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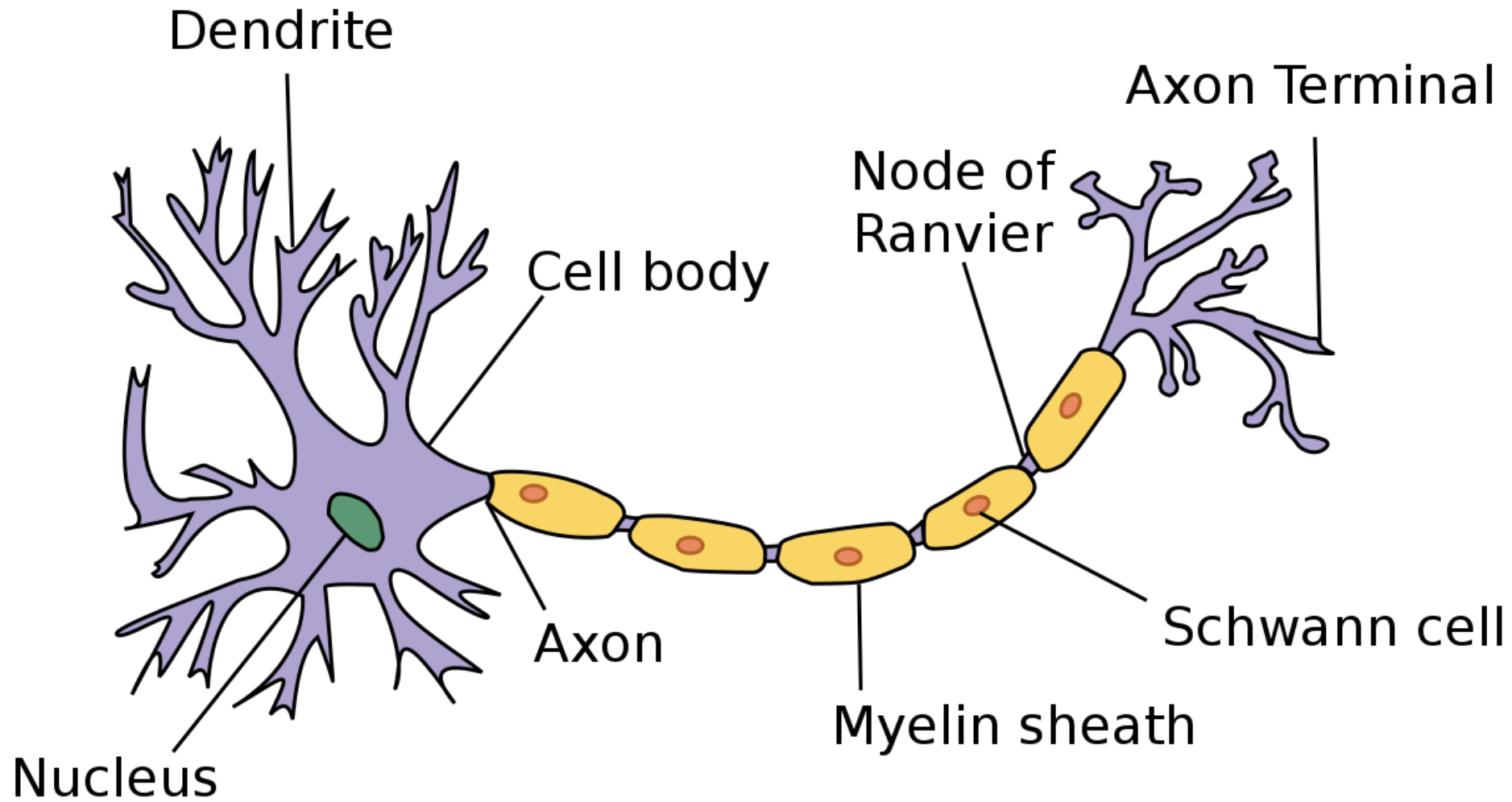
WELLNESS & PAIN CARE

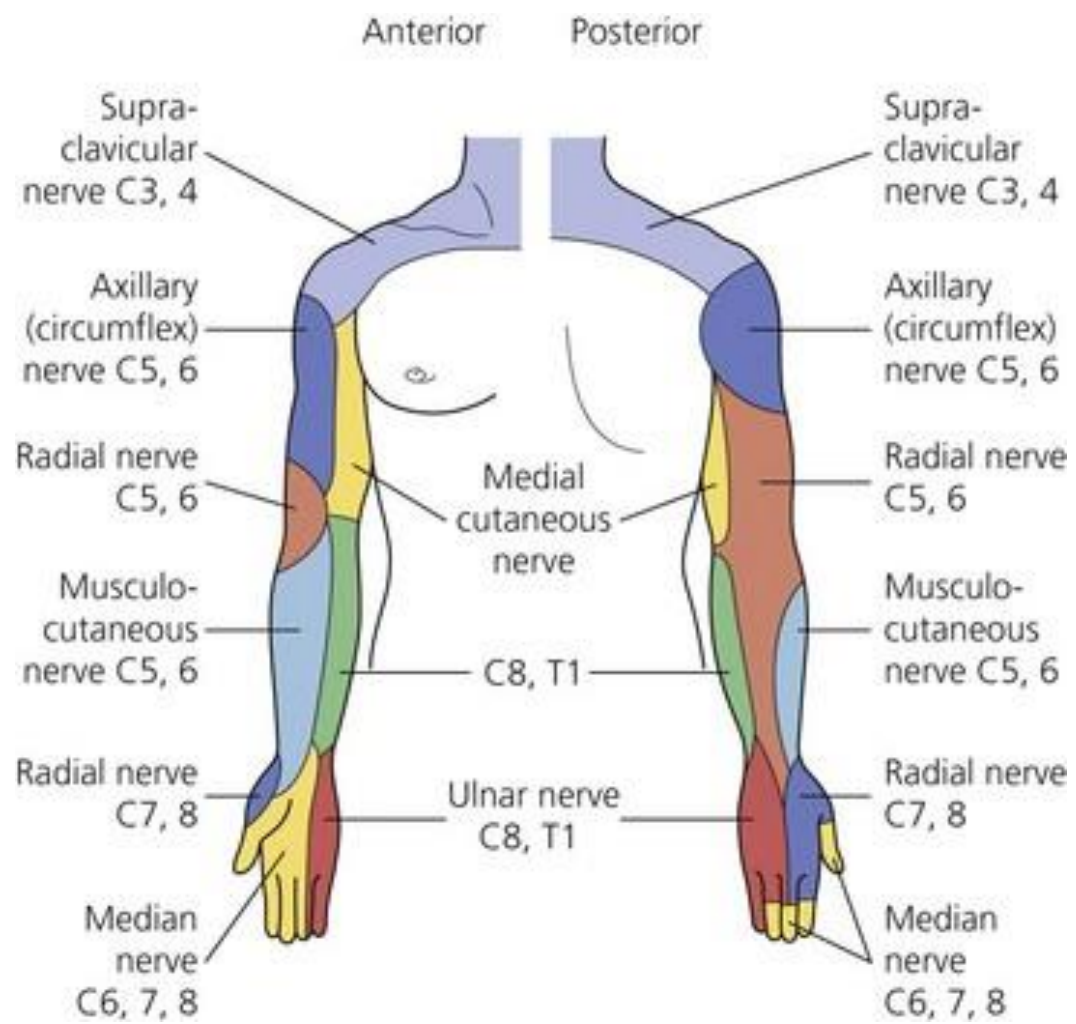
OF LAS VEGAS

Introduction to Electrodiagnostics

By Kyle Wentz D.O.

Peripheral nerve anatomy





Why EMG?

- While an MRI may look at the structure of a nerve, an EMG evaluates nerve *function*.
- EMG can help determine if there is a pinched nerve and where it is being pinched, or if there is diffuse widespread nerve damage.
- Plumbing analogy



What is an EMG?

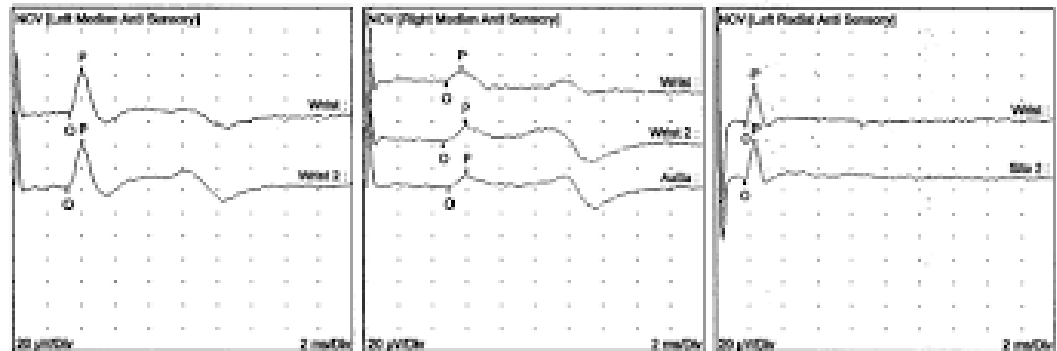
- An Electromyography/Nerve Conduction Study is commonly referred to as an “EMG” which is an examination to determine the cause of a patient’s numbness, tingling, weakness, or pain
(to evaluate neuropathic pain or neurologic deficits)
- The study is divided into two parts:
 - The nerve conduction study – involves stimulating the patient’s peripheral nerves using a stimulator, and recording subsequent electrical activity using electrodes.
 - The needle electromyography (“electro-myography”) – involves placing a needle into the patient’s musculature to observe electrical activity within the muscle

The nerve conduction study

- Small shocks (or better said, “stimulations”) are administered in the arms or legs using a small electrical pulse. Many report this feeling like an intense TENS unit.



Waveforms:



The needle electromyography

- A small needle is inserted into a muscle to listen to electrical activity of the muscle. There is no shocking in this part of the exam. If there is something wrong with the nerve within the muscle, abnormal sounds and signals can be detected.



When to order

- Persistent (over 4-6 weeks) extremity **numbness/tingling**, or **weakness**
- E.g. ***suspected*** carpal tunnel syndrome, ulnar neuropathy, peripheral neuropathy, brachial plexopathy/thoracic outlet syndrome, sciatic neuropathy, radial neuropathy, wrist drop, foot drop, cervical or lumbar radiculopathy, etc.



Patient precautions

- It is best if patient does not use lotion on the day of the study.
- There is no need to fast beforehand.
- No need to hold or modify medications prior to the procedure
- No restrictions or precautions for the patient after the procedure
- Many patients ask if they are allowed to take their Hydrocodone, Percocet, Morphine, Valium, etc before the procedure and the answer is YES.
- Okay to be on blood thinners (Dr. Wentz just needs to know)
- Okay to have pacemaker/defibrillator (Dr. Wentz just needs to know)

“Will it hurt?”

- Everyone is different. Each patient tolerates the study very differently.
- Sometimes afterwards there can be some mild soreness or occasional mild bruising from the needle sticks.



Value of an EMG

- We can determine whether mild/mod/severe peripheral nerve entrapment
- Acute versus Chronic radiculopathy or peripheral nerve entrapment
- Potentially rule out or in pertinent diagnoses

Patient case

- Patient presented with right hand numbness affecting the first three digits. *Numbness of the hand wakes the patient up from sleep.* Negative tinel's at the wrist, phalen's, durkan's tests. 5/5 strength throughout. Negative right spurling's test.
- MR C Spine showed a C5-6 disc herniation
- Patient received a right C5-6 TFESI w/o relief

Patient case continued

- Then an EMG was done which showed moderate right CTS and NO cervical radiculopathy
- Patient trialed right carpal tunnel splint, solely night time use
- Right Carpal tunnel injection was done and patient had 90% relief

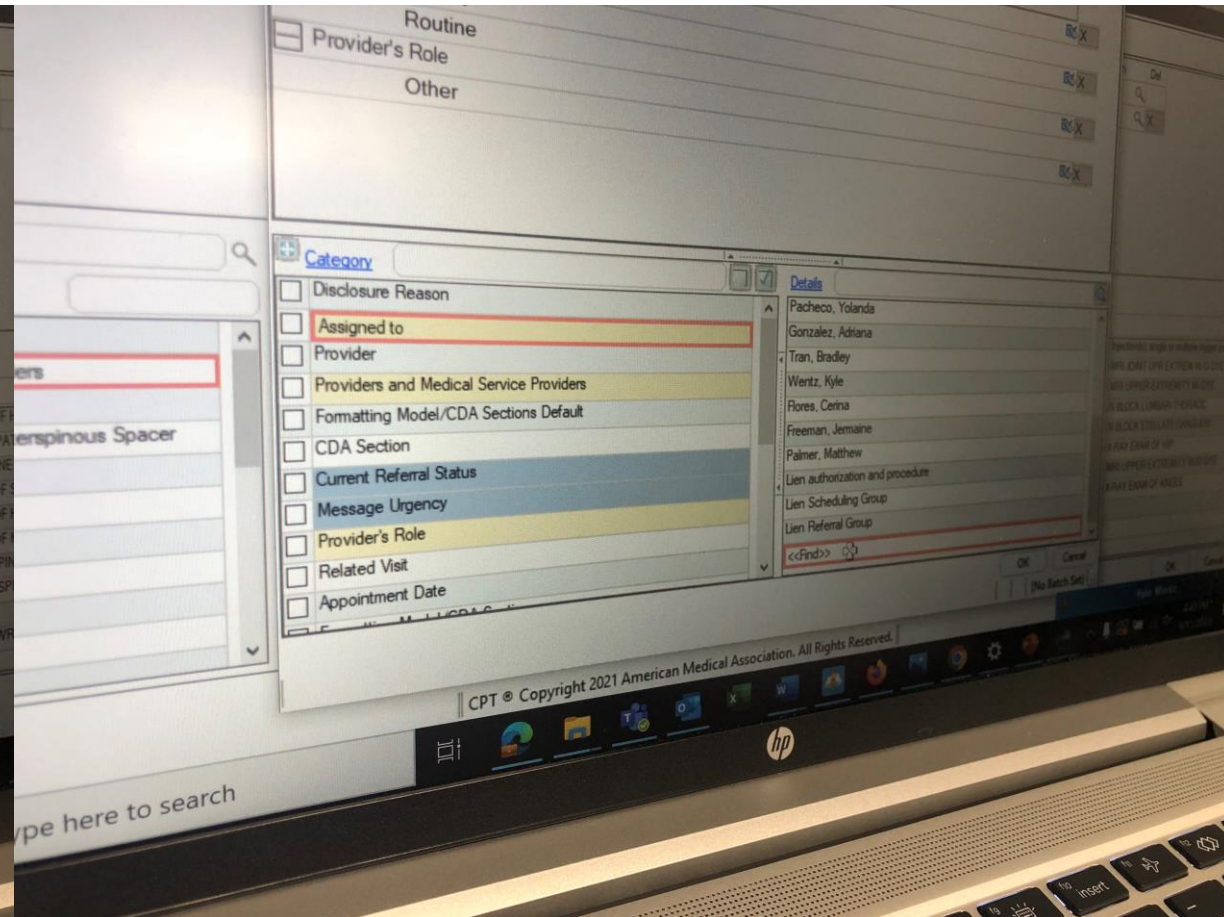
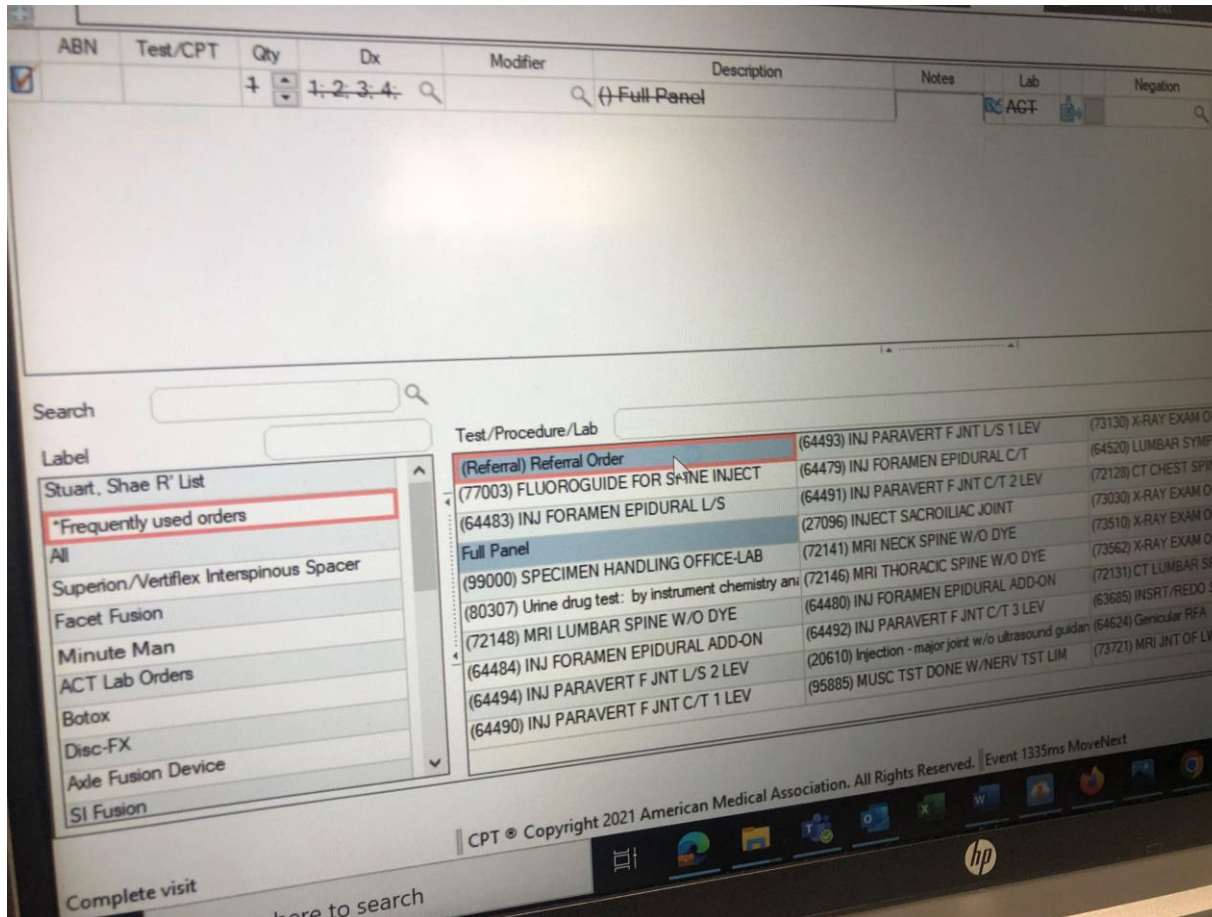
EMG study limitations

- Nerve damage or compression NOT nerve root inflammation/irritation
- Peripheral nervous system NOT central nervous system
- Increased study limitations with age
- Increased study limitations with extremity habitus or edema
- 15% false negative rate

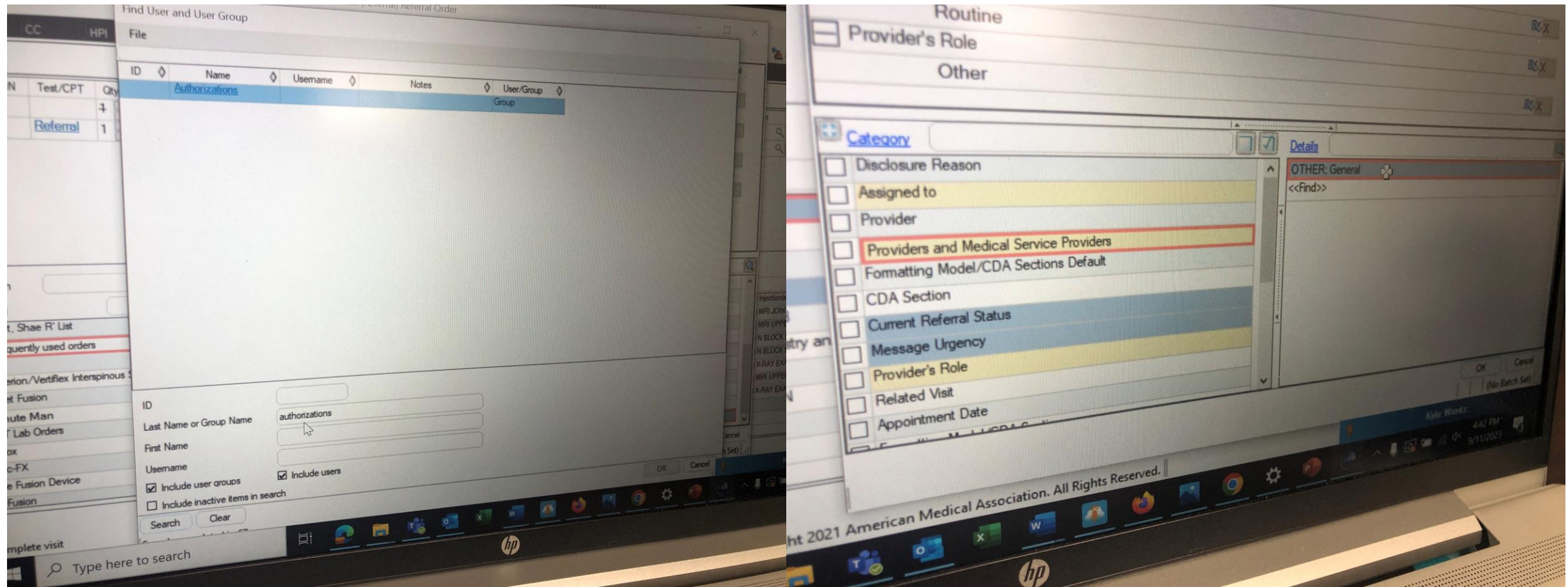
How to order an EMG (EASY as 1..2..3..)

- 1. Click Referral tab, and **CHANGE to assign to authorizations**
- 2. Type in which extremities you want and type in your differential
- 3. Assign which diagnosis you want to associate with the order (numbness, tingling, weakness)

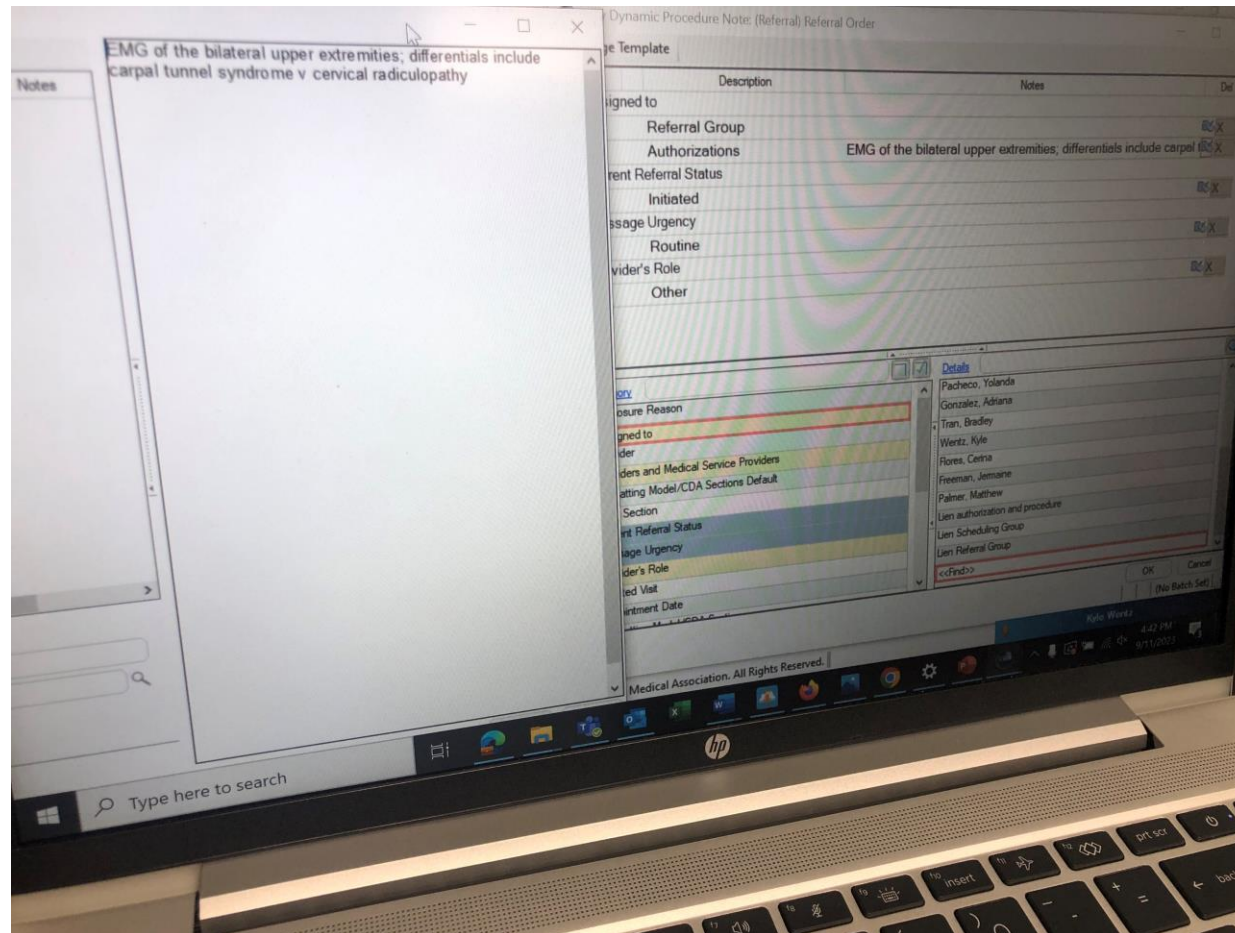
1- click referral and ***reassign to Authorizations***



2-click "other"



3-Write which limbs, and your DDX



Questions?

