colonel and was awarded a Meritorious Service Medal prior to his separation.

In 2006, Grant joined Duke's faculty as an associate professor in the Department of Surgery. In 2013, he was recruited to Stanford as Chief of Pediatric Neurosurgery and held the Botha Chan Endowed Professorship. He was program director of the Stanford residency program in neurosurgery and fellowship director of Pediatric Neurosurgery. Dr. Grant also served as Associate Dean of academic affairs in the School of Medicine from 2021-2022.

In April 2022, Grant was recruited back to Duke as Professor and Chair of the Department of Neurosurgery. He currently holds the Allan H. Friedman Distinguished Professorship at Duke University School of Medicine.



Dr. Ralph B. Cloward 1908-2000

In 2002, the Western Neurosurgical Society established a Medal and Lecture to honor one of its most innovative and pioneering members, Ralph Bingham Cloward. With the gracious support of the Cloward family, this award honors Ralph and his devoted wife Florence, our former president and first lady, both treasured friends who have enriched the Western.

Ralph Cloward was born in Salt Lake City, Utah in 1908. He completed his undergraduate studies at the Universities of Hawaii and Utah, and his medical education subsequently at the University of Utah and Rush Medical School in Chicago. He interned at St. Luke's Hospital, Chicago, and then trained to become a neurosurgeon under Professor Percival Bailey at the University of Chicago. He began practicing neurology and neurosurgery in the Territory of Hawaii in 1938.

His academic accomplishments include Professor and Chair of Neurosurgery at the University of Chicago, 1954-55, and visiting professorships at the University of Oregon, University of Southern California, and Rush Medical School. He served long-term as Professor of Neurosurgery at the John A. Burns School of Medicine at the University of Hawaii. He authored numerous papers and book chapters.

Dr. Cloward's inspired, pioneering quantum leaps encompassed many areas of neurosurgery, but his enduring interest was the spine, where he devised three major operations. He first performed the posterior lumbar interbody fusion in 1943, reporting the operation at a meeting of the Hawaiian Territorial Medical Association in 1945 and publishing it in the Journal of Neurosurgery in 1953. His unique approach for treating hyperhydrosis was reported in 1957. Independently he conceived an anterior approach to the cervical spine, devised instruments for its implementation, and published his classic paper in the Journal of Neurosurgery on anterior cervical discectomy and fusion in 1958. He designed over 100 surgical instruments, which continue to be used today by practicing neurosurgeons.

Throughout his career he educated the international community of neurosurgeons in the operations he devised. He performed them throughout the United States and in 41 cities within 27 countries of the world and in the process healed patients of their painful conditions. Hundreds of thousands of patients benefited both directly and indirectly from his creativity, technical genius, insight and enthusiasm as a teacher and medical evangelist.

In first recognizing all lesions of the spine to be in the province of neurosurgeons, Dr. Cloward engendered controversy and endured severe criticism from upsetting the environment of establishment neurosurgeons by his pioneering breakthroughs. He demonstrated that even in a complex technological world with large research efforts, budgets, and bureaucracies, the individual is key. Engraved on the Medal are words the Cloward legacy epitomizes, which honors recipients "For Epochal Innovation and Pioneering Application."

2024 Cloward Award Recipient

Linda M. Liau, MD, PhD, MBA

Dr. Linda M. Liau is the W. Eugene Stern Professor & Chair of the Department of Neurosurgery at the David Geffen School of Medicine at UCLA. She is the Co-Director of the UCLA Brain Tumor Center, and Principal Investigator and Director of the NCI-designated UCLA Brain Tumor SPORE (Specialized Program of Research Excellence).

Dr. Liau is one of the most accomplished neurosurgeons in the United States. In her leadership position as Chair of the Department of Neurological Surgery at UCLA, she is among very few female neurosurgeons in such a position. In addition to her leadership of a large neurosurgical department, she is a scientist, researcher, teacher, and a role model. Her innovative research in brain tumors is well-known. Dr. Liau has several multi-million-dollar research grants and has been continuously funded by the NIH for the past 25 years.

As her CV demonstrates, she has served neurosurgery and neurosciences in both clinical and research capacity at every level nationally and internationally. She is an elected member of the American Academy of Neurological Surgery (2013), the National Academy of Medicine (2018), and the Academia Sinica (2024).

She also served on the Board of Directors of the American Board of Neurological Surgery (2014 – 2020) and as ABNS Chair from 2019 to 2020, the first female to hold such a position.
She continues to serve on many editorial boards both nationally and internationally; she is in high demand and is well respected as a scientist and as a neurosurgical leader. She has been awarded the Guha Award by the Society for Neuro-Oncology, the Bittner Award by the AANS, the Charles B. Wilson Excellence Award by the AANS/CNS Section on Tumors, and the Winn Prize by the Society of Neurological Surgeons.

Dr. Liau is a dedicated mentor. She truly cares about the success of her residents, students and junior faculty. Despite all her responsibilities, Dr. Liau still finds the time to serve as a faculty mentor and advisor to the UCLA SOM Neurosurgery Interest Group, and is Co-PI of the UCLA Neuroscience Physician-Scientist Training Grant (R25/UE5).

We at the Western Neurosurgical Society have benefited firsthand from her leadership skills, wisdom, and judgement when she served as president of the WNS in 2015-2016, also the first female to hold such a position since the founding of the society in 1955.

Prior Cloward Award Recipients

2003 George Ojemann, MD, Professor of Neurosurgery University of Washington. "Investigating Human Cognition during Epilepsy Surgery"

2005 Donald Prolo, MD, Clinical Professor of Neurosurgery Stanford University. *"Legacy Giants in the Treatment of Spinal Disorders: Ralph Cloward and Marshall Urist"*

2006 Martin Weiss, MD, Professor of Neurosurgery University of Southern California. *"A Historical Walk through Pituitary Surgery"*

2007 Charles Wilson, MD, Past Chairman, Department of Neurosurgery University of California, San Francisco. *"The Future of Neuroscience*

2008 Peter Jannetta, MD, Past Professor and Chairman Department of Neurosurgery, University of Pittsburgh. *"Vascular Compression in the Brainstem: Main Streaming Neurosurgery"*

2009 L. Nelson Hopkins, MD, Professor and Chairman of Neurosurgery University at Buffalo, State University of New York. *"Neurosurgeons and Stroke: From Prevention to Treatment"*

2010 Sean Mullan, MD, Professor Emeritus of Neurosurgery University of Chicago. *"Some Neurosurgical Fossils"*

2011 John A. Jane, Sr., MD, PhD, Professor of Neurosurgery University of Virginia Health System. *"Anterior vs Posterior Approaches to the Cervical Spine"*

2012 John R. Adler, Jr., MD Professor of Neurosurgery. Stanford University**.** *"Stepping- Out of the OR: A Surgeon's Foray into Entrepreneurship"*

2014 Andres M. Lozeno, MD, Professor of Neurosurgery, University of Toronto. *"Taming Dysfunctional Brain Circuits"*

2015 Edward Oldfield, MD, Professor Neurosurgery, University of Virginia. *"The origin of concepts in neurosurgery: One neurosurgeon's perspective"*

2016 Donald P. Becker, MD *"Brain Trauma and Beyond: A Career in Neurosurgery"*

2017 Volker K.H. Sonntag, MD *"The Journey of Spinal Neurosurgery in the United States"*

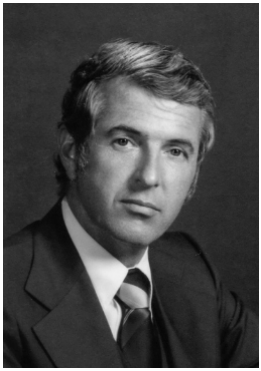
2018 Edward R. Laws, Jr., MD, FACS Professor of Neurosurgery, Harvard Medical School Hospital *"Virtuosity in Surgery and Neurosurgery"*

2019 Robert F. Spetzler, MD *"My Journey in Neurosurgery"*

2021 Richard Ellenbogen, MD. *"The Myth of Equipoise"*

2022 Gary K Steinberg, MD, PhD. *"A Life Odyssey to Understand and Treat Cerebrovascular Disease, with a Few Detours"*

2023 Mitchel S. Berger, MD Professor of Neurosurgery, University of California, San Francisco



Randy Smith Lectureship

Randall W. Smith, Randy to all of us, was our organization's most influential and effective leader for over a generation. He was the mainstay of the Executive Committee.

Randy served the Western Neurosurgical Society in every possible capacity. In particular, he played three important roles. After serving as Secretary/Treasurer for three years, he left a“how-to” manual with a detailed timeline for duties and responsibilities. As Historian, he digitized our annual booklet programs and photos from the past, much to the enjoyment of members at our formal banquet. He started the tradition of publishing a newsletter so members and their families could anticipate the activities of the next annual meeting.

Randy was a Renaissance man. His interests were varied and extended beyond neurosurgery, though his commitment to organized neurosurgery was unwavering. He enjoyed classical music, and sports of all kinds – he had a fantastic memory of various critical plays in baseball and football, farming/ ranching –enjoyed his beloved (and producing!) avocado ranch, woodworking – leaving examples of perfection and beauty; philanthropy, reading and writing. He relished having a drink with members after a board meeting and before a reception. He was a friend and a mentor to his colleagues at the “Western” and beyond. He was very inquisitive and taught by example. He encouraged us to lead a balanced life.

He was the “Conscience” of the Western Neurosurgical Society and will be greatly missed by all.

Randy was also a mentor to many of us. He loved the Western and, in so many ways, enhanced the experience we all enjoy at our annual meetings.

Prior Randy Smith Lecturers

2023 Katie O’Meara Orrico, Esq.
Senior Vice President, Health Policy & Advocacy
American Association of Neurological Surgeons (AANS) and
Congress of Neurological Surgeons (CNS)

On October 25, 2021, we mourned Randy's passing.

To honor his memory, the Executive Committee established the Randy Smith Lectureship.

The committee envisions annual lectures given by speakers who reflect Randy's vision of a wide range of interests in medicine and the humanities, such as music, philanthropy, hobbies, extracurricular activities, leading a balanced life, leadership, and mentorship. The Awards Committee will select speakers and presentations for the annual meetings.

We have asked all WNS members to donate generously to the Randy Smith lectureship; we believe each member will enjoy the lectures, and the WNS as a whole will benefit from the lectureship.

We are happy to announce at the 2024 annual meeting that thanks to your generosity we have reached our $100,000 goal for the Randy Smith Lectureship!

If you would still like to make a donation please fill in the information below, tear it out of the booklet and return to the registration desk or directly to WNS Secretary-Treasurer, Justin Dye.

Name of Donor:_____

Address:_____

City State Zip

Donation Amount:_____ Check [ ] Credit Card [ ] Zelle [ ]

Thank you in advance for your donation!

The Western Neurosurgical Society is a 501(c)(3) not for profit organization and all donors will receive a tax exempt donation receipt for tax purposes.

Please make your checks payable to the Western Neurosurgical Society. In the memo line, please write Randy Smith Lectureship.

If you prefer to mail your check, please send to:

Justin Dye MD, Secretary/Treasurer
The Western Neurosurgical Society
11234 Anderson Street, Room 2562A
Loma Linda, CA 92354

2024 Randy Smith Lecturer

Nuvi Mehta
San Diego Symphony
Special Project Director

Widely considered one of the finest speakers on classical music, Nuvi Mehta has a gift for capturing the mind and heart of every person in his audience. The L.A. Times likens him to Gary Cooper, saying, *"His old-fashioned Hollywood charisma extends to an eloquent and theatrical way of speaking that is almost entirely lost today."* Combining education and drama in his concerts, Mehta is creating new generations of classical music lovers.

As Artistic Director of the Ventura Music Festival Association, Mehta has expanded the range of festival concerts, adding community outreach, On Stage Talks and Up Close events with artists. Mehta is also Artistic Director of the ECHO Chamber Music Series in San Diego, which brings many of the world's leading classical musicians to San Diego's East County.

Appointed Director of Special Projects for the San Diego Symphony in 2006, Mehta launched the Symphony's *Classical Edge* Series - multi-media concerts, introducing new patrons to 'the stories behind the notes'. The series developed a large dedicated following, with Mehta's on stage demonstrations and talks drawing up to 1000 patrons a night.

Conducting appearances have taken Mehta across the United States, to Europe and to Mexico. He has been a guest of the San Diego Symphony, the New World Symphony the Knoxville Symphony, the Fine Arts Chamber Orchestra of Mexico City, and the San Diego Chamber Orchestra. He has appeared as violin soloist with the San Diego Symphony, the Marquette Symphony, the Ann Arbor Symphony, the San Diego Chamber Orchestra, the American Youth Symphony, and as concertmaster and soloist with the New World Symphony.

Mehta is a graduate of Indiana University and The Juilliard School.

George Ablin

1923-1999

In 2000, the members of the Western Neurosurgical Society inaugurated a new lectureship designed to honor, in a tangible and enduring manner, one of the Society's most outstanding members. In its long history, the Society has had no more devoted contributor than Dr. George Ablin. He brought to the group stunning ability and experience, especially in matters of local, national, and international organization, in which he had few peers.

He contributed through service in many areas including a memorable term as President. He was a wise and thoughtful counselor whose advice concerning many professional and personal questions always included a careful analysis, given with words of encouragement.

There was no more active and engaged participant in all of the Society's affairs.

George Ablin was raised in Chicago, received his BS and MD from the University of Michigan, interned at Charity Hospital, New Orleans, Louisiana, did his residency at the University of Wisconsin, later was Instructor at the University of Michigan, and also became a Clinical Professor at California State University, Bakersfield. Dr Ablin was Board Certified in Neurological Surgery, a Fellow of the American College of Surgeons, and a Diplomat of the National Board of Medical Examiners.

Dr Ablin began practice in neurosurgery in Bakersfield, California, in 1953, was President of the Kern County Medical Society in 1984, and was very active in the California Medical Association in various leadership positions. He was Treasurer of the California Medical Review Board and received Distinguished Service awards from the Congress of Neurological Surgeons and the American Association of Neurological Surgeons. He was named Honorary President of the World Neurological Society and in 1989 he was selected as the Kern County Physician of the Year. George was the devoted father of seven children, three of whom became physicians.

George combined an exceptionally perceptive understanding of others, including hundreds of fellow neurosurgeons, with warmth and gentleness and lively humor. He loved his colleagues and friends, and he loved this Society. With this permanent lectureship, the members of the Western Neurosurgical Society honor George Ablin and his cherished wife, Millie.

The Randy Smith Lectureship will replace the Ablin Lecture Series.
This was respectfully discussed with and agreed upon by the Ablin family.

Prior Ablin Lectures

2000 Arthur L. Day, MD, Professor of Neurosurgery, University of Florida. *"Unruptured Intracranial Aneurysms and Sports Medicine in Neurosurgery"*

2002 Tom Campbell, JD, PhD, Professor of Law, Stanford University. Former Congressman. *"Is Freedom Possible in Medicine"*

2003 Frederic H. Chaffee, PhD, Director, WM Keck Observatory, Hawaii. *"The WM Keck Observatory at the Dawn of the New Millennium"*

2004 Gerald Kooyman, PhD, Research Professor, Scripps Institute of Oceanography, San Diego. *"Emperor Penguins: Life at the Limits"*

2005 Lt. Col. Rocco Armonda, MD, Neurological Surgeon, U.S. Army Bethesda, Maryland. *"The Modern Management of Combat Neurotrauma Injuries: Battlefield to the Medical Center"*

2006 August Turak, Spiritual and Business Consultant. *"Spirituality and the Neurosurgeon"*

2007 Donald Trunkey, MD, Internationally Renowned Trauma Surgeon. *"The Crisis in Surgery with Particular Emphasis on Trauma"*

2008 Michael Bliss, PhD, Emeritus Professor, University of Toronto. *"Working Too Hard and Achieving Too Much? The Cost of Being Harvey Cushing"*

2009 Michael A. DeGeorgia, MD, Professor of Neurology. Case Western Reserve University, Cleveland, Ohio. *"Struck Down: The Collision of Stroke and World History"*

2010 Chris Wood, PhD, Vice President for Administration, Santa Fe Institute. *"What Kind of Computer Is The Brain?"*

2011 Volker Sonntag, MD, Vice Chairman, Division of Neurological Surgery Barrow Neurological Institute, Phoenix, Arizona. *"Cervical Instrumentation: Past, Present & Future"*

2012 Robert Schrier, MD, Professor of Medicine, University of Colorado. *"Illnesses in the US Presidents in the 20th Century: Potential Impact on History"*

2013 Samuel Eric Wilson, MD, Professor, Department of Surgery, University of California, Irvine. *"Between Scylla and Charybdis: Can Academic Surgery Survive?"*

2014 Jon H. Robertson, MD, Professor of Neurosurgery, University of Tennessee. *"The challenge of the Future Neurosurgical Education"*

2015 David Piepgras, MD, Professor of Neurosurgery, Mayo Clinic. *"Frontier Surgery: Lessons for Today from Beaumont and St. Martin"*

2016 Larry R. Squire, Ph.D. Professor of Psychiatry, Neurosciences & Psychology, UCSD. **"***The Legacy of Patient H.M. – Cognitive Neuroscience of Human Memory"*

2017 Lucy Kalanithi, MD, FACP Assistant Clinical Professor, Stanford University. *"When Breath Becomes Air-A Conversation with Lucy Kalanithi"*

2018 Michael Edwards, MD, Professor of Neurosurgery, Stanford "*40 years of Pediatric Neurosurgery: The impact of Moore's Law"*

2019 Regis Haid, MD, Professor of Neurosurgery, Emory University, Atlanta, GA *"Spinal Alignment: Keys to the Kingdom"*

Local Interest Lecturer

Matthew Carter
Naval Special Warfare Officer

Matthew Carter is a Naval Special Warfare (SEAL) Officer based out of Coronado, CA and the most recent Officer-in-Charge of the "The Leap Frogs," the U.S. Navy's official parachute demonstration team.

Originally born and raised in Johannesburg, South Africa, Matt came to the US in the early 2000's when his family immigrated to New Jersey, where he discovered an unexpected passion for the unique sport that is water polo. While he still can't figure out how to get the horses in the water, he credits the sport for igniting his passion and thirst for a good challenge. His athletic career led him back abroad to represent the South African national team and ultimately led him out to Pepperdine University where he began his life on the West Coast.

Before taking "the leap" and joining the Navy, Matt spent a short but sweet stint exploring medicine, working as an EMT, physiology researcher, and Orthopedic product developer. After SEAL training, he had the privilege to serve with a West Coast based Special Warfare team, where he deployed to two international theaters and served with the finest special operators our nation has to offer. Most recently, Matt has had the honor of serving with the Leap Frogs, traveling across the country, performing parachute demonstrations in support of Navy recruiting and outreach initiatives.

Matt has also recently developed a deep and growing appreciation for the Neurosurgical community as a patient of the Navy's finest team of (literal) operators at the Naval Medical Center San Diego Neurosurgery Department.

2024 Scientific Program

Fairmont Grand Del Mar
San Diego, California
September 5-8,2024

Friday, September 6, 2024

6:30am - 7:30am **Breakfast with Exhibitors**

7:30am - 8:00am **Presidential Welcome** (Dr. Marco Lee)

8:00am - 8:45am **Scientific Session I**
Moderators: Debbie Henry and Marvin Bergsneider

- 10 min talks 5 min discussion

Neurosurgery Practice

Victor Lo	Use of the generative artificial intelligence (AI) program (Abridge) in neurosurgical practice
Farrokh Farrokhi	Same-Day Discharge Pathway in DBS Electrode Placement Surgery
Andrew S. Little	Outcome Benchmarks for Primary Endoscopic Endonasal Surgery for Low-Risk Patient's with Cushing's Disease: An Evidence-Based Position Statement of the Registry of Adenomas of the Pituitary and Related Disorders (RAPID) Consortium

8:45am - 9:45am **Prolo Lecture**: Gerald Grant, MD
"Intersection of NOTECHS and Neurosurgery"
(Introduction by Gary Steinberg)

9:45am - 10:15am **Coffee with Exhibitors**

10:15am - 11:15am **Local Interest Lecture**: Lt. Matthew Carter, USN
(Introduction by Justin Dye)

11:15am - 12:00pm **Changing Landscape of Neurosurgery**
Moderators: Odette Harris and John McVicker

Steve Giannotta, University of Southern California
Larry Shuer, Stanford

Interviewers: Silvia Vacca and Lily Kim

12:00pm **Adjourn for the day**

Saturday, September 7, 2024

6:00am - 7:55am Members Business Meeting (**Members Only**)
6:30am - 7:55am **Breakfast with Exhibitors** (Non-Members)

8:00am - 8:30am **Scientific Session II**
Moderators: Ciara Harraher and Issac Yang

- 10 min talks 5 min discussion

Basic Science / Clinical Trials

Gary K Steinberg — First-in-human Phase 1/2a Study of Intracerebral Transplantation using Embryonic-derived Neural Stem Cells (NR1) for Chronic Ischemic Stroke (NCT04631406)

Melanie Gephart — A Phase 2a Trial Testing QBS72S in Brain Metastases (NCT05305365)

8:30am - 9:30am **Cloward Award Lecture**: Linda Liau, MD, PhD
(Introduction by Marco Lee)

9:30am - 10:00am **Coffee with Exhibitors**

10:00am - 11:00am **Randy Smith Lecture**: Nuvi Mehta
San Diego Symphony
(Introduction by Moustapha AbouSamra)
Seeing With Our Ears:
Can Music Bring Us To Ourselves?

11:00am - 12:00pm **Presidential Address**: Marco Lee MD, PhD
(Introduction by Arjun Pendharkar)
"*Navigating Cultural Difference in Neurosurgery: Notes from a Small Islander on a Big Continent*"

12:00pm Adjourn for the day

WD-40 was invented in San Diego by the Rocket Chemical Company in 1953

Sunday, September 8, 2024

6:30am - 7:30am	**Breakfast with Exhibitors**
7:30am - 7:45am	Announcements: Introduction of New Members Adair Prall
7:45am - 8:30am	**Scientific Session III** *Moderators:* Laura Prolo and Jason Hauptman

- 10 min talks 5 min discussion

Pediatric Neurosurgery

David Bonda	Deep Brain Stimulation of Bilateral Centromedian Thalamic Nuclei in Pediatric Patients with Lennox-Gastaut Syndrome
Vijay M. Ravindra	Towards a Definition of Physiologic Vulnerability in Pediatric Spine Surgery: Identification of Key Risk Factors in a Cohort Study of Children with Neuromuscular Disease Undergoing Spinal Fusion
Natalie Limoges	Who Are We Training and Where Do They Go? Trends in Practice and Diversity in the Last Five Years in Pediatric Neurosurgery

8:30am - 9:00am	**Scientific Session IV** *Moderators:* Jeff Steinberg and Justin Dye

Cerebrovascular

Phillip Taussky	Big Things are Happening for Small Aneurysms
Ioannis Fouyas	Micro Neurosurgery in Edinburgh: Reflections from the Past Guiding the Future

9:00am - 9:30am	**Resident Award Presentation** (Introduction of winners by Maziyar Kalani

- 10 min talks 5 min discussion

Lily H. Kim	Modulation of Glycolytic Shunting in Myeloid Cells Via Heme Oxygenase-1 Pathway Results in Enhanced T Cell Activation and Improved Survival in a Murine Glioma Model
Silvia Vaca	Disparities in Postoperative Care and Communications between English-Speaking and non-English-Speaking Cervical Myelopathy Patients
9:30am - 10:00am	**Coffee with Exhibitors**

Sunday, September 8, 2024 (continued)

10:00am - 11:00am **Scientific Session V**
Moderators: Sharon Ben-Haim and Mark Sedrak

- 10 min talks 5 min discussion

Functional / Pain

Abhijeet Gummadavel	Resting state fMRI informs vigilance network properties in patients undergoing epilepsy surgery
Michelle Paff	Clinical outcomes of microvascular decompression for glossopharyngeal neuralgia: A single-center experience
Shervin Rahimpour	Demographics of Focused Ultrasound Thalamotomy for Essential Tremor and Trends in Deep Brain Stimulation Surgery After Its Introduction in the United States
Mark Linskey	Re-do Microvascular Decompression (MVD) Surgery for Recurrent/Persistent Trigeminal Neuralgia (TN): Pattern of Failure (POF) Analysis and Operative Findings in 164 Re-Do MVD's over 18 Years

11:00am - 12:00pm **Scientific Session VI**
Moderators: Jay Morgan and Amir Vokshoor

- 10 min talks 5 min discussion

Spine

Rick Chua	Can the Robot Do Anything Else Besides Put in a Screw? The Future of Spinal Robotics is NOW!
Martin Pham	A Spine Surgeon's Learning Curve with the Minimally Invasive L5-S1 Lateral ALIF (OLIF51) Surgical Approach: Perioperative Outcomes and Technical Considerations
Brian Gantwerker	A Novel Case of Occipital Neuralgia Caused by Atlantoaxial Facet Cyst: Do They Need a Fusion?
Anthony DiGiorgio	A Machine Learning Model to Predict 5 Year Post-Operative Back Pain in Patients with Grade 1 Lumbar Spondylolisthesis: A Quality Outcomes Database Study

12:00pm - 12:15pm **Closing Remarks. Meeting Adjourns.**

See you next year
September 11-14, 2025

Coeur d'Alene Resort
Coeur d'Alene, ID

Friday, September 6, 2024
Scientific Session I

Neurosurgery Practice

Use of the generative artificial intelligence (AI) program (Abridge) in neurosurgical practice

Victor Lo, MD, MPH
Southern California Permanente Medical Group – Kaiser Permanente

Jerry Tseng, MD, Kristin Bodnar

Introduction: Abridge, a generative artificial intelligence (AI) program, was introduced into the clinical setting at Kaiser Permanente in early 2024. This innovative tool leverages AI capabilities to assist physicians by streamlining documentation processes and enhancing clinical workflows. The program records the natural conversation between physician and patient, then generates the clinical note. In April 2024, the deployment of Abridge was expanded to include specialty departments including Neurosurgery.

This abstract presents preliminary data from neurosurgeons at Kaiser Permanente in the Southern California region who have integrated Abridge into their practice. The focus of this analysis is to present user experiences and gather insights on the utility and performance of the AI system in a neurosurgical practice. Furthermore, early data will be examined to assess the impact of Abridge on physician focus and the reduction of mental burden across all users within the organization.

Methods: The Abridge program has been made available to all Kaiser Permanente physicians in all specialties in the Southern California region. Use of the program is voluntary. Feedback was gathered through a regional online survey to all users.

Results: 13/42 (31%) neurosurgeons at Kaiser Permanente in the Southern California region registered to use Abridge. 4/13 Abridge neurosurgery users provided survey responses. Overall, there were 744 survey responses across all specialties. Abridge shifted the balance of attention during a patient visit from 58% patient focused and 42% documentation focused to 82% patient focused and 18% documentation focusd. 67% of physicians reported Abridge reduced or greatly reduced their administrative burden. 75% of physicians agree or strongly agree Abridge can help reduce burnout.

Conclusion: Use of Abridge can help shift the focus of a visit from documentation back towards patient care and experience. In addition, users reported reduced administrative burden, which may reduce physician feelings of burnout

Same-Day Discharge Pathway in DBS Electrode Placement Surgery

Farrokh Farrokhi, MD Virginia Mason Franciscan Health

Aaradhya Pant, BS, Stanford School of Medicine; Christine Palermo, MD, Virginia Mason Franciscan Health; Samira Pardakhtim, ARNP, Univ. of Washington School of Medicine; John Roberts, MD, Virginia Mason Franciscan Health; Sindhu Srivatsal, MD, Virginia Mason Franciscan Health Maria Marsans, PAC, Virginia Mason Franciscan Health

Introduction: Deep Brain Stimulation (DBS) surgery has evolved into a highly effective procedure for treating an expanding number of neurological conditions. While DBS surgery has demonstrated low rates of serious complications, it is typically followed by an inpatient hospital stay. A primary barrier to discharging patients same-day is uncontrolled postoperative hypertension, which may lead to serious complications such as intracranial hemorrhage.

In recent years, a combination of limited hospital resources, the growing demand for DBS, and other restrictions on elective, hospital-based procedures have contributed to a shift in the care model. Access to elective surgeries are further limited due to the ongoing nursing shortage and preferences of nurses for working in outpatient settings. To preserve inpatient resources and increase patient accessibility, a transition to outpatient DBS surgery or same-day discharge following DBS surgery is emerging. This discharge model has been previously reported as safe. However, to our best knowledge, no study has evaluated which patient factors can be leveraged to guide the selection of patients suitable for same-day discharge.

Methods: Commencing in January 2022, our institution began a rapid discharge pathway for DBS patients on the same day following surgery. This change in practice provided two cohorts: patients in the same-day pathway and inpatient overnight pathway. Here, we first retrospectively analyzed these two cohorts from January 2022 to July 2023 to determine (1) which, if any, pre-operative factors can predict whether a patient will be discharged same-day and (2) how these pre-operative factors could influence patient selection for same-day discharge.

Results: We found no discernible pre-operative factors to predict the likelihood of same-day discharge after DBS surgery. Recognizing the limitations of pre-operative factors, combined with uncontrolled hypertension being a known barrier to early discharge, we subsequently focused on postoperative antihypertensive medication administration in all patients prior to January 2022. Our analysis underscores the potential for a significant proportion of patients to be considered for same-day discharge based on better preoperative hypertension management, potentially leading to significant healthcare cost savings.

Outcome Benchmarks for Primary Endoscopic Endonasal Surgery for Low-Risk Patient's with Cushing's Disease: An Evidence-Based Position Statement of the Registry of Adenomas of the Pituitary and Related Disorders (RAPID) Consortium

Andrew S. Little, MD, MBA, Barrow Neurological Institute, Phoenix, AZ

For the RAPID Consortium

Introduction: Reports for surgical outcomes for Cushing's disease (CD) are mostly limited to single center experiences by expert surgeons. Therefore, there are no surgical outcomes benchmarks for endoscopic Cushing's disease surgery that practitioners may use to guide their quality improvement efforts despite the high morbidity and excess mortality observed in patients not achieving remission. We propose a bundle of evidence-based benchmarks that focus on *cost efficiency of care*, *disease outcomes*, and *gland recovery* in low-risk patients (age <70, BMI <50, microadenoma, Knosp grade 0-2) using a unique multicenter dataset from US pituitary centers.

Methods: The RAPID steering committee proposed the benchmarks. Patient characteristics and outcomes were aggregated and analyzed by the data coordinating center. Because there is no industry standard, benchmarks were reported using two approaches.

Results: 431 patients from 12 centers who underwent primary endoscopic transsphenoidal surgery from 2006-2022 were included. There were 227 patients in the low-risk cohort. For the *cost efficiency* benchmarks length of stay (LOS) and 90-day unplanned readmission, the mean LOS was 3.8 midnights and the proportion of patients readmitted was 11.1%. For the *outcomes* benchmarks disposition to SNF, CSF leak, and 1-year sustained remission, the rates were 2.2%, 1.3%, and 81.2%, respectively. For the *gland function* benchmarks, the rates of permanent and temporary diabetes insipidus were 1.8% and 11.9%, respectively. The 25th percentile performance by center for LOS and 90-day unplanned readmission were 3.0 midnights and 6.3%, respectively, and disposition to SNF, CSF leak, and 1-year sustained remission were <1%, <1%, and 92.2%, respectively. The 25th percentile for permanent and temporary diabetes insipidus were <1% and <1%.

Conclusions: We propose evidence-based benchmarks in a low-risk Cushing's disease population undergoing first-time endoscopic pituitary surgery from a multi-institutional collaboration. Surgeons may use these benchmarks to assess and improve the quality of their clinical pathways.

Saturday, September 7, 2024
Scientific Session II

Basic Science / Clinical Trials

First-in-human Phase 1/2a Study of Intracerebral Transplantation using Embryonic-derived Neural Stem Cells (NR1) for Chronic Ischemic Stroke (NCT04631406).

Gary K Steinberg, MD, PhD; Stanford University School of Medicine and Stanford Stroke Center, Stanford, CA

Anthony Bet MBA, CPA, Jennifer Williams BS, OTR/L, Kathy McDonald BA, Robert Diaz PhD, Cindy Samos BA, Kirk Trisler PhD, Judy Weissinger MD, Maria L Coburn BA, Elizabeth Tong MD, Neil E Schwartz MD, PhD

Introduction: Except for vagal nerve stimulation, no treatment exists to restore function in chronic stroke patients. NR1 is a human embryonic derived neural stem cell that improved motor-sensory function in rodent stroke models, and was expanded to produce GMP cryopreserved Cell Lots. The safety & efficacy of NR1 intracerebral transplantation in chronic stroke patients was assessed.

Methods: Inclusion Criteria: 18-75 yo; 6-60 mos post-ischemic subcortical MCA stroke; mRS 3-4. Subjects were transplanted with 2.5M, 5M, 10M or 20M. Primary Outcomes: Adverse events 0-6 mos; Change in total Fugl-Meyer motor score (FMMS, max 100) compared to baseline at 6 & 12 months (≥10 points improvement considered "clinically meaningful"). Other outcomes: Gait Speed test, Barthel Index (BI), MR FLAIR, Resting State fMRI and [18F]FDG PET.

Results: 17 patients were transplanted. Adverse events included headache and worsened speech, all resolving spontaneously. All pts demonstrated improved total FMMS. 11/17 subjects showed clinically meaningful recovery in total FMMS total; at 12 mos subjects increased 11.8 points for total FMMS, 7.9 points for BI, while gait improved 11.6 m/s. Linear regression showed mean improvement in total FMMS, UE motor and LE motor score at 12 mos ($p<0.0001$, $p=0.015$, $p<0.0001$), with significant differences in total FMMS, BI and gait speed at 6 mos ($p< 0.05$).
14/17 pts demonstrated new transient FLAIR signal in premotor cortex at d7, that resolved by 2 mos, which in prior studies was highly correlated with sustained neurologic recovery. Resting state fMRI showed improved functional brain connectivity in sensorimotor network, both ipsilesionally & contralesionally. FDG PET showed increased activity in the ipsilesional motor cortex & contralesional cerebellum.

Conclusions: Intraparenchymal transplantation of NR1 cells in chronic stroke patients appears safe and well tolerated. Results suggest improved motor function starting at 1 mos and increasing to 12 mos post-implant.

A Phase 2a Trial Testing QBS72S in Brain Metastases

Melanie Hayden Gephart, MD, PhD
Professor of Neurosurgery, Stanford University

Rukayat Taiwo, Paul M. Harary, Monica Granucci, Thy TH Trinh, Sophia Chernikova, Kate Therkelsen, Mili Arora, Michelle E. Melisko, Michael Iv, Hannes Vogel, Summer Han, Krishna Bharani, Seema Nagpal(Stanford) Jaymes Holland; Gordon Ringold; Ron Weitzman (Quadriga)

Introduction: Breast cancer is the most common cause of cancer death among women and the most common source of brain metastases. Leptomeningeal disease (LMD), a distinct subtype of brain metastases with approximately three-month survival and severe neurologic sequelae, is increasingly common and has no durable treatment options. is a novel molecule, which targets LAT-1, a known brain transporter that is also highly expressed on metastatic cancer. QBS72S showed high CNS permeability and pre-clinical efficacy in a mouse model of breast-to-brain LMD. We have initiated a phase 2a trial of QBS72S in patients with brain metastases, including LMD.

Methods/Results: A single-arm, Phase 2a study will assess the preliminary efficacy and safety of the cytotoxic agent QBS72S for the treatment of brain metastasis within three distinct patient cohorts: breast parenchymal metastasis (Cohort 1), breast LMD (Cohort 2), and any primary LMD (Cohort 3). QBS72S is a novel amino acid analogue conjugated with a DNA alkylating moiety that leverages the blood-brain barrier-specific L-type amino acid transporter 1 (LAT1) for active transport into the brain. All participants will receive a once-monthly dose of intravenous QBS72S at 18 mg/m^2.

Given the diagnostic and monitoring challenges of LMD, the primary endpoint is overall response rate across evaluable participants in Cohort 1 based on modified Response Assessment Neuro-oncology Brain Metastases (mRANO-BM) response criteria. Secondary endpoints include PFS, OS, DOR, and treatment-related adverse effects. Exploratory endpoints include correlation of LAT1 expression, CSF pharmacokinetics, and the development of novel CSF biomarkers.

Conclusion: There remains a significant unmet need in the treatment of brain metastases, particularly for LMD. QBS72S holds great promise for treating patients with brain-trophic metastatic cancers. Our novel exploratory endpoints strive to identify more rapid and reliable biomarkers of treatment response and resistance, to increase throughput of LMD-focused clinical trials.

Sunday, September 8, 2024
Scientific Session III

Pediatric Neurosurgery

Deep Brain Stimulation of Bilateral Centromedian Thalamic Nuclei in Pediatric Patients with Lennox-Gastaut Syndrome

David Bonda, MD; Guerin Children's, Cedars-Sinai Medical Center, Department of Neurosurgery, Los Angeles, CA

Katherine A. Kelly MD[1], Scott Boop MD[1], Abdullah H. Feroze MD[1], Stephanie C. Randle MD[2,3], Mike Bindschadler PhD[6], Ahmad Marashly MD[2,3], James Owens MD PhD[2,3], Jason Lockrow MD PhD[2,3], Xiuhua Bozarth MD PhD[2,3], Edward Novotny MD[2,3,4], Seth Friedman PhD[7], Hannah E. Goldstein MD[1,4,5], Benjamin L. Grannan MD[1], Sharon Durfy PhD[1], Jeffrey G. Ojemann MD[1,4,5], Andrew L. Ko MD[1], Jason S. Hauptman MD PhD[1,4,5]

1. Department of Neurological Surgery, University of Washington, Seattle, WA; 2. Department of Neurology, University of Washington, Seattle, WA; 3. Division of Pediatric Neurology, Seattle Children's Hospital, Seattle, WA; 4. Neurosciences Center, Seattle Children's Hospital, Seattle, WA; 5. Division of Neurosurgery, Seattle Children's Hospital, Seattle, WA; 6. Department of Radiology, Seattle Children's Hospital, Seattle, WA; 7. Center for Clinical and Translational Research, Seattle Children's Hospital, Seattle, WA

Introduction: Surgical management of pediatric patients with nonlesional, drug-resistant epilepsy, including patients with Lennox-Gastaut syndrome (LGS), remains a challenge given the lack of resective targets in most patients and shows seizure freedom rates <50% at 5 years. The efficacy of deep brain stimulation (DBS) is less certain in children than in adults. This study examined clinical and seizure outcomes for pediatric patients with LGS undergoing DBS targeting of the centromedian thalamic nuclei (CMTN).

Methods: An institutional review board-approved retrospective analysis was performed of patients aged ≤19 years with clinical diagnosis of LGS undergoing bilateral DBS placement to the CMTN from 2020 to 2021 by a single surgeon.

Results: Four females and 2 males aged 6-19 years were identified. Before surgery, each child experienced at least 6 years of refractory seizures; 4 children had experienced seizures since infancy. All took antiseizure medications at the time of surgery. Five children had previous placement of a vagus nerve stimulator and 2 had a previous corpus callosotomy. The mean length of stay after DBS was 2 days. No children experienced adverse neurologic effects from implantation; the mean follow-up time was 16.3 months. Four patients had >60% reduction in seizure frequency after surgery, 1 patient experienced 10% reduction, and 1 patient showed no change. No children reported worsening seizure symptoms after surgery.

Conclusions: Our study contributes to the sparse literature describing CMTN DBS for children with drug-resistant epilepsy from LGS. Our results suggest that CMTN DBS is a safe and effective therapeutic modality that should be considered as an alternative or adjuvant therapy for this challenging patient population. Further studies with larger patient populations are warranted.

Towards a Definition of Physiologic Vulnerability in Pediatric Spine Surgery: Identification of Key Risk Factors in a Cohort Study of Children with Neuromuscular Disease Undergoing Spinal Fusion

Vijay M. Ravindra, MD, MSPH
Naval Medical Center San Diego, University of California San Diego

Muhammad S. Ghauri, MS[1], Sujay Rajkumar, BS[2], Lauren E. Stone, MD[3], Michael P. Kelly, MD, MSCI[4], Rajiv R. Iyer, MD[5-7], Jennifer Bauer, MD[6], Christopher Ames[7], MD, Peter O. Newton, MD[4], David D. Gonda, MD[8], Michael L. Levy, MD, PhD[3], Vijay M. Ravindra, MD, MSPH[3-4-5-9]

[1]School of Medicine, California University of Science and Medicine, Colton, California, USA; [2]School of Medicine, Drexel University College of Medicine, Philadelphia, Pennsylvania, USA [3]Department of Neurosurgery, University of California San Diego, San Diego, California, USA [4]Division of Pediatric Orthopedic Surgery, Rady Children's Hospital, San Diego, California, USA [5]Division of Pediatric Neurosurgery, Primary Children's Hospital, University of Utah, Salt Lake City, Utah, USA; [6]Seattle Children's Hospital Department of Orthopedic Surgery, University of Washington Department of Orthopedics and Sports Medicine, Seattle, WA, USA; [7]Department of Neurological Surgery, University of California, San Francisco, San Francisco, CA.; [8]Division of Pediatric Neurosurgery, Rady Children's Hospital, San Diego, California, USA; [9]Department of Neurosurgery, Clinical Neurosciences Center, University of Utah, Salt Lake City, Utah, USA

Introduction: Preoperative risk stratification strategies using "frailty" are commonplace for adults but are difficult to apply for children. We aim to identify key risk factors that indicate physiologic vulnerability and predict perioperative complications in a cohort of children with neuromuscular scoliosis (NMS) and create a patient-specific prediction model for physiological vulnerability (PV-5).

Methods: This is a retrospective cohort study of patients ≤18 years from the National Surgical Quality Improvement Program-Pediatric database with NMS who underwent spinal fusion surgery for correction. The primary outcome was complication occurrence.

Patients were divided into training and testing cohorts. Univariate and multivariate logistic regression were performed; variables significantly associated with the primary outcome were evaluated using Akaike information criterion and area under the curve (AUC). Significant variables received weighted scores, and prediction scores were calculated to generate a patient-specific prediction model. The final model's performance was evaluated using the Brier score.

Results: The study included 9442 patients with NMS. Patients with a central nervous system abnormality (OR 1.32 [95%CI 1.13-1.53]), hematologic disorder (OR 1.4 [1.06-1.85]), congenital malformation (OR 1.3 [1.1-1.54]), nutritional support (OR 2.21 [1.91-2.57]), and preoperative wound infection (OR 2.3 [1.4-3.76]) were more likely to develop a complication following spinal fusion surgery. PV-5 scores were calculated from these risk factors to generate our final prediction model. Patients with PV-5 scores of 1 (OR: 2.0 [1.27-3.43], p<0.004), 2 (OR: 2.75 [1.63-4.64], p<0.001), 3 (OR: 3.67 [2.18-6.19], p<0.001), 4 (OR: 4.09 [2.39-6.99], p<0.001), and 5+ (OR: 3.58 [1.35-9.47], p=0.01) were more likely to experience complications than those with scores of 0 (accuracy=89.65%, Brier score = 0.09).

Conclusions: Using the five factors associated with complications in children with NMS undergoing spinal fusion surgery, we created a prediction model to illustrate physiologic vulnerability and morbidity in this population. Prospective validation and granular analysis of the variables are necessary, but our model serves as a foundation for further body system-specific investigation.

Who Are We Training and Where Do They Go? Trends in Practice and Diversity in the Last Five Years in Pediatric Neurosurgery

Natalie Limoges, DO
Pediatric Neurosurgery at Valley Children's Healthcare. Adjunct Clinical Instructor at Stanford University

Bianca Luna-Lupercio – USC; Logan Muzyka – USC
Susan Durham, MD – Children's Hospital Los Angeles, USC

Introduction: As of 2017, 70% of fellows who graduated from an ACPNF accredited fellowship had a pediatric neurosurgery practice. No one has previously evaluated diversity among trained fellows over time. We sought to trend diversity representation over time as well as practice structure and location of graduates in the last 5 years.

Methods: From a database maintained by the Accreditation Council for Pediatric Neurosurgery Fellowships (ACPNF), all fellowship graduates were identified, and an internet search was conducted to determine gender, undergraduate and graduate degrees, location and dates of post graduate training, current practice/employment, and pediatric extent of current neurosurgical practice. A survey requesting ACPNF fellowship graduates to self-identify race and ethnicity was completed.

Results: 143 individuals completed an ACPNF accredited fellowship between 2018 and 2023. Fifty-five (38.4%) are female, compared to 20.4% prior to 2018. Since 2017, 5 black (3.5%) and 12 total 8.4%) racial under-represented minorities (URM) were trained. From 1992-2017, 31 (8.4%) of fellows were URM. Prior to 2018, 65 (18.1%) were international medical graduates (IMG), and in the last 5 years 11 fellows (7.7%) were IMGs. Seventy-six (53%) are practicing at a freestanding children's hospital.

Conclusion: Between 2018 and 2023, 143 pediatric neurosurgeons graduated from ACPNF fellowships, this is 37% of the total number trained from 1992-2017 (386). From 1992-2017, 70% of fellowship graduates have a pediatric neurosurgery job at a freestanding children's hospital. Since 2017, only 53% have fully pediatric neurosurgery practices. This past fall, only 20 of 32 (62.5%) of programs matched a fellow, possibly a reflection of the limited job market. There has been a small increase in URM being trained in ACPNF fellowships over the past three decades, 39% being trained in the last 5 years.

Cerebrovascular

Big Things Are Happening for Small Aneurysms

Phil Taussky, MD
Beth Israel Deaconess Medical Center, Harvard Medical School

Sam Pettersson MD, Mira Salih MD, Michael Young DO, Max Shutran MD, Christopher Ogilvy MD (same institution)

Introduction: Identifying predictors for rupture of small intracranial aneurysms (sIAs) have become a growing topic in the literature given the relative paucity of data on their natural history. The authors performed a meta-analysis to identify reliable predictors.

Methods: PubMed, Scopus, and Web of Science were used to systematically extract references which involved at least 10 IAs <7mm which including a control group experiencing no rupture. All potential predictors reported in the literature were evaluated in the meta-analysis.

Results: Fifteen studies yielding 4,739 sIAs were included in the meta-analysis. Four studies were prospective and 11 were retrospective. Univariate analysis identified 7 predictors which contradicted or are absent in the current scoring systems, while allowing to perform subgroup analysis for further reliability: patient age (MD -1.97, 95%CI -3.47-0.48; P = 0.01), the size ratio (MD 0.40, 95%CI 0.26-0.53; P < 0.00001), the aspect ratio (MD 0.16, 95%CI 0.11-0.22; P < 0.00001), bifurcation point (OR 3.76, 95%CI 2.41-5.85; P < 0.00001), irregularity (OR 2.95, 95%CI 1.91-4.55; P < 0.00001), the pressure loss coefficient (MD -0.32, 95%CI -0.52-0.11; P = 0.002), wall sheer stress (Pa) (MD -0.16, 95%CI -0.28-0.03; P = 0.01). All morphology related predictors listed above have been confirmed as independent predictors via multivariable analysis among the individual studies.

Conclusions: Morphology related predictors are superior to the classic patient demographic predictors present in most scoring systems. Given that morphology predictors take time to measure, our findings may be of great interest to developers seeking to incorporate artificial intelligence into the treatment decision-making process.

Micro Neurosurgery in Edinburgh: Reflections from the Past Guiding the Future

Ioannis Fouyas, MD PhD
Dept. Clinical Neurosciences, Univ. of Edinburgh, UK

Edinburgh has contributed to the birth and evolution of vascular - including neurovascular - surgery. Professor Hunter, credited with the "Hunterian ligation" was the President of the Royal College of Surgeons and Professor Dott, the first clinician to surgically protect an intracranial aneurysm, was the first Professor of Clinical Neurosciences at the University of Edinburgh. Their legacy has been perpetuated by their successors, with the Academic Department contributing significantly to the establishment of evidence based medicine. ISAT and ARUBA trials, are both pertinent examples. More recently, the Academic department has organized the CARE trial, a pilot randomized study addressing the treatment of symptomatic cavernomas.

Ironically, the success of these trials has resulted in fewer opportunities to preserve technical competence. The dissemination of the necessary microsurgical skills has been facilitated by cadaveric workshops run at the College of Surgeons, with regular international contributors. In addition, Edinburgh attracts high calibre trainees, who provide a vital contribution to the professional ethos for the preservation of excellence. This includes the application of evolving technologies for the improvement of surgical outcomes, which will be elaborated.

2023 Basic Science Resident Award Recipient

Lily Kim, MD
Stanford University

Lily Kim, MD, is a current fifth-year neurosurgery resident at Stanford Department of Neurosurgery with an interest in neuro-oncology, immunotherapy, and skull base surgery.

She earned her undergraduate degree in Human Biology with distinction from Stanford University. Continuing her academic journey at Stanford, she obtained her M.D. from the Stanford School of Medicine, where she discovered her passion for neurosurgery.

In addition to her current research focus on immunometabolism, Dr. Kim's research interests over the years have encompassed bioinformatics/ computational biology, AI, and clinical epidemiology. She has authored over 40 peer-reviewed publications and has presented at multiple national scientific meetings. Currently, she is investigating ways to enhance immunotherapy for various CNS malignancies under Dr. Michael Lim's mentorship.

Beyond her research, Dr. Kim actively participates in national neurosurgical leadership, serving as a CSNS Socioeconomic Fellow, WINS Resident Executive Board Diversity Committee Co-Chair, and CNS Resident Committee Member.

Modulation of Glycolytic Shunting in Myeloid Cells Via Heme Oxygenase-1 Pathway Results in Enhanced T Cell Activation and Improved Survival in a Murine Glioma Model

Lily H. Kim, MD; Department of Neurosurgery, Stanford University School of Medicine

John Choi, MD, MEd; Ryan Nitta, PhD; Ayush Pant, BS; Ethan Schonfeld, BS; Gordon Li, MD; Christina Jackson, MD; Xinnan Wang, MD, PhD; Michael Lim, MD; Department of Neurosurgery, Stanford University School of Medicine

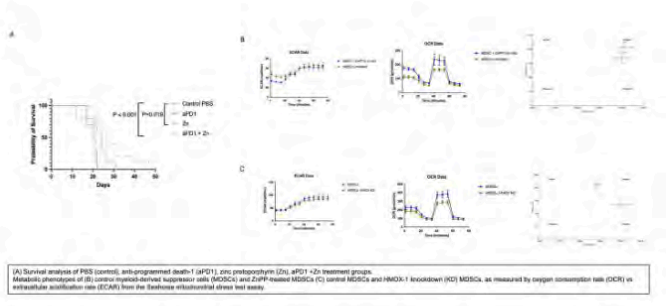
Introduction: Cancer cells preferentially utilize aerobic glycolysis (Warburg effect). Recent studies show similar metabolic reprogramming in immune cells of the tumor microenvironment (TME). Heme oxygenase-1 (HMOX-1), a metabolic regulatory gene, is known to be upregulated in glioblastoma (GBM) myeloid cells, but how HMOX-1 specifically modulates immunosuppression and energy utilization remains poorly understood. We aimed to investigate the effect of HMOX-1 downregulation in GBM TME on immune response and energy metabolism.

Methods: Syngeneic glioma models with C57BL/6J mice implanted with CT-2A cells were treated with intracranial (IC) injection of the HMOX-1 inhibitor zinc protoporphyrin (ZnPP), intraperitoneal (IP) injection of anti-PD-1, IC ZnPP + IP anti-PD-1, or IC saline (sham). Adoptive cell transfer of myeloid-derived suppressor cells (MDSCs) with siRNA knockdown of *Hmox-1* into CSF-1R myeloid-depleted mice were used for mechanistic studies. Changes in glycolytic energy dynamics were assessed with the Seahorse mitochondrial stress test. Immunophenotyping was performed with flow cytometry.

Results: Myeloid *Hmox-1* knockdown as well as HMOX-1 inhibition with ZnPP resulted in increased T cell activation with a significantly higher IFN-γ expression in brain compared to non-treated mice ($P = 0.039$, 0.02, respectively). However, there was also a compensatory upregulation of PD-L1 in myeloid cells with ZnPP treatment ($P < 0.0001$). ZnPP monotherapy and combination therapy with anti-PD-1 + ZnPP led to improved median overall survival compared to sham and anti-PD-1 monotherapy arms, with combination therapy demonstrating the greatest survival benefit ($P < 0.0001$). Metabolic assays for both ZnPP treatment and *Hmox-1* knockdown demonstrated a shift away from glycolysis-predominant metabolism in MDSCs, indicating a change in energy dynamics from the usual TME.

Conclusions: HMOX-1 inhibition enhanced T cell activation, shifted MDSCs away from cancer cell-like glycolytic shunting, and improved survival in a murine glioma model. Modulation of metabolic reprogramming can have an anti-tumor, immune-activating effect that synergizes with checkpoint inhibition.

Figure 1.



(A) Survival analysis of PBS (control), anti-programmed death-1 (aPD1), zinc protoporphyrin (Zn), aPD1 +Zn treatment groups.
Metabolic phenotypes of (B) control myeloid-derived suppressor cells (MDSCs) and ZnPP-treated MDSCs (C) control MDSCs and HMOX-1 knockdown (KD) MDSCs, as measured by oxygen consumption rate (OCR) vs extracellular acidification rate (ECAR) from the Seahorse mitochondrial stress test assay.

2023 Clinical Science Resident Award Recipient

Silvia Vaca
Stanford University

Dr. Silvia Vaca was born in Bogotá, Colombia and moved to the United States at a young age.

She completed her Bachelor's degree in Biomedical Engineering with a minor in Mandarin Chinese at Georgia Tech, then attended Stanford School of Medicine for her medical degree with a scholarly concentration in global health and bioengineering.

Dr. Vaca is now a neurosurgery chief resident at Stanford Health Care. She is interested in cerebrovascular neurosurgery and a variety of global neurosurgery efforts, including neurosurgical capacity building in Latin America and the use of technology and innovation to advance neurosurgery in low-resource settings.

Disparities in Postoperative Care and Communications between English-Speaking and non-English-Speaking Cervical Myelopathy Patients

Silvia Vaca MD; Department of Neurosurgery, Stanford Healthcare

Janet Wu BS[2], Laura Chang PhD[2], Corinna Zygourakis MD[1]
[1]Department of Neurosurgery, Stanford Healthcare; [2]School of Medicine, Stanford University

Introduction: Immigrants are a critical proportion of the United States population, of which 19% speak English "not well" or "not at all". However, literature regarding effects of primary language on postoperative care in neurosurgery is limited. We assessed differences in postoperative communications and 90-day outcomes between English-speakers (ES) and non-English-speakers (NES) with cervical myelopathy.

Methods: Cervical myelopathy patients who underwent surgery at Stanford Healthcare from 2011-2023 were assessed for demographics, language, Charlson Comorbidity Index (CCI); number of calls/messages initiated to surgical team, escalation of care; ED visits, readmissions, reoperations, and complications 90 days post-discharge. 181 ES were randomly sampled to match 181 NES. Statistical analysis was performed in R.

Results: NES had higher CCI and re-admission to surgery directly from ED, clinic, or outside hospital (all $p<0.001$). ES had higher proportions of Medicare and private insurance, while NES had more Medi-Cal and joint Medicare/Medi-Cal policies ($p<0.001$). Fewer NES called/messaged overall; NES who did sent fewer communications and had elevated rate of escalation of care (all $p<0.001$). More ES than NES enrolled in MyChart ($p<0.001$), but rates of communications among enrolled patients were similar. NES had higher rate of family, healthcare workers, or caregivers communicating on their behalf with surgical teams ($p<0.001$). ED visits, readmissions, reoperations, and complication rates 90 days post-discharge were not significantly different between ES and NES, but there were three NES yet no ES deaths. One-year follow-up rates were similar.

Conclusion: Language is a barrier to postoperative care for cervical myelopathy patients. NES relied heavily on family members for support—presenting a barrier for NES who do not have that support system and an impetus to expand proxy access for electronic medical records to protect patient privacy. Expanding MyChart in different languages and helping NES enroll may allow them to participate more independently in their healthcare.

Functional / Pain

Resting state fMRI informs vigilance network properties in patients undergoing epilepsy surgery

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6. Department of Biostatistics, Vanderbilt University Medical Center, Nashville, TN; 7. Department of Neurology, Vanderbilt University Medical Center, Nashville, TN; 8. Department of Radiology and Radiological Sciences, Vanderbilt University Medical Center, Nashville, TN; 9. Department of Electrical and Computer Engineering, Vanderbilt University, Nashville, TN

Introduction: Epilepsy is a common neurological disease affecting nearly 1% of the global population, and temporal lobe epilepsy (TLE) is the most common type. Patients experience recurrent seizures and chronic cognitive deficits that can impact their quality of life, ability to work, and independence. These cognitive deficits often extend beyond the temporal lobe and are not well understood. The extended network inhibition hypothesis (ENIH) suggests that repeated spread of seizure activity to the ascending reticular activating system (ARAS) may contribute to these deficits.

Methods: Resting state functional magnetic resonance imaging (fMRI) data were collected for 40 pre-operative TLE patients, 25 post-operative TLE patients, and 40 age-matched healthy controls. Functional connectivity was computed between all regions. Functional connectivity and segregation, a graph-theory measure of network isolation, were compared across the age spectrum in patients and controls.

Results: We found that increases in epilepsy duration were associated with greater segregation of the ARAS and decreased functional connectivity between the pedunculopontine tegmental nucleus and the frontoparietal association cortex. Furthermore, patients with impaired neurocognitive function were noted to have longer epilepsy duration and higher ARAS segregation compared to patients with spared neurocognition. After surgery, completely seizure-free patients demonstrated ARAS connectivity patterns that resembled controls, whereas those with residual seizures had persistent abnormal connectivity.

Conclusions: Recurrent seizures may contribute to the progressive isolation of critical subcortical activating structures, possibly impacting cognitive function. Furthermore, some ARAS functional connectivity abnormalities can be reversed if seizure freedom is achieved after epilepsy surgery.

Clinical outcomes of microvascular decompression for glossopharyngeal neuralgia: A single-center experience

Michelle Paff, MD, University of California, Irvine

Mark Linskey, MD, University of California, Irvine

Introduction: Glossopharyngeal neuralgia (GN) is a rare facial pain syndrome that affects 2 – 7 per million individuals annually and is 8.5 times less common than trigeminal neuralgia. In GN, neuropathic pain involves the auricular and pharyngeal branches of cranial nerves (CN) IX and X, with pain felt in the ear, base of the tongue, and in the tonsillar fossa. The pain may be typical (paroxysmal, sharp, stabbing) or atypical (constant, burning, aching). Here we report the clinical outcomes of 62 patients with typical and/or atypical GN treated with microvascular decompression (MVD) at our institution.

Methods: The characteristics and clinical outcomes of patients treated for GN with MVD were prospectively collected and retrospectively analyzed. Pain severity was assessed using the visual analog scale, ranging from 0 (no pain) to 10 (worst pain). The mean pain reduction after MVD was assessed for patients presenting with typical GN versus atypical or mixed GN. Descriptive statistics were calculated, and significant differences in outcomes between patient groups were confirmed using unpaired t – tests. Intraoperative findings and side effects after MVD were also assessed among our cohort.

Results: Between September 2011 and April 2024, 62 patients (48 females and 8 males) with GN underwent MVD at our center. The majority of patients (55/62 patients, 88.7%) presented with GN as a complex craniofacial pain syndrome consisting of multiple cranial neuralgias, such as trigeminal and/or geniculate neuralgia. 62.9% of patients (39/62) complained only of typical neuralgic pain while 37.1% (23/62) reported either partial or total atypical pain. Intraoperatively, 21% of patients (13/62) were found to have a single offending vessel compressing the IX/X complex, while 79% (49/62) were found to have multiple vessels. Mean postoperative pain scores for typical GN were 1/10 at short-term follow up and remained 1/10 at last follow up with 85.7% of patients maintaining at least 50% or more reduction in their initial pain severity. Isolated atypical GN fared significantly worse with a mean of 9.5/10 pain at both immediate and long term follow up, and no patients achieving 50% reduction in their initial pain. Atypical GN in the setting of multiple cranial neuralgias demonstrated significantly superior outcomes with a mean postoperative pain score of 2.64/10 at immediate follow up and 2.4/10 at last follow up with 70.8% of patients experiencing at least 50% reduction in pain at last follow up. Complications and side effects from surgery were infrequent. The incidence of temporary hoarseness was 22.5% and the incidence of permanent hoarseness was 6.5%. Temporary postoperative dysphagia occurred in 14.5% of cases with no patients experiencing permanent dysphagia.

Discussion: Our case series represents the fourth largest reported cohort of GN patients treated with MVD. Microsurgical decompression of the IX/X complex is an effective treatment for typical GN and may also be effective for atypical GN in the setting of multiple cranial neuralgias. The most common offending vessel is PICA; however, the majority of cases (~75%) involve multiple vessels, including veins and unnamed arterial branches. Voice hoarseness was the most commonly encountered side effect, which was temporary in the majority of cases. there were only 3 surgical complications, two of which occurred in the setting of a re-do MVD. We conclude that MVD of the IX/X cranial nerve complex is a safe and effective treatment for GN. There is need for the development of palliative procedures to treat refractory atypical GN.

Demographics of Focused Ultrasound Thalamotomy for Essential Tremor and Trends in Deep Brain Stimulation Surgery After Its Introduction in the United States

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Diwas Gautam, BS; Vishal Venkatraman, MHSc; Joshua Horns, PhD; Lexie Z. Yang, MB; Hui-Jie Lee, PhD; Ben Shofty, MD, PhD, Panagiotis Kassavetis, MD, PhD; Jumana Alshaikh, MD; Paolo Moretti, MD

Introduction*:* Essential tremor (ET) is a movement disorder that affects 4-5% of adults >65 years. For patients with medically refractory ET, neurosurgical interventions like deep brain stimulation (DBS) and unilateral magnetic resonance-guided focused ultrasound thalamotomy (MRgFUS) are available. Here, we examine the demographics of ET patients treated with MRgFUS and evaluate trends in DBS usage in the United States after the introduction of MRgFUS in 2016.

Methods*:* We used multiple databases to examine the demographics of patients who received DBS and MRgFUS, and trends in DBS. To assess the demographics, we queried the TriNetX database from 2003 to 2022 to identify patients diagnosed with ET and stratify them by DBS or MRgFUS treatment. To examine the trends in DBS for ET, the yearly frequency of DBS procedures done for ET between 2012-2020 were extracted from the National Inpatient Sample (NIS) database, and breakpoint analysis was performed. Additionally, the yearly frequency of MRgFUS procedures for ET was obtained from Insightec Exablate.

Results*:* Most patients (88.69%) in the cohort extracted from TriNetX database self-identified as White, followed by Black or African American (2.40%) and Asian (0.52%). A higher percentage of Black patients received MRgFUS treatment than DBS (4.10% vs. 1.88%). According to NIS, from 2012 to 2020, 13,525 patients received DBS for ET, with 61% (8,270) occurring from 2016 to 2020. From 2016 to 2022, 4,819 MRgFUS procedures were performed for ET in the U.S, with an increasing trend each year since 2016 and highest frequency (1,890) in 2022.

Conclusion*:* This study provides an overview of the characteristics of patients who undergo DBS or MRgFUS. We found notable differences in sex and race among patients who underwent each treatment type. Additionally, until at least the beginning of 2020, the number of DBS procedures for ET was not negatively affected after the introduction of MRgFUS.

Re-Do Microvascular Decompression (MVD) Surgery for Recurrent/Persistent Trigeminal Neuralgia (TN): Pattern of Failure (POF) Analysis and Operative Findings in 164 Re-Do MVD's over 18 Years

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University of California, Irvine

Heather Corsn, PA-C, Wendy Richardson, PA-C; University of California, Irvine

Introduction: As more neurosurgeons perform MVD, persistent/recurrent TN after first MVD attempt is becoming more common.

Objective: POF analysis.

Methods: 164 sequential re-do MVD's for persistent/recurrent TN from prospective database over 18 years, retrospectively analyzed. Retrosigmoid craniectomy (RSC) with intra-operative ABR, monitoring. Endoscope assisted (EA) in 59 (25%). Temporal bone dissection (TBD) in 7 (0.6%). Our re-do 23 [14% - 2/23 (35%) pediatric, 16y-22y at re-do]. 141 (86%) initial operation elsewhere. Intra-operative findings carefully documented & photographed. Clinical evaluations, 3m, 1y, & annually. Pain relief for typical neuralgic pain (TNP) & atypical neuralgic pain (ATNP), 0-10 scale.

Results: Shredded Teflon felt (TF) found in 75.6%, non-shredded TF (15.9%), no material (8%), Ivalon 2 patients & Cellulose, Telfa, Dacron & Gortex in 1 each. Two patients material on cranial nerves (CN) 7/8. Only 6 negative explorations (all our own). Multiple vessels identified 146 (89%). Arteries & Veins 139 (84.8%). Veins only 16 (9.8%), Artery +/- unnamed artery Branch(es) (UAB) only 8 (4.9%). 135 vessels dorsal/lateral proximal third under Cerebellar Ala (CA). 95 vessels ventral/medial middle third, 76 vessels ventral/medial distal third. Failure to mobilize the CA was the proximate cause in 78/164 (47.6%0 of patients. Re-do from elsewhere 70% pain-free (PF) TNP and 50% ≥50% improved ATNP. Our own re-do MVD only 30% pain-free (PF) TNP and ≥50% improved ATNP.

Conclusions: Not releasing tethering veins to mobilize the CA is the major cause of technical failure of MVD for TN with failure to adequately expose/ explore the dorsal/lateral proximal third of the CN 5 shoulder-nerve root-brainstem junction, followed by failure to appreciate the potential causal nature of veins &/or UAB's, followed by failure to explore the ventral medial aspect of the nerve root, followed by poor distal exposure due to failure to remove obscuring bone. Endoscopic assistance & TBD are useful adjuncts

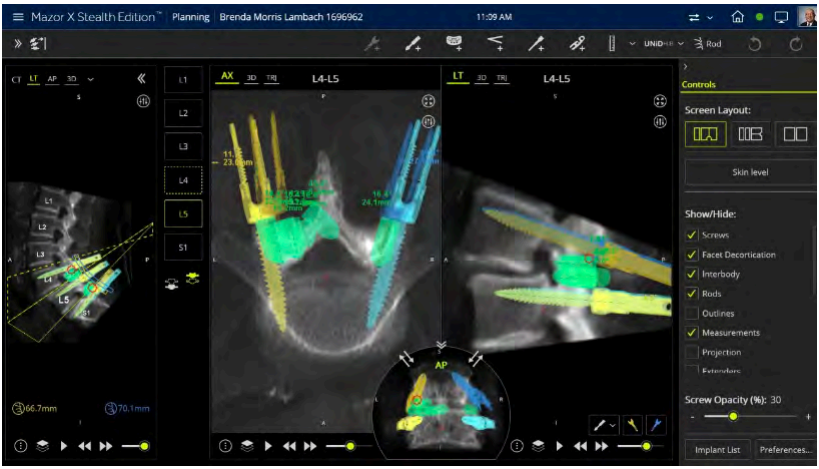
Sunday, September 8, 2024
Scientific Session V

Spine

Can the Robot Do Anything Else Besides Put in a Screw? The Future of Spinal Robotics is NOW.

Rick Chua, MD, FAANS, FCS, FACS, Professor of Neurosurgery/University of Arizona – Tucson
Director, Spine MIS and Robotics
Medical Director, Comprehensive Spine Program
Banner University Medicine - Tucson

The use of navigated, robotic-guided techniques for spinal instrumented fusion surgery have created a new era for enabling technologies to improve outcomes and reduce complications. Early generations of spine robots improved the precise placement of pedicle screws, however, were limited with other aspects of spinal fusion procedure. Recent software and hardware advancements now allow for patient-specific, pre-operative computer planning of skin incisions for minimally invasive surgery, interbody cage configuration, segmental correction of alignment in short-segment fusions, deformity correction in long-segment fusions, patient-specific rods. The newest updated technology allows for navigated, robotic-guided facet decortication and facet fusion and bony decompression. This includes performing a complete facetectomy and laminectomy (both ipsilateral and contralateral, for example, in a TLIF technique). Early observations suggest that this technique is accurate, improves efficiency, reduces drill-related jumping, may reduce durotomies, improves surgeon ergonomics, and reduces surgeon hand fatigue. We report our early experience with navigated, robotic-guided bone resection including operative technique, clinical results, and complications.



A Spine Surgeon's Learning Curve with the Minimally Invasive L5-S1 Lateral ALIF (OLIF51) Surgical Approach: Perioperative Outcomes and Technical Considerations

Martin H. Pham, MD
UC San Diego

Megana Saripella, BS UC San Diego; Alexander Schupper, MD Mount Sinai Hospital; Brian Hirshman UC San Diego; Timothy Kim UC San Diego

Introduction: While the supine ALIF exposure has historically been performed by vascular surgeons, minimally invasive lateral ALIF exposure has increasingly become a technique performed by spine surgeons familiar with lateral interbody approaches at other levels.

Methods: This retrospective case series includes the first 50 patients who underwent lateral ALIF at or including L5-S1 by a single surgeon. Patients were also analyzed based on the author's first 1-25 patients (group A) and last 26-50 patients (group B).

Results: Demographic analysis showed a mean age of 59.7 (range 28-80), mean BMI of 28.7 (range 18.2-42.6), with 52% female (26 patients). Diagnosis was degenerative in 36 patients and deformity in 14 patients; all degenerative patients also underwent lateral single position surgery (SPS) with posterior fixation in the same setting. Fourteen patients underwent single interbody level fusions at L5-S1, 21 patients at 2 interbody levels, and 15 patients at 3-6 interbody levels. Segmental L5-S1 lordosis increased by 9.6° ± 3.9° with a final mean lordosis of 25.3° ± 8.3°; L5-S1 disc angle increased by 11.5° ± 4.9° with a final mean disc angle of 19.7° ± 3.8°; posterior disc height increased by 3.6 mm ± 2.1 mm with a final mean disc height of 7.6 mm ± 1.8 mm. There were no significant differences in operative times for degenerative 1-level or 2-level SPS operations between groups A and B (3h 14m vs. 3h 6m and 4h 39m vs. 4h 43m, respectively). There were no approach-related vascular, bowel, ureteral, or neurologic injuries, and no intraoperative blood transfusions needed.

Conclusion: With good patient selection and meticulous technique, the minimally invasive lateral ALIF approach at L5-S1 can be performed by spine surgeons already experienced with lateral access approaches to other levels of the lumbar spine.

A Novel Case of Occipital Neuralgia Caused by Atlantoaxial Facet Cyst: Do They Need a Fusion?

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The Craniospinal Center of Los Angeles

Presented here is a novel case of an atlantoaxial facet cyst causing occipital neuralgia in a 78 year-old woman.

Introduction: Facet cysts are inflammatory entities that result from irritation and propagation of synovial fluid into the joint capsule. The capsule expands and a cascade of reactions occur that enlarge the synovium into a redundant tissue "bag" that becomes adherent to adjacent structures. More commonly seen in the lumbar spine, they are not as commonly described in the cervical spine. In this patient, a facet cyst formed in the left atlantoaxial joint that became adherent to the left C2 ganglion and nerve root, resulting in classic, severe, constant, refractory occipital neuralgia pain.

Methods: Surgically, the patient was positioned prone in a military tuck and a standard, midline incision was made on the nuchal line. Near-bloodless dissection was carried out. The left atlantoaxial joint was identified by following the left lateral mass of C2 and the ring of C1. The left C2 nerve root, ganglion and an adherent cyst was identified.

A large, dilated vein was positioned superoposteriorly on the C2 ganglion. Dissection along the nerve root was carried out under the microscope and the root was free circumferentially by sharp dissection with a microscissors and microcurette.

After the dissection was done, Separafilm was place deep and also above the freed C2 root. Finally, the dilated vein on the C2 root was carefully coagulated using microbipolar cautery. Standard closure was carried out. A drain was not used, nor any fusion performed.

Results: The patient was extubated after being re-positioned supine and taken to recovery. On her first postoperative appointment her pain was 2/10.

At her 6 month and 1 year appointment her pain was 0/10 and she was off of gabapentin.

Conclusions: Facet cysts are a rare source of occipital neuralgia and reemphasizes the need to scan patients for other causes other than sclerosis, vessels, or lymph nodes as a source for occipital neuralgia. Finally, this case demonstrated a motion-preserving method for freeing the nerve root can have durable and effective results.

A Machine Learning Model To Predict 5 Year Post-Operative Back Pain in Patients with Grade 1 Lumbar Spondylolisthesis: A Quality Outcomes Database Study

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Introduction: Back pain is a common symptom in patients with lumbar spondylolisthesis. Machine learning (ML) can predict improvement in back pain following surgery in patients with grade 1 lumbar spondylolisthesis. We evaluated predictors of achievement of the minimum clinically important difference (MCID) in back pain and related disability after surgery in patients with grade 1 spondylolisthesis using ML models.

Methods: This was a prospective analysis using the Quality Outcomes Database consisting of patients with grade 1 lumbar spondylolisthesis. 608 patients were split into an 80% training/20% testing cohort. Hyperparameter tuning was performed with 5 fold cross-validation. Recursive feature selection was used to select key variables for predicting MCID achievement in Numerical Rating Scale Back Pain(NRS-BP) and Oswestry Disability Index(ODI). The final model was tested for accuracy on the testing cohort.

Results: In total, 70% of patients achieved MCID for NRS-BP at the 5 year post-operative period while 66% achieved MCID for ODI at the 5 year post-operative period. Of the algorithms tested, logistic regression demonstrated the best accuracy (0.77±0.03), followed by AUROC (0.75±0.04) at predicting MCID achievement for NRS-BP at 5 years post-operatively. Similarly, logistic regression demonstrated the best accuracy (0.71±0.04), followed by AUROC (0.73±0.04) at predicting MCID achievement for ODI at 5 years post-operatively. Top variables for predicting MCID for NRS-BP include baseline NRS-BP, baseline NRS-Leg Pain (NRS-LP), baseline ODI, ASA grade, and age at time of surgery. Top variables for predicting MCID for ODI included baseline ODI, NRS-LP, educational level, baseline NRS-BP, and smoking status.

Conclusion: Logistic regression performed the best of all models tested. The top 5 variables for predicting MCID for NRS-BP included baseline NRS-BP, baseline NRS-LP, baseline ODI, ASA grade, and age at time of surgery. The top 5 variables for predicting MCID for ODI included baseline ODI, baseline NRS-Leg Pain, educational level, baseline NRS-BP, and smoking status.

ORGANIZATIONAL COMMITTEE

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Edwin B. Boldrey*
Howard A. Brown*
Herbert G. Crockett*
John Raaf*
Rupert B. Raney*
David L. Reeves*
C. Hunter Sheldon*

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John B. Doyle
John C. Oakley
Nat, D. Reid
Alan W. Rosenberg
A. Earl Walker
Eric Yuhl
Peter Allen
Lester B. Lawrence
John S. Marsh
Charles Needham
Benjamin L. Crue Jr.
Alexander Johnson
James Lansche
Anthony Gallo
Hale A. Haven
Homer McClintock
Bruce Sorensen
Roger Slater
Charles Scibetta
William Wright
Eben Alexander, Jr.
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Charles W. Elkins
Carl W. Rand
Ted Roberts
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W. Keasley Welch
Edward Zapanta
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Justin Renaudin
John C. Kennady
Attilla Felsoory
Leslie Geiger
William A Newsom
Alan Hunstock
Burton Wise
Glenn Kindt
Michael Robbins
James R. Atkinson,
David Brown
Cyril B. Courville
Hal Pittman
Aidan Raney
Adolf Rosenauer,
Harry F. Steelman
William Wright
Michael Robbins
William Hyman
Frank W. Lusignan
Richard Newquist,
Sam Assam
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Peter A. Lake
Robert D. Fiskin
John W. Hanbery
Shokei Yamada
Edward Reifel
Robert Porter
H. Jack Siefert
Scott Berta

(Expired while a member, non-Officers or founder)

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Edmund G. Morrissey*	1960	Ronald F. Young	1994
C. Hunter Sheldon*	1961	John A. Kusske	1995
Ernest W. Mack*	1962	Melvin L. Cheatham	1996
Hale A. Haven*	1963	Robert Florin*	1997
Frank M. Anderson*	1964	Frank P. Smith*	1998
Edwin B. Boldrey*	1965	Ralph F. Kamm *	1999
John R. Green*	1966	Steven L. Giannotta	2000
Arthur A. Ward, Jr.*	1967	Donald J. Prolo	2001,2002
Lester B. Lawrence*	1968	Grant E. Gauger	2003
John D. French*	1969	Randall W. Smith*	2004
Chester B. Powell*	1970	John P. Slater	2005
Robert W. Porter*	1971	Moustapha Abou-Samra	2006
Henry M. Cuneo*	1972	Kim Burchiel	2007
Charles W. Elkins*	1973	Gerald Silverberg	2008
Edward K. Kloos*	1973	Lawrence Shuer	2009
W. Eugene Stern *	1974	L. Philip Carter*	2010
Ralph B. Cloward*	1975	David W. Newell	2010
James R. St. John*	1976	Austin R.T. Colohan	2011
Eldon L. Foltz*	1977	John T. Bonner *	2012
John Tytus*	1978	Jeffery L. Rush	2013
Donald B. Freshwater*	1979	Richard Wohns	2014
William A. Kelly*	1980	Gary Steinberg	2015
Byron C. Pevehouse*	1981	Linda M. Liau	2016
Robert W. Rand*	1982	Charles Nussbaum	2017
Theodore S. Roberts*	1983	Martin Weinand	2018
Thomas K. Craigmile*	1984	Tom Scully	2019
Ulrich Batzdorf	1985	Marvin Bergsneider	2020, 2021
Gale C. Clark*	1986	David Pitkethly	2022
Lyman Maass*	1987	Jay K. Morgan	2023
Gordon B. Thompson*	1988		

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Past Vice-Presidents

John Raaf*	1955	W. Ben Blackett	1990
Frank Turnbull*	1956	Ronald F. Young	1991
Howard A. Brown*	1957	Edward Reifel *	1992
Rupert R. Raney*	1958	Grant E. Gauger	1993
Edmund J. Morrissey*	1959	Ralph F. Kamm*	1994
C. Hunter Sheldon*	1960	Steven L. Giannotta	1995
Ernest W. Mack*	1961	Randall W. Smith*	1996
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Edwin B. Boldrey*	1964	Lawrence Shuer	1999
Herbert C. Crockett*	1965	John C. Oakley*	2000
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Peter O. Lehman*	1969	Kim Burchiel	2005
Charles W. Elkins*	1970	John Adler	2006
Nathan C. Norcross*	1971	Philip Weinstein	2007
James R. St. John*	1972	Betty MacRae	2008
Edward K. Kloos*	1973	Linda Liau	2009
Ralph B. Cloward*	1974	David W. Newell	2010
Thomas K. Craigmile*	1975	J. Paul Muizelaar	2011
Lyman Maass*	1976	Richard Wohns	2012
Gale C. Clark*	1977	Marc Vanefsky	2013
William A. Kelley*	1978	Marvin Bergsneider	2014
Byron C. Pevehouse*	1979	Thomas Scully	2015
Robert W. Rand*	1980	David Pitkethly	2016
Theodore S. Roberts*	1981	Odette Harris	2017
Ulrich Batzdorf	1982	John McVicker	2018
George Ablin*	1983	Jay Morgan	2019
George A. Ojemann	1984	Deborah Henry	2020, 2021
Gale C. Clark*	1985	Javed Siddiqi	2022
Robert Weyand	1986	Richard Chua	2023
Robert Florin*	1987		
John A. Kusske	1988		
Basil Harris*	1989		

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Past Secretary-Treasurers

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Samuel W. Weaver*	1961, 1962, 1963
James R. St. John*	1964, 1965, 1966
Robert W. Porter*	1967, 1968, 1969
William A. Kelly*	1970, 1971, 1972
John S. Tytus*	1973, 1974, 1975
Theodore S. Roberts*	1976, 1977, 1978
Ulrich Batzdorf	1979, 1980, 1981
John A. Kusske	1982, 1983, 1984
W. Ben Blackett	1985, 1986, 1987
Francis E. LeBlanc	1988, 1989, 1990
Melvin L. Cheatham	1991, 1992, 1993
Grant E. Gauger	1994, 1995, 1996
Randall W. Smith*	1997, 1998, 1999
Moustapha Abou-Samra	2000, 2001, 2002
Hector E. James	2003
Austin R. T. Colohan	2004, 2005, 2006
Jeffery L. Rush	2007, 2008, 2009
Charles E. Nussbaum	2010, 2011, 2012, 2013
Deborah C. Henry	2014, 2015
Marc Vanefsky	2016, 2017, 2018
Marco Lee	2019, 2020, 2021, 2022

Past Historians

Henry M. Cuneo*	1962-1966
Ernest W. Mack*	1967-1971
Donald B. Freshwater*	1972-1976
George Ablin*	1977-1982
Gale C. Clark*	1983-1984
Robert Rand*	1985-1990
Frank P. Smith*	1991-1995
John C. Oakley*	1996-1999
John P. Slater	1999-2002
John T. Bonner*	2002-2008
Randall Smith*	2009-2013
Moustapha Abou-Samra	2014-2019
Charles Nussbaum	2020-

**deceased*

Past Resident Award Recipients

Ralph Kamm, OHSU**	1966
Jerry Greenhoot, UW	1968
L. Philip Carter, BNI**	1971
Ronald J. Ignelzi, U. Of Colorado	1972
Henry G. Fieger, Jr., U. of Colorado	1973
Peter F. Schlossberger, UCLA	1974
Paul Steinbok, UBC	1975
Arden F. Reynolds, Jr., UW	1976
John W. Hutchison, UCI	1977
Kim J. Burchiel, UW**	1978
Roy A.E. Bakay, UW	1979
Herbert Fried, UCLA	1980
Linda M. Liau, UCLA **	1997
Sean D. Lavine, USC	1998
Soohoo Choi, USC	1999
Michael Y. Wang, USC	2000
Odette Harris, Stanford**	2001
Raymond Tien, OHSU	2002
Michael Sandquist, OHSU	2003
Iman Feiz-Erfan, BNI**	2004
Johnathan Carlson, OHSU	2005
Mathew Hunt, OHSU	2005
Kiarash Golshani, OHSU	2006
Edward Chang, UCSF	2006
Jonathan Miller, OHSU	2007
Kenneth Liu, OHSU	2007
Justin Cetas, OSHU	2008
Edward Chang, UCSF	2008
Zachary Litvack, OHSU	2009
Kiran Rajneesh, UCI	2009
Justin Dye, UCLA **	2010
Isaac Yang, UCSF **	2010
Terry Burns, Stanford**	2011
Gabriel Zada, USC	2011
Walavan Sivakumar, U. of Utah	2012
David Stidd, U. of Arizona	2012
Allyson Alexander, Stanford	2013
Anand Veeravagu, Stanford**	2013
Terry Burns, Stanford**	2014
Karam Moon, BNI	2014
Achal Achral, Stanford	2015
Jesse Skoch, Tucson	2015
Nicholas Au Yong, UCLA	2016
Priscilla Pang, OHSU	2016

***WNS Member*

Past Resident Award Recipients

Kevin Kwong-Hon Chow, Stanford	2017
Douglas Hardesty	2017
Allen Ho, Stanford	2018
Yevgeniy Freyvert, UCLA	2018
Arjun Pendharkar, Stanford**	2019
Srinivas Chivukula, UCLA	2019
Jessica Eaton, U. of Washington	2021
Matthew Sun, UCLA	2021
Joshua Catapano, BNI	2022
Jacob Young, UCSF	2022
Gianna Fote, UCI	2023
Jacob Young, UCSF	2023

***WNS Member*

California grows 90% of domestic avocados, 60% of this is produced in San Diego

Past Meetings of the Society

1. Biltmore Hotel, Santa Barbara, CA	Nov 25-26, 1955
2. Timberline Lodge, OR	Dec 9-11, 1956
3. Holiday Hotel, Reno, NV	Sept 29-Oct 1,1957
4. Del Monte Lodge, Pebble Beach, CA	Oct 19-22, 1959
5. La Valencia Hotel, La Jolla, CA	Sept 27-30, 1959
6. Del Monte Lodge, Pebble Beach, CA	Oct 23-26, 1960
7. Bayshore Inn, Vancouver, BC	Oct 29-Nov 1, 1961
8. Camelback Inn, Phoenix, AZ	Oct 28-31, 2962
9. El Mirador Hotel, Palm Springs, CA	Oct 20-23, 1963
10. Fairmont Hotel, San Francisco, CA	Oct 18-21, 1964
11. Olympic Hotel, Seattle, WA	Oct 3-6, 1965
12. Hotel Utah, Salt Lake City, UT	Nov 6-9, 1966
13. Kona Kai Club, San Diego, CA	Oct 15-18, 1967
14. Mauna Kea Beach Hotel, Kamuela, HI	Nov 16-19, 1968
15. Del Monte Lodge, Pebble Beach, CA	Oct 15-18, 1969
16. Bayshore Inn, Vancouver, BC	Oct 4-7, 1970
17. The Broadmoor, Colorado Springs, CO	Oct 31-Nov 3, 1971
18. The Skyline Country Club, Tucson, AZ	Oct 29-Nov 1, 1972
19. Airport Marina Hotel, Albuquerque, NM	Sept 16-19, 1973
20. Santa Barbara Biltmore Hotel, CA	Oct 27-30, 1974
21. Mauna Kea Beach Hotel, Kamuela, HI	Sept 28-Oct 1, 1975
22. Harrah's Hotel, Reno, NV	Sept 26-29, 1976
23. La Costa Resort Hotel, Carlsbad, CA	Sept 18-21, 1977
24. The Lodge, Pebble Beach, CA	Oct 8-11, 1978
25. Camelback, Inn, Scottsdale, AZ	Sept 23-26, 1979
26. Mauna Kea Beach Hotel, Kamuela, HI	Sept 21-24, 1980
27. The Empress Hotel, Victoria, BC	Sept 20-23, 1981
28. Jackson Lake Lodge, Jackson Hole, WY	Sept 12-15, 1982
29. Hotel del Coronado, Coronado, CA	Oct 2-5, 1983
30. The Broadmoor, Colorado Springs, CO	Sept 9-12, 1984
31. Silverado Country Club & Resort, Napa, CA	Sept 22-25, 1985
32. Maui Intercontinental, Wailea, Maui, HI	Sept 28-Oct1, 1986
33. Banff Springs Hotel, Banff, AB	Sept 6-9, 1987
34. Ritz-Carlton, Laguna Niguel, CA	Sept 11-14, 1988
35. The Lodge, Sun Valley, ID	Sept 10-13, 1989
36. Mauna Lani Bay Hotel, Kawaihae, HI	Sept 9-12, 1990
37. The Pointe, Phoenix, AZ	Sept 22-25, 1991
38. The Whistler, Whistler, BC	Sept 20-23, 1992
39. Mauna Lani Bay Hotel, Kawaihae, HI	Sept 19-22, 1993
40. Le Meridien Hotel, San Diego, CA	Sept 18-21, 1994

Past Meetings of the Society

...continued

41. Salishan Lodge, Gleneden Beach, OR — Sept 9-12, 1995
42. Manele Bay, Island of Lanai, HI — Sept 14-17, 1996
43. Ojai Valley Inn, Ojai, CA — Sept 20-23, 1997
44. Silverado Resort, Napa, CA — Sept 12-15, 1998
45. Coeur d'Alene Resort, Coeur d'Alene, ID — Sept 18-21, 1999
46. Mauna Lani Bay Hotel, Hawaii, HI — Sept 9-11, 2000
47. Ocean Pointe Resort, Victoria BC (Cancelled) — Sept 15-18, 2001
48. Delta Victoria Resort, Victoria, BC — Oct 12-15, 2002
49. Hapuna Beach Prince Hotel, Kamuela, HI — Sept 20-24, 2003
50. Rancho Bernardo Inn, San Diego, CA — Sept 11-14, 2003
51. Squaw Creek Resort, Lake Tahoe, CA — Sept 17-20, 2005
52. Semiahmoo Resort & Spa, Blaine, WA — Sept 16-19, 2006
53. Mauna Lani Bay Hotel, Kawaihe, HI — Sept 8-11, 2007
54. Hotel Captain Cook, Anchorage, AK — Aug 16-19, 2008
55. Sun River Resort, Bend, OR — Sept 11-14, 2009
56. Eldorado Hotel, Santa Fe, NM *In Memory of L. Philip Carter* — Oct. 8-11, 2010
57. Grand Hyatt Kauai Resort & Spa, Kauai, HI — Sept 10-13, 2011
58. The Broadmoor, Colorado Springs, CO — Sept 7-11, 2012
59. Ritz Carlton Half Moon Bary, Half Moon Bay, CA — Sept 15-18, 2013
60. The Lodge, Sun Valley, ID — Aug 16-19, 2014
61. Grand Hyatt Kauai Resort & Spa, Kauai, HI — Sept 10-13, 2015
62. Park Hyatt Aviara, Carlsbad, CA — Sept 9-12, 2016
63. Fairmont Bank Springs Hotel, Banff, Alberta, Canada — Sept 8-11, 2017
64. Fairmont Orchid, Kona, HI — Sept 14-17, 2018
65. Hyatt Regency at Gainey Ranch, Scottsdale, AZ — Nov 8-11, 2019
66. Virtual Annual Meeting (Covid-19 Pandemic) — July 25, 2020
    And Special Virtual Scientific Meeting — Aug 29, 2020
67. Hyatt Tamaya, Santa Ana Pueblo, NM — Sept 10-13, 2021
68. Fairmont Orchid, Kohala Coast, HI — Sept 9-12, 2022
69. Portola Hotel & Spa, Monterey, CA — Sept 29-Oct 2, 2023

Future Meetings

71. Coeur d'Alene Resort, Coeur d'Alene, ID — Sept 11-14, 2025
72. Royal Sonesta Kauai Resort, Lihue, HI — Sept 24-27, 2026
73. Snow King Resort, Jackson Hole, WY — Sept 9-12, 2027

Western Neurosurgical Society
Member Directory
and
Geographical Directory

Please provide corrections and/or updates to the WNS Registration desk.

Fast Times at Ridgemont High, the 1982 comedy-drama film, was inspired by the lives of students at San Diego's Clairemont High School

Member Geographical Listing

CANADA

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Alim Mitha, MD

Parksville
Gordon B. Thompson, MD

Ontario
Andres M. Lozano, MD, PhD

Vancouver
Christopher Honey, MD
Ian M. Turnbull, MD

ALASKA

Anchorage
Richard Perrin, MD

ARIZONA

Flagstaff
Stephen Ritland, MD

Phoenix
Iman Feiz-Erfan, MD
Maziyar Kalani, MD
Michael T. Lawton, MD
Andrew Little, MD
Laura Snyder, MD
Volkar Sonntag, MD
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Jay Turner, MD
John Wanebo, MD

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Hillel Baldwin, MD
Richard Chua, MD
Travis Dumont, MD
Thomas, Scully, MD
Martin E. Weinand, MD

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Carmel
Dewitt Gifford, MD

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John P. Slater, MD

LaFayette
Cavett M. Robert, Jr. MD

Los Gatos
Marshal Rosario, MD

Napa
Jay M. Levy, MD

Redwood City
Aleksandyr Lavery, MD
Mark Sedrak, MD
William Sheridan, MD

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Michael S.B. Edwards, MD

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Mitchel S. Berger, MD
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Bruce M. McCormack, MD
Praveen Mummaneni, MD
Lee Tan, MD
Philip R. Weinstein, MD

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Kenneth Blumenfeld, MD
Marco Lee, MD, PhD
Don Prolo, MD

San Luis Obispo
Philip Kissel, MD

Santa Cruz
Ciara Harraher, MD

Santa Rosa
Eldan Eichbaum, MD

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Gerald A. Grant, MD
Juan Fernandez-Miranda, MD
Melani Hayden-Gephard, MD
Odette Harris, MD
Jaimie Henderson, MD
Barton Lane, MD
Gordon Li, MD
Michael Lim, MD
Arjun Pendharker, MD
Laura Prolo, MD
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Anand Veeravagu, MD
Benjamin Yim, MD

Tahoe
John P. Phillips, MD

Visalia
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Mark Linskey, MD
William Loudon, MD
Marc Vanefsky, MD

El Segundo/Long Beach/Marina del Ray/Torrance

Duncan McBride, MD
David F. Morgan, MD
Amir Vokshoor, MD

Los Angeles

Ulrich Batzdorf, MD
Ausaf A. Bari, MD
Marvin Bergsneider, MD
Keith Black, MD
Harismran Brara, MD
Jeff Chen, MD, PhD
Ray Chu, MD
Aria Fallah, MD
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Steven L. Giannotta, MD
J. Patrick Johnson, MD
Won Kim, MD
Brian Lee, MD
Linda Liau, MD, PhD, MBA
Luke Macyszyn, MD
R.L. Patrick Rhoten, MD
Martin H. Weiss, MD
Isaac Yang, MD

Pasadena/Duarte/Glendale

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Ian Ross, MD
Patrick J. Wade, MD

Redlands/Riverside/San Bernardino/Palm Desert

Farbod Asgarzadie, MD
Blake Berman, MD
Justin Dye, MD
George Koenig, MD
J. Charles Rich, MD
Javed Siddiqi, MD, PhD
John Zhang, MD, PhD

San Diego/La Jolla/La Mesa

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Sharona Ben-Haim, MD
Gregory G. Gerras, MD
John Seelig, MD
Alexander A. Khalessi, MD
Christine Smith, PhD
Hoi-Sang U, MD

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Samer Ghostine, MD
Martin Mortazavi, MD
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Temecula

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Ventura

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Boulder

Krista Greenan, MD, MD

Breckenridge

Jeffery L. Rush, MD

Colorado Springs

John H. McVicker, MD

Englewood

J. Paul Elliott, MD

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Stephen D. Johnson, MD

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Larry D. Tice, MD

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Michael M. Kendrick, MD
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Edmund Frank, MD

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David T. Pitkethly, MD
Richard Rapport, MD
Laligam Sekhar, MD
Peter Shin, MD
Timothy Steege, MD
Richard Wohns, MD

Tacoma

W. Ben Blackett, MD

WEST VIRGINIA

Huntington

J. Paul Muizelaar, MD

GERMANY

Hanover

Majid Samii, MD

Wyatt Earp was a famous Wild West gunslinger, but he lived at the Horton Grand Hotel in downtown San Diego for seven years

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71st Annual Meeting
September 11-14, 2025

Coeur d'Alene Resort
Coeur d'Alene, Idaho

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