ASAP'S 38TH ANNUAL (VIRTUAL) CONFERENCE

Advancing research, treatment and hope for Chiari Malformation, Syringomyelia, and related disorders.

YOU ASKED. WE LISTENED.

JULY 28-29, 2026

www.ASAP.org

American Syringomyelia & Chiari Alliance Project

WELCOME

Welcome to the 38TH Annual ASAP Conference!

Thank you for joining us! Our conference is brought to you in a virtual format this year, which means that, while we still have a wealth of information coming to you, we will not have the same level of personal interaction that we normally enjoy at these events. I have been directly involved with the American Syringomyelia & Chiari Alliance Project since 2010, and over the past 16 years I have had the incredible opportunity to attend over a dozen conferences, only one of which was held virtually—and yes, it's a little different than what we're accustomed to doing. However, rest assured that, as an organization, ASAP firmly believes that holding these conferences is critical for our community, whether virtually or in person. We are excited to announce that we will resume our in-person conference in July of 2027, to be held in Salt Lake City, Utah. So be sure to "save the date"!

In today's "post-modern" society, so much of what we are doing now is online, whether with school, work, events, or socially. While we do receive an incredible amount of information, we also lose the opportunity for personal interactions and relationship-building. At ASAP, we feel strongly that providing a forum that encourages an interpersonal experience is of utmost value for patients, loved ones, and caregivers, as well as the doctors, researchers, and medical professionals who give their time and energy to be involved and support our mission. Having the ability to meet with people who share these conditions and live with them daily, and those who have devoted their lives to treating and overcoming these conditions, is truly invaluable—which is why we do it! It is for you, and it is for us. Our community is quite special, is it not?

"We strive to improve the lives of persons affected by Syringomyelia, Chiari Malformation and related disorders while we find a cure." That is ASAP's mission. How have we accomplished that goal over nearly four decades? Through 3 primary avenues: RESEARCH, EDUCATION, and SUPPORT. Since our founding in 1988 by Barbara and Don White, our methods of providing these avenues of interaction have continued to evolve and change with the times, while still remaining true to our mission and purpose.

ASAP began with the newsletter, mailed out from the living room of the Whites' home. Today, we still produce the newsletter, although now we are trending away from paper and instead embracing the digital space for cost savings and efficiency.

In the early days of the internet, we created one of the first "message boards" for CM/SM, where patients could collaborate and share information and support for each other in a safe and moderated format. In addition, we maintained an 800 number for the newly-diagnosed who were seeking information, and would send out our comprehensive "blue book" of useful information about these conditions and the treatments for them. Eventually, these resources converged into the more immediately accessible social media platforms and our recently refreshed website (www.asap.org). Our YouTube channel houses all of our past conference videos, as well as a growing volume of helpful educational material.

ASAP continues to provide educational opportunities sponsored through the conference, as well as our ongoing monthly collaboration with The Global Neurosciences Institute and ASAP virtual support groups.

To date, ASAP's Board of Directors and Medical Advisory Board have authorized the funding of over $3,000,000 in research grants, underwriting the projects and fellowships of many medical, engineering, clinical, and other professionals devoted to learning about and developing treatment for the CM/SM conditions and their related disorders. This research has had a direct impact on the lives we all lead. Without it, some of us would not be here to speak about it. Truly groundbreaking advances have come from the work commissioned by ASAP over the years.

You may be wondering, "What about direct financial support for myself and my personal situation?" Well, simply put, that is not the type of organization ASAP is, nor our stated mission or vision. While we do strive to provide various forms of support and encouragement to our community as a whole, and continue to fund research towards understanding, treatment, and ultimately a cure, we are simply not equipped to provide direct medical cost relief for an individual's needs. However, we are very pleased to partner with other organizations that do just that! For quite some time, ASAP was the only nonprofit dedicated specifically to syringomyelia and Chiari malformation. Today, several non-profits have branched off our original "tree," and established themselves in the community in an effort to enhance what we are doing, but in their own ways. During this time, ASAP has partnered with some of them to fund research projects presented to us for consideration. Are we able to fund every project? Unfortunately, no, but we always welcome each submission for consideration based on its merits and the overall benefit to the CM/SM community. After reviewing a proposal, sometimes we have declined to fund it because the Medical Advisory and Board have deemed it insufficient in overall impact. Other times, the proposal is determined to be of wide potential impact, and we vote to approve funding. To that end: even if ASAP is unable to approve an initial proposal, don't give up on future project considerations! If you or your medical team are aware of research intentions seeking funding, please do not hesitate to visit our website for the application process. We are excited to continue to offer funding towards valuable research by any organization that is pushing the horizon for treatment and greater understanding of these conditions.

One organization we have been very happy to collaborate with is The Bob Jones Open, a wonderful group of people who have been longtime supporters of ASAP. BJO used to fund academic scholarships for SM-affected individuals, as well as ASAP's 800 number. Both of those programs have since been retired, BJO's collaboration with ASAP is changing in an exciting and new way. Exciting details to be coming soon. BJO's generosity will continue to benefit members of ASAP.

I do hope you enjoy this year's virtual conference! I want to deeply thank all our speakers who are presenting online this year and giving their valuable time to do so. Also, a huge debt of gratitude is owed to the dedicated folks behind the scenes who are making this event possible. Even though we all miss being able to see you and chat face-to-face, we are confident you will come away from this conference feeling energized about the future. As I said before, I highly encourage you to make plans to join us in Salt Lake City next July and look forward to seeing you there! In closing, always remember: "You may have to live a life within limits, but you can still lead a limitless life!"

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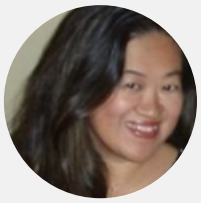

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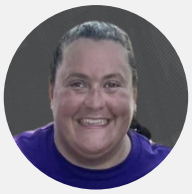

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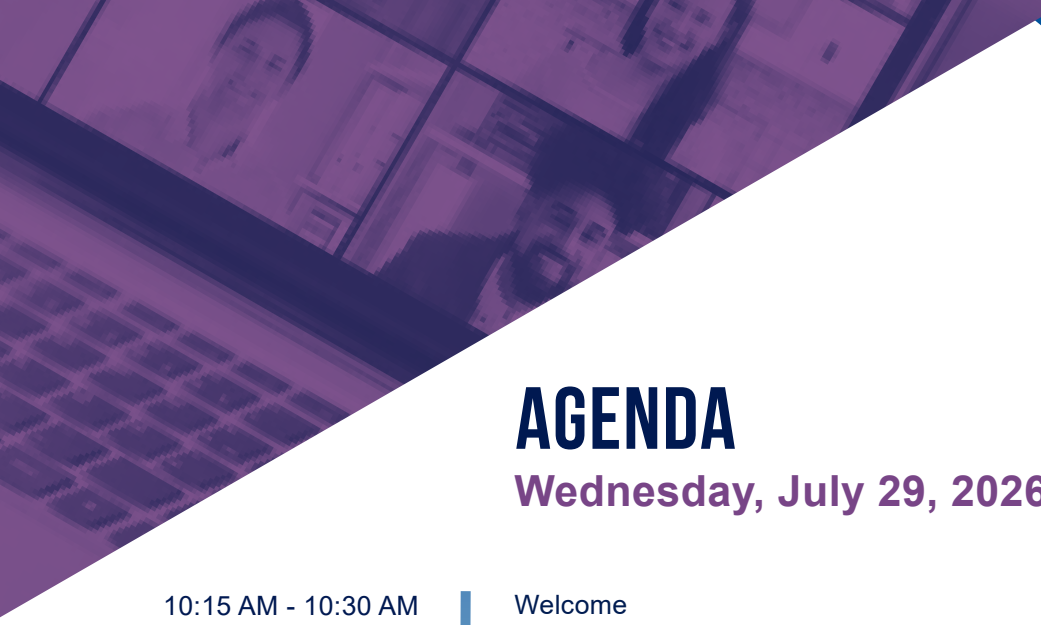
American Syringomyelia & Chiari Alliance Project

AGENDA

Tuesday, July 28, 2026

10:15 AM - 10:30 AM	Welcome
10:30 AM - 10:55 AM	Anne Maitland, MD - “The Epithelial-Neuroimmune Axis in Ehlers-Danlos Syndromes—Bridging Barrier Dysfunction and Systemic Inflammation to Structural Spinal Pathology”
11:00 AM - 11:25 AM	Michael Levy, MD - “Syringomyelia, Syrinx, and Central Canal Dilation”
11:30 AM - 11:55 AM	Barth Green, MD - “Chiari/Syringomyelia/EDS: Opportunities for Wellness & Longevity”
12:00 PM- 12:25 PM	Jorge Lazareff, MD - “Large Cohort Analysis of Chiari Malformation Type 1. Real-World Data from Multi-Centers in Central China”
12:30 PM - 12:55 PM	Ulrich Batzdorf, MD - “Primary Spinal Syringomyelia”
1:00 PM - 1:45 PM	Lunch Break
1:45 PM - 2:00 PM	Chris Jones, Bobby Jones Open - New Scholarship Opportunity Announcement
2:00 PM - 2:25 PM	John Heiss, MD - “Mechanisms for the Development of Chiari I Malformation”
2:30 PM - 2:55 PM	Linda Gray Leithe, MD - “Beware of CSF Pressure Disorders Mimicking Chiari Malformations & Syringomyelia”
3:00 PM - 3:25 PM	Ilene Ruhoy, MD - “Mast Cells and Disease”
3:30 PM - 3:55 PM	Rajiv Iyer, MD - “Tethered Spinal Cord”
4:00 PM - 4:25 PM	Jeffrey Greenfield, MD - “Under Pressure: How Patients Can Understand the How & Why of Surgery for Chiari in the presence of Syringomyelia”
4:30 PM - 4:55 PM	Brian Mehling, MD - “Stem Cell Therapy for Syringomyelia, Chiari Malformation, and Related Neurological Disorders: Current Evidence, Clinical Experience, and Future Directions”
5:00 PM - 5:25 PM	Petra Klinge, MD - “Chiari Malformation Across the Lifespan—Developmental Anomaly or Progressive Disorder? Understanding Age-Dependent Pathology and Phenotypes”
5:30 - 5:45 PM	Closing Remarks



American Syringomyelia & Chiari Alliance Project

AGENDA

Wednesday, July 29, 2026

10:15 AM - 10:30 AM	Welcome
10:30 AM - 10:55 AM	Gerald Grant, MD - “Disappearing Chiari”
11:00 AM - 11:25 AM	Erol Veznedaroglu, MD - “New Surgical Technique for Chiari Decompression”
11:30 AM - 11:55 AM	Brian Dlouhy, MD - “Surgical Failure in Chiari – What to Do Next”
12:00 PM- 12:25 PM	Allison Bloom, MD - “Eagle Syndrome in Connective Tissue Disorders: New Insights into Symptoms, Diagnosis, and Mechanisms”
12:30 PM - 12:55 PM	Paolo Bolognese, MD - “Craniocervical Instability in Chiari I Malformation and EDS Patients”
1:00 PM - 1:45 PM	Lunch Break
1:45 PM - 2:00 PM	Vijay Ravindra, MD - 2027 Conference Announcement
2:00 PM - 2:25 PM	Vijay Ravindra, MD - “Updates on the Management of Chiari Malformation – Current Evidence Review”
2:30 PM - 2:55 PM	Carina Yang, MD - “Lowering the Bar on MR: A Deep Dive into Craniocervical Pathologies”
3:00 PM - 3:25 PM	Safwan Jaradeh, MD - “Management of Orthostatic Intolerance in Chiari”
3:30 PM - 3:55 PM	Bermans Iskandar, MD - “We’re Not Alone—Chiari Malformation Across Species”
4:00 PM - 4:25 PM	Jonathan Sisti, MD - “C1 Transverse Process Resection Technique for Internal Jugular Vein Decompression at the Skull Base”
4:30 PM - 4:55 PM	Gad Klein, PhD - “The Path to Cranio-cervical Fusion - Important Psychosocial Considerations”
5:00 PM - 5:15 PM	Closing Remarks

SPEAKERS

LISTED IN ALPHABETICAL ORDER

Ulrich Batzdorf, MD, FAANS(L)

Los Angeles, California

Primary Spinal Syringomyelia

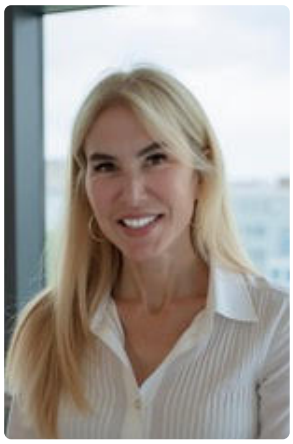
Synopsis: Syringomyelia unrelated to Chiari abnormalities is less common and poses unique challenges to patients and physicians. Among other causes, it may occur after spine injuries, spinal infections and bleeding into the spinal canal. Obstruction of the normal spinal fluid circulation is the most common problem, and treatment is directed at relieving such blockage, although this is not always possible. In such cases, shunting the fluid out of the spinal cord remains an option.

About Dr. Batzdorf: Ulrich Batzdorf, MD, FAANS(L), attended the Bronx High School of Science and City College in New York City as a chemistry major. He received his master's degree in biochemistry from Rutgers University, which preceded entry to New York Medical College, where he taught in the biochemistry department while attending medical school. An internship at the U.S. Naval Hospital, Newport, R.I., was followed by two years of active duty at the Submarine Base, New London, Conn. (Project Officer, Physiology Branch, Naval Research Laboratory).

Dr. Batzdorf completed his general surgery training at the University of Maryland, neurology training at National Hospital, Queen Square, London and a fellowship in neuropathology at the University of California, San Francisco (UCSF). This training prepared him for his neurosurgical residency at the University of California, Los Angeles (UCLA), completed in 1966.

Dr. Batzdorf has been actively involved with the Southern California Neurosurgical Society (SCNS), the Western Neurosurgical Society (WNS) and California Association of Neurological Surgeons (CANS), serving as president of these organizations. He has also been active on various committees for several national societies.

Dr. Batzdorf's clinical research has focused on chiari malformations, syringomyelia, spinal cord tumors and cervical spondylotic myelopathy. Currently, Dr. Batzdorf is professor of neurosurgery and director of the Section of Spine Surgery in the Division of Neurosurgery at UCLA Medical Center and serves on the editorial board of Neurosurgery.



Allison Bloom, MD, FAAP, FABOM

Oceanside, New York

Eagle Syndrome in Connective Tissue Disorders: New Insights Into Symptoms, Diagnosis, and Mechanisms

Synopsis: Connective tissue disorders experience a broader range of symptoms that are often difficult to recognize and may be attributed to other conditions. This presentation will review findings from the largest verification-based study of Eagle syndrome in connective tissue disorders and discuss emerging evidence supporting a distinct symptom pattern characterized by auditory complaints, cranial nerve involvement, and autonomic dysfunction.

The presentation will explore the prevalence of Eagle syndrome in connective tissue disorders, common symptom patterns, proposed mechanisms involving the glossopharyngeal nerve and autonomic pathways, and a structured diagnostic approach designed to improve recognition. Implications for treatment and future directions for research will also be discussed, with the goal of increasing awareness of this often overlooked condition and improving outcomes for affected patients.

About Dr. Bloom: Allison R. Bloom, MD, FAAP, FABOM is Director of Translational Research at the Chiari and Ehlers–Danlos Syndrome Center at Mount Sinai South Nassau and Assistant Professor of Pediatrics at the Icahn School of Medicine at Mount Sinai. Board-certified in Pediatrics and Obesity Medicine, she holds a Master's degree in Molecular Genetics and Cellular Biology.

Dr. Bloom's research focuses on clinical phenotyping and translational medicine in hypermobility-associated connective tissue and neurosurgical disorders. Her work seeks to improve diagnostic precision, promote earlier recognition, and advance individualized approaches to care for patients with complex multisystem disease. Her research interests include craniocervical instability, venous outflow disorders, Eagle syndrome, dysautonomia, bone health in connective tissue disorders, and the recognition and characterization of complex neurological presentations associated with hypermobility-related disorders.

Dr. Bloom's early work as a pediatrician helped shape her preventive, integrative, and whole-person approach to caring for patients with complex and often misunderstood disorders. Her perspective has also been shaped by more than 15 years as Medical Director of a New York City foster care agency, where she developed a holistic, trauma-informed approach to caring for medically and socially complex patients—an approach that continues to inform her work with individuals affected by multisystem connective tissue disorders.

She remains actively involved in humanitarian and community health initiatives and continues to volunteer with organizations providing medical care, education, and advocacy to underserved populations. Through multidisciplinary collaboration, her work aims to improve recognition, understanding, and outcomes for individuals living with complex multisystem disorders.

Paolo Bolognese, MD

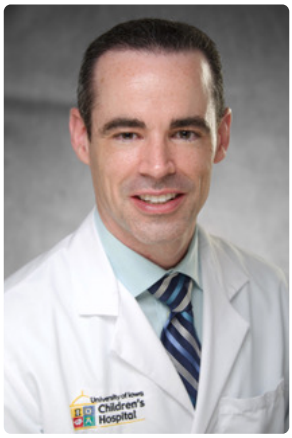
Oceanside, New York

Craniocervical Instability in Chiari I Malformation & EDS Patients

Synopsis: Complex Chiari is the anatomical combination of a Chiari I Malformation alongside a Craniocervical Junction pathology (static or dynamic). Craniocervical Instability (CCI) is a dynamic disorder of the CCJ and can be caused by abnormal skeletal anatomy at the CCJ and/or defects of the ligaments keeping the CCJ together (acquired or congenital).

Whenever its clinical effects raise above the surgical qualification threshold, Complex Chiari represents a difficult technical problem, since the basic tenets of Chiari Decompression and Craniocervical Fusion are at odds with each other, and put the surgeon in the uncomfortable position of favoring one at the expense of the other, or undercutting them both, unless a radically different technical choice is made.

About Dr. Bolognese: Paolo Bolognese, MD, graduated from the Medical School of the University of Turin where he completed his neurosurgical training in 1990.A native of Torino, Italy, Dr. Bolognese graduated from the Medical School of the University of Turin. He trained twice in Neurosurgery, under Prof. Fasano (Turin, Italy) and under Dr. Milhorat (Brooklyn, NY). In 2001, Dr. Bolognese joined Dr. Thomas Milhorat and then co-founded The Chiari Institute. In 2014, he started the Chiari EDS Center at Mount Sinai South Nassau, along with Dr. Roger W. Kula. His Neurosurgical interests span from Chiari I Malformation to Craniocervical Instability, Tethered Cord, Styloid Hypertrophy, Idiopathic Intracranial Hypertension, and Intracranial Hypotension.



Brian Dlouhy, MD

Iowa City, Iowa

Surgical Failure in Chiari - What to do Next

Synopsis: Despite generally favorable outcomes, surgery for Chiari Malformation Type I can fail due to persistent cerebrospinal fluid obstruction, inadequate decompression, craniocervical instability, tethered cord, elevated intracranial pressure, alternative diagnoses, and more. Dr. Dlouhy will review the common causes of failed Chiari surgery, discuss a systematic approach to postoperative evaluation, and present evidence-based strategies for revision treatment. Emphasis will be placed on identifying the underlying mechanism of failure and tailoring surgical management to optimize patient outcomes.

About Dr. Dlouhy: Dr. Brian Dlouhy is a pediatric and adult neurosurgeon at the University of Iowa Hospitals & Clinics and University of Iowa Children's Hospital in Iowa City, Iowa. He completed his neurosurgery residency at the University of Iowa worked extensively under and alongside Dr. Arnold Menezes treating all disorders of the craniovertebral junction (CVJ) in children and adults. He also has an active research program studying the pathophysiology of Chiari I malformation and other conditions of the CVJ.

Gerald Grant, MD, MBA, FACS

Durham, North Carolina

Disappearing Chiari

Synopsis: We will explore the literature and personal experience on Chiari I, which may vanish over time. We don't understand the natural history of Chiari I over time, but these discussions are important for patients wondering how Chiari might change without any surgical intervention. We will explore what is known together, and I look forward to your thoughts during the Q/A.

About Dr. Grant: Dr.Gerald A.Grant, is a neurosurgeon, scientist, and chair of the Department of Neurosurgery at Duke University. Clinically, Dr. Grant specializes in treating brain tumors, medically refractory epilepsy, Chiari malformation, and concussion. He treats pediatric patients 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.

Dr. 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 326 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 2003-2006. 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 Vice Chair of Neurosurgery. He served as Associate Dean of academic affairs at Stanford from 2021-2022. In April 2022, Grant was recruited back to Duke as Professor and Chair of the Department of Neurosurgery.

Linda Gray Leithe, MD

Durham, North Carolina

Beware of CSF Pressure Disorders Mimicking Chiari Malformations & Syringomyelia

Synopsis: This lecture will look at secondary causes of Chiari and syrinx, that if treated, can obviate the need for Chiari decompression or syringe-subarachnoid shunts. Imaging strategies for detection and findings that will help to identify these secondary causes will be described.

About Dr. Gray: Dr. Linda Gray began her career at Duke Medical Center in neuroradiology and has been on faculty at Duke in Neuroradiology for 37 years. Initially her career was occupied with running the residency-training program for a dozen years. In 2002 when CT fluoroscopy came to fruition, she initiated CT fluoroscopic guided pain management and pioneered CT interventions along the spinal axis including central cervical epidurals extending from C1-2 and throughout the cervical, thoracic and lumbar spine. In 2006, she initiated a program in CT fluoroscopic guided interventions for the treatment of spontaneous intracranial hypotension. There are now 8 faculty at Duke treating patients with CSF pressure disorders in both neuroradiology and IR. Additionally, she and her colleagues have mentored at least 40 neuroradiologists and 30 institutions throughout the United States, Europe and Australia in the performance of these procedures and has initiated the concept of cerebrospinal fluid (CSF) pressure problems as a secondary cause of migraine headaches throughout the headache community. She is now an invited speaker on the subject, giving multiple lectures throughout the year.

MISSED A SPEAKER?

All presentations will be recorded and shared on our YouTube channel. Subscribe to view past conference presentations and receive notification of new videos.

YouTube
@ASAPChiariSyringo

Barth Green, MD

Miami, Florida

Chiari/Syringomyelia/EDS: Opportunities for Wellness and Longevity

Synopsis: This presentation emphasizes that while conditions such as Chiari I malformation, syringomyelia, and Ehlers-Danlos syndrome require appropriate medical and surgical management, long-term health and quality of life are best achieved through a proactive, holistic approach to wellness. The talk highlights the importance of combining conventional treatments with healthy lifestyle practices—including a Mediterranean-style diet, regular exercise, weight management, adequate sleep, preventive healthcare, cognitive engagement, stress reduction, mindfulness, and maintaining strong social connections—to reduce inflammation, improve physical and mental well-being, and promote resilience and longevity. Ultimately, Dr. Green encourages individuals to take an active role in their health by making daily choices that support overall wellness and maximize their quality of life.

About Dr. Green: Dr. Barth A. Green, Executive Dean for Global Health and Community Service served 22 years as Chairman of the Department of Neurological Surgery. He is a Professor of Neurological Surgery, Neurology, Orthopedics, Radiology and Rehabilitation Medicine and a world-renowned specialist in the surgical management of complex spine and spinal cord injuries and disorders. Dr. Green is a diplomat of the American Board of Neurological Surgeons and a fellow of American College of Surgeons. He served 37 years in the U.S. Army Reserve Medical Corps where he reached the rank of Lt. Colonel.

In 1985 Dr. Green co-founded “The Miami Project to Cure Paralysis,” an internationally acclaimed spinal cord injury and paralysis research center. In 1990 he co-founded Shake-A-Leg Miami, an adaptive watersport center, which combines education with recreation and annually serves thousands of children and adults with physical, developmental, and economic challenges. Aside from these important initiatives here in the United States, Dr. Green is Chairman of the Board of the Project Medishare for Haiti, which he co-founded in 1994 to help improve the health status of Haiti’s citizens through an integrated and community approach to sustainable development. Dr. Green also co-founded the University of Miami Global Institute for Community Health and Development, a University of Miami Miller School of Medicine program focused on improving healthcare by capacity building and creating sustainable infrastructure in the healthcare sector focused on the western hemisphere and beyond. He has also been a global leader in disaster response.

In June of 2021, Dr. Green retired from his surgical practice but actively continues his neurosurgery clinic, seeing patients both in person and by telemedicine, as well as overseeing patients during rounds at both UHealth Tower and Jackson Memorial Hospital. In addition to his clinical work, he dedicates his time as Chairman of the Miami Project to Cure Paralysis, Executive Dean for the Global Institute for Community Health and Development and serves on the board of multiple organizations such as Project Medishare, the Buoniconti Fund, the Maven Project, the Center for Haitian Studies, and Haiti Air Ambulance.

He has received numerous local, national and international honors and awards for his community service and humanitarian work including: Humanitarian Award (American Association of Neurological Surgeons), Lawton’s Heart Humanitarian Award (Florida Association of Nonprofit Organizations), the Dorothy Shula Award for Outstanding Volunteerism (United Way of Miami Dade County), the Chairman’s Recognition Humanitarian Award (Florida Board of Medicine), the President’s Medal (University of Miami), the

Barth Green, MD (Cont.)

Miami, Florida

Healthcare Heros Award (Greater Miami Chamber of Commerce) and the James W. McLamore Outstanding Service Award (University of Miami Faculty Senate). Dr. Green authored and coauthored hundreds of peer reviewed articles, abstracts and book chapters and has received numerous federal and foundation grants and endowed chairs. He has lectured locally, nationally, and globally and continues all of these activities in 2023.

Ralph Wilson was a decorated naval officer and combat hero. He also founded the Buffalo Bills Football team and was inducted into the NFL Hall of Fame. He was nationally recognized as a leader in the industrial and business sectors and was a generous philanthropist. He was Dr. Green's close friend and a generous supporter of the Miami Project to Cure Paralysis.

Dr. Green proudly honors his name with his academic and community activities.

Jeffrey Greenfield, MD, PhD

New York, New York

Under Pressure: How Patients Can Understand the How and Why of Surgery for Chiari in the presence of Syringomyelia

Synopsis: This session reframes surgery not as a dangerous intrusion, but as a relieving way to make space for cerebrospinal fluid (CSF) flow. The goal is to lower patient anxiety by demystifying the operating room and focusing on the goal of symptom relief and validates their specific, often hard-to-explain physical symptoms. We will focus on explaining CSF fluid dynamics and syrinx improvement in simple terms and mapping out realistic recovery timelines.

About Dr. Greenfield: Dr. Jeffrey Greenfield is a board-certified neurosurgeon who specializes in pediatric neurosurgery. In addition, he sees certain adult patients with congenital neurosurgical conditions. Compassionate clinical care, research, and education are all central to his philosophy as a neurosurgeon and physician.

As creator and director of the Chiari CARE program, Dr. Greenfield has developed an international reputation caring for children and adults with Chiari malformation, tethered cord, syringomyelia, and other associated conditions such as craniocervical instability, CSF leaks, and hydrocephalus as part of a large multidisciplinary team. Dr. Greenfield is a strong proponent of the unique concept of transitional neurosurgery – caring for patients with specific conditions from childhood through adulthood.

Dr. Greenfield also directs the pediatric skull base surgery program, evaluating and removing tumors of the pituitary gland region and skull base such as craniopharyngiomas with minimally invasive endoscopic tools. Dr. Greenfield is also expert in utilizing minimally invasive ventricular endoscopy of the brain to treat tumors, hydrocephalus, and cysts within the ventricles, and intraoperative brain and spine mapping and imaging to care for children with benign and malignant tumors of the brain and spine.

John Heiss, MD

Bethesda, Maryland

Mechanisms for the Development of Chiari I Malformation

Synopsis: Genetic and MRI studies have provided scientific evidence that Chiari I malformation can arise through several mechanisms. Congenital or primary processes leading to Chiari I malformation include 1) reduced development of the bone of the posterior fossa surrounding the foramen magnum, 2) reduced development of the entire skull, 3) increased growth of the cerebellum, and 4) increased growth of the entire brain. Chiari I malformation can also develop secondary to 5) hydrocephalus, 6) cerebrospinal fluid (CSF) leak, or 7) basilar invagination. These processes reduce the space in the posterior fossa or increase the pressure gradient across the foramen magnum, resulting in the cerebellar tonsils protruding through the foramen magnum. This talk will describe these mechanisms, how to distinguish them on MRI scans, and how treatment is tailored to the mechanism of Chiari I malformation development. The influence of genetic factors on these mechanisms will be mentioned. The talk will conclude by summarizing how advances in genetics, imaging, outcome studies, and surgical experience influence the care of patients with Chiari I malformation.

About Dr. Heiss: Dr. John D. Heiss, is a Senior Clinician, the Head of the Clinical Unit of the Surgical Neurology Branch, and Program Director of the Neurological Surgery Residency Training Program at the National Institute of Neurological Disorders and Stroke (NINDS), National Institutes of Health (NIH) in Bethesda, Maryland. He is actively involved in clinical and translational research to improve the understanding and treatment of Chiari I malformation, syringomyelia, pain, brain tumors, and Parkinson's disease. He is board-certified in neurological surgery and an expert in supervising and conducting clinical trials for CNS disorders. Dr. Heiss received his BS in Biomedical Sciences and MD from the University of Michigan. In addition, he completed his surgical internship and residency in neurosurgery at the University of Cincinnati College of Medicine. Before joining NINDS, Dr. Heiss was Co-Director of the Neuroscience Intensive Care Unit at the University of Cincinnati.

Bermans Iskandar, MD

Madison, Wisconsin

We're Not Alone—Chiari Malformation Across Species

Synopsis: This presentation reviews what is currently known about Chiari and Chiari-like malformations across species, comparing symptoms, diagnostic criteria, and management approaches against the human condition. By drawing these threads together, we aim to highlight shared mechanisms, identify where animal findings may inform human understanding, and outline open questions that a more unified view of etiology could help address.

Chiari malformation, marked by displacement of the cerebellum and/or brainstem toward or through the foramen magnum, is well characterized in humans but also occurs naturally in other species. Veterinary medicine has documented comparable malformations most extensively in dogs, with occasional reports in other companion and captive animals, offering models that complement human research. Across species, clinical presentation, diagnostic approach, and treatment strategies show notable overlap, alongside meaningful differences shaped by anatomy, skull conformation, and species-specific biology.

About Dr. Iskandar: Dr. Bermans Iskandar is Professor of Neurosurgery and Pediatrics, and Director of the Pediatric Neurosurgery program at the University of Wisconsin Hospital and Clinics. His clinical interests include neuro-endoscopy, brachial plexus reconstruction, and surgery of congenital CNS malformations, especially hydrocephalus, Chiari malformations, and syringomyelia. Led by Dr. Iskandar, the Wisconsin Hydrocephalus Group (WHP) of engineers, physicists, neurologists, and neurosurgeons aims to determine the etiology of ventricular shunt malfunction and optimize the devices used to treat it. As well, Dr. Iskandar directs a translational research laboratory that has uncovered an important link between folate metabolism, epigenetic influences, and axonal regeneration after central nervous system injury. Dr. Iskandar has recently concluded his service as Chair of the AANS/CNS Section on Pediatric Neurosurgery, and Chair of the American Board of Pediatric Neurological Surgery.

Rajiv Iyer, MD

Salt Lake City, Utah

Tethered Spinal Cord

Synopsis: We will discuss the diagnosis of tethered spinal cord, clinical evaluation of patients with occult spinal dysraphism, and clinical management of patients with tethered spinal cord, including direct intradural untethering and spinal column shortening.

About Dr. Iyer: Dr. Rajiv Iyer is an Assistant Professor of Neurosurgery at the University of Utah and a dual fellowship-trained pediatric neurosurgeon with a special focus on pediatric spinal disorders. After completing neurosurgery residency at The Johns Hopkins Hospital, he completed a pediatric neurosurgery fellowship at the University of Utah/Primary Children's Hospital and then went on to complete the Advanced Pediatric Spinal Deformity Fellowship at the Department of Orthopedic Surgery at Columbia University Medical Center in New York with Dr. Michael Vitale and Dr. Lawrence Lenke.

He has a special interest in treating and studying severe spinal deformity, as well as the tethered spinal cord. He is especially interested in understanding the role of spinal column shortening in the treatment of tethered cord. He also serves as the pediatric neurosurgery fellowship director and medical director of the Primary Children's Hospital multidisciplinary Spina Bifida Clinic.

Safwan Jaradeh, MD

Stanford, California

Management of Orthostatic Intolerance in Chiari

Synopsis: A brief review of orthostatic intolerance in patients with Chiari malformation will provide an overview of the condition, including examples of common forms of orthostatic intolerance. The session will also discuss both non-pharmacological and pharmacological approaches to management, helping patients better understand available treatment strategies.

About Dr. Jaradeh: Dr. Safwan Jaradeh is currently Professor and Director of the Autonomic Disorders Program at Stanford University School of Medicine since 2011. Prior to that, he was on the Neurology Faculty at the Medical College of Wisconsin from 1989 to 2011, where he also served as Professor and Chair of the Department of Neurology from 2000 to 2011. Dr. Jaradeh trained in Internal Medicine and Neurology in Paris and Cincinnati, and completed Neuromuscular and Autonomic Fellowships at the Mayo Clinic, and Neuromuscular and Neuro-rehabilitation Fellowship at the University of Michigan. His research and clinical focus is in the areas of Autonomic Disorders, Orthostatic intolerance, Peripheral and Autonomic Neuropathies, Neuromuscular Disorders, Electromyography, Cranial and Bulbar disorders. He has won several teaching awards at both Institutions.

Gad Klein, PhD

East Meadow, New York

The Path to CCF (Cranio-Cervical Fusion) – Important Psychosocial Considerations

Synopsis: This session discusses the importance of addressing mental health and other psychosocial factors before potential cranio-cervical fusion. It highlights how these factors can influence surgical decision-making, recovery, and patient expectations, emphasizing the value of a comprehensive, patient-centered approach to care.

About Dr. Gad Klein: As a neuropsychologist at NYU Langone Ambulatory Care East Meadow, Gad Klein, PhD, specializes in comprehensive neuropsychological evaluations for patients with neurologic conditions including dementia, multiple sclerosis, epilepsy, brain tumors, and movement disorders. His assessments support accurate diagnosis, track symptom progression, and guide individualized treatment planning in collaboration with physicians.

He works closely with the Department of Neurosurgery, providing expertise in pre- and post-surgical evaluations, awake craniotomies, and advanced functional neuroimaging. These collaborations enhance surgical precision and inform postoperative care.

Dr. Klein's path into neuropsychology began with a deep interest in the relationship between brain function and behavior, ultimately leading him to earn a PhD focused on cognitive and emotional effects of neurologic disorders. Beyond diagnosis, he is committed to helping patients and families understand results, navigate treatment options, and access appropriate medical and psychological support, offering clarity and compassion during challenging times.

Petra Klinge, MD, PhD
Providence, Rhode Island

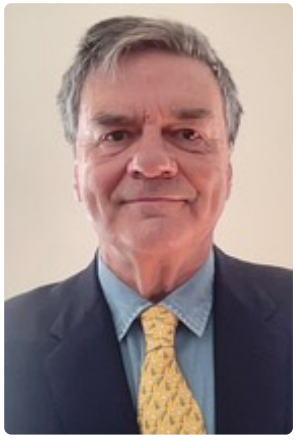
Chiari Malformation Across the Lifespan—Developmental Anomaly or Progressive Disorder? Understanding Age-Dependent Pathology and Phenotypes

Synopsis: The talk will explore Chiari malformation as a dynamic condition spanning the entire lifespan discussing the differences in clinical observations, imaging evolution, and emerging pathophysiological insights and symptoms spectrum in children and adults. Chiari represents a developmental malformation, a progressive disorder, or a continuum of both. Age-dependent phenotypes—from pediatric presentations with brainstem and craniovertebral junction crowding to adult-onset symptoms linked to connective tissue, CSF dynamics, aging and impacts of the degenerative spine and acquired tethering—will be highlighted. The discussion emphasizes how shifting pathology influences diagnosis, surveillance, and treatment strategies, underscoring the need for individualized, lifespan-oriented care and a nuanced framework for understanding disease progression and therapeutic decision-making. The talk will propose research strategies directed to also understand environmental impacts and health stressors that impact the pathological and clinical progression or symptomatic onset condition in both children and adults.

About Dr. Klinge: Dr. Petra Klinge serves as an internationally renowned clinician for diagnosing and neurosurgical treatment of patients with CSF disorders working on the unifying concept of cognitive problems related pathology in Hydrocephalus of aging and pediatric patients. Her practice also includes patients with associated developmental Cerebrospinal fluid disorders, such as spina bifida, Chiari malformation, tethered cord, patients with connective tissue disorders and associated spinal fluid disorders including SM and occult tethered cord syndrome. Her research focuses on the pathophysiology and diagnosis of tethered cord and on establishing criteria and clinical biomarkers for surgical intervention in tethered cord syndromes (1-5).

In collaboration with neuroradiology in her practice at Rhode Island Hospital and the Carney-Institute and the department of bio-engineering at the Brown Medical School she develops pioneering and novel clinical and in-vivo diagnostics and pathological studies to improve the management and validation of those conditions.

In the past 2 years, Dr. Klinge has also collaborated with the University of Akron Conquer Chiari Research Center, founded by the Department of Psychology and the Department of Biomedical Engineering on the implications of ageing in Chiari as well as identifying cognitive and imaging biomarkers to support the biodynamic concept of the failure of Cerebrospinal fluid regulation at the base of the skull in adult Chiari malformation. Her research has focused on the failure of “Myodural bridges” and defunct collagen that supports the aspects of CSF circulatory failure at the base of the skull in various conditions including Chiari associated with connective tissue disease and she works on the novel concept of a “Spinal cord motion disorder” that might explain and support occult neurosurgical pathologies associated with impaired CSF regulation and tethering of the spinal cord and brain stem. She had been appointed by the National Academy of Sciences and served in 2022 in a committee to establish disability criteria for the neurological conditions in patients with Ehlers-Danlos-Syndrome and Marfan Syndrome as a nationally acknowledged expert for spinal cord disorders and tethered cord syndrome.



Jorge Lazareff, MD
Los Angeles, California

Large Cohort Analysis of Chiari Malformation Type 1. Real-World Data from Multi-Centers in Central China

Synopsis: This study reports on the clinical and surgical histories of 827 patients with Chiari type 1 in Henan Province, the People's Republic of China. There are disparities and similarities with the clinical experience of American clinical and surgical researchers. This highlights the breadth of the complexities of Chiari I. Our society expands its reach to researchers and their patients from other nations.

About Dr. Lazareff: Dr. Jorge Lazareff is Emeritus Professor of Neurosurgery at the David Geffen School of Medicine at the University of California, Los Angeles (UCLA). His clinical practice and research have focused on congenital malformations of the central nervous system. He is currently investigating barriers to care for individuals with congenital neurological disorders, with the goal of improving access to timely diagnosis and treatment.

DID YOU KNOW?

Scoliosis is 2 to 4% in the general population but may be as high as 30% in patients with Chiari malformation type 1 and as high as 70% with spinal cord syrinx.

Michael Levy, MD, PhD

San Diego, California

Syringomyelia, Syrinx, and Central Canal Dilation

Synopsis: I will discuss the radiographic appearances of these abnormalities in addition to the proposed mechanisms as to why they occur. Additionally, I would discuss patient presentation and manifestations and how they relate to the anatomy specific to those disease states. Lastly, I would discuss the neurosurgical management and follow up of each and when surgical intervention is considered appropriate or not.

About Dr. Levy: Dr. Michael Levy is the Professor and Division Head of the University of California San Diego Division of Pediatric Neurosurgery. Dr. Levy is also Chief of Pediatric Neurosurgery at Rady Children's Hospital-San Diego and UC San Diego School of Medicine.

In 2002, he was recruited to develop a Pediatric Neurosurgical Center of Excellence at Rady Children's and a pediatric neurosurgical fellowship at UC San Diego. Currently, Dr. Levy is the director of UC San Diego's Pediatric Neurosurgical Fellowship Training Program and its pediatric neurosurgical international fellowship.

Dr. Levy's expertise lies in the treatment of complex pediatric brain tumors and cerebrovascular malformations. He is also involved with the design and utilization of endoscopy and three- dimensional imaging technologies to facilitate surgery.

Along with his clinical expertise, Dr. Levy is actively involved in research and is widely published, with more than 200 papers appearing in peer-reviewed literature, seven books and more than 60 book chapters. Additionally, he is currently on the editorial boards of 16 peer-reviewed journals, including Neurosurgery, Journal of Health Communications, World Neurosurgery, Frontiers in Pediatrics and Journal of Neurosurgical Sciences.

Dr. Levy's professional memberships include the Society of University Neurosurgeons, the American Academy of Neurological Surgery and the American Society of Pediatric Neurosurgery, along with Alpha Omega Alpha (Medical Honor Society), the American College of Surgeons, the American Association of Neurological Surgeons, the Congress of Neurological Surgeons, Joint Section of Pediatric Neurosurgery and the WHO Global Initiative for Emergency and Essential Surgical Care.

Anne Maitland, MD, PhD

Charleston, South Carolina

The Epithelial-Neuroimmune Axis in Ehlers-Danlos Syndromes - Bridging Barrier Dysfunction and Systemic Inflammation to Structural Spinal Pathology

Synopsis: EDS—particularly the hypermobile type (hEDS)—is characterized by weak extracellular matrix (ECM) and ligamentous laxity. Unlike most other EDS subtypes, this ECM dysfunction and laxity are thought to be acquired, driven by chronic neuro-immune dysregulation. The epithelial barrier hypothesis proposes that modern environmental exposures—such as detergents, microplastics, processed foods, and particulate matter—damage epithelial barriers in the gut, skin, and lungs. Barrier disruption increases permeability, allowing microbes and allergens to enter the body, which promotes microbial dysbiosis and sustained low-grade micro-inflammation. These neuroimmune–spinal interactions may contribute to conditions such as Chiari Malformation Type I (CMI) and tethered cord syndrome by weakening ligaments and altering the ECM, thereby exposing the brainstem and spinal cord to deformative mechanical stress.

For neurosurgeons treating patients with EDS and related spinal disorders, these patients present distinct biological and structural challenges: (1) chronic systemic neuroimmune dysfunction, (2) tissue fragility and impaired wound healing, (3) dysautonomia—often manifesting as postural orthostatic tachycardia syndrome (POTS), (4) structural pathology, and (5) the need to anticipate potential failure mechanisms to reduce the risk of poor surgical outcomes. Successful management therefore requires coordinated, integrated, multidisciplinary care spanning neurosurgery, neurology, immunology, and genetics, alongside relevant medical specialties.

About Dr. Maitland: Anne L. Maitland, MD, PhD is the Director of the Ehlers Danlos Syndrome Institute, at Medical University of South Carolina, and an Associate Professor in the Department of Medicine, Division of Rheumatology at the Medical University of South Carolina.

Her career has long been driven by curiosity about the neuro-immune axis and its dysregulation in disease. She was introduced to the spectrum of neuroimmune dysregulation, as she witnessed the HIV and asthma epidemics unfold in her hometown, in the 1980s. Nowadays, Long COVID exemplifies acquired neuro-immune dysregulation, which follows infection by SARS CoV-2 and impacts 7% of the US population; and, children as well as adults with connective tissue disorders, such as Ehlers-Danlos Syndromes (EDS), face neurodevelopmental challenges and heightened sensitivity to environmental exposures, which reflect chronic dysregulation of the autonomic nervous and immune systems, respectively.

In collaboration with Drs. Norris, Gensemer and Patel, Ehlers-Danlos Syndrome Institute (EDSI) will become a model of innovative care for complex medical disorders, amidst of sea of siloed healthcare. Dr. Maitland serves on committees, addressing mast cell activation disease (MCAD), Health Care Disparities and Integrative Medicine of the American Academy of Allergy, Asthma and Immunology. She also serves on the scientific faculty for the Mast Cell Disease Society, the Ehlers-Danlos International Consortium and the Chiari-Syringomyelia Foundation.

Brian Mehling, MD, MS
Hackensack, New Jersey

Stem Cell Therapy for Syringomyelia, Chiari Malformation, and Related Neurological Disorders: Current Evidence, Clinical Experience, and Future Directions

Synopsis: Stem cell therapy is emerging as a promising area of regenerative medicine for patients living with complex neurological disorders. In this presentation, Dr. Brian Mehling will review the scientific rationale behind stem cell therapy, discuss current clinical evidence, and share his clinical experience treating patients with neurological conditions, including Syringomyelia, Chiari Malformation, and related disorders.

Attendees will learn how stem cells may help reduce inflammation, modulate the immune system, support tissue repair, and promote nerve regeneration. Dr. Mehling will also explain what a typical stem cell treatment involves, including patient evaluation, treatment protocols, safety considerations, expected outcomes, and the current limitations of this rapidly evolving field.

The presentation will provide a balanced overview of where regenerative medicine stands today, what is supported by current scientific evidence, and the exciting research that may shape future therapies for patients living with these challenging neurological conditions. Time permitting, the session will conclude with an interactive question-and-answer discussion.

About Dr. Mehling: Brian Mehling, MD, MS is the founder and chief medical officer of Blue Horizon International (BHI). He is a practicing American orthopedic trauma surgeon, researcher, and philanthropist. He is spearheading groundbreaking research in stem cell therapy through his company, Blue Horizon International, a healthcare consulting organization focused on treatment and research using stem cells and exosomes. He is board-certified in orthopedic surgery and anti- aging/regenerative medicine.

Dr. Mehling started his path in medicine through undergraduate study at Harvard University, obtaining his Bachelor of Arts and Master of Science degrees in Biochemistry from Ohio State University. Completing his degree of medicine at Wright State University School of Medicine, Dr. Mehling received post graduate education through residencies and fellowships at St. Joseph's Hospital in Paterson, NJ and the Graduate Hospital in Philadelphia, PA. He is currently pursuing a Ph.D. in Chemistry at Seton Hall University.

An orthopedic trauma surgeon, Dr. Mehling operates his own practice, Mehling Orthopedics, in both West Islip, NY and Hackensack, NJ. He also has privileges and takes call at Hackensack University Medical Center, Hackensack University Medical Center at Pascack Valley, Hackensack Meridian Palisades Medical Center, Hudson Regional Hospital, St. Joseph's Medical Center, and St. Joseph's Wayne Medical Center.

Dr. Mehling has traveled extensively throughout Asia and the Middle East observing first-hand the differences in healthcare standards. Identifying the need for a universal high-quality standard, he founded Blue Horizon International.

Brian Mehling, MD (Cont.)

Hackensack, New Jersey

He and his colleagues have successfully treated and monitored more than 600 patients using stem cell and regenerative therapies. Patients have been treated for a wide range of diseases and disorders including spinal cord injury and cerebral palsy.

Dr. Mehling founded the Blue Horizon Charitable Foundation, which was with the mission to assist in and finance the advancement of all aspects of stem cell therapies and cellular regenerative medicine and research in full regulatory conformance, in conjunction with the scientific community. The foundation will also support and provide charitable therapies to those suffering from degenerative diseases and debilitating conditions.

Dr. Mehling also raises awareness through his film company, Industrial Motion Pictures (IMP). His full feature documentary, “Tiny Tears,” presented at the Cannes and New York Film Festivals, is a collection of testimonials from caregivers and volunteers in different countries, devoted to saving and helping children affected by AIDS. He is currently working on several other film projects, among them a documentary exploring the future of medicine and the revolution taking place in stem cell therapy.

Vijay Ravindra, MD

San Diego, California

Updates on the Management of Chiari Malformation - Current Evidence Review

Synopsis: In the presentation I will discuss the current evidence base for the management of Chiari malformation in children. This will include presentation and explanation of the most up to date literature and how that translates to patients and their families. This will help in understanding why providers make the decisions they do when managing children with Chiari I malformation.

About Dr. Ravindra: Dr. Vijay Ravindra is a board-certified adult and pediatric neurosurgeon and former active-duty Naval Officer. He is currently an Associate Professor of Neurosurgery at the University of Utah and practices at Primary Children's Hospital in Salt Lake City, UT.

He completed his neurosurgery training at the University of Utah, where he worked closely with Dr. Douglas Brockmeyer. He completed his pediatric neurosurgery fellowship at Texas Children's Hospital – Baylor College of Medicine. His clinical interests include disorders of the pediatric spinal column, in particular the craniocervical junction and scoliosis. He is actively studying tissue properties of the CCJ in children with Chiari malformations.

ASAP'S 39TH ANNUAL CONFERENCE

We are excited to announce Dr. Vijay Ravindra as ASAP's 2027 conference host. Join us next year in Salt Lake City, Utah!

Ilene Ruhoy, MD, PhD

New York, New York

Mast Cells and Diease

Synopsis: This lecture will discuss how and why mast cells have been implicated in an increasing number of diseases over the past few years. With over 1200 mediators and 300 membrane receptors as well as their physiologic role and tissue residence, these innate immune cells are poised to cause a multitude of symptoms that have previously been thought to be idiopathic, refractory, and sometimes functional.

About Dr. Ruhoy: Director of Neuroimmune & Connective Tissue Neurology at Atria Health Institute, New York, NY Ilene S. Ruhoy, MD, PhD is a board-certified neurologist and environmental toxicologist and serves as the Director of Neuroimmune and Connective Tissue Neurology at the Atria Health Institute in NYC. Dr. Ruhoy has served as the Medical Director for the EDS-Chiari Center at Mount Sinai South Nassau Hospital. Originally from New York, she trained in both pediatric and adult neurology at the University of Washington and Seattle Children's Hospital. In addition to neuromuscular fellowship training at the University of Washington, she is a graduate of the University of Arizona Integrative Medicine Fellowship. Dr. Ruhoy is the co-editor of Integrative Neurology, published by Oxford Press and the co-editor of the *Preventative Neurology* issue of Seminars in Neurology published by Thieme Medical. She is also the author of *Invisible No More* published by St. Martins Press.

WHY SHOULD YOU TEST FOR EDS?

- EDS Can Affect Surgical Outcomes
- It May Explain Unusual Symptoms
- Instability Risks
- Treatment Plans Must Be Adjusted

Jonathan Sisti, MD
New York, New York

C1 Transverse Process Resection Technique for IJV Decompression at the Skull Base

Synopsis: Compression of the internal jugular vein at the skull base can lead to venous outflow obstruction and intracranial hypertension. Anterolateral approaches, including styloidectomy with partial C1 transverse process shaving is a common approach, however this may leave residual osseous and soft tissue constraints. We describe a posterior technique for complete C1 transverse process resection, including unroofing of the transverse foramen and periosteo-fascial release. The approach can be performed bilaterally through a single midline exposure, provides direct visualization of the vertebral artery, does not transverse lower cranial nerves, and can be combined with other craniocervical procedures. We'll review the operative steps and early radiographic findings demonstrating IJV re-expansion on CTA.

About Dr. Sisti: Jonathan A. Sisti, MD, is a neurosurgeon specializing in cerebrovascular and endovascular neurosurgery at the Icahn School of Medicine at Mount Sinai, where he holds the academic rank of Assistant Professor in the Department of Neurosurgery.

Dr. Sisti earned his MD from Columbia University College of Physicians & Surgeons and completed his residency in neurological surgery at New York-Presbyterian Hospital (Columbia Campus). He subsequently pursued dual fellowship training — first in neurovascular and endovascular neurosurgery at the Icahn School of Medicine at Mount Sinai, and then in minimally invasive cranial and skull base surgery at LAC-USC Medical Center (Keck School of Medicine).

Erol Veznedaroglu, MD, FACS, FAANS, FAHA

Philadelphia, Pennsylvania

New Surgical Technique for Chiari Decompression

Synopsis: This presentation will review an innovative surgical technique for treating Chiari Malformation. I will discuss the rationale behind the new approach, how it differs from traditional decompression procedures, and the potential benefits for patients. Topics will include patient selection, surgical planning, operative technique, expected outcomes, and complication management. Clinical results and case examples will be presented to illustrate the effectiveness of this evolving procedure and its impact on symptom relief, restoration of cerebrospinal fluid flow, and overall quality of life for patients living with Chiari malformation. My talk is designed for patients, caregivers, and healthcare professionals seeking to understand advances in Chiari surgery and their potential implications for treatment.

About Dr. Veznedaroglu: Erol Veznedaroglu, MD, FACS, FAANS, FAHA, or Dr. Vez, is one of the nation's most innovative and experienced vascular, dual-trained neurosurgeons. He is director of the Drexel Neurosciences Institute and holds the Robert A. Groff Chair in Neurosurgery. Dr. Vez is also chair of Global Neurosciences Institute, LLC (GNI) leading a team of some of the nation's most experienced neurosurgeons specializing in comprehensive care including vascular, tumor, spine and functional neurosurgery, as well as a consortium of neuroscience physicians providing subspecialty neurology and comprehensive pain management clinical services. He is board certified in neurological surgery, and is a fellow of the American College of Surgeons (FACS), the American Association of Neurologic Surgeons (FAANS) and the American Heart and Stroke Association (FAHA).

Carina Yang, MD

Chicago, Illinois

Lowering the Bar on MR: A Deep Dive into Craniocervical Pathologies

Synopsis: Foundational concepts and tips on orientation to and basic image interpretation of MRI of the brain, craniocervical junction, and spinal cord will be reviewed, in relation to various craniocervical pathologies. Get ready to be guided by an academic neuroradiologist to increase your familiarity with imaging of normal anatomy and more common disease processes.

About Dr. Yang: A board-certified radiologist/neuroradiologist, Dr. Carina Yang is a Professor of Radiology, and has served as the Director of Pediatric Neuroradiology at the University of Chicago Medicine since 2013, with a focus on diagnosing and characterizing the full scope of head, brain, spine and neck conditions. Dr. Yang is an expert in interpretation of neuroradiological computerized tomography (CT) and magnetic resonance (MR) examinations, and promotes techniques for pediatric patients to minimize radiation exposure and performing testing without the need for extended sedation. She also serves as the Vice Chair of Diversity & Inclusion for her department, and is the Faculty Director for Fellowship Accreditation with the Office of Graduate Medical Education.

Dr. Yang was previously a team member for the Margaret Hackett Family Program at the University of Chicago, which aims to collaborate with physicians who advocate for the education and the advancement of knowledge pertaining to the care of patients. She is an elected member of the American Syringomyelia & Chiari Alliance Project Board. Dr. Yang is also a collaborating researcher with other pediatric neuroscience clinicians in evaluating topics including noninvasive MR of meningeal lymphatics in patients with craniosynostosis, and the potential relationship of retinopathy of prematurity to posterior reversible encephalopathy syndrome (PRES) in premature infants.

She was selected as a Senior Faculty Scholar in the Bucksbaum Institute for Clinical Excellence, as well as recently inducted as a Fellow of the University of Chicago Pritzker School of Medicine Academy of Distinguished Medical Educators. She also has great interest in promoting neuroradiology education to trainees and practicing clinicians on a global arena, with past invited visiting professorships to locations such as Newfoundland, Canada; Trinidad; Hong Kong; as well as Gwalior and New Delhi, India, in part with funding from two University of Chicago Provost's Global Faculty Awards. She was selected as the 2019 Anne G. Osborn American Society of North America International Outreach Professor to Ethiopia, and most recently traveled to Armenia for additional volunteer pediatric neuroradiology teaching. She hopes to continue to further her worldwide educational endeavors at new upcoming sites.

MEDICAL GLOSSARY

Abduction: Movement of an arm or leg away from the body.
Acute: Having rapid onset, severe symptoms, and a short course. Not chronic.
Adduction: Movement of an arm or leg toward the body.
Adhesions: Tissue surfaces which are adherent or attached to each other, either loosely or firmly, as a result of wound healing and sometimes inflammation.
Amyotrophic: Muscle wasting.
Anomaly: A deviation from the average or norm; anything structurally unusual or irregular i.e., presence of an extra finger or absence of a limb or congenital malformation.
Anterior: Pertaining to the front of the body.
Antiemetic: Medication to stop or prevent vomiting.
Apnea: Cessation of breathing. Skin color changes, pallor and/or cyanosis may ensue. There is a lack of chest wall movement; Can be caused by compression of the brainstem or lower cranial nerves.
Arachnoid: Delicate, web - like middle layer of the three membrane layers that cover the brain and spinal cord; arachnoid mater; Named after a spider web.
Arachnoiditis: Inflammation of the arachnoid membrane.
Ascending tracts: Groups of nerve fibers in the spinal cord that transmit sensory impulses upward to the brain.
Aseptic: Sterile, without bacteria; living pathogenic organisms are absent.
Aseptic meningitis: Inflammation of the membranes (meninges) that cover the brain and spinal cord. NOT an infection.
Aspiration: The act of withdrawing a fluid from the body by a suction device; the inspiratory sucking into the airways of fluid or foreign body, such as vomit.
Astrocytes: The most numerous of the neuroglial cells in the CNS derived from the neuroectoderm. Astrocytes function is fundamental for maintaining the homeostasis in the CNS. Astrocytes are part of the blood brain barrier, function as de-toxificating cells in the neuronal microenvironment and produce a variety of growth factors and mediators that contribute to the interaction between neurons and their environment (neuronal – neuroglial interaction).
Asymptomatic: Without symptoms or producing no symptoms.
Ataxia: Impaired ability to coordinate the muscles in voluntary muscular movements; symptomatic of any of several disorders of the nervous system.
Atrophy: A wasting of tissues or decrease in size of a part of the body because of disease or other influences.
Atypical: Not typical.
Autonomic nervous system: Portion of the nervous system that functions to control the actions of the visceral organs and skin; its actions are not under voluntary control.
Axon: A nerve fiber that conducts a nerve impulse away from a neuron cell body.
Barium swallow: X - ray using barium to view the act of swallowing, the esophagus or stomach. It can show if a person may be aspiring.
Basal ganglion: Mass of gray matter located deep within a cerebral hemisphere of the brain; has important functions in automatic movements of the limbs and in the control of muscle tonus.
Basilar impression: Upward displacement, particularly of the uppermost part of the cervical spine, into the region of the posterior fossa often produces compression of the brainstem and portions of the cerebellum.
Bilateral: Something that occurs or appears on both sides. A patient with equal strength bilaterally means there is equal strength on both sides of the body.
Brainstem: The portion of the brain that includes the midbrain, pons and medulla, thalamus and hypothalamus.
Calamus sciptorius: Inferior part of the rhomboid fossa; the pointed lower end of the fourth ventricle of the brain. It is shaped like a pen and lies between the restiform bodies.

Canalization neurulation: The formation of canals or passages to form the neural tube during the early stages of embryonic development.
Catheter: A tube designed for insertion into vessels, canals, passageways or body cavities to permit the injection or withdrawal of fluids or substances. It can also be used to keep a passageway open.
Caudal: Toward the lower end of the spine.
Central canal: The opening or channel normally present through the length of the spinal cord in later fetal life and early infancy. It gradually disappears throughout childhood, but segments of it may remain in adults (see also hydromyelia).
Central nervous system: The part of the nervous system consisting of the brain and spinal cord, which coordinates the entire nervous system of the body.
Cerebellar cortex: The outer layer of the cerebellum.
Cerebellar speech: Abnormal speech patterns seen in people who have a disease of the cerebellum or its connections; a slow, jerky and slurred speech that may come and go or it may be unvaried in pitch.
Cerebellar tonsils: Normal downward extensions of each cerebellar hemisphere.
Cerebellomedullary: Refers to the connections of the cerebellum and the medulla.
Cerebellum: Portion of the brain that lies in the posterior fossa and coordinates skeletal muscle movement.
Cerebral aqueduct: A narrow conduit or passage between the third and fourth ventricles located in the midbrain. CSF moves from the third ventricle through the cerebral aqueduct to the fourth ventricle.
Cerebral cortex: The outer layer of the cerebrum.
Cerebral hemisphere: One of the large, paired structures that together constitute the cerebrum of the brain.
Cerebral spinal fluid: Fluid occupying the ventricles of the brain, subarachnoid space of the meninges, and the central canal of the spinal cord.
Cerebrum: Portion of the brain that occupies the upper part of the cranial cavity.
Cervical: The area of the neck made up of seven cervical vertebrae, which are counted from top to bottom. The top is C1, the first cervical vertebra, followed by C2, C3, etc.
Charcot joint: A type of diseased joint associated with varied conditions, syringomyelia among them, which involves disease or injury to the spinal cord. Because normal pain sensation of the joint is impaired, the pain mechanisms that protect the joint are diminished or absent. As a result, the joint may undergo relatively painless severe degenerative changes with deformity.
Chiari malformation: Descent of the brainstem and lower cerebellum through the foramen magnum into the cervical vertebral canal.
Choroid plexus: Mass of specialized capillaries that lie in the ventricles of the brain; these vascular tissue tufts produce cerebral spinal fluid from blood.
Cine MRI: Test performed in the MRI scanner that looks at the flow of CSF around the cerebellum and into the spinal canal.
Cisterna magna: One of three principal openings in the subarachnoid space between the arachnoid and pia mater layers of the meninges surrounding the brain. The openings are collectively referred to as cisterns. The cisterna magna is located between the cerebellum and the dorsal surface of the medulla oblongata. Cerebrospinal fluid produced in the fourth ventricle drains into the cisterna magna via the lateral apertures and median aperture.
Clonus: A series of alternating muscle contractions and partial relaxations that produces a jerking spasm of a limb, most often seen at the ankle, indicative of a brain or spinal cord abnormality involving motor pathways.
CM: See Chiari malformation.
CNS: See central nervous system.
Coele or cele: Related to a cavity or space.
Congenital: Existing at birth usually refers to certain mental or physical traits, peculiarities or diseases; a more general term than hereditary since congenital includes conditions due to influences arising during gestation.
Contraindicated: A medication or procedure that is not advisable i.e., tetracycline is contraindicated during pregnancy.
Contrast: The difference between two areas in an image; a substance that selectively increases the imaging signal of specific structures such as blood vessels or tumors.

Conus medullaris: The lowest end of the spinal cord.
Cranial nerves: The 12 nerves of the brain that control motor and sensory functions, including swallowing, heart rate, eye movement and smell.
Craniectomy: The excision (removal) of part of the skull.
Craniocervical instability: Occurs when the ligaments and connective tissues that support the head and neck become weakened or damaged.
CSF: See cerebral spinal fluid.
CT scan: A specialized radiographic technique in which many fine x - ray beams converge on one small target area (pixel); a computer calculates the x - ray absorption of tissue in each pixel and converts this numerical value into a gray scale value; placing pixels of various shades of gray into anatomic arrangement results in an anatomic image.
Cyanosis: Blue or purple color to the skin and mucous membranes resulting from insufficient oxygen in the blood.
Dandy Walker syndrome: A condition characterized by hydrocephalus in infants associated with an abnormal closure of the foramina of Luschka and Magendie.
Decompression: To relieve or take pressure off.
Diencephalon: Portion of the brain in the region of the third ventricle that includes the thalamus and hypothalamus.
Diplopia: Double vision; occurs when the two eyes are unable to fix (look at) the same point.
Dissociation of sensation: Loss of pain and temperature sensation while light touch sensation is preserved.
Distal: Moving further from the midline or center of the body.
Dorsal: Posterior; pertains to the back of the body or of its parts, such as the spinal cord.
Dura mater: Tough outer layer of the membranes surrounding the brain and spinal cord.
Dysarthria: Speech that is difficult and poorly articulated; this may be caused by damage to the cerebellum or its connections, or to injury to nerves involved in speech.
Dysequilibrium: Inability to maintain proper balance.
Dyesthesia: Alteration in sensation; sensation of pins and needles, burning pain or unpleasant exaggeration of normal sensation that may occur with or without skin stimulation.
Dysmetria: An inability to accurately control the range or force of muscle movement; often seen in cerebellar disorders.
Dysphagia: Inability or difficulty in swallowing.
Dysplastic tonsil: Abnormal development of a cerebellar tonsil. Each cerebellar hemisphere has a downward extension called tonsil.
Dyspnea: Labored or difficult breathing resulting in air hunger.
Ectopia: Malposition or displacement of any organ or structure, congenital or acquired.
Edema: An excessive accumulation of fluid within tissues.
Elongated: To make or to grow longer.
Enuresis: Involuntary passage of urine, usually during sleep.
Epidural space: Space between the dura and the bone of the vertebral canal.
Esophagus: Muscular tube extending from the pharynx at the back of the throat to the stomach.
Excision: To cut away a portion.
Extremity: A limb; an arm or leg.
Fascia lata graft: A graft - covering or repair of tissue with fascia, the fibrous membrane that covers muscle over the lateral thigh.
Fasciculations: Involuntary contractions or twitching of groups of muscle fibers; a coarser form of muscle contractions than fibrillation.
Filum terminale: A long, slender filament at the end of the spinal cord.
Foramen: An opening, usually in bone or organ or membrane (plural is foramina).
Foramen magnum: Large opening in the base of the skull through which the spinal cord becomes continuous with the medulla oblongata.
Foramina of Luschka: Openings or passages for CSF on the lateral sides of the fourth ventricle.

Fossa: A depression or cavity within bone or surrounded by bone.
Fourth ventricle: Ventricle (a normal cavity) of the rhombencephalon of the brain; a cavity of irregular tent – like shape extending from the obex upward to its communication with the sylvian aqueduct, enclosed between the cerebellum and the rhombencephalic tegmentum. The ventricle of the brain that lies between the cerebellum and the brainstem, it expresses CSF into the subarachnoid space via the two lateral foramina of Luschka and the single medial foramen of Magendie.
Gait: Manner of walking.
Gliogenous: The tissue that forms the support element of cells and fibers of the nervous system.
Gliosis: Proliferation (growth by reproduction) of the neuroglial tissue in the central nervous system.
Greenstick fracture: A bone break in which the bone is bent but cracked only on the outside of the bend.
Gyrus: One of the convolutions of the cerebral hemispheres of the brain; The upraised ridges of the cerebrum.
Hemiplegia: Paralysis or severe weakness (paresis) of one side of the body, usually due to injury or disease of the brain or spinal cord.
Hemivertebrae: A congenital absence of half of a vertebra.
Horner syndrome: A condition with constriction of the pupil, partial drooping of the eyelid, recession of eyeball back into the socket, and sometimes loss of sweating over the affected side of the face, due to paralysis of the cervical sympathetic nerve trunk. It is often incomplete, i.e. not all the listed manifestations are present in one patient.
Hydro: Water, or collection of watery fluid.
Hydrocephalus: Enlargement of the normal cavities (ventricles) present in the brain. It may result from impairment in outflow of CSF normally produced within the brain ventricles. It may also result from developmental anomalies, infection, injury or brain tumors.
Hydromyelia: Accumulation of fluid in the enlarged central canal of the spinal cord.
Hyper: Prefix meaning above, excessive or beyond.
Hyperreflexia: Increase in action of the reflexes.
Hypo: Prefix meaning less than, below or under.
Hypoplasia: Defective development of tissue.
Hyporeflexia: Decrease in the action of the reflexes.
Hypotonia: Reduced tension, relaxation of arteries; loss of muscle tone.
ICP: See intracranial pressure.
Idiopathic: Pertaining to conditions without clear cause, as of spontaneous origins.
Impulse: A wave of depolarization conducted along a nerve fiber or muscle fiber.
Increased intracranial pressure: An increase in CSF production or blockage of CSF pathways resulting in pressure on the brain; the skull cannot expand to accommodate the pressure, which leads to symptoms such as headache.
Inferior: Situated below something else, pertaining to the lower surface of a part.
Insidious: A disease that develops without recognized symptoms so that the patient is unaware of the onset of the disease.
Interpedicular spaces: Space between the pedicles of the vertebrae.
Invasive procedures: A medical procedure that necessitates entrance into the body as part of the action required. Examples include needles introduced for injections or lumbar puncture and all surgical procedures.
Ipsilateral: On the same side; affecting the same side of the body. Said of findings (paralysis) appearing on the same side of the body as the brain or spinal cord lesion producing them.
Ischemia: A deficiency of blood in a part of the body.
Klippel Feil syndrome: Congenital anomaly characterized by a short wide neck, low hairline and fusion of two or more cervical vertebrae. The central nervous system may be affected.
Kyphosis: One form of abnormal curvature of the spine. The condition of kyphosis of the thoracic spine commonly called hunchback is an extreme form.
Laminectomy: The surgical removal of the posterior arch (lamina) of a vertebra.
Larynx: Structure located between the pharynx and trachea that houses the vocal cords.
Lateral: Pertaining to the side of the body.

Magnetic resonance imaging: A scanner using magnetic energy that interacts with tissue to yield clear black and white pictures, for example of the brain and spinal cord.
Medial: Toward or near the middle of the body.
Medulla oblongata: Portion of the brainstem located between the pons and the spinal cord.
Meninges: A group of three membranes that covers the brain and spinal cord. Closest to the brain and spinal cord is the pia, then the arachnoid and the outermost covering is the dura.
Meningitis: Infection or swelling of the membranes (meninges) that cover the brain and spinal cord.
Meningo: Refers to the meninges, membranes covering the brain and spinal cord.
Mesencephalon: The midbrain, one of three primitive cerebral sacs from which develop the corpora quadrigemina, the crura cerebri and the aqueduct of Sylvius.
Microgyri: Abnormally small cerebral convolutions.
Morvans chorea type: A condition with irregular uncontrollable movements.
MRI: See Magnetic resonance imaging
Myelo: Refers to the spinal cord.
Myelodysplasia: Defective formation of the spinal cord.
Myelogram: Imaging technique of the spinal cord and nerve roots by use of a radiopaque medium injected into the subarachnoid space, the fluid space surrounding the spinal cord.
Myelomeningocele: Form of spina bifida in which portions of the spinal cord and its membranes protrude through the open space in the vertebral column.
Myelotomy: Surgical incision into the spinal cord.
Necrosis: Death of cells or areas of tissue surrounded by healthy tissue.
Neurovascular bundle: Structure consisting of a group of nerves and blood vessels lying in direct contact with each other.
Nissen fundoplication: An operation of the fundus of the stomach which sutures the fundus of the stomach to the esophagus as a treatment for gastric reflux.
Nuchal rigidity: Muscle stiffness in the back of the neck.
Nystagmus: Constant, involuntary, cyclical movement of the eyeball. Movement may be in any direction, i.e. sideways, up, down or rotatory. May be present continually or only with looking in a certain direction; May be due to congenital conditions, labyrinthine irritability or neurological disease.
Obex: A thin, crescent - shaped band of tissue covering the Calamus scriptorius at the point of convergence of the nervous tissue at the lower end of the fourth ventricle. The point on the midline of the top surface of the medulla oblongata that marks the tail end of the fourth ventricle.
Occipital: The back of the head.
Occipital bone: The cup - like bone at the back of the skull. It houses the occipital lobes of the brain and the cerebellum; its lower edge makes up the back rim of the foramen magnum.
Opisthotonos: Involuntary backward arching of the head, neck or back with stiffening of the entire body.
Papilledema: Swelling of the optic nerve at the point of entrance into the eyeball. Choked disk. In general, considered a sign of increased ICP.
Paraparesis: Partial paralysis affecting the lower limbs.
Paraspinous muscles: Muscles on either side of the spine.
Paresthesia: Abnormal sensation such as numbness, prickling and tingling.
Paucity: Smallness or lower in number.
Peduncle: Stalk - like structures in the brain connecting different functioning areas.
Percutaneous aspiration: Drawing out through the skin.
Peritoneum: The membrane covering the visceral organs and lining the abdominal cavity.
Permeable: Capable of allowing passage of fluid or substances in solution.
Pia mater: The inner membrane of the meninges that encloses the brain and spinal cord.
Platybasia: A developmental anomaly of the skull or an acquired softening of the skull bones so that the floor of the posterior cranial fossa bulges upward in the region adjacent to the foramen magnum.
Pleura: The membranes covering the lungs and lining the inside of the chest cavity.

Polygyria: Excess of the normal number of convolutions of the brain.
Poster Pleural space: Space between the lungs and the inside lining of the chest cavity; or, toward the back of the body.
Posterior fossa: Concavity at the back of the skull wherein the cerebellum lies.
Posterior fossa angiogram: A study of the blood vessels of the back of the brain: cerebellum and brainstem.
Prone: Lying horizontal with face down.
Proprioception: The sensory modality allowing awareness of posture, movement and changes in equilibrium and the knowledge of position, weight, and resistance of an object in relation to the body.
Proximal: Closer to the midline or origin; opposite of distal.
Pseudotumor cerebri: A condition that occurs when pressure inside the skull increases for no clear reason.
Pseudomeningocele: A pocket of cerebrospinal fluid that has formed in an area of previous surgery as a result of an opening in the covering membranes of the spinal cord.
Ptosis: Drooping of the eyelid, often related to the third cranial nerve function; also applied to the drooping of the cerebellum through a large skull opening.
Queckenstedt: A sign or maneuver used for diagnostic purposes. Upon compression of the veins of the neck, unilaterally or bilaterally, CSF pressure measured by lumbar puncture rises rapidly in healthy persons and falls rapidly when pressure is released. In spinal canal block, the pressure is scarcely affected by this procedure.
Reflex: A rapid automatic response mediated by the nervous system.
Reflux: A return or backwards flow; regurgitation.
Respiratory distress: Difficulty breathing of any cause, including cardiac, pulmonary and neurological problems.
Reticular formation: Groups of cells and fibers arranged in a diffuse network throughout the brainstem. They fill and connect the tracts that ascend and descend through this area. They are important in controlling or influencing alertness, wakefulness, sleeping and some other reflexes.
Rhomboencephalon: Primary division of the embryonic brain that gives rise to the metencephalon and myelencephalon. It includes the pons, cerebellum and medulla oblongata, sometimes called the hindbrain.
Sagittal: A plane or section that divides a structure into right and left portions.
Scoliosis: A side - to - side curvature of the vertebral column.
Sensory: Pertaining to or conveying sensation (i.e. pain, touch, temperature).
Sheath: A covering structure usually elongated.
Shunt: Passage constructed to divert flow of fluid when the normal pathways for the fluid are either blocked or inadequate.
Skull series: A group of x-rays taken of the skull from various positions.
Sleep apnea: To stop breathing for brief periods while sleeping.
Somatosensory evoked potentials: An electrophysiological test often used during spinal cord surgery to help determine whether conduction of electrical signals through the sensory pathways of the spinal cord are impaired.
Spasticity: Stiffness or position that is difficult to release voluntarily.
Spina bifida: Failure of the spine to close properly during the first month of pregnancy. In severe cases, the spinal cord protrudes through the back and may be covered by only skin or a thin membrane. When there is no externally evident abnormality, referred to as spina bifida occulta.
Stenosis: A constriction or narrowing of a passage.
Stent: A device used to maintain an opening into a cavity or to hold tissues in place during healing.
Strabismus: Disorder in which the two eyes cannot be directed at the same object; when one eye fixes upon a point (sees an object), the other eye deviates to some other point; vision in the deviated eye is usually suppressed; if not, diplopia results; squint.
Stridor: A harsh sound made during respiration. It is high - pitched and sounds like the howling of the wind. It is due to constriction of the air passages.
Subarachnoid space: The space within the meninges between the arachnoid mater and the pia mater; it is normally filled with CSF.
Subcutaneous tissue: Tissue beneath the skin.

Suboccipital: Area beneath the back of the head; below the occipital bone.
Subperiosteal: Beneath the periosteum (the membrane covering of the bones).
Sulcus: A furrow, fissure or depression, especially of the brain. Many brain sulci have specific names.
Supine: Lying on the back; a position.
Sylvian aqueduct: A narrow canal connecting the third to the fourth ventricle.
Syncope: Fainting, most often the result of inadequate circulation of blood to the brain, characterized by sudden pallor, coldness of the skin and partial or complete unconsciousness.
Syringo: Prefix used to denote a procedure or process originating in a syrinx cavity (example: syringoperitoneal shunt).
Syringocoele or Syringocele: The central cavity or canal of the spinal cord continuous with the fourth ventricle of the brain stem; used synonymously with central canal; also used for the cavity in the ectopic cord in a myelomeningocele.
Syringomyelia (SM): Chronic progressive disease of the spinal cord characterized by the development of a fluid – filled cavity or cavities within the spinal cord. Cavitations can occur in any area of the spinal cord. It can involve pathways of the cord that carry impulses of pain and temperature sensations resulting in sensory losses. Pain and paresthesias also occur. Destruction of lateral and anterior gray matter in the cord causes muscular atrophy, spastic paralysis and weakness. Scoliosis is often found in association with syringomyelia.
Syringotomy: An operation to create an opening into a syrinx cavity.
Syrinx: A hollow cavity or tube. In medicine it refers to a fluid - filled cavity within the spinal cord.
Telencephalon: The embryonic endbrain or the anterior division of the prosencephalon from which the cerebral hemispheres, corpora striata and the rhinencephalon develop.
Tentorium: A tent - like structure or part. In the brain the tentorium cerebelli is the fold of the dura mater that lies between the cerebellum and the cerebrum.
Tethered cord: Abnormal attachment and scarring of the spinal cord or its coverings (meninges) can occur as the result of a developmental disorder such as a small mass of fatty tissue, a tight filum terminale or a midline bone spur. Tethering results in loss of normal tiny movements of the spinal cord inside its linings and may place tension on the cord resulting in cord injury. The spinal cord can also become adherent, i.e. tethered, by scar tissue that results from injury, surgery or disease process.
Thoracic: The area of the back between the cervical and lumbar region comprised of 12 vertebrae.
Tinnitus: A ringing, tinkling or buzzing sound in the ear.
Torticollis: A stiff neck caused by spasms of the neck muscles drawing the head to one side with the chin pointed to the other side. It may be congenital or acquired.
Trachea: Tubular organ that leads from the larynx to the bronchi.
Trachea malacia: Softening of the cartilage of the trachea.
Trophic: Concerning nourishment; applied to a type of nerve believed to control the growth and nourishment of the parts they innervate (supply).
Unilateral: Pertaining to one side.
Ventral: Pertaining to the front of the body or its parts; the belly.
Ventricle: A cavity such as those normally present in the brain that are filled with cerebrospinal fluid.
Ventriculography: An x - ray process used to visualize the size and shape of the brain's ventricles by injecting air or contrast to replace the CSF that normally fills this space.
Ventriculo - peritoneal shunt: A shunt or tube inserted into the ventricles of the brain attached to tubing that is placed into the abdominal (peritoneal) cavity to drain excess spinal fluid from the brain.
Ventriculostomy: Establishment of an opening performed in the third ventricle to relieve hydrocephalus.
Vermis: The normal midline portion of the cerebellum lying between the two cerebellar hemispheres. Its outer surface appearance reminded early anatomists of a worm.
Visceral: Pertaining to one of the organs found in the skull, chest, abdomen or pelvis (brain, lung, liver, etc.).
Weakness: Inability of muscles to perform their normal function. Weakness of the hands may result in difficulty grasping objects; weakness of the legs may result in difficulty walking; weakness of certain muscles in the pharynx may cause difficulty swallowing.