AANEM EDGE

Back to the Future: Advances in NM Medicine

AANEM Helps Shape New AMA Policies

QI/PIP Credits Now Available for Labs

Making Strides Toward Early Detection of NMDs

Faye Tan, MD
AANEM/ANF President
Member Since 1993

AANEM
American Association of Neuromuscular & Electrodiagnostic Medicine | Winter 2025

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MEETINGS

AANEM offers several educational events throughout the year. The annual meeting, UltraEMG, and other meetings provide learning and networking opportunities for those involved in NM and EDX medicine. Attend our meetings to build professional relationships and stay current in your practice.

EDUCATION

Stay up-to-date in your practice, and meet education and maintenance of certification requirements with exclusive AANEM products developed by experts. Many products are free or discounted for AANEM members.

AANEM FELLOWSHIP MATCH

The AANEM Fellowship Match Portal facilitates a standardized timeline and fair process for NM medicine and EMG-focused clinical neurophysiology fellowship applications and offers.

NEWS SCIENCE EDITORIAL BOARD (NSEB)

The NSEB reviews several medical journals to identify important, newsworthy items in the field and summarizes pertinent manuscripts to share with AANEM colleagues. The NSEB consists of physicians from varied backgrounds and practice settings.

MUSCLE & NERVE JOURNAL HIGHLIGHTS

Muscle & Nerve is a monthly, peer-reviewed, interdisciplinary publication of original scholarly contributions centered on studies of the muscle; NM junction; and peripheral motor, sensory, and autonomic neurons.

MEMBERSHIP

As a member of AANEM, you are an important part of a prestigious community of healthcare professionals dedicated to strengthening the fields of NM and EDX medicine while providing the highest-quality patient care. AANEM provides the tools you need to excel in your field, such as access to relevant research, educational information, and opportunities for collaboration and community-building across primary specialties.

ADVOCACY

AANEM's advocacy efforts aim to improve the quality of patient care. AANEM monitors state and federal issues, works to ensure appropriate reimbursement, creates position statements to educate lawmakers and insurance companies, and fights against fraud and abuse.

PRACTICE

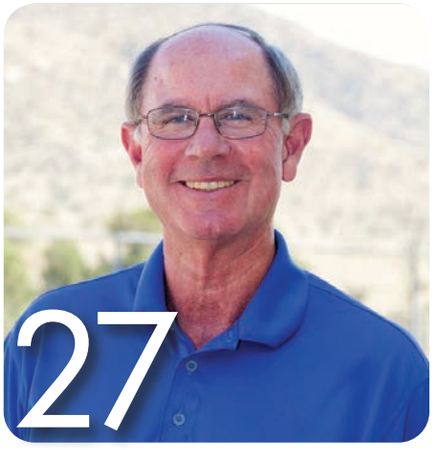
AANEM offers several resources to help you succeed in your practice, such as complimentary coding and billing assistance and information surrounding government healthcare programs and rules (QPP, PFS, etc.). AANEM also provides position statements on key topics and evidence-based guidelines to help you deliver quality patient care.

PROFESSIONAL STANDARDS

AANEM's Professional Standards Department supports examinations for physicians and technologists, including the ABEM Certification Exam, NMUS Certification for neuromuscular ultrasound, and the CNCT Exam for nerve conduction technologists. These certifications demonstrate expertise and a commitment to patient care, with maintenance supported through continuing education and the Continuous Certification Program. The department also oversees the EDX Laboratory Accreditation Program, which recognizes laboratories that achieve and maintain high standards of quality, performance, and professionalism.

AMERICAN NEUROMUSCULAR FOUNDATION (ANF)

ANF is a nonprofit dedicated to STRENGTHENING the global effort to CURE neuromuscular disease by funding research and education. ANF also leverages the AANEM network and LONDC partnerships to improve time to diagnosis by increasing awareness.



AANEM Edge is a biannual publication. It is mailed, free of charge, to AANEM members and related associations. Other interested persons should contact the AANEM for a complimentary issue.

Send inquiries to AANEM Edge, Attn: AANEM Communications Department, 2621 Superior Drive NW, Rochester, MN 55901 or communications@aanem.org.

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PRESIDENT'S PERSPECTIVE

FAYE TAN, MD

AANEM is pleased to announce Faye Tan, MD, as the 2024-2025 AANEM and ANF president. Dr. Tan is a Princeton and Baylor College of Medicine graduate and a tenured full professor and vice chair of faculty affairs at Baylor's H. Ben Taub PM&R department. She is also the EDX director at Harris Health System. As a member of AANEM since 1993, she has served on multiple committees, including chair of the Finance and Annual Meeting Coordination Committees and co-chair of the Program Committee. Her extensive experience will guide AANEM and its members through another exciting year of growth.

What inspired you to become a physician, specifically a physiatrist?
My older sister, an ophthalmologist, informed me I would be best suited to be a physiatrist since I ace wrapped my dolls in various patterns and methods all throughout my childhood. I was also very sporty and played volleyball. She was right.

What are some of your interests or hobbies outside of medicine?
I love to take nature walks, hike, and travel. I also crochet mittens and socks while watching Netflix. Finally, we are a foodie household and cook a lot of yummy foods.

How did you learn about AANEM?
My VA professor was an ABEM certified oral examiner and encouraged attendance at AANEM. Dr. Lawrence Robinson was an early mentor as well.

What inspired you to join?
Everyone I knew and wanted to become attended the AANEM meetings annually.

What motivated you to get involved, and why did you continue to stay involved?
I am passionate about research, education, and moving the field of neuromuscular medicine forward in these exciting times.

Do you have any committee initiatives or moments of committee work that stand out to you as particularly meaningful or impactful?
I like that we advocate for quality and safety, and fight fraud and abuse in our programs nationally.

How have you seen the organization grow over your years of involvement?
The size and sponsorship of the organization has grown steadily over these years. The exciting discoveries and incorporation of ultrasound make us cutting edge.

As president, what are your goals for the association for 2024-2025?
My goal would be to advance neuromuscular medicine with new discoveries in AI technology, genetic therapies, and fascicular ultrasound.

What is something your fellow AANEM members may not know about you?
This used to be little known, but now they know I have great interest in space medicine.

Certifications
- ABEM
- ABPMR

Titles at Baylor College of Medicine
- Tenured full professor
- Vice chairman faculty affairs H. Ben Taub PMR
- Senior faculty coach in the faculty development section

AANEM & ANF
- President
- Secretary Treasurer
- Board member
- Chair of Research Committee
- ABEM board member
- Program Committee co-chair

Education
- Bachelors - Princeton University
- MD - Baylor College of Medicine
- PMR Residency - Baylor College of Medicine
- Fellowship - Baylor College of Medicine
- Fellowship - National Institute on Disability, Independent Living, and Rehabilitation Research in EDX and NM research.

Clinical Expertise and Research Interests
- EDX
- NM medicine
- Rehabilitation traumatology (brain injury, spinal cord injury, polytrauma)
- Space medicine

MEETINGS

Discover New Breakthroughs at the 2025 Annual Meeting

Launch into a new era of discovery and innovation in NM and EDX medicine at the 2025 AANEM Annual Meeting in San Francisco, California, Oct. 29-Nov. 1. This year's annual meeting plenary topic, chosen by Dr. Faye Tan, is *Back to the Future: Advances in NM Medicine*. This topic will cover three major areas: fascicular anatomy, space medicine, and new therapies and technologies in NM and EDX medicine. "The lectures derived from the plenary topic will bring an exciting lineup for the NM/EDX community to enjoy," says Dr. Tan.

The annual meeting will offer engaging in-person sessions, skill-building workshops, lively social events, and options to participate virtually for those unable to join in person. Registration opens June 15, 2025. Find updates and details at www.aanem.org/meeting.

2025 Plenary Sessions

Sabrina Paganoni, MD, PhD
Olney Lecture

Cutting edge drug trials including your own and potential screening of drug candidates with AI.

Sheyna Gifford, MD
Lambert Lecture

How space travel may affect neuromuscular conditions and its impact on travelers with disabilities.

Susan MacKinnon, MD
Reiner Lecture

The development of fascicular surgery and research for motor control of prosthetic limbs.

Lisa Hobson-Webb, MD

Fascicular ultrasound in NM diseases and changing of fascicle echotexture, number, and more.

Lauren Cheung, MD

AI fall and gait technology in apple watches and other devices.

2024 AANEM ANNUAL MEETING CORPORATE SUPPORTERS

AANEM deeply appreciates the support, contributions, and partnerships of our corporate supporters. Their assistance helps AANEM provide an exceptional annual meeting.

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Present Your Latest Discoveries at the 2025 Annual Meeting

Share your discoveries with leading researchers in NM and EDX medicine by submitting an abstract to the 2025 AANEM Annual Meeting in San Francisco, California, Oct. 29-Nov. 1.

Unlike other organizations, there is no limit to the number of abstracts an author may submit, and all accepted abstracts are reviewed and scored by the AANEM Abstract Committee without knowledge of the authors' identities. Abstracts are accepted based on their medical and scientific significance, timeliness, quality of data and methodology, adherence to specific format requirements, and other criteria. Submissions must present basic, clinical, technical, or developing research or case reports on one of the following topics:

- Clinical neurophysiology
- Nerve
- Muscle
- NM junction
- Anterior horn cell
- Musculoskeletal
- Practice issues
- Academics
- Pain
- Therapies

Don't miss this opportunity to present your work. Submit your abstract by March 15. Learn more today at www.aanem.org/abstracts.

Abstract Awards

Accepted abstracts may also be considered for the following awards, supported by the American Neuromuscular Foundation:

Golseth Young Investigator Award
Given to the best research paper submitted by a young physician.

Best Abstract Award
Given to the best research paper submitted for the meeting.

President's Research Initiative Award
Given to individuals who submit the best abstracts related to the AANEM President's plenary topic.

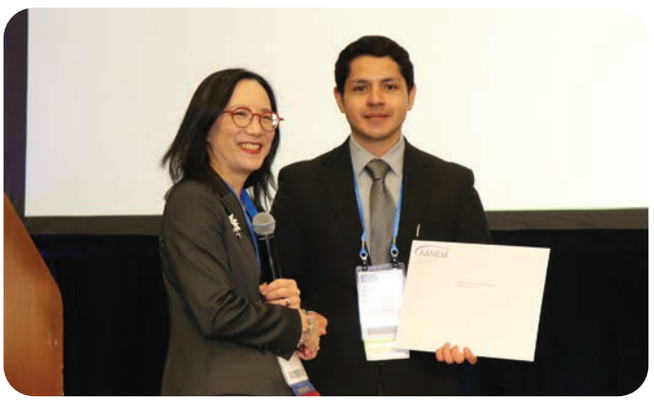
Residency/Fellowship Member Award
Given to AANEM members in a residency or fellowship who are first authors on a submitted abstract.

Pediatric Research Award
Given to individuals who submit the best abstracts related to NM pediatric medicine or rehabilitation.

Technologist Best Abstract Award
Given to the best research paper conducted and submitted by a technologist.

Medical Student Research Award
Given to medical students who are first authors and designated presenters on a submitted abstract.

Learn more about each award's requirements and benefits at www.neuromuscularfoundation.org/awards.



Bring Your US Skills and Techniques to a New Level at UltraEMG

Advance your skills in US and EMG at AANEM's UltraEMG. Over 4 days, this unique course offers attendees the opportunity to take their EDX, US, and chemodenervation skills to a whole new level. Engage with distinguished faculty, including Dr. Jeffrey Strakowski, during live demonstrations, practical skills sessions, and focused small-group discussions. Improve your ability to assess MSK and NM disorders while earning valuable *AMA PRA Category 1 Credits*™.

Join us in Fort Lauderdale, Florida, March 12-15, 2025, at the Sonesta Fort Lauderdale Beach Hotel. Visit www.aanem.org./ultraEMG to learn more.

EDUCATION

Explore the New, Simplified Learning Center

A fresh look and new features offer AANEM Learning Center visitors an easy way to navigate to their favorite resources. Users can now quickly access the newest releases, scheduled events, training materials, podcasts, and more from the Learning Center homepage. Looking for education on a specific topic or in a particular format? Use the new Category and Course Type filters to find what you need.

Interested in earning credits? Use the Credit Type filter to find educational materials offering credit.

Check out all the latest tools and resources at:

Learn More About Nerve Injuries in the AANEM Learning Center

Find educational materials on topics that interest you with AANEM's Learning Center. Offering a wide variety of educational materials on basic and advanced NM and EDX topics in several formats, there is something for everyone. Check out some of the most recently added materials related to nerve injuries.

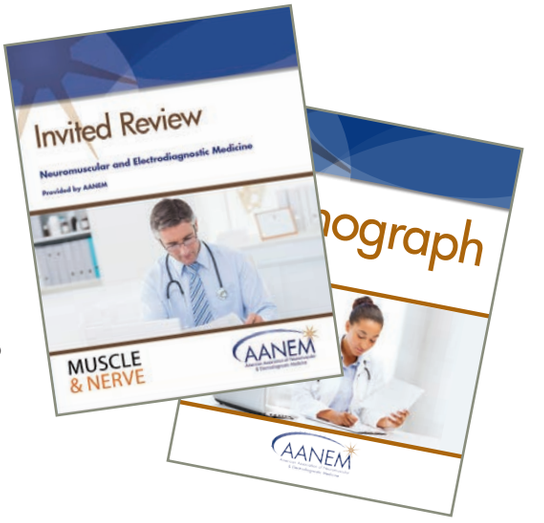
Invited Review: Peripheral nerve injuries in the performing artist

Invited Review: Occupational nerve injuries

Invited Review: Assessment, management, and rehabilitation of traumatic peripheral nerve injuries for non-surgeons

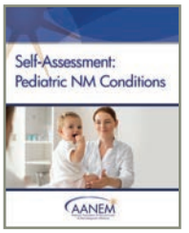
Monograph: Sports-related peripheral nerve injuries of the upper limb

Monograph: Traumatic injury to peripheral nerves



Curious about other topics? With the new AANEM Learning Center update, you can now filter content by category or utilize the search bar to find the latest content on your favorite topics. Find more on nerve injuries and other topics at www.aanem.org/education.

NEW Pediatric Mini SAE



Test your knowledge of pediatric NM medicine with the new Pediatric Neuromuscular Conditions Mini Self-Assessment Exam (SAE). Designed for anyone interested in deepening their understanding of pediatric NM medicine, this short SAE offers 3 SA CME. Don't miss out—find it now in the AANEM Learning Center!

Check out this educational resources and more in the AANEM Learning Center!

Assess Your Trainees With Self-Assessment Exams

Compare your program's residents and fellows with peers across the field and help them practice, build confidence, and identify areas for improvement using the EDX and NM Self-Assessment Exams (SAEs). The 2025 exams will be administered May 5-12, 2025. Join hundreds of participating institutions when you register today at www.aanem.org/SAE.

Access Expert US Training Resources With Gulfcoast Ultrasound Institute

Elevate your diagnostic expertise with the specialized training series from AANEM's educational partner, Gulfcoast Ultrasound Institute. This series is designed to help you master the clinical application of high-frequency US for evaluating peripheral nerves in both upper and lower limbs and offers comprehensive insights into the clinical utilization of US to diagnose pathologic conditions of peripheral nerves, along with electrophysiologic techniques.

Learn from videos on introductory US methods, anatomical analysis, EDX testing, and strategic approaches to peripheral nerve procedures to enhance your skill set and proficiency. Explore educational activities from course director and NMUS expert Dr. Jeffrey Strakowski:

Ultrasound and Electrodiagnosis (EMG) of the Tibial Nerve
Ultrasound and Electrodiagnosis (EMG) of the Fibular Nerve
Ultrasound and Electrodiagnosis (EMG) of the Nerves About the Hip and Thigh
Ultrasound and Electrodiagnosis (EMG) of the Ulnar Nerve
Ultrasound and Electrodiagnosis (EMG) of the Brachial Plexus
Ultrasound and Electrodiagnosis (EMG) of the Median Nerve
Ultrasound and Electrodiagnosis (EMG) of the Neck and Shoulder Nerves
Peripheral Nerve Sonography: Introductory Ultrasound and EMG Concepts
Ultrasound and Electrodiagnosis (EMG) of the Radial Nerve

View more courses and learn how to earn AMA PRA credits at www.gcus.com/organization/aanem.

Don't Miss Valuable Education From the 2024 Annual Meeting

Annual Meeting Video Collection

This collection offers access to audio and video recordings from most sessions from the annual meeting, allowing you to watch presentations at your convenience. The Annual Meeting Video Collection gives you access to content from the annual meeting forever and the option to claim over 90 *AMA PRA Category 1 Credits*™ or CEUs for 3 years.

The Annual Meeting Video Collection contains recordings of most sessions; however, it does not include Ask the Expert session, roundtable discussions, workshops, or sessions that experienced technical difficulties.

Annual Meeting Workshop Handout Bundle

Access comprehensive workshop handouts from the annual meeting, including key teaching points and valuable insights from workshop faculty. This collection contains downloadable materials from all workshops that provided handouts, allowing you to review content or explore sessions you couldn't attend.

Please note: This is a handout-only resource. Workshop sessions were not recorded, and no audio or video content is available. CME/CEUs for workshops were only available through in-person attendance and cannot be obtained through this handout bundle.

Self-Assessment Exams

Earn SA CME with self-assessment exams (SAEs) from the 2024 AANEM Annual Meeting. These SAEs are free for those who attended the meeting and accessible in My Courses, while others can purchase them from the AANEM Learning Center.

AANEM FELLOWSHIP MATCH PORTAL

Advance Your Career With a Fellowship

AANEM FELLOWSHIP MATCH PORTAL

The AANEM Fellowship Match Portal is open for residents to apply for the 2025 Match. Discover what each NM, CNP (EMG-focused), and other fellowship programs offer, from clinical training to faculty expertise. Evaluating these factors will help you rank programs based on your career goals and find the best fit for your future. With over 95% of applicants matching with their top choice, there has never been a better time to join these fields!

Applications are released to programs March 1. Don't miss this opportunity to join these advancing fields. Learn more and apply today at www.aanem.org/fellowship.

2025 TIMELINE

JAN. 1	MARCH 1	MARCH 1 - MAY 27	MAY 28	JUNE 2
Fellowship portal opens for applicants	Applications released to programs	Interviews conducted	Rank lists due	Match results sent

AANEM staff are here to support you throughout the application and match process. Contact us at 507-288-0100 or aanem@aanem.org with any questions.

Access Free Training and Membership for Trainees

Take advantage of a wide range of educational resources, free membership, and training with AANEM's Training Program Partnership (TPP). Whether you are a resident or fellow wanting to learn more about EDX, US, and NM medicine or an institution aiming to strengthen your NM medicine program, the TPP provides the support and resources you need to succeed. Enroll unlimited trainees for just $253 per department each academic year.

By participating in TPP, your residents and fellows receive:

- Free AANEM membership with full physician-in-training member benefits, career support, and networking opportunities
- Free access to hundreds of training resources, including case reports, journal articles, practice questions, lectures, and reference materials
- Deeply discounted in-person registration for the AANEM Annual Meeting
- Significant discounts on the interactive training tools by Dr. Devon Rubin

AANEM also offers program directors and coordinators a streamlined account management portal, access to track trainee progress, and supplemental resources to support their training programs.

Join the many programs and over 3,300 trainees benefiting from TPP by enrolling today at www.aanem.org/TPP.

Navigate Career Paths as a PM&R Trainee

Learn how to navigate your career as a trainee in PM&R with a Trainee Talk from James Meiling, MD, a NM physiatrist at Mayo Clinic in Rochester, Minnesota. In an interview-style article between Dr. Meiling and Drs. Dale Colorado and Zachary Ashmore, they discuss the multiple career paths and fellowship options available to PM&R residents post-graduation, including NM medicine, pain medicine, and sports medicine.

Scan the QR code to read the full interview:

NEWS SCIENCE EDITORIAL BOARD

Publications to Explore

Stay informed of the latest and most exciting advancements in neurology, PM&R, and EDX medicine with journal highlight summaries from the News Science Editorial Board (NSEB). This dedicated team of volunteer members reviews over 40 medical journals and online sources year-round, curating the most relevant articles for the AANEM community and providing easy-to-read summaries for quick access to essential information.

The following article summaries have been identified as particularly relevant to the community. Explore these and more on the AANEM website and keep up with the latest summaries on social media (@AANEMorg) and in Spark, the AANEM bi-weekly e-newsletter.

Dry Needling Versus Corticosteroid Injections To Treat Tendinopathy: A Systematic Review

Submitted by: Sarah Breevoort, MD, PhD
Edited by: Rebecca O'Bryan, MD

Citation: Aman IM, Zutshi K, Singla D. Dry needling versus corticosteroid injections to treat tendinopathy: a systematic review. *J Int Soc Phys Rehabil Med.* 2023;6(3):77-82. doi:10.1097/PH9.0000000000000014.

Summary: This study is looking at the comparison of dry needling to steroid injection for treating tendinopathy.

During physical activities and exercise there is increased stress and force exerted on the tendon which increases the risk of both traumatic and overuse injury. Tendon injuries have become a common health issue and often is a MSK mimic that is commonly referred for EDX testing. Dry needling can be used to treat muscles, tendons, and NM bundles and can lower central and peripheral sensitization by affecting substance P, endorphin, and local blood flow. Several studies suggest that dry needling has a positive influence in treating tendinopathies. Similarly, corticosteroid injections are used to treat tendon injuries, however, also have several disadvantages and risks.

In this systematic review the authors compare dry needling with steroid injections for tendinopathy and their efficacy in reducing symptoms.

The authors identified 121 articles which included dry needling or corticosteroid injections as their treatment protocol and any type of tendinopathy as a condition. Based on eligibility criteria ultimately four articles were selected for review. In these studies, dry needling versus single dose corticosteroid methylprednisolone acetate injections were compared and follow up was done at several weeks, months, and up to 1 year in one study. Outcome measures included visual analog scale, numerical pain rating scale and functional outcome measures to compare the effect of dry needling and steroid injection.

This systematic review of randomized control studies comparing dry needling with corticosteroid injection for the treatment of tendinopathy was limited by sample size, however, did find evidence of the effectiveness of both steroid injection and dry needling for the treatment of tendinopathy. From the selected data, authors conclude that both dry needling and corticosteroid injections are significantly better for short-term use, whereas dry needling is significantly better than corticosteroid for long-term use as there are no or less adverse effects of dry needling in comparison with corticosteroid injections.

Comments: Corticosteroid injection and dry needling have been widely used for the treatment of musculoskeletal conditions; however, it is unclear which intervention is the most effective. This study is one of a few recent systematic reviews that seeks to address this matter. This systematic review is a recent attempt to address the efficacy of in a head-to-head comparison of both dry needling and corticosteroid injections for the treatment of tendinopathy. The authors admit the limitation of small sample size of randomized controlled trials highlighting a potential opportunity for future studies. Both dry needling and corticosteroid injections are widely used for the treatment of tendinopathies, however, corticosteroid injections have more inherent risks, require more training or expertise for administration, and may not be as easily available understanding the comparative effectiveness has significant clinical utility. This review highlights the need for additional studies but does demonstrate the efficacy of dry needling for long-term treatment.

This article has relevance for the AANEM audience as many referrals for EDX studies are musculoskeletal mimics. Many tendinopathies present with pain at tendon insertion sites where common mononeuropathies also may cause discomfort. If EDX physicians or allied health staff could offer in clinic treatment that is both relatively safe and effective this could enhance patient care as well as increase provider satisfaction by being able to offer in lab treatment for study patients who often have normal EDX tests.

Continued on next page

Articles of Similar Interest: Sousa Filho LF, Barbosa Santos MM, Dos Santos GHF, da Silva Júnior WM. Corticosteroid injection or dry needling for musculoskeletal pain and disability? A systematic review and GRADE evidence synthesis. *Chiropr Man Therap.* 2021;29(1):49. Published 2021 Dec 2. doi:10.1186/s12998-021-00408-y

Stoychev V, Finestone AS, Kalichman L. Dry needling as a treatment modality for tendinopathy: A narrative review. *Curr Rev Musculoskelet Med.* 2020;13(1):133-140. doi:10.1007/s12178-020-09608-0

Clinical Relevance of Distinguishing Autoimmune Nodopathies From CIDP: Longitudinal Assessment in a Large Cohort

Submitted by: Pritikanta Paul, MD
Edited by: Miliva Pleitez, MD

Citation: Broers MC, Wieske L, Erdag E, et al. Clinical relevance of distinguishing autoimmune nodopathies from CIDP: Longitudinal assessment in a large cohort. *Journal of Neurology, Neurosurgery & Psychiatry* 2024;95:52-60.

Summary: Patients with autoimmune nodopathy (AN) typically have specific clinical features and may not respond well to initial treatment with intravenous immunoglobulin (IVIg). However, there is limited documentation on investigating serial antibody titers in correlation with treatment response over the disease course.

This prospective study aimed to assess the treatment response in patients with AN initially diagnosed as chronic inflammatory demyelinating polyradiculoneuropathy (CIDP). Antibody titers for neurofascin-155 (NF155), contactin-1 (CNTN1), and contactin-associated protein 1 (CASPR1) were measured in CIDP patients. Among 401 patients, 21 were identified with AN. The study's findings align with previously reported prevalence rates for anti-NF155 (3% vs 1–25%), anti-CNTN1 (2% vs 0.7–7%), and anti-CASPR1 (2% vs 0.2–3%) antibodies.

The study observed stable or increased antibody titers in most patients treated with IVIg. Patients undergoing plasmapheresis, corticosteroids, rituximab®, or a combination tended to experience a decrease in antibody titers. Notably, stopping immunomodulatory therapy led to clinical deterioration in four patients, accompanied by the reappearance of antibodies or an increased antibody titer in three cases supporting their pathogenic role. All four patients demonstrated clinical improvement upon resuming treatment. The authors concluded that monitoring disease activity using antibodies against paranodal proteins can be beneficial, particularly when contemplating treatment withdrawal. Limitations of the study include diverse treatment regimens among patients, complicating the assessment of treatment efficacy.

Comments: This study shows that patients with AN treated with plasma exchange, corticosteroids, or rituximab® often reduce antibody levels, but stopping therapy may cause clinical decline and antibody reappearance. This highlights the potential of using antibodies against nodal/paranodal proteins to monitor disease activity during treatment withdrawal. Further research is needed to compare rituximab's effects with non-B-cell depleting agents. A vast majority of AANEM audience are care providers for patients with CIDP and autoimmune nodopathy and this study provides updated knowledge as well as directions for future research.

Clinicopathologic Findings in Patients With Paraneoplastic Neuropathies and Antibodies Strongly Associated With Cancer

Submitted by: Milvia Y. Pleitez, MD
Edited by: Rebecca O'Bryan, MD

Citation: Granger A, Rajnauth T, Lahoria R, et al. Clinicopathologic findings in patients with paraneoplastic neuropathies and antibodies strongly associated with cancer. *Neurology.* 2024;102(2):e207982. doi:10.1212/WNL.0000000000207982

Summary: This is a retrospective review of the electronic medical record over a 27-year period of patients with paraneoplastic neurological syndromes (antibody positive) and clinicopathological findings on nerve biopsies. A total of 19 patients were identified to have paraneoplastic antibodies and included those that were positive for Amphyiphysin (4 patients), ANNA-1 (6 patients), ANNA-1 and CRMP 5 (3 patients), ANNA-2 (2 patients), and CRMP-5 (4 patients) were included. Neuropathy phenotypes noted were sensorimotor peripheral neuropathy (6), sensory neuropathy (3), lumbosacral radiculoplexus neuropathy (3), polyradiculopathy (2), and multifocal sensorimotor neuropathy (2). Nerve biopsies all showed axonal degeneration with three showing a mixed axonal and demyelinating type of neuropathy. Three nerve biopsies were normal. All biopsies showed reduced nerve fiber density with 16/19 showing subperineural edema. Epineural/perivascular inflammation was found in three.

These findings suggest that patients with sensorimotor and sensory neuropathies, especially if subacute, should be considered for paraneoplastic antibody testing. Additionally, patients who have reduced nerve fiber density, absent inflammation and subperineurial edema on nerve biopsy should also undergo paraneoplastic antibody testing.

Comments: This study is limited by it being retrospective and regional. However, it points out the importance of thinking about paraneoplastic causes for neuropathy especially in sensory peripheral neuropathies. This study will help clinicians recognize the importance of thinking about paraneoplastic etiologies for sensory neuropathies and in cases when nerve biopsies have the triad of reduced nerve fiber density, absent inflammation and subperineurial edema.

Nerve Transfer After Cervical Spinal Cord Injury: Who Has a "Time Sensitive" Injury Based on Electrodiagnostic Findings?

Submitted by: Josh Wilson, MD
Edited by: Nakul Katyal, MD

Citation: Berger MJ, Dengler J, Westman A, et al. Nerve transfer after cervical spinal cord injury: Who has a "Time sensitive" injury based on electrodiagnostic findings?. *Arch Phys Med Rehabil.* 2024;105(4):682-689. doi:10.1016/j.apmr.2023.11.003

Summary: Injuries sustained during a traumatic spinal cord injury (tSCI) are pure CNS lesions and many have evidence of lower motor neuron lesion (LMNL). During the care of these individuals, LMNL may go undetected during early to subacute management. Individuals that sustain significant denervation of intrinsic hand muscle may miss the ideal opportunity for early nerve transfer and potentially improved outcome. While the literature has demonstrated good outcomes after one year of injury, clinically six months is often used as the ideal time in which to complete a nerve transfer. The study at hand investigated the use of nerve conduction study (NCS) to investigate the degree of injury and change overtime to help identify the subpopulation of tSCI that would best serve by early consideration of nerve transfer.

In a retrospective using the European Multicenter Study About SCI database, 79 individuals with tSCI underwent formal NCS evaluation at three and six month injury and completed standardized muscle testing using the Medical research council score. Independent limb analysis was used to account for individual heterogeneity resulting in 145 limbs. Only individuals with a score of four or greater at C5-6 level and partial innervation of intrinsic hand muscles with a grade of less than three. The ulnar motor compound motor action potential (CMAP) amplitude was utilized as surrogate for C8-T1 spinal levels and results were categorized into normal (>6.0 mV), sub-normal (1.0-5.9 mV), and very abnormal (<1.0 mV).

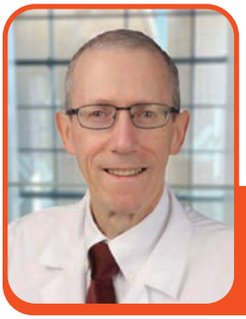
At baseline, 74.7% of subjects had AIS score of A or B. At 3 months, 87.2% had CMAP that were either subnormal or very abnormal, and at 6 months, it was 80%. Over the 3-month period, only 4 limbs (9.1%) improved at all, and none reached normal range. Twelve of the limbs improved to normal level (16%). In comparing complete versus incomplete there was no difference in CMAP amplitude (p=0.31). While incomplete tSCI had a median CMAP 2.4 mV greater than incomplete injuries (p=.001). Utilization of CMAP amplitude cut off of <1.0 mV resulted in a PPV 0.73 and 0.78 for muscle strength of zero vs 1-2 for C8 and T1 segments respectively.

Comments: Following SCI there exists a subpopulation of individuals who are unlikely to regain functional hand use and are also amenable to nerve transfers. Individuals with damage resulting significantly in the denervation of intrinsic hand muscle, in essence, have a finite time before atrophy and fibrosis making successful nerve transfer unlikely. While ulnar CMAP amplitudes are often tolerable of axonal loss up to 50%, the result of this study provides an objective cut off for clinicians to identify at-risk individuals in a timely manner. It also provides a three-month time period for clinicians to provide stabilizing care and for confirmation of LMN findings, but also a significant amount of time in which individuals can be evaluated as surgical candidates. Traumatic SCIs are rarely just injuries of the SCI and there often exist concurrent peripheral nerve injuries. Providers rely on the expertise and clinical knowledge of electro diagnosticians in evaluating and fully characterizing these injuries. The insights gained from this study assist clinicians in managing and improving outcomes for patients with SCI, while also drawing attention to potentially overlooked peripheral nerve injuries.

MUSCLE & NERVE JOURNAL HIGHLIGHTS

Staffing Updates for *Muscle & Nerve*

AANEM is pleased to announce that Dr. Zach Simmons' second term as Editor-in-Chief has been extended by 2 years. It was originally set to expire on Dec. 31, 2024. Additionally, Drs. Doris Leung and Aravindhan Veerapandiyan began their terms as associate editors on Jan. 1, 2025 joining Dr. Pushpa Narayanaswami. AANEM thanks Drs. Peter Kang and Neil Simon for their work as associate editors as they step down from this role.



"I thank the AANEM Board and Wiley for the opportunity and will try to serve in a manner that justifies this level of confidence."

Dr. Zach Simmons, MD

To learn more about *Muscle & Nerve* and their Editorial Board, visit MUSCLE & NERVE

Editor's Choice Articles

Articles deemed to be impactful or of particularly wide appeal are selected as "Editor's Choice" articles.

Highlighted below are the latest articles from the Editor's Choice collection (as of Dec. 18, 2024):

1. *The spectrum of rippling muscle disease*
2. *Rehabilitation is [still] necessary to optimize function in neuromuscular disorders*

Access these articles and explore the complete collection of Editor's Choice articles on the *Muscle & Nerve* website.

Downloaded Articles of 2024

The following articles are the most downloaded articles published in the last year (as of Dec. 18, 2024):

1. *Musculoskeletal mimics of lumbosacral radiculopathyimage*
2. *Diagnosis and treatment of hereditary transthyretin amyloidosis with polyneuropathy in the United States: Recommendations from a panel of experts*
3. *The role of artificial intelligence in electrodiagnostic and neuromuscular medicine: Current state and future directions*
4. *Survival among patients receiving eteplirsen for up to 8 years for the treatment of Duchenne muscular dystrophy and contextualization with natural history controls*
5. *Efficacy of ravulizumab in patients with generalized myasthenia gravis by time from diagnosis: A post hoc subgroup analysis of the CHAMPION MG study*

Access these articles (and more) by logging into your AANEM account at www.aanem.org. Then click on the "*Muscle & Nerve*" link at the top of the webpage and scroll down to find articles at the top of each section.

MEMBERSHIP

Introducing the 2025 AANEM/ANF Board of Directors

Meet the 2025 AANEM/ANF Board of Directors. This group of dedicated healthcare professionals are committed to advancing NM and EDX medicine. With a wide range of expertise, they are ready to make 2025 a year of growth and success.

Pictured left to right: (Back row) John Morren, MD; Ruple Laughlin, MD; Samuel Bierner, MD; Earl Craig, MD; Monika Krzesniak-Swinarska, MD; Devon Rubin, MD; (Front row) Laura Corrigan, MD; Dianna Quan, MD; Faye Tan, MD; and Lisa Hobson-Webb, MD

Shawn J. Bird, MD, Receives 2024 Jun Kimura Outstanding Educator Award

The Jun Kimura Outstanding Educator Award recognizes members for their significant contributions related to NM and EDX medicine education. Due to his numerous NM and EDX-related contributions, Shawn J. Bird, MD, was selected to receive the 2024 Jun Kimura Outstanding Educator Award.

Dr. Bird's career began when he received his electrical engineering and biology undergraduate degrees from Cornell University. He obtained his medical degree from Johns Hopkins University in 1983 and completed his neurology residency at the hospital of the University of Pennsylvania. "I enjoyed the field immensely when I did a rotation for several months in the EMG lab at Penn as a neurology resident. That is what drew me to it in the first place. I saw from my mentors how even more enjoyable the EMG lab is while teaching at the bedside - passing on that knowledge to other trainees."

For the next 2 years, he did a fellowship in NMDs and EMG at the University of Pennsylvania and was mentored in EMG by Dr. Austin Sumner. Dr. Bird notes that he was motivated by collaboration and mentorship, "I was especially motivated by Dr. Sumner, who was able to uniquely bring the clinical and electrophysiologic correlations to life in patients with neuropathy. His approach to the patient in the EMG lab is something that I have tried to aspire to throughout my career." After his training, Dr. Bird was appointed the medical director of the EMG laboratory at the University of Pennsylvania.

He has remained on the faculty at the University of Pennsylvania and was promoted to professor in 2011. Dr. Bird has been chief of the NM division there since 2017, in addition to serving as director of the EMG laboratory and director of the Myasthenia Gravis Clinic. He was the program director for the clinical neurophysiology fellowship program at the University of Pennsylvania from 1997 to 2012 and served as program director of the NM fellowship program from 2013 to 2021. As the lead educator in the EMG laboratory, he has

Continued on next page

mentored over 50 fellows in EDX medicine, which he says is his proudest accomplishment, noting, "Most of [them] have gone on to mentor the next generation in NM and EDX medicine in other academic institutions."

In the future, Dr. Bird wants to impact even more young physicians. "I plan to continue to focus my efforts on training our fellows to be superb EDX clinicians and to try to pass on that enthusiasm for the bedside physiology to others when they move on. One of my goals is to expose our neurology residents earlier in their residency to the exciting fields of NM and EDX medicine so they can be drawn to our subspecialty when they pursue fellowship training."

His academic efforts have focused on the interface between NM medicine and clinical electrophysiology. He and his colleagues wrote extensively about critical illness myopathy and were the first to demonstrate the basic abnormality in critical myopathy was that the muscle membrane was electrically inexcitable. They developed a novel technique to direct muscle stimulation as a bedside tool in the ICU diagnosis of that disorder. He and his colleagues wrote an editorial in *Muscle & Nerve*, coining the term "critical illness myopathy" for this disorder and defining its diagnostic criteria. He has authored 46 peer-reviewed articles and over 50 editorials and chapters.

As an active member of AANEM since 1988, Dr. Bird encourages young physicians to do the same. "I would strongly encourage young physicians to be very active in the AANEM. It is an organization that is superb and brings together individuals with similar interests and aspirations. The annual meetings are an educational gold mine, especially for younger clinicians. I would also encourage them to be active in the committees, particularly if they have any specific interests related to this field. It provides a format to meet many others from all over with similar interests," he says.

Dr. Bird's dedication and contributions have earned him this award, which he accepts, saying, "I am very honored to receive the 2024 Jun Kimura Outstanding Educator Award. I am grateful to the AANEM for this recognition of what I enjoy most about NM and EDX medicine, passing that knowledge on to others. Professionally, there is nothing more satisfying than watching our trainees develop into superb NM and EDX clinicians."

Do you know someone who has made a significant contribution to NM and EDX medicine? Learn more about AANEM's Achievement Awards at www.aanem.org/awards today.

Nominate a Colleague

Advance Your Career With AANEM Membership

Join a community of over 7,800 members dedicated to improving the lives of patients with NM diseases through the advancement of NM and EDX medicine.

- Access a variety of exclusive educational and practice resources.
- Collaborate with colleagues across neurology, physiatry, and related specialties.
- Explore the latest in NM and EDX medicine at the annual meetings.
- And more!

"The exciting discoveries and incorporation of ultrasound make AANEM cutting edge. If you are interested in neuromuscular medicine or wish to learn more, please join us!"

~ Faye Tan, MD
2025 AANEM & ANF President

Member Spotlight

Andriana Tompary, DO

Neuromuscular Physiatrist at Advocate Health in Park Ridge, Illinois
AANEM Member since 2020

Please tell us about your educational and professional background:

I grew up in the Chicago suburbs and completed my undergraduate studies at Loyola University Chicago. I went on to attend Marian University Wood College of Osteopathic Medicine in Indianapolis for medical school. Afterward, I completed my residency in physical medicine and rehabilitation, followed by a fellowship in neuromuscular medicine at the University of North Carolina in Chapel Hill, finishing in June 2024. After 5 years away from family and Midwest winters, my husband and I decided to return to the Chicago area, where I began my attending position at Advocate Health Lutheran General Hospital in Park Ridge, IL.

What sparked your interest in PM&R?

My interest in PM&R was sparked by its focus on improving function and quality of life for patients. I was drawn to the teamwork involved in rehabilitation, where a multidisciplinary approach is essential to patient care. The field's broad scope—ranging from neuromuscular medicine to sports rehabilitation—really appealed to me, as did seeing how many physicians in PM&R genuinely enjoy their careers. Most importantly, I wanted to advocate for patients with disabilities and help them regain independence, which aligns perfectly with the goals of this specialty.

You have shared a little about your journey with myasthenia gravis publicly. How does having this condition impact your life and work?

Having myasthenia gravis has deeply influenced both my personal life and my work as a physician. Being diagnosed at age 16 gave me a unique perspective and allows me to connect with patients on a more personal level. My journey with the condition has kept me grounded and focused on the importance of managing stress, building strong relationships with treating physicians, and maintaining a healthy lifestyle. While I'm fortunate to be minimally affected by the condition at this stage in my life, that hasn't always been the case. It's humbling to have walked in the shoes of many of the patients I now treat, and it has given me a deeper understanding in my practice.

What has been the highlight or most memorable moment of your professional career thus far?

There have been many memorable moments in my career so far, but one of the highlights has been receiving the Robert C. Cefalo House Officer Award during my residency training at the University of North Carolina. I was the first resident in our hospital in the field of PM&R to be recognized. This recognition for my dedication to patient care, professionalism, and teamwork was incredibly meaningful and reaffirmed my commitment to making a lasting impact in neuromuscular medicine and physiatry.

Continued on next page

How did you learn about AANEM?

I first learned about AANEM during my PGY-2 year when my program director, Dr. William Filer, encouraged me to join after I expressed an interest in neuromuscular medicine. Dr. Rebecca Traub, director of the neuromuscular fellowship at UNC, also introduced me to various valuable resources and opportunities within the organization that helped deepen my understanding and connection to the field. Their guidance helped me discover the wealth of resources and support that AANEM offers to those pursuing a career in this specialty.

What AANEM membership benefits or opportunities have you found most valuable? What have you enjoyed the most about being a member?

The most valuable AANEM membership benefits for me have been the Training Program Partnership (TPP) and access to the members-only forum, AANEM Connect. AANEM Connect provides a platform to engage in discussions, share knowledge, and seek advice from peers. Additionally, I've thoroughly enjoyed attending the annual meetings, which are fantastic opportunities for learning and networking.

You were a member of the Young Leadership Council, your term ending in October of 2024. What was your favorite part of your involvement with this group?

Completing my term with the Young Leadership Council in October 2024 was an incredibly rewarding experience. My favorite aspect was connecting with peers and future leaders within the field. It was such an honor to be in a leadership role within the AANEM early on in my career. It was fulfilling to promote educational opportunities for early career physicians while also building meaningful friendships and engaging in numerous mentorship opportunities that have had a lasting impact on my professional growth.

You are now an active member of the AANEM Recognized Curriculum Committee EDX & NMUS Fellowship Task Force. What excites you about the projects this group is working on?

As an active member of the AANEM Recognized Curriculum Committee EDX & NMUS Fellowship Task Force, I'm excited about the opportunity to collaborate on creating a unique educational program tailored for fellows interested in gaining additional expertise and certification in EDX and neuromuscular ultrasound (NMUS). It's gratifying to contribute to a project that will provide enhanced training and support to help shape the next generation of specialists in these areas.

What would you say to other young physicians looking to find their way and start their career?

To other young physicians starting their careers, I'd say: Find a program that supports you in all aspects of your career and life. Don't rush the process—take the time to explore different areas of medicine, as you might be surprised by what interests you the most. Embrace opportunities and find mentors who will guide you in making decisions that align with both your professional and personal goals.

What are some of your hobbies or interests outside of medicine?

Outside of medicine, I love traveling, hiking, and playing ultimate frisbee. I once played professionally, and now I enjoy the game with my husband. Being outdoors is a big part of my life, and I also enjoy spending time with my dogs and extended family.

Expand Your Network

Build meaningful connections with other members, immerse yourself in the latest science, and make an impact in the NM and EDX community when you join an AANEM committee. Explore the committee brochure to learn more and find a group that fits your interests and experience.

Applications are due May 15, 2025.

Visit www.aanem.org/volunteer to learn more and apply.

"I became involved in an AANEM committee as a way to give back to an organization that has been the greatest advocate and supporter of my clinical practice. Being involved in a committee is a great way of getting to know other professionals from around the country who share your same interests."

~ James Klejka, MD

2025 CALENDAR OF EVENTS

February

- 1 **Winter Board Meeting** — In Bloomington, Minnesota.
- 1 **Spring CNCT Exam** — Early registration begins.
- 15 **Surinderjit Singh Young Lectureship** — Application deadline.
- 17 **NM & EDX SAEs** — Regular registration begins.
- 21 **ANF Development Grants** — Grant application deadline.
- 21 **ANF Mid-Career/Established Investigator Grants** — Grant application deadline.

March

- 1 **AANEM Fellowship Match Portal** — Applications released to programs.
- 1 **Spring CNCT Exam** — Regular registration opens.
- 9-10 **AANEM Staff Liaison Meeting** — Hill Day.
- 12-15 **AANEM UltraEMG** — UltraEMG in Fort Lauderdale, Florida.
- 13-23 **ABEM Certification Exam** — 2025 exam administered worldwide.
- 15 **ANF & IFCN Travel Scholarships** — Application deadline.
- 15 **AANEM Annual Meeting Abstracts** — Application deadline.
- 22 **MGFA Abstracts** — Abstract submissions open.

April

- 5 **ANF Development Grants** — Grant notification.
- 5 **ANF Mid-Career/Established Investigator Grants** — Grant notification.
- 6 **NM & EDX SAEs** — Regular registration closes.
- 16-18 **Spring CNCT Exam** — Exam administered worldwide.
- 25-26 **Spring Board Meeting** — In Chicago, Illinois.

May

- 1 **AANEM Achievement Awards** — Nominations accepted.
- 5-12 **NM & EDX SAEs** — SAEs proctored.
- 27 **AANEM Fellowship Match Portal** — Rank lists due.

June

- 1 **NMUS CAQ Exam** — Early registration opens.
- 2 **AANEM Fellowship Match Portal** — Match results sent.
- 6-11 **AMA House of Delegates** — House of Delegates annual meeting.
- 15 **AANEM Annual Meeting** — Early registration opens.
- 30 **Training Program Partnership** — Program participations expire.

July

- 1 **NMUS CAQ Exam** — Regular registration opens.
- 31 **AANEM Annual Meeting** — Early registration ends.

August

- 1 **AANEM Annual Meeting** — Regular registration opens.
- 1 **Fall CNCT Exam** — Early registration opens.

Visit www.aanem.org for additional information.

ADVOCACY

AANEM Advocacy Team Helps Shape New AMA Policies

In June of 2024, the AMA's House of Delegates (HOD) met for its annual session in Chicago, addressing key healthcare issues affecting the USA. AANEM was represented by Drs. Bill Pease (delegate), Bill David (alternate delegate), Dan Pierce (young physician delegate), and Rachel Volbrecht, JD (staff liaison).

During the visit, AANEM co-sponsored a resolution with AAPM&R advocating for insurance coverage of shoes and shoe modifications for pediatric patients requiring lower extremity orthoses. This resolution, supported by personal testimonies, aimed to alleviate the financial burden on families and encourage providers to recommend necessary interventions. It successfully passed. The delegation also supported another resolution urging the AMA to advocate for insurance coverage for adaptive sports equipment, which also passed with strong backing.

The HOD discussed several pressing health policy issues, including Medicare payment reform, prior authorization fixes, promoting physician-led care, and addressing effective technology use in healthcare, and cybersecurity challenges. Other significant topics included tackling the physician workforce crisis, enhancing public health, and reducing burnout.

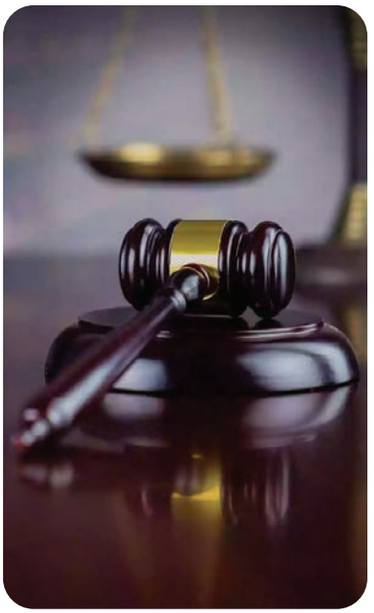
AANEM expresses their gratitude to Dr. Bill Pease for his 20 years of service as he has stepped down as delegate. AANEM also welcomes Dr. Bill David, a former alternate delegate, who now leads AANEM's delegation and Dr. Ileana Howard as the new alternate.

AANEM attended the AMA Interim HOD meeting in November 2024 and will meet at the HOD again June 6-11, 2025. To learn more about how AANEM's advocacy efforts work to improve patient care and physician practice at www.aanem.org/clinical-practice-resources/advocacy.

View a detailed list of major topics discussed during the session.

Advocacy at Work for You

AANEM is committed to championing policies that make a real difference for patients with NM diseases, their healthcare providers, and the communities they serve. Advocacy efforts focus on initiatives that empower individuals living with NM diseases and the professionals who care for them. Here's how AANEM makes an impact:



Tackling the Physician Shortage and Improving Access to Care

Every patient deserves quality care, which is why AANEM is addressing the critical shortage of NM physicians. AANEM supports innovative solutions like telehealth and initiatives that make treatments more affordable and accessible. For example, during Hill Day in 2023 and 2024, AANEM advocated for the **Resident Physician Shortage Reduction Act (S. 1302/H.R. 2389)**. This bipartisan legislation would add 14,000 Medicare-supported residency positions over the next seven years, ensuring more physicians are available to meet patients' needs.

Ensuring Fair Reimbursement for Physicians

Fair compensation is essential for high-quality care. AANEM is fighting for and supports fair reimbursement for physicians, including an inflationary payment update in Medicare that is tied to the Medicare Economic Index and budget neutrality reforms. AANEM is also actively involved in the coding and payment process, making sure members are fairly reimbursed for the services they provide. Through the work with CPT and RUC committees, AANEM ensures the right codes are used and reimbursement is optimized.

Combating Fraud and Abuse in EDX Medicine

Dedicated to protecting patients and the integrity of EDX medicine, AANEM supports the **Electrodiagnostic Medicine and Patient Protection and Fraud Elimination Act (H.R. 2639),** which aims to stop fraud by ensuring EDX testing is performed by the right provider, at the right time, with the right equipment. Modeled after successful initiatives in mammography and sleep labs, this legislation enforces the standards patients deserve.

To learn more about AANEM advocacy work or to support the mission, visit www.aanem.org/advocacy.

PRACTICE

APPs in NM Medicine: A New Framework for Collaboration

As the demand for specialized medical care grows, advanced practice providers (APPs) are taking on a more prominent role in NM medicine. Maggie Naclerio, PA-C and Chris Doughty, MD, offered insights into the new APP position statement from the AANEM (which they helped author), the evolving landscape of APP involvement in this field, and the importance of APP membership with AANEM.

According to Ms. Naclerio, the new APP position statement was developed to formally recognize the contributions of APPs in NM medicine and strengthen the support for APP practice within the AANEM. With the increasing demand for subspecialty care, APPs have begun to take on patient care responsibilities traditionally handled exclusively by physicians. "While APPs cannot replace physician-delivered care, they can enhance practice through team-based care models," Ms. Naclerio explained. "This can increase access to high-quality care, reduce excessive workloads, and prevent physician burnout."

The statement emphasizes that there are already APPs working within the field, and the AANEM has welcomed them by creating an APP membership category and offering conference programming. Ms. Naclerio noted that with these changes, it was crucial to expand the conversation around the role of APPs in NM care. The statement's primary audience includes all NM and rehabilitation medicine providers. Ms. Naclerio hopes to reach not only physicians currently working with APPs but also those who are interested in doing so. For the latter group, the statement outlines the scope of APP practice and the potential benefits of team-based care models. It also highlights the importance of high-quality onboarding and education for APPs.

"For physicians who currently work with APPs, we aimed to provide guidance on APP utilization," said Ms. Naclerio, hoping this "provokes further discussion toward a best-practice framework in the future." In addition, the statement addresses APPs themselves, affirming their role in team-based care and emphasizing the support the AANEM provides for their practice and education.

Both Ms. Naclerio and Dr. Doughty stressed the value of APPs joining the AANEM. Ms. Naclerio noted that the AANEM has established an APP committee to support APP practice and education, and membership can foster a sense of community and mentorship, among APPs working in NM and rehabilitation medicine. "In the future, we hope to collect survey data among AANEM APP members so the AANEM can expand professional development and educational opportunities," Ms. Naclerio added. "Just as AANEM provides physician training and educational resources, the organization can also serve as an invaluable resource to help APPs be successful practitioners of NM and rehab medicine."

Dr. Doughty echoed this sentiment, emphasizing the AANEM's commitment to providing targeted educational materials for APPs. He highlighted that membership gives APPs a direct voice in shaping curriculum development and identifying needed resources. "AANEM membership can also help facilitate networking among APPs to help build community and identify mentorship," Dr. Doughty said.

To read the full position statement, visit www.aanem.org/advocacy.

Drive Change With a Donation to the Advocacy Fund

Help transform laws and policies that impact NM and EDX physicians in the USA with a donation to the AANEM Advocacy Fund.

www.aanem.org/advocacy-fund

PROFESSIONAL STANDARDS

Highlight Your NMUS Expertise

With NMUS becoming an integral part of practice as EDX medicine evolves, it's more important than ever to demonstrate your ability to deliver high-quality EDX care. The NMUS Certificate of Added Qualification (CAQ) from the American Board of Electrodiagnostic Medicine (ABEM) allows physicians to showcase their expertise and proficiency in NMUS.

Join those committed to offering the best patient care by achieving your NMUS CAQ through the next exam administered Sept. 15-19, 2025. Early registration opens June 1, 2025. To learn more, visit www.aanem.org/NMUS-CAQ.

Congratulations to those who achieved their NMUS CAQ in the fall of 2024!

Top 10%
Marie Beaudin, MD, MSc
David Chaar, MD
Thapat Wannarong, MD

Robert D. Adams, MD, PhD
Abdullah M. Al-Ajmi, BMBCh, FRCPC
Dipti Baskar, MBBS, MD
Marie Beaudin, MD, MSc
M. J. Carlson, MD
David Chaar, MD
Ted L. Freeman, DO
Raed A. Gasemaltayeb, MD
Andre Granger, MD
Igal Mirman, MD
Ryan C. O'Connor, DO
Drasko Simovic, MD
Joshua A. Smith, DO
Sarah M. Smith, MD
David P. Speach, MD
Thapat Wannarong, MD
Theresa R. Wolfe, MD

Registration Now Open for Spring CNCT Exam

Highlight your ability to provide a higher standard of patient care and showcase your skills as a Certified Nerve Conduction Technologist (CNCT). Registration is now open for the spring CNCT Exam, April 16-18, 2025. Administered online and proctored with AI technology, this exam offers the flexibility to complete it at any time of the day, allowing even those with the busiest schedules the opportunity to enhance their careers. Learn more and register at www.aanem.org/abem/technologist-certification.

Congratulations to those who demonstrated their excellence and became CNCTs in the fall of 2024.

Top 10%
Adam Nygren-Larson, CNCT
Helana Bourgeois, CNCT

Adam Nygren-Larson, CNCT
Aref Tekehei, CNCT
Betty Lowkaran, CNCT
Brianna Falgoust, CNCT
Brittney Yelli, CNCT
Byron Wiley, CNCT
Elisha Martin, CNCT
Helana Bourgeois, CNCT
Kelby Blubaugh, CNCT
London Jones, CNCT
Muhammad Al-Khafaji, CNCT
Scott Kurtzke, CNCT
Sophia Judish, CNCT
Sydney Lester, CNCT
Tamara Johnson, CNCT

Featured AANEM Accredited Lab

Featured Lab: Florida Orthopaedic Institute

Submitted By: Syed Zaffer, MD

What prompted you to accredit your lab initially?:

Florida Orthopaedic Institute's mission is to provide excellence in clinical outcomes and an exceptional patient experience, while in an environment that fosters growth through teaching, education, and research in all aspects of musculoskeletal medicine. Our EMG laboratory decided to get accredited to further our mission of being a center of excellence. We wanted our patients to have peace of mind of being provided the highest standard of care that every patient deserves.

What value or benefits have you seen from accreditation?

Accreditation has built confidence in our referral sources of having their patients evaluated at a nationally accredited EMG laboratory. It has motivated our staff to strive to provide the best care possible by periodically reviewing our procedures, protocols, and patient satisfaction.

How did going through the accreditation process help you shore up or improve processes and procedures? Did you make any patient report improvements? If so, which ones?

Accreditation has helped us improve our processes and procedures. We review a sample of our patient reports every quarter to make sure we follow AANEM's best practices in report writing.

What did you learn by going through the accreditation process?

The accreditation process encouraged us to be methodical in creating and maintaining our laboratory's manual and to focus on best practices.

What was the most challenging portion of the application?

As I recall, we did not find any aspect of the application to be significantly challenging.

Did anything about the accreditation process surprise you? If so, what?

There were absolutely no surprises during our accreditation process.

Why should others accredit their laboratory?

Accreditation of a laboratory provides a "seal" of credibility and competency for an EMG practice. Accreditation makes a practice more marketable. More importantly, it provides our patients with the satisfaction of receiving the highest standard of care.

AANEM
Electrodiagnostic Laboratory Accreditation Program

QI/PIP Credits Now Available for Labs

Earn Valuable QI/PIP Credits

Your dedication to maintaining high standards in the accreditation and reaccreditation process isn't just valuable for the lab, it is an opportunity to earn QI/PIP credits.

ABPMR

As the lead-physician managing the accreditation process, you're eligible for QI/PIP credit once accreditation is granted. Your leadership is rewarded with professional recognition for driving quality improvement.

ABPN

Every physician in the laboratory can turn their commitment to quality into QI/PIP credit. By completing a simple two-step review of patient reports, all participating physicians can earn PIP credit and improve patient care.

To learn more, contact accreditation@aanem.org.

Highlight Your Lab's Commitment to Excellence

Submit your lab for a chance to be featured in our spotlight and showcase your commitment to delivering high-quality care.

Submission Form:

AANEM CONNECT

Your Community for Collaboration

Designed specifically for physicians, the AANEM Connect forum is your go-to platform to discuss challenging cases, access valuable resources, and network with peers. Whether you're looking for expert advice, sharing your own insights, or staying updated on the latest in NM and EDX medicine, AANEM Connect keeps you plugged into a community that understands your needs.

Engage With Experts
Join discussions led by seasoned professionals.

Collaborate With Peers
Exchange ideas, share experiences, and grow together.

Stay Informed
Access cutting-edge research, case studies, and clinical updates.

AANEM CONNECT

www.aanem.org/Connect

TRAINEE CONNECT

Your Pathway to Professional Growth

Designed for physicians in training, AANEM's Trainee Connect forum offers a supportive environment to learn, ask questions, and connect with fellow trainees. Get a head start on your professional journey by engaging in discussions with a community that understands your needs.

Gain Understanding
Share questions you have on challenging topics to get insight from peers.

Build Your Network
Meet fellow trainees, share your journey, and expand your professional connections.

Find Support
Engage in an encouraging environment with others navigating similar professional challenges.

TRAINEE CONNECT

www.aanem.org/trainee-connect

New Funded Research Projects

Research that can identify treatments or cures is key to improving the lives of patients with NM disease. The American Neuromuscular Foundation (ANF) is committed to advancing NM research through independently funding research.

Rebecca Schmitt, PhD

Rebecca Schmitt, PhD, an assistant scientist in anatomy, cell biology, and physiology at the Indiana University School of Medicine, Indiana, has been awarded an ANF Development Grant to support her research, "Evaluation of Aberrant Autophagy and Myogenesis in GNE Myopathy."

Dr. Schmitt's research aims to uncover the underlying mechanisms behind GNE myopathy, a rare genetic disorder that leads to progressive muscle weakness and wasting. She is motivated by the lack of understanding of this disease and its impact on patients and hopes this research is the next step toward finding treatments and cures. "Neuromuscular diseases (NMDs) result in disability, drastic quality of life changes, and eventual long-term dependency on caregivers. To date, many NMDs do not have cures or substantive treatments. We investigate one such NMD, GNE myopathy, to uncover underlying contributing factors of the disease," she says.

Addressing the impact of GNE myopathy, Dr. Schmitt says that the effects differ per person, from age of onset to severity of symptoms. With no treatments or cures for GNE myopathy, she notes the importance of studies like this to eliminate the knowledge gap and improve patient care by preventing worsening symptoms, improving muscle health, and finding a cure.

Dr. Schmitt says that although GNE myopathy is considered a rare disease with low overall global prevalence, there are ethnic populations anticipated to be affected at a much higher rate. In addition, the current number of GNE myopathy patients recorded likely does not capture the full extent of those suffering from GNE myopathy, as many who suffer from it may not have a diagnosis or may be misdiagnosed. "Furthermore, unlike other diseases that have established pre-clinical (animal) models, the ones created for GNE myopathy have not been able to recapitulate the human phenotype. This has allowed for opportunities to create reliable models, which we are utilizing for investigations," she says.

To produce a basic understanding of the molecular pathways involved in how mutations in the GNE gene lead to the development of the clinical phenotype and potential therapeutic strategies, Dr. Schmitt and her team have planned extensive research. "GNE myopathy typically presents within the second or third generation of life with the typical symptom of muscle weakness in the lower legs. There is a slow progression of muscle weakness, including the upper leg and arm muscles. Currently, little is understood about the mechanism of GNE myopathy, besides that mutations in the gene GNE result in the clinical pathology. We utilize a patient-derived cell-based model, molecular analyses, and genetic tools to investigate mechanisms and therapeutic avenues. Specifically, we are studying the role of autophagy – a process used to remove unwanted components in a cell – in which we have discovered activation of autophagy can improve muscle health in the GNE myopathy patient-derived samples," she says. She hopes the long-term results of this research will allow for investigations into potential therapeutic strategies that improve patient quality of life.

Christopher Cashman, MD, PhD

Christopher Cashman, MD, PhD, is an instructor at Harvard Medical School, assistant physician of neurology at Massachusetts General Hospital, and clinical instructor of neurology at Brigham and Women's Hospital in Boston, Massachusetts. He has been awarded an ANF Development Grant for his research project, "Acquired Mitochondrial Dysfunction in Diabetic Neuropathy."

Motivated by a report from the Centers for Disease Control in 2021 that stated 40% of Americans suffer from diabetes type 1 and 2 and that nearly half of these patients are expected to develop neuropathy, Dr. Cashman's desire to investigate began. "Symptoms of neuropathy may lead to decreased quality of life as well as morbidity due to falls or other injuries. Currently, all therapies for non-inflammatory or inherited neuropathies are symptomatic, with no effective treatments available to slow or stop the progression. Given the many people predicted to have neuropathy, effective treatments are critical," he says.

Continued on next page

Dr. Cashman explains neuropathy as dysfunction of the nerves in the body that leads to symptoms including pain, weakness, or numbness. He says that many neuropathies are length-dependent and have a "stocking-glove" pattern of symptoms. "In this situation, the feet become symptomatic first, then symptoms slowly ascend to the knees, at which point the hands may become involved, as well," he says.

Dr. Cashman notes that diabetes is often associated with a length-dependent neuropathy, but how a systemic disorder like diabetes can lead to isolated symptoms in the ends of only the longest nerves remains unknown and that recent work has shown that an axon's metabolism is critical for its maintenance. The goal of the "Acquired Mitochondrial Dysfunction in Diabetic Neuropathy" project is to increase the understanding of how diabetes may lead to length-dependent neuropathy, particularly relating to the differential function and health of the mitochondria within the nerve. "My research is focused on the health of the mitochondria (primary source of energy in cells and axons) in the start and end of axons in a model of diabetes," he says.

Dr. Cashman believes this project lays the foundation for future work on diabetic and other length-dependent neuropathies by identifying fundamental processes that may drive their development. "With this improved understanding of diabetes, studies may be developed to investigate other neuropathies with different clinical features (such as inherited neuropathies)," he says. Dr. Cashman also believes this research will lead to a greater understanding of the standard and unique processes that drive different types of neuropathies and may lead to targeted therapeutic development.

Grateful for ANF's support through the Development Grant, Dr. Cashman says he can devote the necessary time toward the project. He looks forward to sharing his project results and connecting with the NM community through the ANF and at the AANEM Annual Meeting. "I am excited to work with the American Neuromuscular Foundation over the next 2 years in an effort to help the millions of patients with neuromuscular disease and neuropathy," he says.

Brett Morrison, MD, PhD

Brett Morrison, MD, PhD, has been awarded an ANF Mid-Career/Established Investigator Research Grant for his project, "Role of Macrophage MCT1 in Diabetic Peripheral Neuropathy." His team aims to determine whether macrophage MCT1 plays a role in diabetic peripheral neuropathy and whether lipid nanoparticles can target this molecule and prevent neuropathy from occurring or accelerate its recovery.

As an associate professor of neurology at Johns Hopkins University, Dr. Morrison finds motivation for this project from his experience with this area of study. He shares what he and his team have already learned, noting that, "The function of macrophages is highly dependent on their cellular metabolism. In our prior publication in the *Journal of Clinical Investigations*, we found that ablating MCT1 from macrophages impairs peripheral nerve regeneration following nerve injury, while upregulation of MCT1 improves nerve regeneration. Peripheral nerve injury is relatively rare. In contrast, diabetic peripheral neuropathy is the most common cause of peripheral neuropathy, affects up to 15 million people in the United States alone, and is currently untreatable." He says these findings motivated him and his team to determine whether metabolic changes in macrophages through altering MCT1 can impact diabetic peripheral neuropathy.

He explains, "We have previously shown that altering the metabolic transporter, MCT1, in macrophages impacts the speed of recovery following peripheral nerve injury. In the current proposal, we will study whether varying MCT1 expression in macrophages impact mouse models of diabetic peripheral neuropathy. Macrophage MCT1 will be altered both by transgenic mice engineered to have low or high expression of MCT1 and lipid nanoparticles that target macrophages and upregulate MCT1." The genetically and pharmacologically modified mice will be assessed for the development of peripheral neuropathy in commonly studied mouse models of both type 1 and type 2 diabetes.

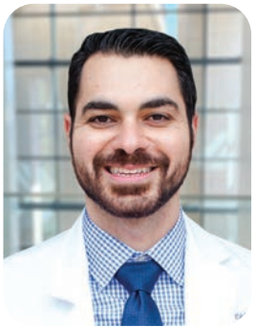
Dr. Morrison hopes this study's long-term results will positively impact patients suffering from diabetic peripheral neuropathy. He expects the experiments from this grant will help the field to better understand the role of macrophages in diabetic peripheral neuropathy in general and whether changing metabolism in macrophages is a valuable target for treating diabetic peripheral neuropathy. "If the macrophage manipulations prove effective, this research will provide a springboard to larger studies in other diabetic models and ultimately patients with diabetes," he says.

Expressing appreciation for the ANF Mid-Career/Established Investigator Research Grant, Dr. Morrison notes how impactful the grant will be in allowing the project to continue. He says fiscal support will help procure supplies and protect research time. He believes that the data generated with this grant could lead to support of other related research projects in the future.

Funded Research Project Updates

Successful Research in Small Fiber Neuropathy

In 2020, Alexander Chamessian, MD, PhD, was awarded an ANF Development Grant for his research titled, "Determining the Pathogenicity of Autoantibodies in Idiopathic Small Fiber Neuropathy." In this study, Dr. Chamessian's project aimed to determine the role of some of the small fiber neuropathy (SFN)-associated autoantibodies. SFN is a group of disorders that involves preferential damage to and dysfunction of small diameter sensory and autonomic nerve fibers. There are many known causes of SFN, including diabetes, nutritional deficiencies, and certain autoimmune diseases. However, in many patients, the cause of SFN is never identified. Those cases are labeled "idiopathic" or "cryptogenic," meaning the cause is unknown.



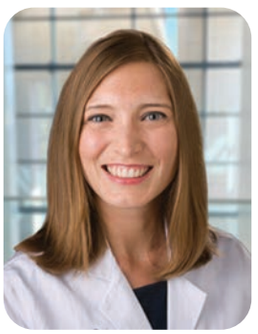
With limited federal research funds for young physicians, Dr. Chamessian notes the importance of the ANF Development Grant. A resident at the time he was awarded this grant, he was able to be the principal investigator on the research. Dr. Chamessian says this was a rare opportunity as a resident to be able to develop his research and was a vital component of growing his career. He says patients have been an incredibly motivating factor for him. As patients became aware of the research project through the ANF website, Dr. Chamessian says he gets emails every month from someone whose life had been altered by NM disease and would reach out looking for answers. "I appreciated the way that this grant enabled me to connect with patients living with the disease that I was studying," he says. "It motivates my efforts and gives me a sense of urgency," he adds.

The research project ended up having great success. "We identified potential abnormalities in T cells that may shed light on underlying mechanisms in this particular type of SFN and may potentially serve as a diagnostic biomarker for the stratification of different types of SFN," he says. Crediting the funding, Dr. Chamessian says the substantial amount of funding he received from the ANF grant enabled him to do things he wouldn't have been able to do otherwise, including additional collections of samples, which lead to his discoveries. He says his research led to the production of a new manuscript and the next steps of his research are being planned and are in progress.

Now running an independent lab and a neuropathic pain-focused clinical practice as pain management specialist, Dr. Chamessian credits this experience for his career growth. "It really catalyzed all of the productivity I had in my clinical training and accelerated my career advancement such that I could start a clinical research training program right out of training. I would not have been able to do that without the support of the ANF in those early days." Going forward, he hopes the t-cell work continues and will have an impact on the patients he sees and encourages others to apply for research grants through the ANF. "If you have an idea for compelling research and it's well designed and well planned, go for it! Find the right mentors, and just do it! Propose it."

Surprising Results in CIDP Research

In 2019, Dr. Karissa Gable, who is a NM specialist and associate professor of neurology at Duke University in Durham, North Carolina, was awarded the ANF's Clinical Research Fellowship in Chronic Inflammatory Demyelinating Polyneuropathy (CIDP). She and her collaborators at Duke aimed to define the pattern of immune regulatory cell pathology in CIDP through comprehensive immune phenotyping of Treg and B10 cells to help clarify the ongoing pattern of immune dysregulation in patients with CIDP.



In further exploring the underlying pathophysiology of the disease, Dr. Gable believes it will be possible to more effectively develop targeted treatments for patients with CIDP to improve their quality of life. "By using flow cytometry, samples from patients with CIDP who were clinically stable were compared to healthy and disease state controls. We found that even though patients with CIDP appeared clinically stable, there appeared to still be a continued state of immune dysregulation and a pro-inflammatory state with impaired T-regulatory cell function," says Dr. Gable of her study. "It also provided insight into further targets that may be possible to research in the future for potential drug development," she adds.

Since her study in 2019, further studies have been conducted on the treatment and underlying pathophysiology of CIDP. "A rare subset of patients that were previously classified as CIDP were discovered and since have been referred to as paranodopathies/nodopathies. These patients have some unique clinical phenotypic characteristics in addition to a better response to B-cell-depleting medications. Future research with newer techniques such as single-cell RNA sequencing and proteomics research will likely expand our knowledge in the future in CIDP," she says.

Dr. Gable hopes that by continuing to conduct research and contribute to the scientific understanding of the underlying immunopathology of CIDP, the future holds a greater awareness for the development of potential serologic biomarkers that could assist with diagnosis and treatment. "Research is fundamental to understanding, and with that understanding is a path forward to developments for patients that would not be possible otherwise."

To learn more about research grants from the ANF, visit:

AMERICAN NEUROMUSCULAR FOUNDATION (ANF)

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The ANF knows the causes and symptoms among NM diseases are often interconnected, and deepening the understanding of one unlocks critical insights to others. By focusing on these key areas together, we can STRENGTHEN the global effort to CURE neuromuscular disease. Get involved with the ANF today to join the fight against neuromuscular disease. The ANF works to:

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American Neuromuscular FOUNDATION

www.neuromuscularfoundation.org/grants

Patient Perspective

Navigating CIDP: How One Man Survived a Near-Fatal Battle

In late October of 2022, James (Jim) Dines, a retired civil lawyer and previous service member of the New Mexico Legislature House of Representatives, was preparing for a round of golf. As he was warming up, he noticed his hands and arms weren't moving as they usually did during his swing. He was unable to continue with his game, and 2 days later, Jim woke up to find he could no longer raise his hands or arms above his shoulders. He immediately went to the emergency room, where they performed an MRI. With inconclusive results, they were unable to find a definitive diagnosis, and Jim was admitted to the hospital for treatment.

By November 2022, the medical team initiated a treatment of intravenous immunoglobulin (IVIg), a therapy commonly used for neurological or autoimmune conditions. After completing the treatment, Jim was sent home with the hope that his condition would improve. Unfortunately, his symptoms quickly worsened, and he again found himself unable to use his hands or arms again.

> "Keep your faith, family, and friends; never quit, and be treated by doctors who are willing to consult with others to determine the best course of treatment."
>
> - James Dines

Jim was readmitted to the hospital for a second round of IVIg treatment and was transferred to inpatient rehabilitation to regain strength. However, his recovery took a sharp downward turn. Just days into rehab, his legs gave out completely. With his condition declining, Jim was sent back to the hospital. This time, Jim was treated with plasmapheresis and returned to inpatient rehab. Within 2 more days, his condition worsened. He lost the ability to swallow and could no longer eat or move his body.

By the first week of December 2022, his providers readmitted Jim to the hospital in a state of near-total paralysis. His situation had become critical, and his condition —still without a clear diagnosis—was worsening quickly. His paralysis had advanced to the point where he struggled even to speak and could only do so with great difficulty. With his condition rapidly declining, Jim considered what this meant for him. "During my last hospital admission, I was told that I would need a feeding tube and eventually maybe a ventilator. I did not want to die that way, so I refused that treatment," he said. Knowing this choice meant he would not survive long, Jim began to make funeral arrangements.

At the same time, Dr. John Norbury, a long-time AANEM member, was introduced to Jim's case. He worked diligently with colleagues, Jim's primary doctor, and others to find answers. Jim says, "As I was dying, I felt at peace and was comforted by my Lord. I was prepared for what may happen, but when I heard that others were doing research and consulting on my situation, it gave me renewed hope during the dark hours."

Leveraging his AANEM committee involvement and collaboration with other members through AANEM Connect, Dr. Norbury worked alongside the care team to diagnose Jim with chronic inflammatory demyelinating polyneuropathy (CIDP), determining the need for long-term plasmapheresis several days a week over the course of several weeks. As they tested this new treatment, Jim's family stuck with him every moment of every day for the several weeks it took for his condition to improve. Jim says although recovery was challenging, he was motivated by his will to hold his grandchildren and supported by the care and prayers he received from his family and friends.

By Christmas Day, Jim noticed an improvement in his condition. During a visit with his grandchildren, he miraculously raised two of his fingers and placed them on the tops of his grandchildren's hands. His condition steadily improved as his plasmapheresis and rehabilitation treatments continued through January 2023. When he was able to walk with assistance, he was discharged to inpatient rehabilitation.

After 10 days, Jim's condition had improved, so he was discharged from inpatient rehab. He started outpatient rehab three times a week, and by June of 2023, Jim was back to playing golf. "I was 75 years old then, and since then, I have shot my age or better, several times," Jim says.

He now manages his condition with mycophenolate twice a day and stays aware of his symptoms. "I try not to let it impact my daily life, but it stays in the back of your mind. I am mindful to watch out for any indicators of relapse, like numbness or impaired use of fingers, hands, and feet. The bottoms of both feet are numb sometimes, and the tops of both feet have tingling sometimes."

Through everything, Jim says he is thankful every day that he is alive and can help others. He has returned to his favorite activities of delivering Meals on Wheels, serving food at his church,

Continued on next page

playing golf, traveling, and spending time with his wife, children, grandchildren, and friends. Jim encourages others who may be in a similar situation to "keep your faith, family, and friends; never quit, and be treated by doctors who are willing to consult with others to determine the best course of treatment."

Rare NM conditions like CIDP are difficult to diagnose and treat due to the limited scientific data. That's why the American Neuromuscular Foundation (ANF) supports efforts to learn more about these diseases and improve patient care by funding research studies and the creation of the Late-Onset Neuromuscular Disease Consortium (LONDC).

In 2019, Dr. Karissa Gable received the ANF Research Fellowship Award for her study of CIDP. She discusses the challenges with this disease. "Patients with CIDP continue to have unmet needs with respect to treatment and management. It is important to explore the underlying pathophysiology in this rare disease to more effectively treat it and improve patients' quality of life," says Dr. Gable. She says, "Research is fundamental to understanding, and with that understanding is a path forward to developments for patients that would not be possible otherwise."

The LONDC also aims to improve the lives of patients with NMDs by helping to address the critical need for timely diagnosis in the LOND community. They work to improve awareness, understanding, and identification of LONDs, increase access to resources and support services, and enhance collaboration among providers, advocacy organizations, and the LOND community.

These initiatives mark a significant step toward creating meaningful change for individuals living with NMDs. To find out how you can contribute and make a lasting impact, visit www.neuromuscularfoundation.org.

The team of physicians whose collaboration led to a life-saving diagnosis for Jim.
Pictured left to right: David Preston, MD; James Dines; John Norbury, MD; and Holli Horak, MD

Help strengthen the global effort to cure NM disease with a tax-deductible donation to the ANF at www.neuromuscularfoundation.org/Donate.

Stay informed and learn about the latest ANF research funding opportunities and ongoing projects by visiting our website and connecting with us on social media.

Making Strides Toward Early Detection of NMDs

The Late-Onset Neuromuscular Disease Consortium (LONDC) is an important project of the American Neuromuscular Foundation (ANF) focused on improving the lives of individuals living with late-onset neuromuscular diseases (LONDs). Collaborating closely with the patient community, the LONDC aims to identify shared experiences and challenges within this population to advance research and awareness. Through initiatives like the Common Experience Research and Awareness Campaign, they are uncovering critical insights that can improve recognition and referral pathways for those affected by LONDs. Together with patients, healthcare providers, and key opinion leaders, they are building tools that empower individuals and providers alike to recognize the early signs of LONDs and facilitate timely specialist referrals. They have made substantial strides in executing our research program, including:

- More than 60 interviews with patients across 14 LONDs to understand first-hand experience with early signs and symptoms of these diseases
- More than 120 survey responses from primary care, advanced practice providers, and neurologists to identify challenges to recognizing LONDs and characterizing barriers to specialist referrals
- Input from more than a dozen key opinion leaders and clinicians on clinical observations and summarizations of literature on both the commonalities and distinguishing features of LONDs

From this research, they aim to develop a physician-focused tool to aid in the recognition and referral of potential LOND cases, and a consumer-focused mnemonic to help individuals recognize early signs of LONDs and advocate for specialist care.

Key Milestone: Consensus Discussion Initiated

Now, the LONDC is drawing from these research efforts to gain alignment from the clinical and patient communities on the presenting symptoms that differentiate LONDs from other more common diagnoses and identify the diagnostic triggers that should signal the possibility of a NM condition.

The first consensus discussion was held on Oct. 14, 2024, in Savannah, Georgia, ahead of the AANEM Annual Meeting. This meeting assembled a diverse group of more than 20 individuals, including NM specialists and key opinion leaders, representatives from patient communities and members of the LONDC Steering Committee, and industry partners and sponsors.

This first session was intended to:

- Secure feedback on the research findings, including patient interviews, healthcare provider survey responses, and disease catalogue
- Surface key considerations and end points to incorporate in the clinical tool
- Review and iterate on an early outline of the clinical tool

The LONDC was successful in outlining the combination of symptoms broadly indicative of LONDs, and aligning on the actions first-line healthcare providers could take to more quickly identify patients who need to see a NM specialist on the basis of a suspected LOND.

Next Steps

Development of the clinical tool remains the first priority and key output of this work. The LONDC will continue to refine and iterate this tool with clinical and community leaders, before ultimately testing the tool in the clinic to demonstrate its ability to drive recognition of LONDs.

Additional participation and perspectives in these continued consensus discussions are welcome. If you are interested in contributing to the conversation, please contact LONDC@neuromuscularfoundation.org.

Thank You

The LONDC's work is made possible by passionate healthcare professionals, community partners, and committed industry sponsors. The LONDC recognizes and thanks our 2024 sponsors for supporting this important initiative:

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The LONDC appreciates the AANEM for supporting the LONDC's administrative fees. To learn more about the LONDC and the Common Experience Research and Awareness Campaign, visit londc.neuromuscularfoundation.org.

Thank You for Supporting Research and Education

The American Neuromuscular Foundation (ANF) was established to promote health for patients with NM diseases by supporting and advancing NM and EDX research and education through research grants and awards, and fellowship funding. AANEM is the founder and partner of the ANF. AANEM has transferred nearly $7 million to ANF to support these initiatives and covers all administrative costs to ensure that 100% of all outside donations directly support the ANF's mission. The foundation thanks each and every donor for their generous contributions. Contributions listed were received between Jan. 1, 2024, and Dec. 1, 2024.

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ANF sincerely thanks the generous donors who supported the silent auction at this year's AANEM Annual Meeting. Your contributions helped raise $25,000 to directly help fund ANF research grants.

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- **Immunosuppression and Increased Risk of Infection:** Use of corticosteroids, including AGAMREE, increases the risk of new infection, exacerbation of existing infections, dissemination, and reactivation or exacerbation of latent infection and may mask some signs of infection; these infections can be severe, and at times fatal.
- **Alterations in Cardiovascular/Renal Function:** Monitor for elevated blood pressure and monitor sodium and potassium levels in patients chronically treated with AGAMREE.
- **Gastrointestinal Perforation:** Use of corticosteroids increases the risk of gastrointestinal perforation in patients with certain gastrointestinal disorders, such as active or latent peptic ulcers, diverticulitis, fresh intestinal anastomoses, and non-specific ulcerative colitis. Signs and symptoms may be masked.
- **Behavioral and Mood Disturbances:** Potentially severe psychiatric adverse reactions may occur with systemic corticosteroids, including AGAMREE, and may include hypomanic or manic symptoms (eg, euphoria, insomnia, mood swings) during treatment and depressive episodes after discontinuation of treatment.
- **Effects on Bones:** Prolonged use of corticosteroids, such as AGAMREE, can lead to osteoporosis, which can predispose patients to vertebral and long bone fractures. Monitor bone mineral density in patients on long-term treatment with AGAMREE.
- **Ophthalmic Effects:** The use of corticosteroids, such as AGAMREE, may increase the risk of cataracts, ocular infections, and glaucoma. Monitor intraocular pressure if treatment with AGAMREE is continued for more than 6 weeks.
- **Vaccination:** Do not administer live-attenuated or live vaccines to patients receiving AGAMREE. Administer live-attenuated or live vaccines at least 4 to 6 weeks prior to starting AGAMREE.

Please see Brief Summary of full Prescribing Information on the next page.

References: 1. Liu X, et al. *Proc Natl Acad Sci USA.* 2020;117(39):24285-24293. 2. AGAMREE (vamorolone) Oral Suspension [prescribing information]. Catalyst Pharmaceuticals, Inc.; 2024.

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Dosing Information

The recommended dosage of AGAMREE is 6 mg/kg taken orally once daily preferably with a meal, up to a maximum daily dosage of 300 mg for patients weighing more than 50 kg.

Some patients may respond to a dose of 2 mg/kg daily. Doses may be titrated down to 2 mg/kg/day as needed, based on individual tolerability.

Discontinuation

Dosage of AGAMREE must be decreased gradually if the drug has been administered for more than one week.

CONTRAINDICATIONS

AGAMREE is contraindicated in patients with known hypersensitivity to vamorolone or to any of the inactive ingredients of AGAMREE. Instances of hypersensitivity, including anaphylaxis, have occurred in patients receiving corticosteroid therapy.

WARNINGS AND PRECAUTIONS

Alterations in Endocrine Function

Corticosteroids, such as AGAMREE, can cause serious and life-threatening alterations in endocrine function, especially with chronic use. Monitor patients receiving AGAMREE for Cushing's syndrome, hyperglycemia, and adrenal insufficiency after AGAMREE withdrawal. In addition, patients with hypopituitarism, primary adrenal insufficiency or congenital adrenal hyperplasia, altered thyroid function, or pheochromocytoma may be at increased risk for adverse endocrine events.

Acute adrenal insufficiency can occur if AGAMREE is withdrawn abruptly, and could be fatal. The risk of adrenal insufficiency is reduced by gradually tapering the dose when withdrawing treatment. For patients already taking corticosteroids during times of stress, the dosage may need to be increased.

Immunosuppression and Increased Risk of Infection

Corticosteroids, including AGAMREE, suppress the immune system and increase the risk of infection with any pathogen, including viral, bacterial, fungal, protozoan, or helminthic pathogens. Corticosteroids can reduce resistance to new infections, exacerbate existing infections, increase the risk of disseminated infections, increase the risk of reactivation or exacerbation of latent infections, and mask some signs of infection. Corticosteroid-associated infections can be mild but can be severe, and at times fatal.

The rate of infectious complications increases with increasing corticosteroid dosages. Monitor for the development of infection and consider AGAMREE withdrawal or dosage reduction as needed.

Tuberculosis

If AGAMREE is used to treat a condition in patients with latent tuberculosis or tuberculin reactivity, reactivation of tuberculosis may occur. Closely monitor such patients for reactivation. During prolonged AGAMREE therapy, patients with latent tuberculosis or tuberculin reactivity should receive chemoprophylaxis.

Varicella Zoster and Measles Viral Infections

Varicella and measles can have a serious or even fatal course in non-immune patients taking corticosteroids, including AGAMREE. In corticosteroid-treated patients who have not had these diseases or are non-immune, particular care should be taken to avoid exposure to varicella and measles.

- If an AGAMREE-treated patient is exposed to varicella, prophylaxis with varicella zoster immunoglobulin may be indicated. If varicella develops, treatment with antiviral agents may be considered.
- If an AGAMREE-treated patient is exposed to measles, prophylaxis with immunoglobulin may be indicated.

Hepatitis B Virus Reactivation

Hepatitis B virus reactivation can occur in patients who are hepatitis B carriers treated with immunosuppressive dosages of corticosteroids, including AGAMREE Reactivation can also occur infrequently in corticosteroid-treated patients who appear to have resolved hepatitis B infection.

Screen patients for hepatitis B infection before initiating immunosuppressive (e.g., prolonged) treatment with AGAMREE. For patients who show evidence of hepatitis B infection, recommend consultation with physicians with expertise in managing hepatitis B regarding monitoring and consideration for hepatitis B antiviral therapy.

Fungal Infections

Corticosteroids, including AGAMREE, may exacerbate systemic fungal infections; therefore, avoid AGAMREE use in the presence of such infections unless AGAMREE is needed to control drug reactions. For patients on chronic AGAMREE therapy who develop systemic fungal infections, AGAMREE withdrawal or dosage reduction is recommended.

Amebiasis

Corticosteroids, including AGAMREE, may activate latent amebiasis. Therefore, it is recommended that latent amebiasis or active amebiasis be ruled out before initiating AGAMREE in any patients who have spent time in the tropics or patients with unexplained diarrhea.

Strongyloides Infestation

Corticosteroids, including AGAMREE, should be used with great care in patients with known or suspected Strongyloides (threadworm) infestation. In such patients, corticosteroid-induced immunosuppression may lead to Strongyloides hyperinfection and dissemination with widespread larval migration, often accompanied by severe enterocolitis and potentially fatal gram-negative septicemia.

Cerebral Malaria

Avoid corticosteroids, including AGAMREE, in patients with cerebral malaria.

Alterations in Cardiovascular/Renal Function

Corticosteroids, including AGAMREE, can cause elevation of blood pressure, salt and water retention, and increased excretion of potassium and calcium.

Monitor blood pressure and assess for signs and symptoms of volume overload. Monitor serum potassium levels.

AGAMREE should be used with caution in patients with congestive heart failure, hypertension, or renal insufficiency. Literature reports suggest an association between use of corticosteroids and left free wall rupture after a recent myocardial infarction; therefore, therapy with AGAMREE should be used with great caution in these patients.

Gastrointestinal Perforation

There is an increased risk of gastrointestinal perforation with the use of corticosteroids in patients with certain gastrointestinal disorders, such as active or latent peptic ulcers, diverticulitis, fresh intestinal anastomoses, and non-specific ulcerative colitis. Signs of gastrointestinal perforation, such as peritoneal irritation, may be masked in patients receiving corticosteroids.

Avoid AGAMREE if there is a probability of impending perforation, abscess, or other pyogenic infections; diverticulitis; fresh intestinal anastomoses; or active or latent peptic ulcer.

Behavioral and Mood Disturbances

Potentially severe psychiatric adverse reactions may occur with systemic corticosteroids, including AGAMREE. Symptoms typically emerge within a few days or weeks of starting treatment and may be dose-related. These reactions may improve after either dose reduction or withdrawal, although pharmacologic treatment may be necessary.

Inform patients or caregivers of the potential for behavioral and mood changes and encourage them to seek medical attention if psychiatric symptoms develop, especially if depressed mood or suicidal ideation is suspected.

Effects on Bones

Decreased Bone Mineral Density

Corticosteroids, such as AGAMREE, decrease bone formation and increase bone resorption both through their effect on calcium regulation (i.e., decreasing absorption and increasing excretion) and inhibition of osteoblast function. This, together with a decrease in the protein matrix of the bone secondary to an increase in protein catabolism and reduced sex hormone production, may lead to inhibition of bone growth in pediatric patients and the development of bone loss at any age. Bone loss can predispose patients to vertebral and long bone fractures.

Consider a patient's risk of osteoporosis before initiating corticosteroid therapy. Monitor bone mineral density in patients on long-term treatment with AGAMREE.

Avascular Necrosis

Corticosteroids may cause avascular necrosis.

Ophthalmic Effects

The use of corticosteroids, such as AGAMREE, may produce posterior subcapsular cataracts. Corticosteroids may also cause glaucoma with possible damage to the optic nerves, and may increase the risk of secondary ocular infections caused by bacteria, fungi, or viruses. Corticosteroids are not recommended for patients with active ocular herpes simplex. Intraocular pressure may become elevated in some patients taking corticosteroids. If treatment with AGAMREE is continued for more than 6 weeks, monitor intraocular pressure.

Immunizations

Administer all immunizations according to immunization guidelines prior to starting AGAMREE. Administer live-attenuated or live vaccines at least 4 to 6 weeks prior to starting AGAMREE. Patients on AGAMREE may receive concurrent vaccinations, except for live-attenuated or live vaccines.

Effects on Growth and Development

Long-term use of corticosteroids, including AGAMREE, can have negative effects on growth and development in children.

Myopathy

Patients receiving corticosteroids and concomitant therapy with neuromuscular blocking agents (e.g., pancuronium) or patients with disorders of neuromuscular transmission (e.g., myasthenia gravis) may be at increased risk of developing acute myopathy. This acute myopathy is generalized, may involve ocular and respiratory muscles, and may result in quadriparesis. Clinical improvement or recovery after stopping corticosteroids may require weeks to years.

Kaposi's Sarcoma

Kaposi's sarcoma has been reported to occur in patients receiving corticosteroid therapy, most often for chronic conditions. Discontinuation of corticosteroids may result in clinical improvement of Kaposi's sarcoma.

Thromboembolic Events

Observational studies have shown an increased risk of thromboembolism (including venous thromboembolism) particularly with higher cumulative doses of corticosteroids. It is unclear if risk differs by daily dose or duration of use. Use AGAMREE with caution in patients who have or may be predisposed to thromboembolic disorders.

Anaphylaxis

Rare instances of anaphylaxis have occurred in patients receiving corticosteroid therapy.

ADVERSE REACTIONS

The following serious adverse reactions are discussed in more detail in other sections:

- Alterations in Endocrine Function
- Immunosuppression and Increased Risk of Infection
- Alterations in Cardiovascular/Renal Function
- Gastrointestinal Perforation
- Behavioral and Mood Disturbances
- Effects on Bones
- Ophthalmic Effects
- Immunizations
- Effects on Growth and Development
- Myopathy
- Kaposi's Sarcoma
- Thromboembolic Events
- Anaphylaxis

Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

Common Adverse Reactions in Clinical Studies

Table 1 lists the adverse reactions that occurred in ≥5% of the patients treated with AGAMREE 6 mg/kg/day (N=28) or AGAMREE 2 mg/kg/day (N=30) and that occurred more frequently than in the patients who received placebo (N=29) in Study 1, which was 24 weeks and included patients with DMD between the ages of 4 and 7 years.

Table 1: Adverse Reactions in Patients with DMD that Occurred in ≥5% of Patients Treated with AGAMREE and More Frequently than in Patients Who Received Placebo During 24 Weeks (Study 1)

Adverse Reaction	AGAMREE 2 mg/kg/d (N=30) %	AGAMREE 6 mg/kg/d (N=28) %	Placebo (n=29) %
Cushingoid features	7	29	0
Psychiatric disorders[1]	7	21	14
Vomiting	17	14	7
Weight increased	0	11	3
Vitamin D deficiency	7	11	0
Cough	10	7	3
Headache	7	7	3
Diarrhea	3	7	3
Increased appetite	3	7	3
Rhinitis	3	7	3

[1]Includes the following adverse reactions that occurred more frequently in the AGAMREE group than in placebo: abnormal behavior, aggression, agitation, anxiety, irritability, mood altered, sleep disorder, and stereotypy.

In a separate open-label safety study of pediatric patients aged 2 to less than 4 years (n=16) and pediatric patients aged 7 to less than 18 years (n=16) with DMD, adverse reactions were similar to those seen in the Study 1 pediatric patients.

DRUG INTERACTIONS

Effect of Other Drugs on Vamorolone

Co-administration of AGAMREE with itraconazole, a strong CYP3A4 inhibitor, increases vamorolone exposure. Reduce the dosage of AGAMREE in patients when strong CYP3A4 inhibitors are used concomitantly. No dosage adjustments are required when AGAMREE is concomitantly administered with moderate or weak CYP3A4 inhibitors.

USE IN SPECIFIC POPULATIONS

Pregnancy

Risk Summary

AGAMREE is indicated for use for the treatment of DMD, which is a disease of young male patients. However, corticosteroids in general should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. Infants born to mothers who have received substantial doses of corticosteroids during pregnancy should be carefully observed for signs of hypoadrenalism. There are no data on the use of AGAMREE during pregnancy. Animal reproduction studies have not been conducted with AGAMREE.

Lactation

Risk Summary

There are no data on the presence of vamorolone in human milk or the effects on milk production.

AGAMREE is indicated for use for the treatment of DMD, which is a disease of young male patients. However, systemically administered corticosteroids appear in human milk and could suppress growth, interfere with endogenous corticosteroid production, or cause other untoward effects. The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need and any potential adverse effects on the breastfed infant.

Pediatric Use

The safety and effectiveness of AGAMREE for the treatment of DMD have been established in patients 2 years of age and older. Use of AGAMREE in pediatric patients is supported by a multicenter, randomized, double-blind, placebo- and active-controlled study in 121 males 4 to less than 7 years of age. Use of AGAMREE in patients 2 years to less than 4 years of age and 7 to less than 18 years of age is supported by findings of efficacy and safety in patients 4 to less than 7 years of age with DMD, and by pharmacokinetic and safety data from patients 2 to 4 years of age and 7 to less than 18 years of age.

The safety and effectiveness in pediatric patients below the age of 2 years have not been established.

Geriatric Use

DMD is largely a disease of children and young adults; therefore, there is no geriatric experience with AGAMREE.

Hepatic Impairment

Moderate hepatic impairment increases vamorolone exposure. Reduce the AGAMREE dosage in patients with mild to moderate hepatic impairment. There is no clinical experience with AGAMREE in patients with severe hepatic impairment, and a dosing recommendation cannot be provided for patients with severe hepatic impairment.

CLINICAL PHARMACOLOGY

Mechanism of Action

Vamorolone is a corticosteroid that acts through the glucocorticoid receptor to exert anti-inflammatory and immunosuppressive effects. The precise mechanism by which vamorolone exerts its effect in patients with DMD is unknown.

Pharmacodynamics

Vamorolone produced a dose-dependent decrease in morning cortisol levels in the clinical studies. Treatment with corticosteroids is associated with a suppression of endogenous cortisol concentrations and an impairment of the hypothalamus-pituitary-adrenal (HPA) axis function. A dose-dependent increase in leukocyte counts and lymphocyte counts was observed in clinical studies with vamorolone.

Cardiac Electrophysiology

Vamorolone does not cause a mean increase in the QTc interval >20 milliseconds (ms) at 1.6 times the approved recommended dose.

See full Prescribing Information available at AGAMREEhcp.com.

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FUTURE MEETINGS

2025 AANEM Annual Meeting

Oct. 29 - Nov. 1
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2026 AANEM UltraEMG

March 18 - 21
San Diego, California

2026 AANEM Annual Meeting

Sept. 30 - Oct. 3
Orlando, Florida