

2024 PN Summer education Series

WEBINARS | JULY 9 | JULY 12 | JULY 17 | JULY 25 | JULY 31 | AUG 1

Thank you for joining us! *We will begin shortly.*

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Unraveling the Basics: ***Introduction to*** Peripheral Neuropathy

Thank you for joining us!



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Moderator:

April Hubert

*Director of Development and External Affairs
the Foundation for Peripheral Neuropathy*

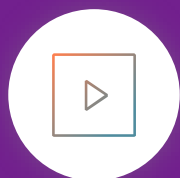


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Before We Begin



This presentation is being recorded. The recording link will be emailed to you and posted on the FPN website in the coming days.



Submit your questions anytime via the Questions Box. We will try to answer as many as we can.

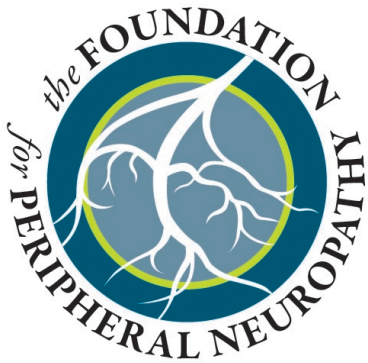


Audio issues? You can dial in by phone (check your email for dial-in instructions).



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Guest Speaker:
Vanessa Tiongson, MD
Assistant Professor
Mount Sinai Hospital



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Unraveling the Basics: Introduction to Peripheral Neuropathy

Lecture by: Vanessa Tiongson



What is peripheral neuropathy?

Neuro - means nerve or nervous system

Pathy comes from pathos - suffix meaning disease

Disease of the nerves

What is the Nervous System?

The Command Center

Observes what is going on
inside and outside the body

Commands the body on how
to respond



Parts of the Nervous System

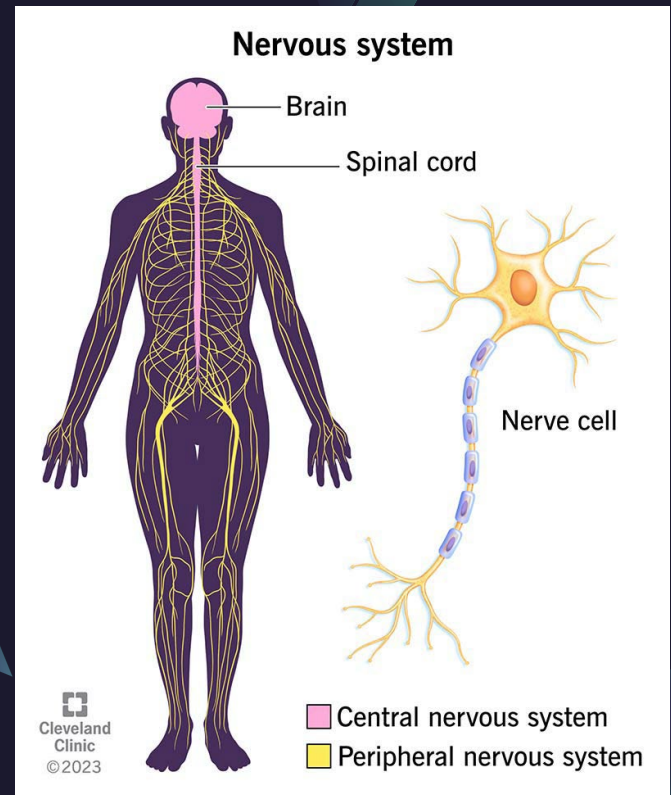
Central Nervous System

Brain

Spinal Cord

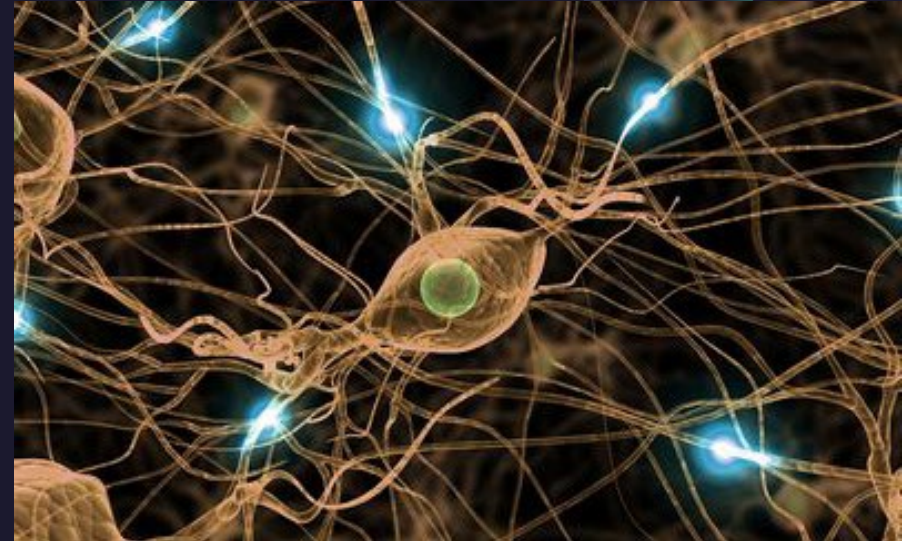
Peripheral Nervous System

Nerves that travel between the brain and spinal cord into the rest of the body

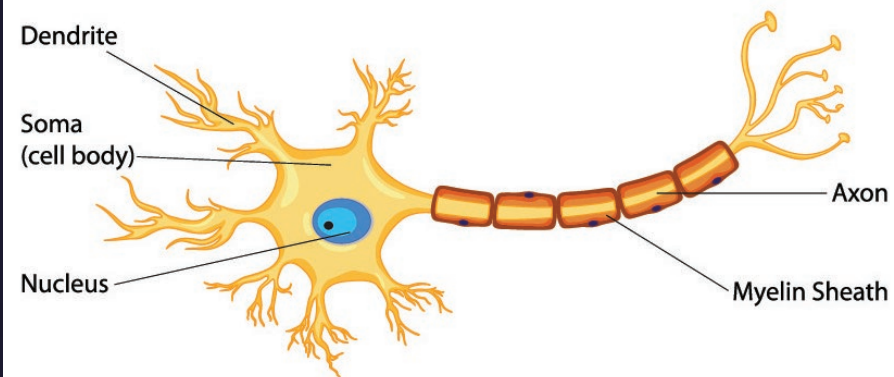


What is a nerve?

- A bunch of fibers that conducts electrical signals between the brain and the rest of the body
- They provide the inputs and the outputs to the central nervous system

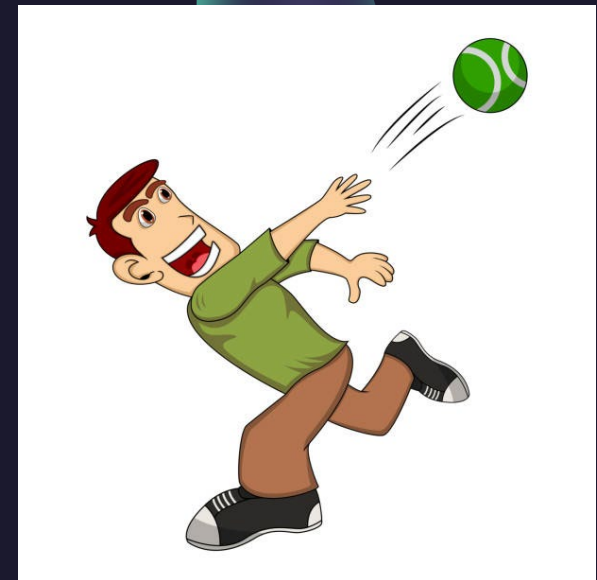


Nerve Cell



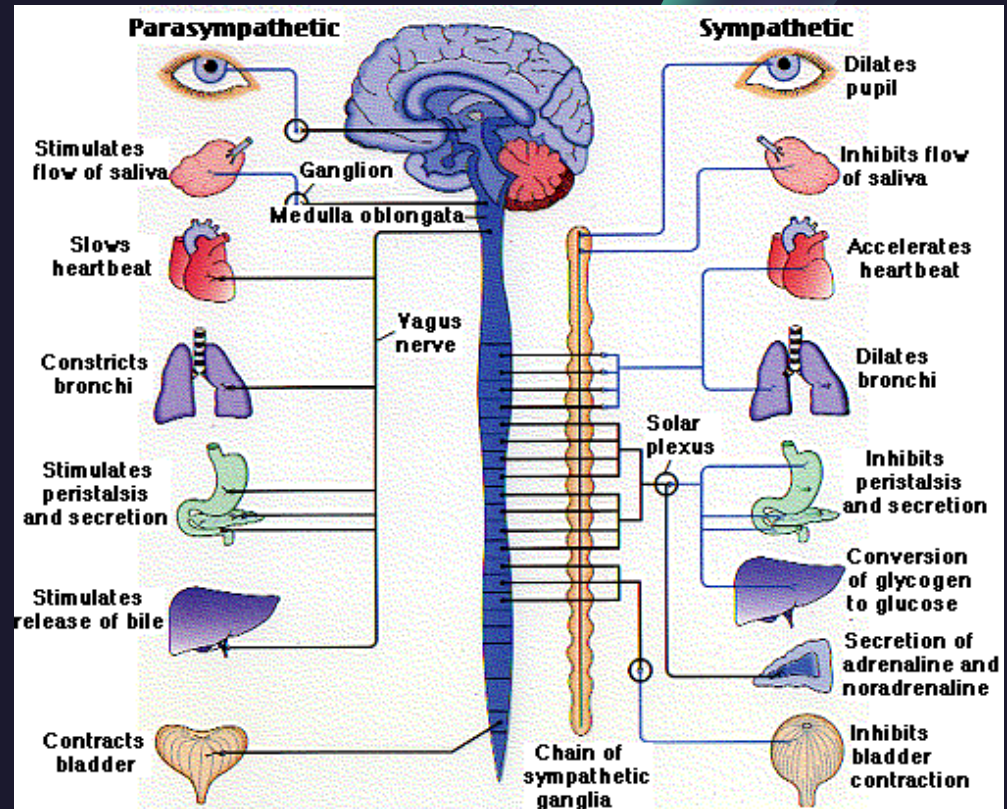
Parts of the Peripheral Nervous System

- Somatic Nervous System
 - Sensory nerves
 - Touch
 - Position in space
 - Pain
 - Temperature
 - Motor nerves
 - Movement of muscles



Parts of the Peripheral Nervous System

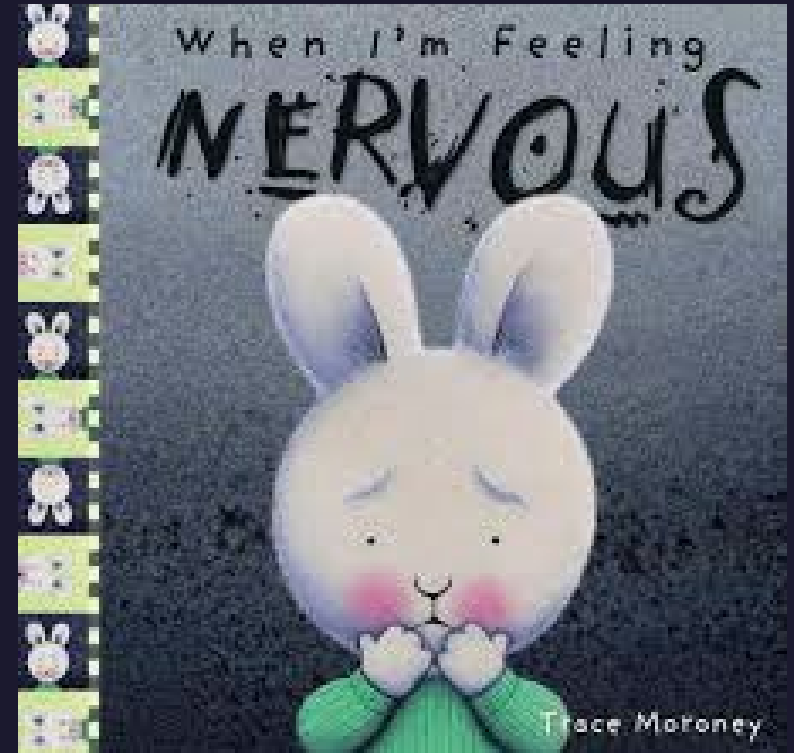
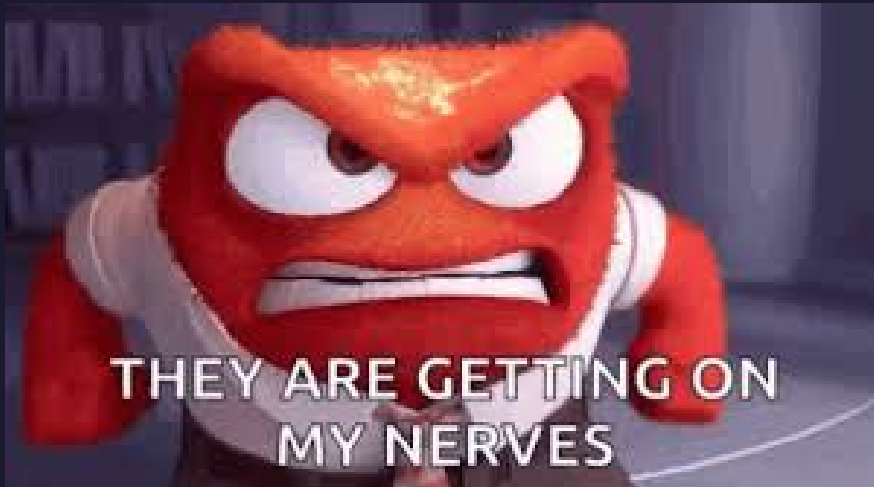
- Autonomic Nervous System
 - Sympathetic Nervous System
 - Fight or flight response
 - Parasympathetic Nervous System
 - Rest and digest





What happens when something goes wrong with the peripheral nervous system? What happens when these nerves get damaged?

What is not usually related
to the Peripheral
Neuropathy?



Signs and Symptoms of Peripheral Neuropathy

Disease of the Somatic Nervous System

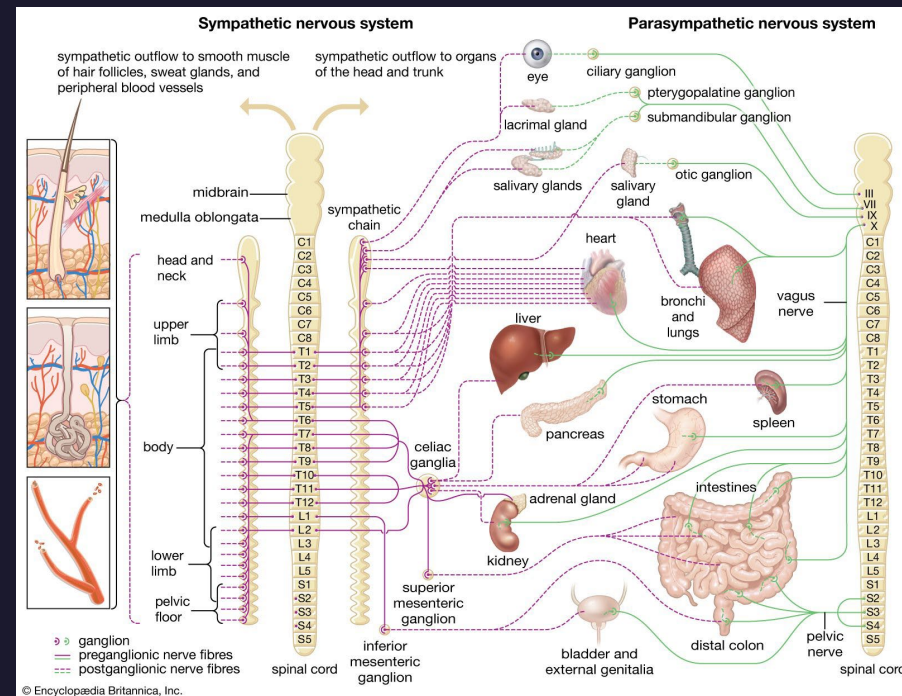
- Sensory nerves
 - Large fibers
 - Imbalance
 - Numbness
 - Tingling
 - Small fibers
 - Burning
 - Hypersensitivity
 - Allodynia



Signs and Symptoms of Peripheral Neuropathy

Disease of the Autonomic Nervous System

- Dizziness
- High heart rate, Low heart rate
- Constipation, Diarrhea
- Sweating, tearing, urinating, salivating





**Wait but
WHY?!**

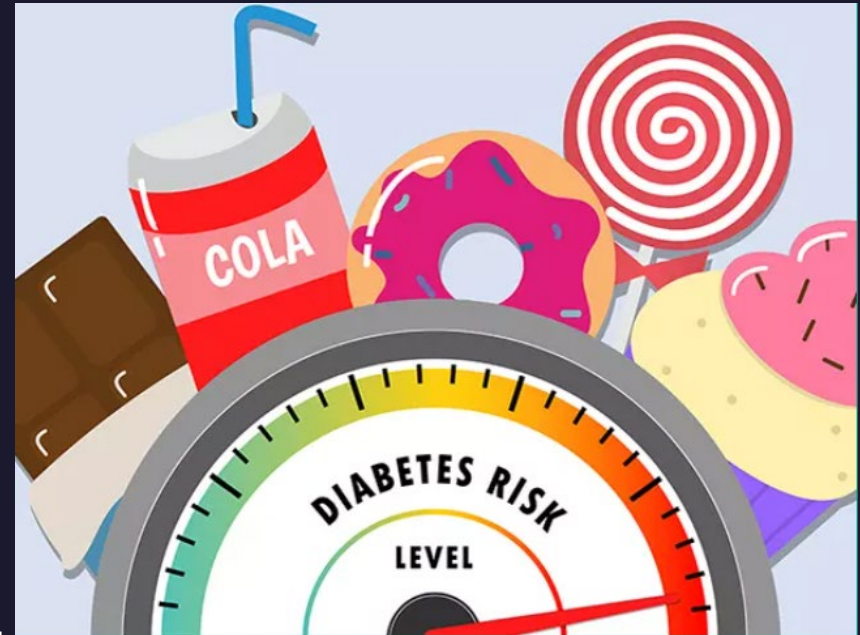
Causes of Neuropathy

- Diabetes mellitus
- Diabetes mellitus
- Diabetes mellitus
- Diabetes mellitus

More frequent and severe the longer you have had diabetes.

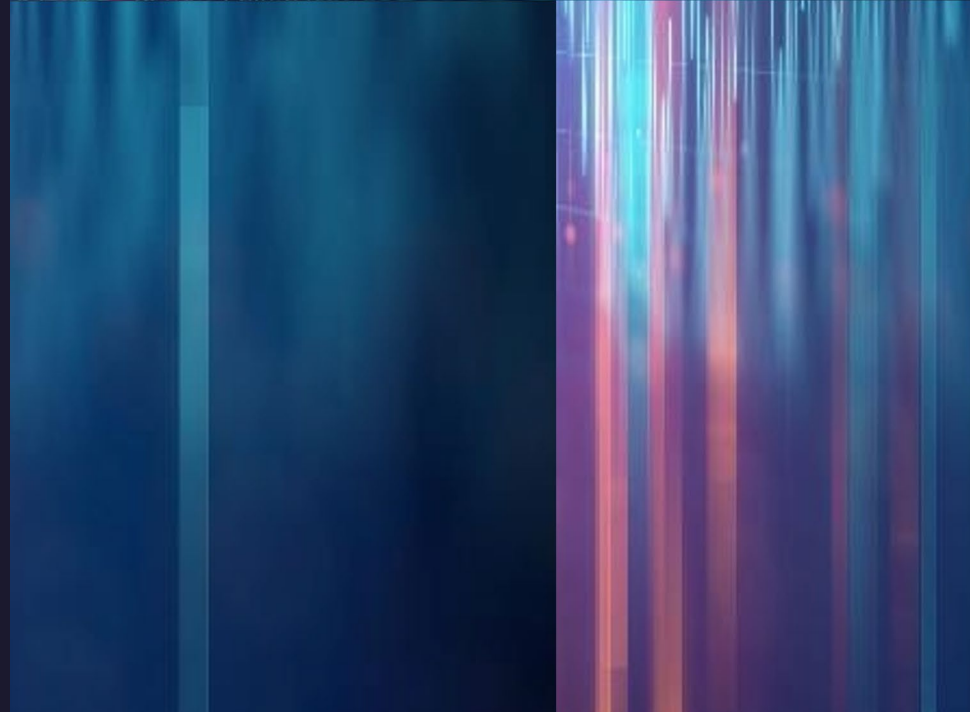
Present in 25-50% of patients

Worsened by big fluctuations in glucose





What are Other Causes of Neuropathy?



Causes of Neuropathy

Vitamin Deficiencies

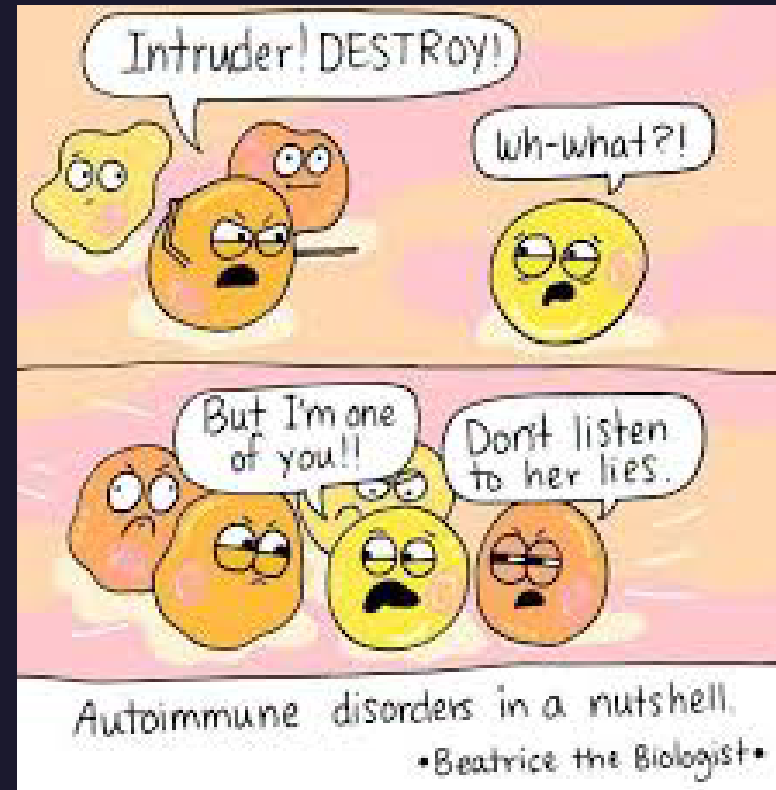
- Vitamin B12
- Vitamin B6 (also in excess)
- Copper
- Folate
- Thiamine
- Vitamin E
- Zinc (can contribute to copper def)



Causes of Neuropathy

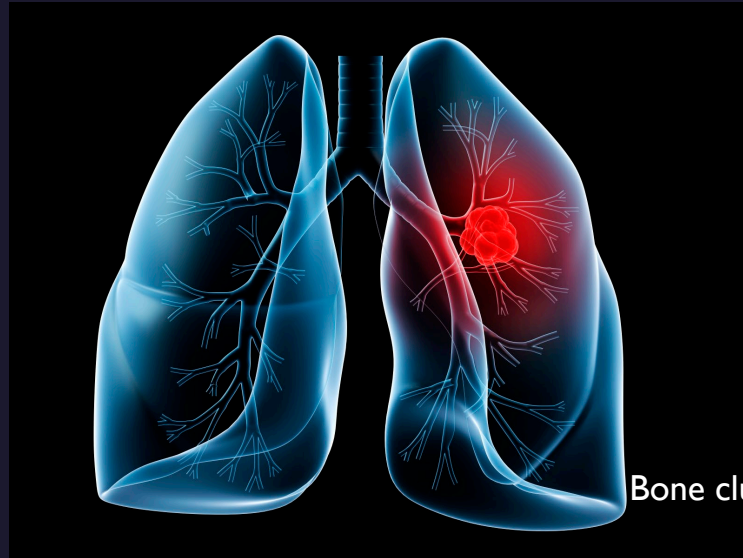
Autoimmune Diseases

- Acute Inflammatory Demyelinating Polyneuropathy (Guillain Barre Syndrome)
- Chronic Inflammatory Demyelinating Polyneuropathy (CIDP)
- Lupus (Systemic lupus erythematosus)
- Rheumatoid Arthritis
- Sjogren's Syndrome
- Celiac disease
- Sarcoidosis

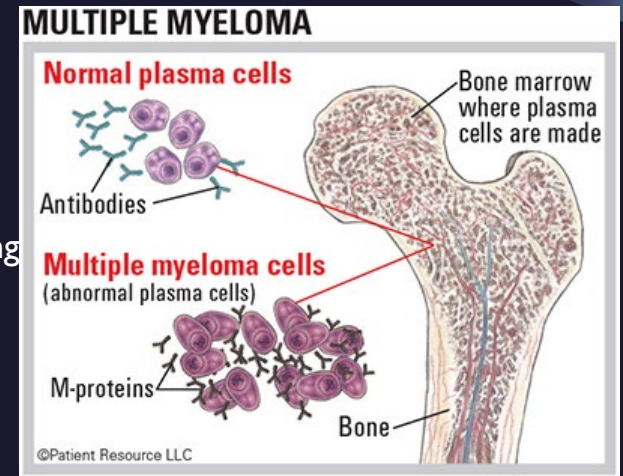


Some Cancers

- Multiple Myeloma
- Lung Cancer
- Lymphoma



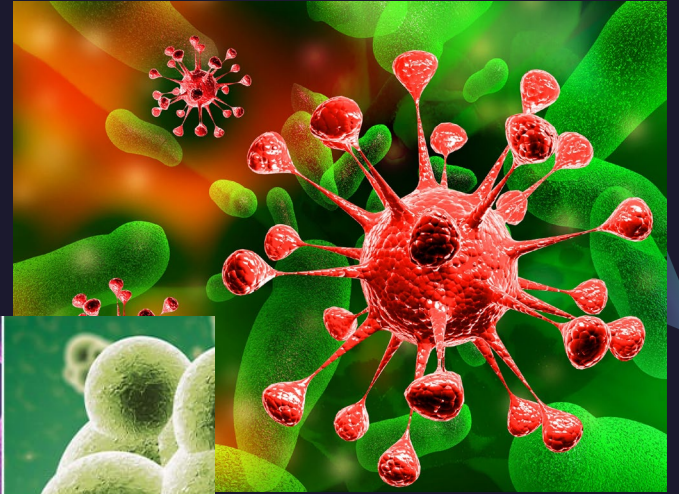
Bone clung



Causes of Neuropathy

Infectious Diseases

- Lyme Disease
- HIV
- HTLV
 - Shingles
 - Leprosy



Causes of Neuropathy

Medications

- Some antibiotics
- Some chemotherapy medications

Toxins

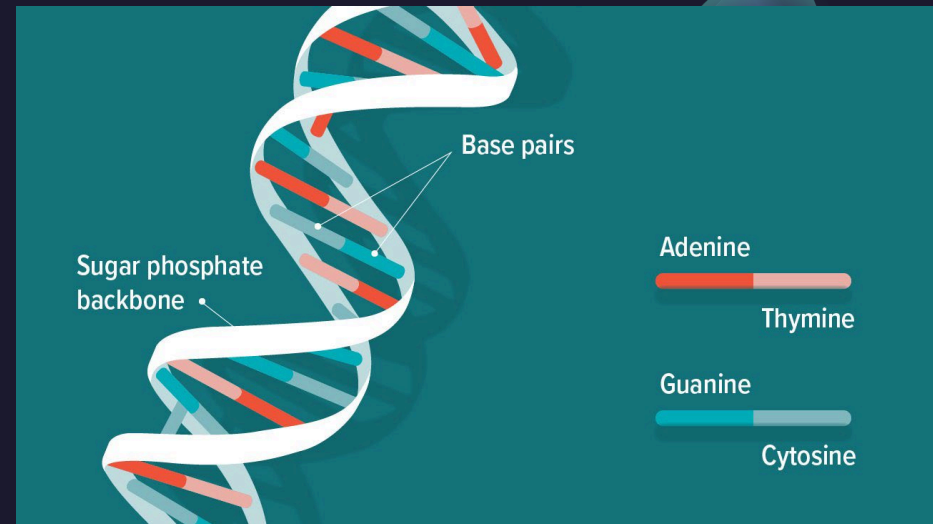
- **Alcohol**
- Mercury
- Lead



Causes of Neuropathy

Genetics

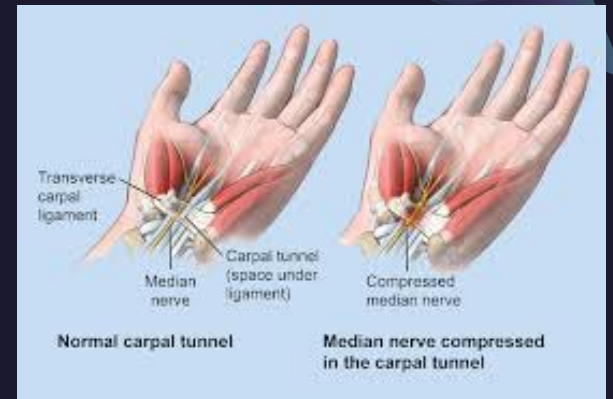
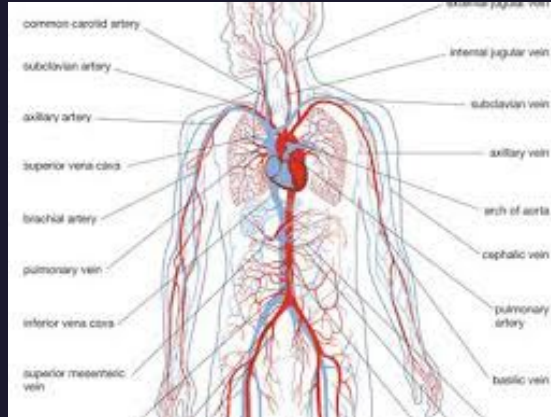
- Charcot Marie Tooth
- Hereditary Neuropathy with Liability to Pressure Palsies
- Hereditary Transthyretin Amyloidosis



Causes of Neuropathy

Local Injury to Nerve

- Trauma
- Vascular disease
- Nerve compression



Idiopathic Neuropathy

- Fancy way of saying I don't know
- 25% to 46% of cases, the cause is not determined



How Do We Diagnose Neuropathy

Neurological Evaluation

- Are your symptoms due to neuropathy vs other disease? – central nervous system disease
- What type of neuropathy do you have? – distribution, sensory vs motor, axonal vs demyelinating, etc.
- What could be the cause? This can help determine treatment!



How Do We Diagnose Neuropathy

History from the Patient

- Numbness, Tingling, Burning
- Electric Sensations
- Weakness
- Balance disturbance
- Exacerbating Factors - Inactivity, Sleeping
- Timeline
- Medical History
- Family History
- Medications (especially new ones)
- Toxic Exposures



How Do We Diagnose Neuropathy

Neurological Examination

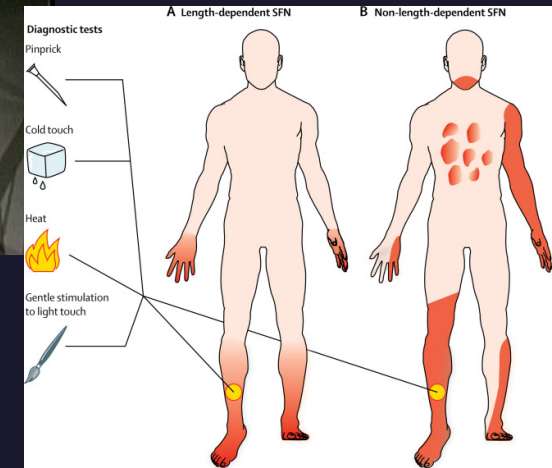
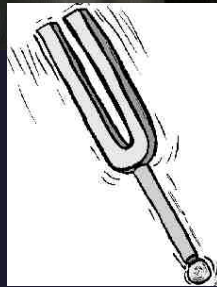
The examination for a neurologist is important!

Helps determine potential source of problem - central nervous system versus peripheral nervous system

How Do We Diagnose Neuropathy

Examination

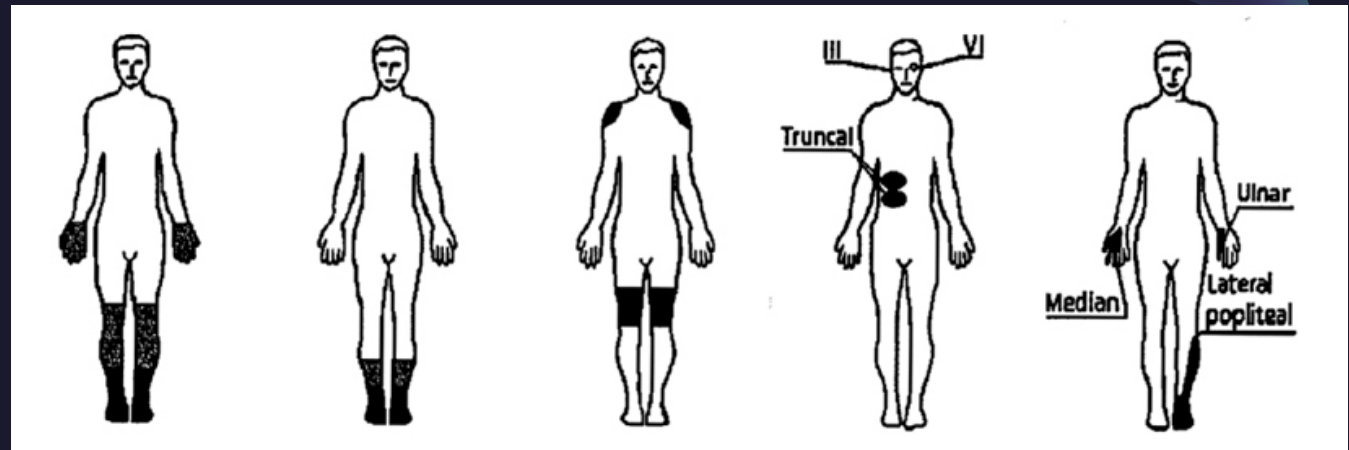
- Strength
 - Muscle Weakness
- Sensation
 - Decreased sensation
 - Hypersensitivity
 - Allodynia
- Reflexes
 - Decreased



How Do We Diagnose Neuropathy

Patterns of Neuropathy

- Focal
- Multifocal
- Distal Symmetric



How Do We Diagnose Neuropathy

Autonomic Involvement

- Diabetes
- Guillain Barre Syndrome
- Hereditary transthyretic amyloidosis
- Paraneoplastic neuropathies
- Lymphoma

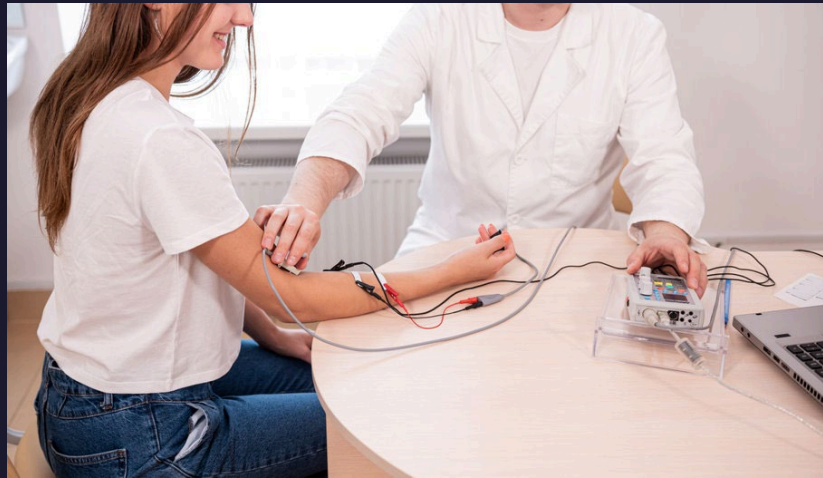


How Do We Diagnose Neuropathy

Nerve Conduction Studies and Electromyography

Test evaluating nerve and muscle function

Performed primarily on distal the upper and lower extremities

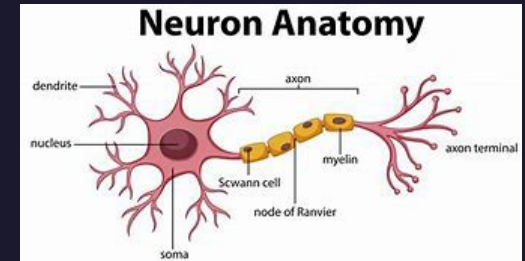


How Do We Diagnose Neuropathy

Nerve Conduction Studies and Electromyography

What information does the doctor get from this test?

- Can confirm the presence of a large fiber polyneuropathy
- Can also test for locally “pinched” nerves – carpal tunnel syndrome, lumbar radiculopathy
- Can determine type of neuropathy – axonal versus demyelinating
- Can assess severity
- The completion of this test might not have all the answers but is helpful



How Do We Diagnose Neuropathy

Nerve Conduction Studies and Electromyography

Possible Complications

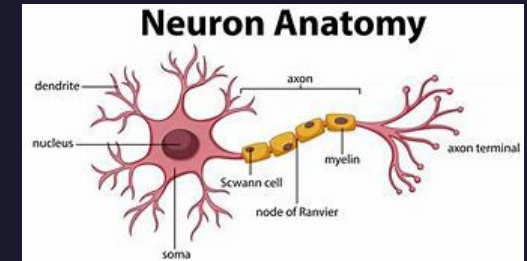
- Discomfort
- Bleeding
- Technically risk of infection due to presence of needle (needles are sterile)
- Muscle aches
- Should be able to go about your day normally after testing

How Do We Diagnose Neuropathy

Nerve Conduction Studies and Electromyography

How to prepare

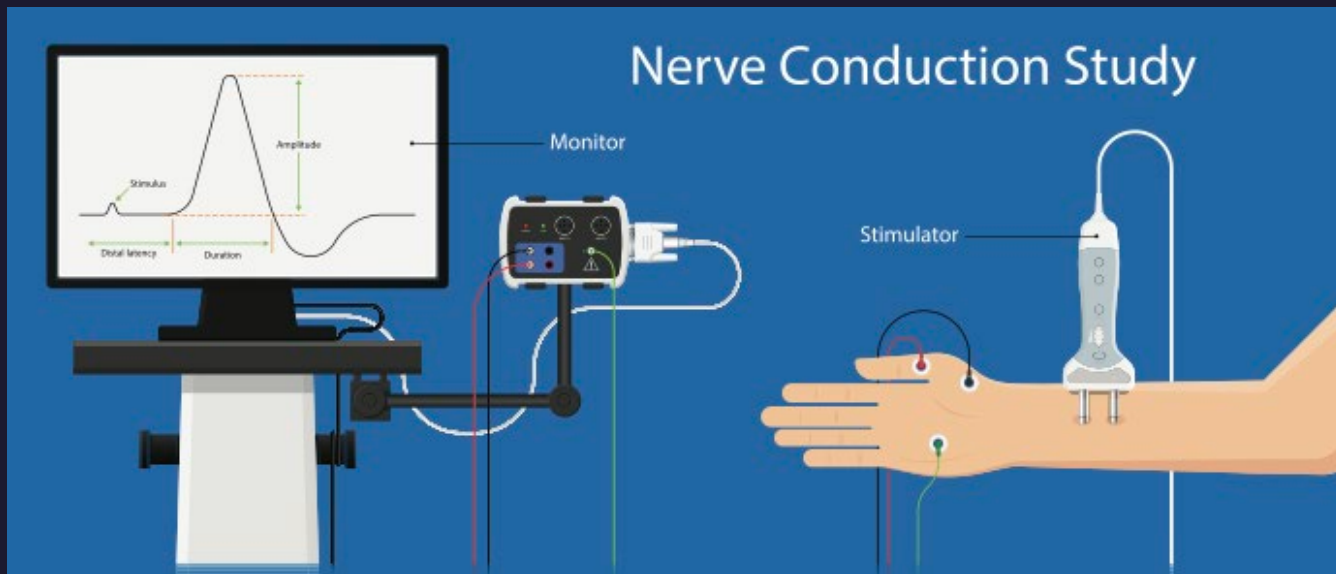
- Ask your physician
- Shower before the test
- Do not wear lotion or other moisturizing agents
- Take medications as usual unless directed by physician
- Inform physician if you are on blood thinners, have a bleeding disorder, or have a pacemaker



How Do We Diagnose Neuropathy

Nerve Conduction Studies and Electromyography

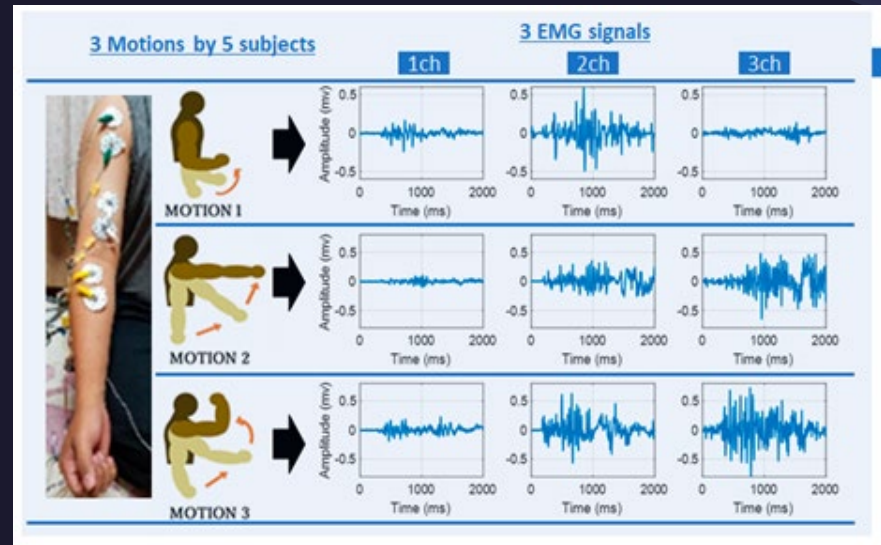
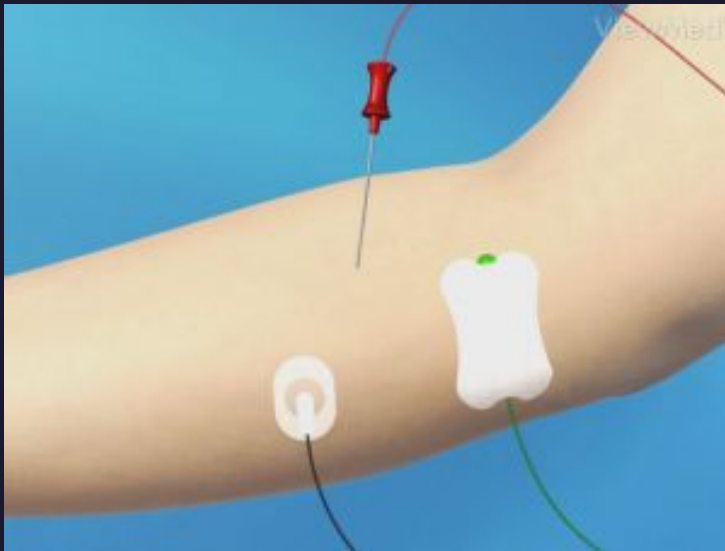
Extension of our physical exam



How Do We Diagnose Neuropathy

Nerve Conduction Studies and Electromyography

Extension of our physical exam



How Do We Diagnose Neuropathy

Nerve Conduction Studies and Electromyography

Is it painful?



This is a not a comfortable test, but discomfort is usually minor

Nerve Conduction Studies – usually annoying, static sensation, not that uncomfortable unless your nerves are very hypersensitive

Electromyography – it is a small needle – thinner than a blood draw needle but a little thicker than an acupuncture needle, the prick is not that bad but the activation of the muscle with the needle in is painful

How Do We Diagnose Neuropathy

Nerve Conduction Studies and Electromyography

- Done by a physician (usually neurologist or physiatrist) with or without a technologist
- Usually takes around 60 minutes but significant variability
- Your nerves may need to be warmed with warm water or heating pads if cold
- May need to change into a hospital gown
- Physician may tell you preliminary results
- Physician will send the report to the referring physician if it was not ordered by physician themselves

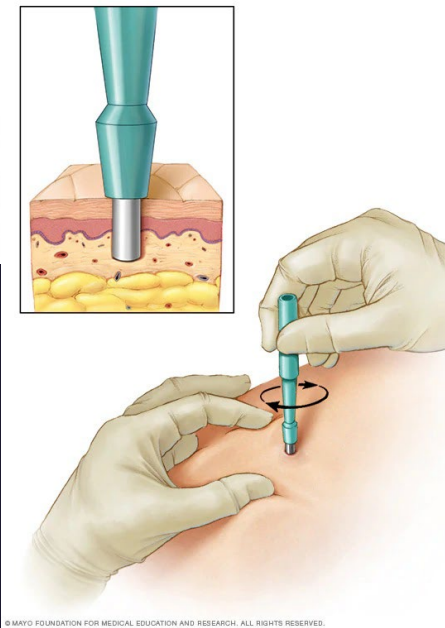
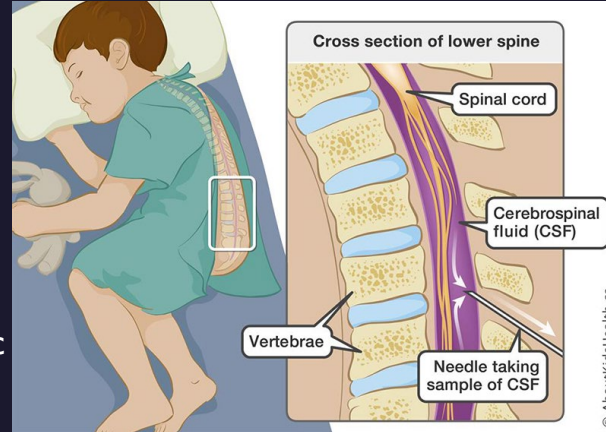
Other Diagnostic Testing to Consider

- Blood Tests
 - Highest yield testing: tests for diabetes, Vitamin deficiencies, tests to rule out multiple myeloma
 - Additional tests depending on characteristics and risk factors
- Genetic Testing
 - Can be saliva, buccal, or blood sample
 - Requires counseling due to potential implications for family



Other Diagnostic Testing to Consider

- Spinal Tap
 - May be considered depending on time course and EMG results
 - Useful for diagnosing CIDP, paraneoplastic syndromes
- Skin Biopsy
 - Can be part of evaluation for small fiber neuropathy
 - Sent when concern for amyloidosis
- Nerve Biopsy



Thank you

Vanessa Tiongson

Attending Physician at Mount Sinai Hospital



References

1. Castelli G, Desai KM, Cantone RE. Peripheral Neuropathy: Evaluation and Differential Diagnosis. Am Fam Physician. 2020 Dec 15;102(12):732-739. PMID: 33320513.
2. Novello BJ, Pobre T. Electrodiagnostic Evaluation of Peripheral Neuropathy. 2023 Jan 30. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan—. PMID: 33085316.
3. Video from the AANEM: What to Expect During Nerve Conduction Study and EMG Test
<https://www.youtube.com/watch?v=GalU9SWiYic>
4. Vinik AI, Strotmeyer ES, Nakave AA, Patel CV. Diabetic neuropathy in older adults. Clinics in Geriatric Medicine. 2008 Aug;24(3):407-35, v. DOI: 10.1016/j.cger.2008.03.011. PMID: 18672180; PMCID: PMC2706706.



Questions?



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Please consider a \$25 donation to fund this series and future programing.



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next up

Holistic Treatment Options for
Peripheral Neuropathy

Did you like this webinar? Please take our survey at the end of this webinar. A recording will be uploaded on our website at FoundationForPN.org shortly.

Support FPN! If you have not already, please consider making a \$25 gift to help fulfill our mission of improving the lives of those with peripheral neuropathy. Give securely using the QR code:

Anything else? 847-883-9942 info@tffpn.org
485 E. Half Day Road, Suite 350, Buffalo Grove, Illinois 60089.



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The rest of the summer series:

- Friday, July 12, 2pm CT | 3pm ET: **Holistic Treatment Options for Peripheral Neuropathy**
- Wednesday, July 17, 11am CT | 12pm ET: **Addressing the Emotional Impact: Coping with Peripheral Neuropathy**
- Thursday, July 25, 7pm CT | 8pm ET: **Living with Peripheral Neuropathy: Real Stories of Resilience and Hope**
- Wednesday, July 31, 6pm CT | 7pm ET: **Living Well with Peripheral Neuropathy: Enhancing Quality of Life**
- Thursday, August 1, 11am CT | 12pm ET: **Empower Your Voice: Advocating for Peripheral Neuropathy**



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