

# Latest Treatments for Aching Nerve Damage:

*Understanding Peripheral Neuropathy*

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- Peripheral nervous system=the nerves outside of the spinal cord
- Central nervous system=brain and spinal cord
- Peripheral nerves include motor (go to muscles), sensory (carry sensations), and autonomic (carry out involuntary/reflexive functions like blood pressure, sweating, digestion, heart rate, breathing)

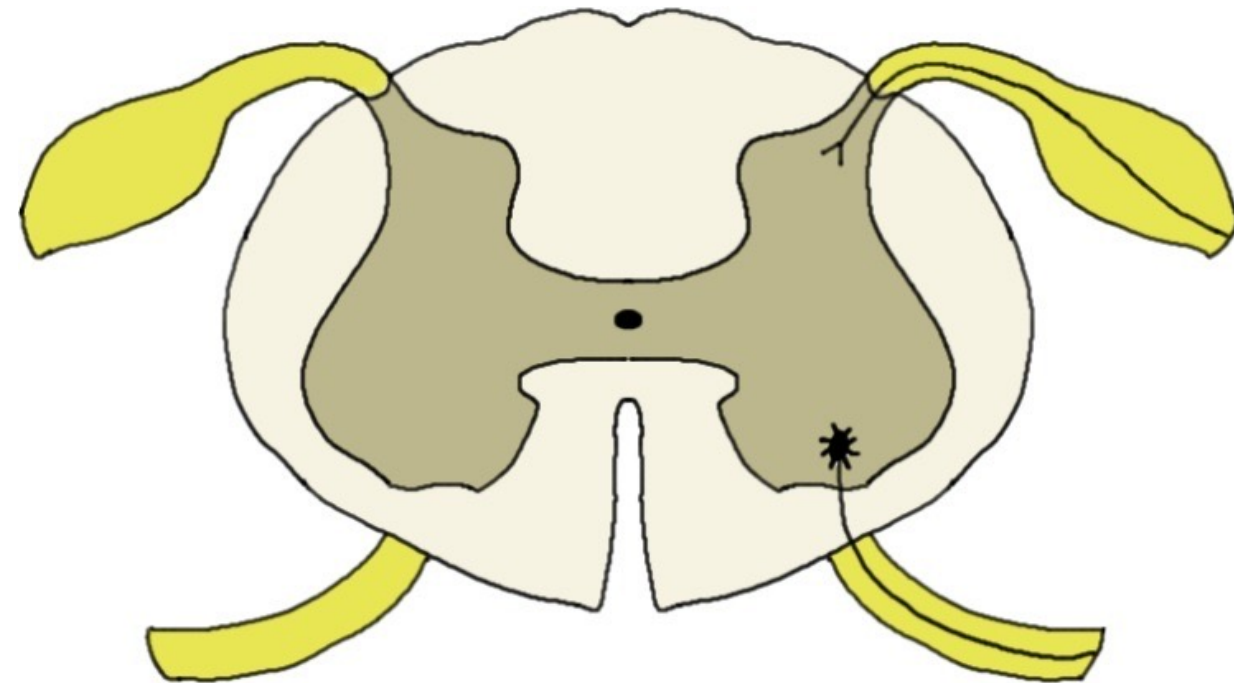
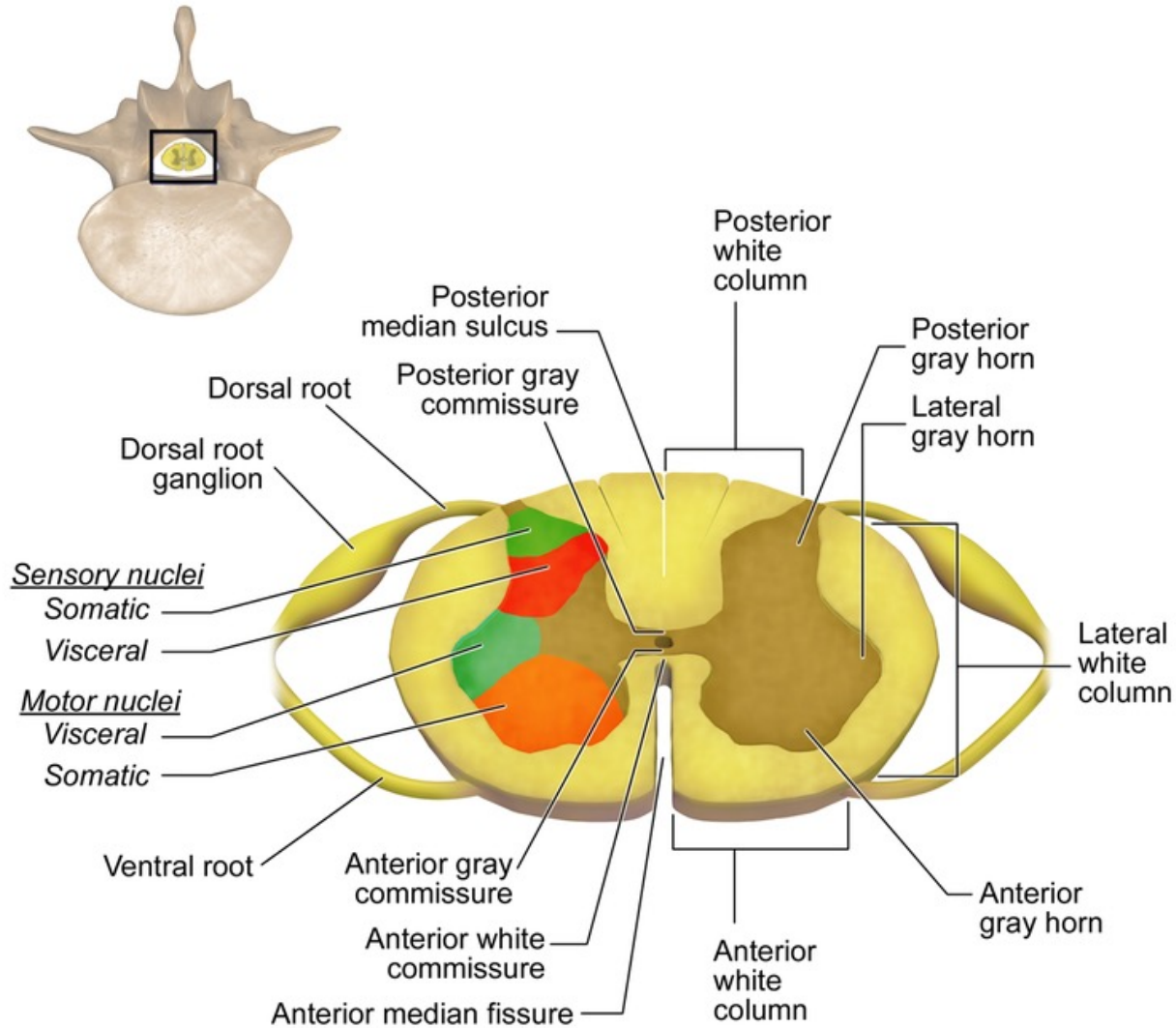
- Neuropathy=abnormal (pathologic) nerves
- Peripheral neuropathy (PN)=abnormal nerves of the peripheral nervous system.
- PN applies to a large number of conditions in which the site of pathology is confined to the peripheral nervous system.
- There can be involvement of the central nervous system (CNS) in addition to the peripheral nervous system (PNS), but diseases of the CNS are never called peripheral neuropathy.
- Examples of CNS diseases are stroke, Parkinson's disease, and multiple sclerosis.

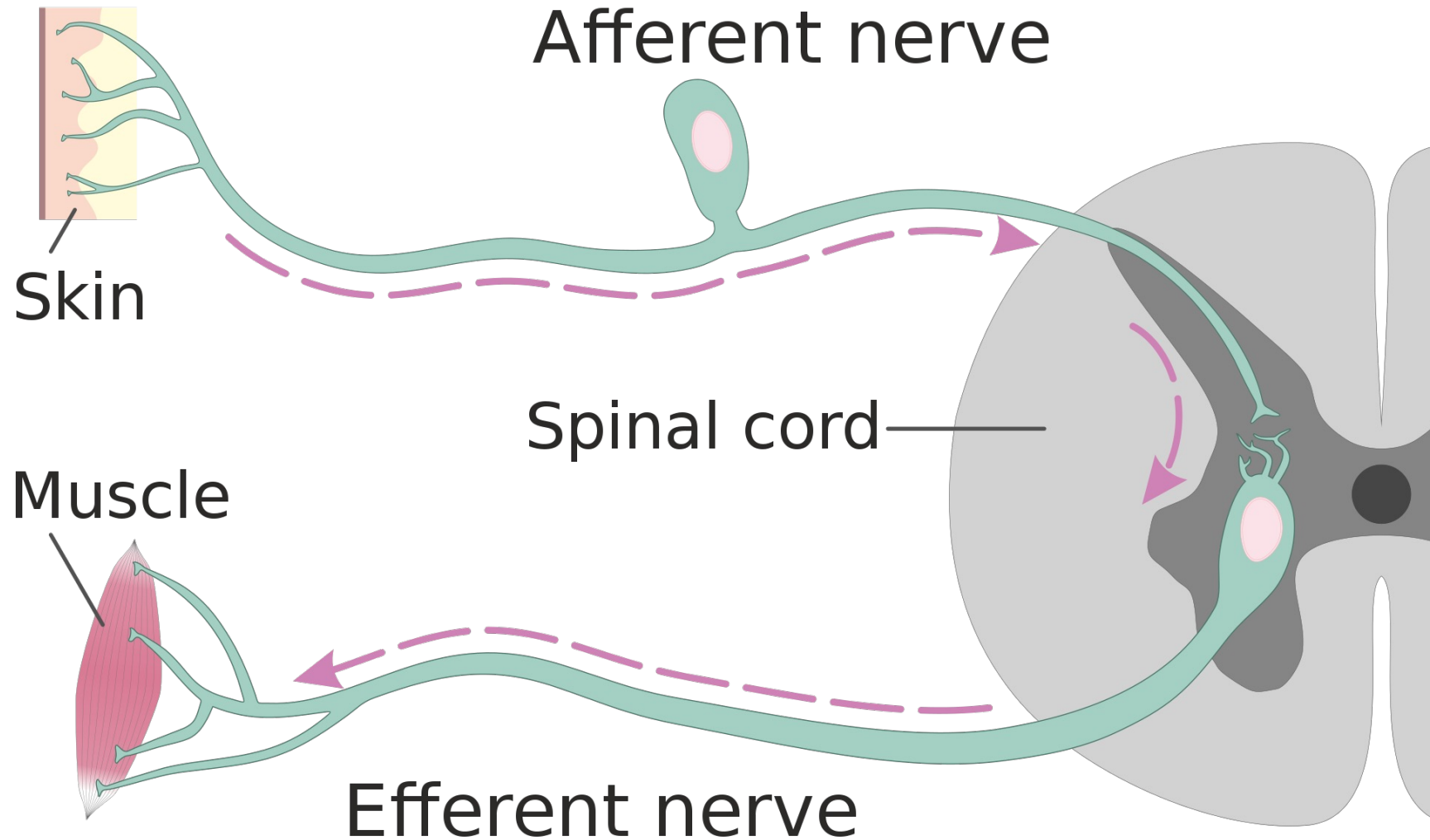
- Afferent nerve=a nerve that carries signals into the CNS. These are our sensory nerves.
- Efferent nerve=a nerve that carries signal from the CNS into the body. An example is our motor nerves.





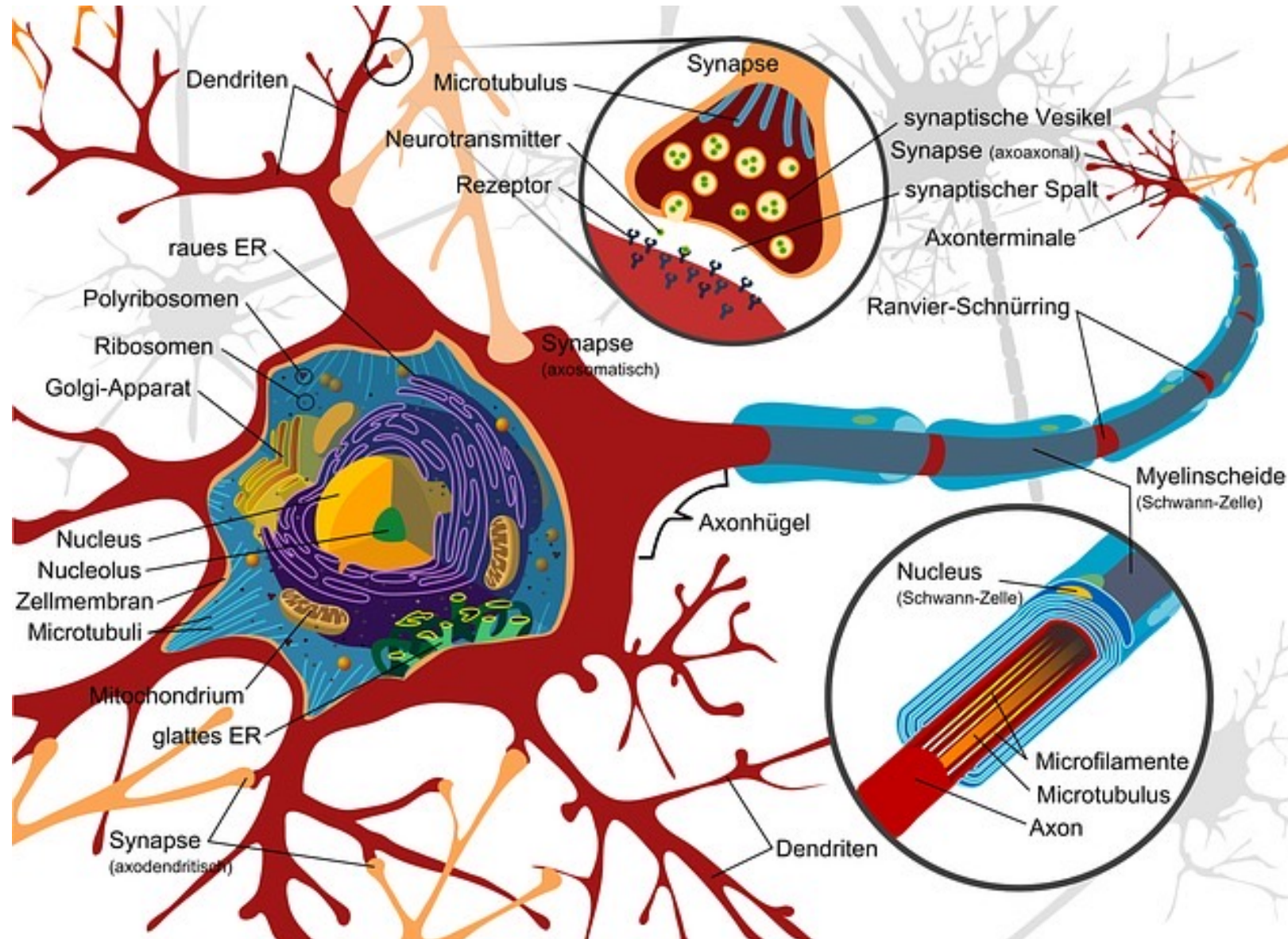
# Spinal Cord



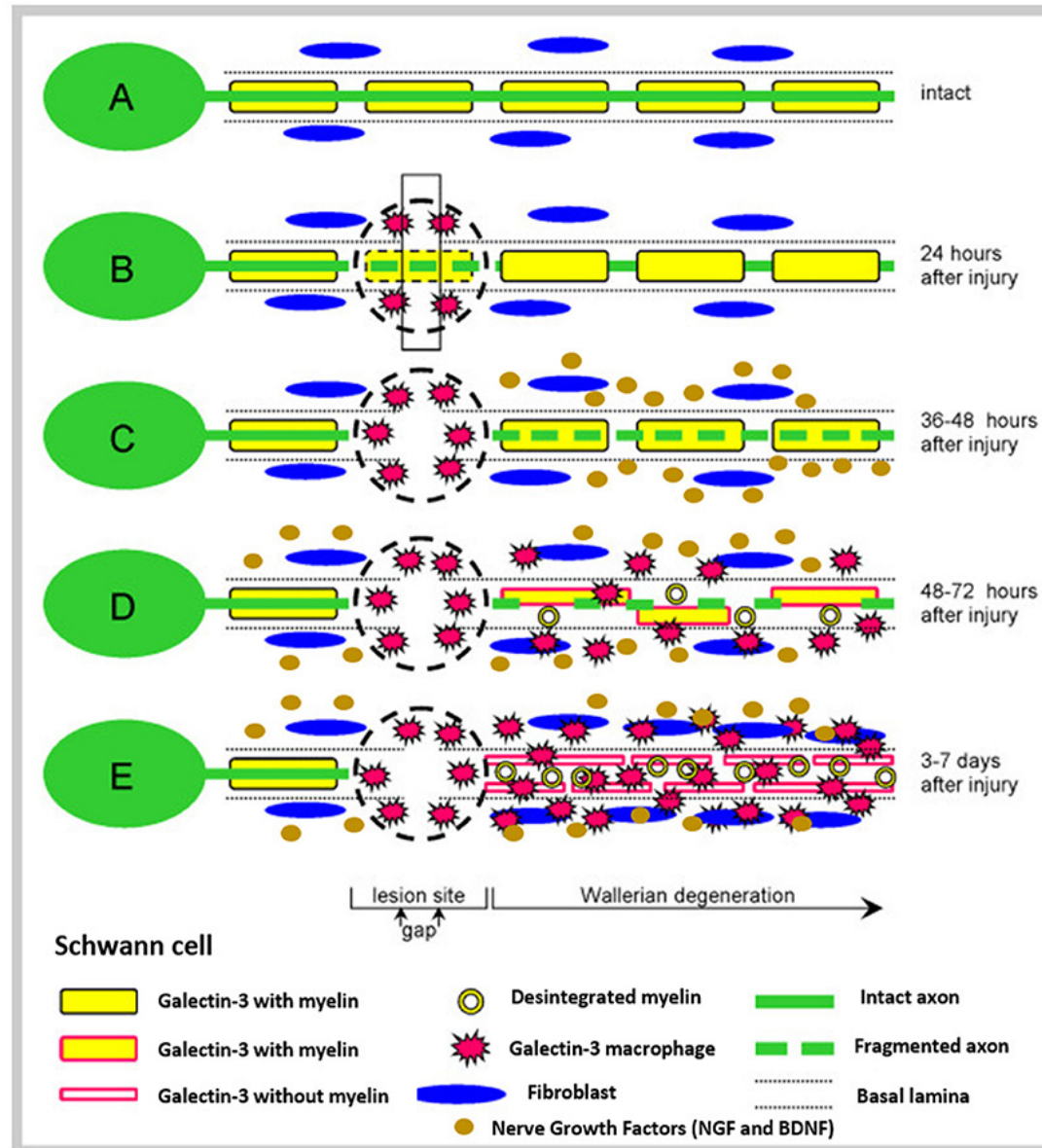








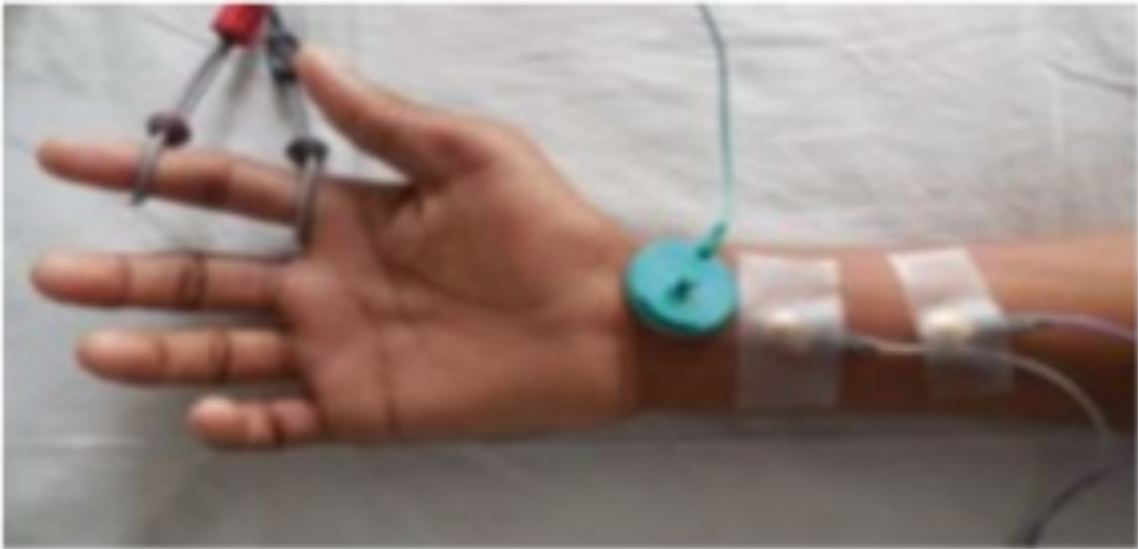
# Nerve Degeneration



- A 65 year old woman with diabetes presents with painful numbness in the feet.
- Slowly getting worse for 5 years and hard to sleep.
- Labs show mild elevation of hemoglobin A1C.
- Electromyography (EMG) shows damage to sensory nerves.
- Diagnosis: Diabetic neuropathy with neuropathic pain.
- Treatment: Alpha lipoic acid and pregabalin.
- Prognosis: Stable, slow progression.



# EMG with Nerve Conduction



- A 45 year old man presents with progressive weakness 10 days after the onset of cough with fever and positive COVID test.
- He noticed trouble with going up stairs and feels shortness of breath with activity.
- Exam shows weakness predominantly in the legs with loss of reflexes and some reduced perception of cold in the feet.
- Blood work notable for COVID but otherwise normal.
- Lumbar puncture shows high protein.
- EMG consistent with a demyelinating neuropathy.



- Diagnosis: Guillain-Barre Syndrome (GBS)
- Treatment: Intravenous Immunoglobulin (IVIg)
- Prognosis: Maximum worsening at 2 weeks then slow improvement over many months typically.
- Vaccination with Vector vaccines-but not mRNA-associated with rare GBS, typically within 3 weeks. Moderna is mRNA vaccine.

- A 30 year old woman presents with numbness in the feet and tendency to trip when walking.
- Symmetric and progressive over 10 years and recently falling if she catches her toe. Her father and paternal grandmother also had these problems.
- Symmetric distal atrophy in the legs with foot drop and loss of reflexes as well as loss of most sensation in the feet.
- EMG shows a symmetric, severe, demyelinating neuropathy.
- Genetic testing shows a duplication in the PMP-22 gene.

# Case 3 (cont.)

- Diagnosis: Charcot-Marie-Tooth type 1A.
- The most common inherited neuropathy.
- No effective treatment other than symptoms management.
- Prognosis: Slowly progressive.



- Vitamin deficiency (B12)
- Chemotherapy (platinum, immune checkpoint inhibitors)
- Chronic alcoholism
- Autoimmune diseases (lupus, sarcoidosis)
- Infections (West Nile Virus, Lyme disease)
- Compression (carpal tunnel syndrome)
- Amyloidosis (acquired and familial)



- Underlying disease state when possible
- At least 25% of cases lack a known cause (idiopathic)
- Exercise with physical and occupational therapy
- Stimulating devices
- Decompression surgeries
- Hot/cold therapy
- Acupuncture
- Mind/body approaches

- Acetaminophen and ibuprofen
- Antidepressants
  - Amitriptyline, duloxetine
- Anticonvulsants
  - Gabapentin, pregabalin
- Topicals
  - Capsaicin, compounded options
- Narcotics
  - Morphine or morphine equivalents

Overall, the definitive studies are lacking but potential benefits seem reasonable with relatively low risks.

- Alpha lipoic acid (mainly in diabetic neuropathy)
- B-vitamins (B1, B6, B9, B12)
- Vitamin D
- Zinc
- Magnesium
- Curcumin from turmeric
- St. John's Wort

- Peripheral neuropathy is common.
- Can occur at any age but usually older adults.
- Easy to diagnose but causes often elusive.
- Prognosis is fair (slowly progressive and disabling over years).
- Treatments usually helpful but rarely cure or eliminate symptoms of pain, numbness, and weakness.
- Awaiting more effective options.

- The Numb Foot Book, McLellan and Spitz
- Nutritional supplements for the treatment of neuropathic pain, *Biomedicines*, 2021 Jun; 9(6):674
- The Foundation for Peripheral Neuropathy:  
[foundationforpn.org](https://foundationforpn.org)
  - Please use this site for gaining even more detail of all forms of treatment and excellent patient resources about peripheral neuropathy.



# Questions?

Thank you for your interest!

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