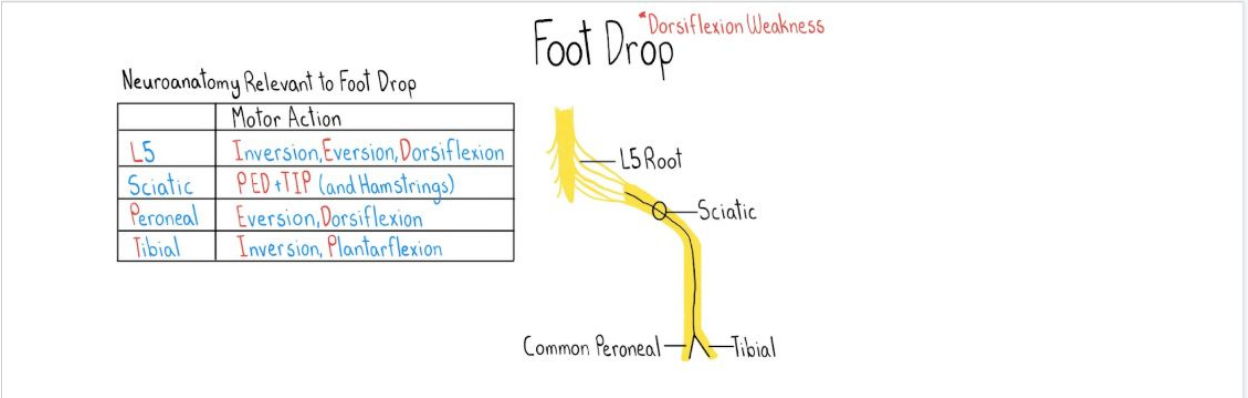
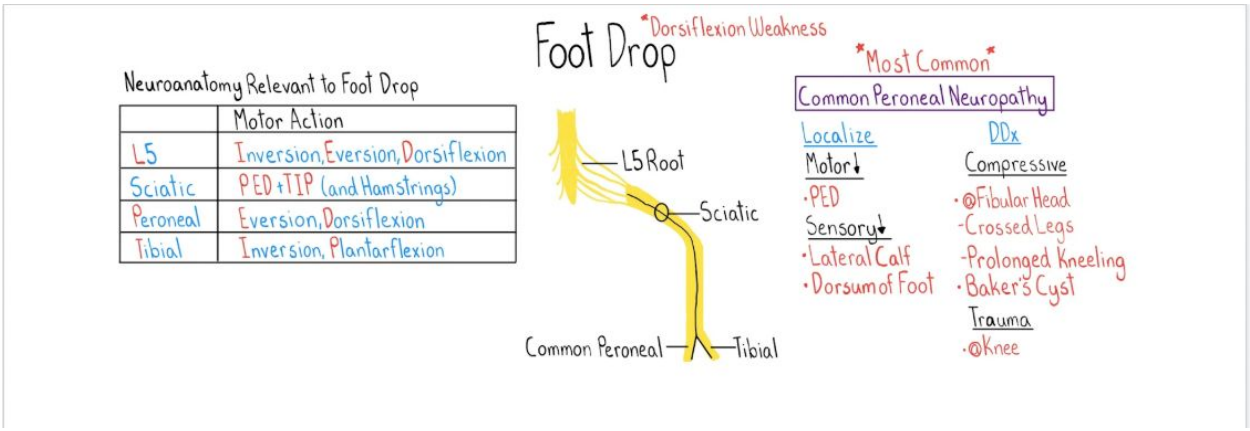
CPS Foot Drop Schema Script



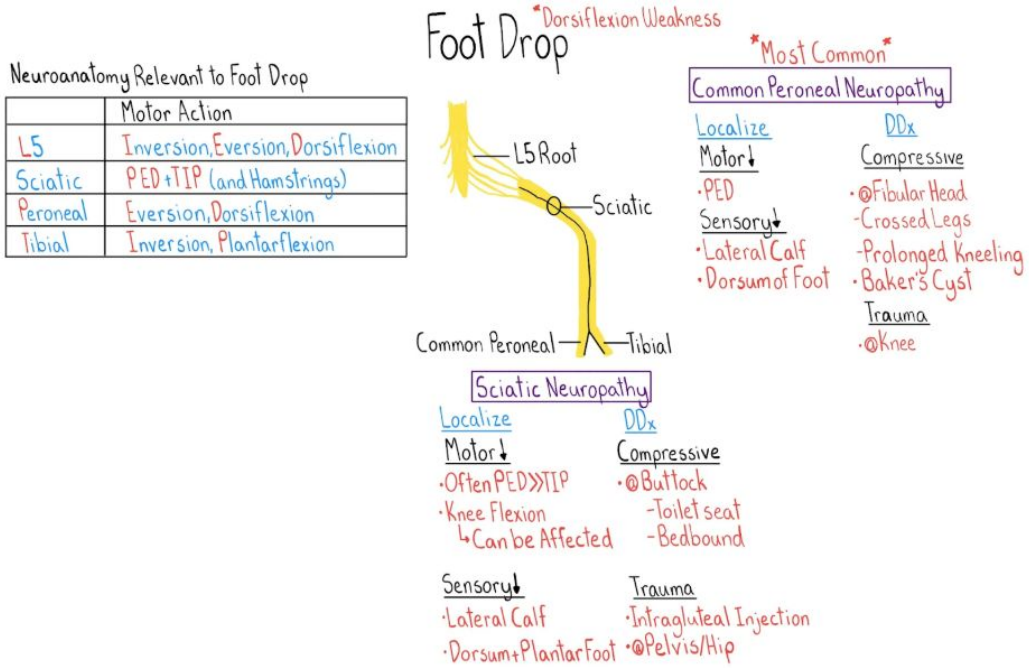
Hi everyone - my name is Maniraj. I'm excited to narrate this Clinical Problem Solvers schema on foot drop. Foot drop is really a story about a weakness or paralysis in the muscles that dorsiflex the foot. A patient with foot drop will drag their toes while walking. To avoid tripping over their toes while walking, a patient will lift their foot higher off the ground. Since there is no dorsiflexion for a heel strike when bringing their foot down, the patient "overshoots" and slaps their foot on the ground. This is called a steppage gait.

What muscles are we talking about? The main dorsiflexor muscles are the tibialis anterior and the extensors of the toes (extensor hallucis longus and extensor digitorum longus). All of these muscles are innervated by the deep peroneal nerve, which is a branch of the common peroneal nerve. The peroneal nerve itself is a terminal branch of the sciatic nerve; the other branch of the sciatic is the tibial nerve.

To help anchor the nerve functions we'll be talking about, I think it'd be beneficial to first review acronyms that can be used to memorize them. The peroneal nerve functions to evert and dorsiflex at the ankle, which can be remembered by the acronym PED. The tibial nerve functions to invert and plantarflex at the ankle, so that becomes TIP. Since the sciatic nerve is really just the bundle of peroneal & tibial nerves, you can remember the sciatic nerve functions as PED + TIP. The sciatic nerve also supplies the hamstrings, which flex the leg at the knee. Another anatomical point to remember is the action of L5 nerve root. The actions are inversion (I), eversion (E), dorsiflexion (D). The L from L5 joins the first letters of each of the actions to form the acronym LIED.

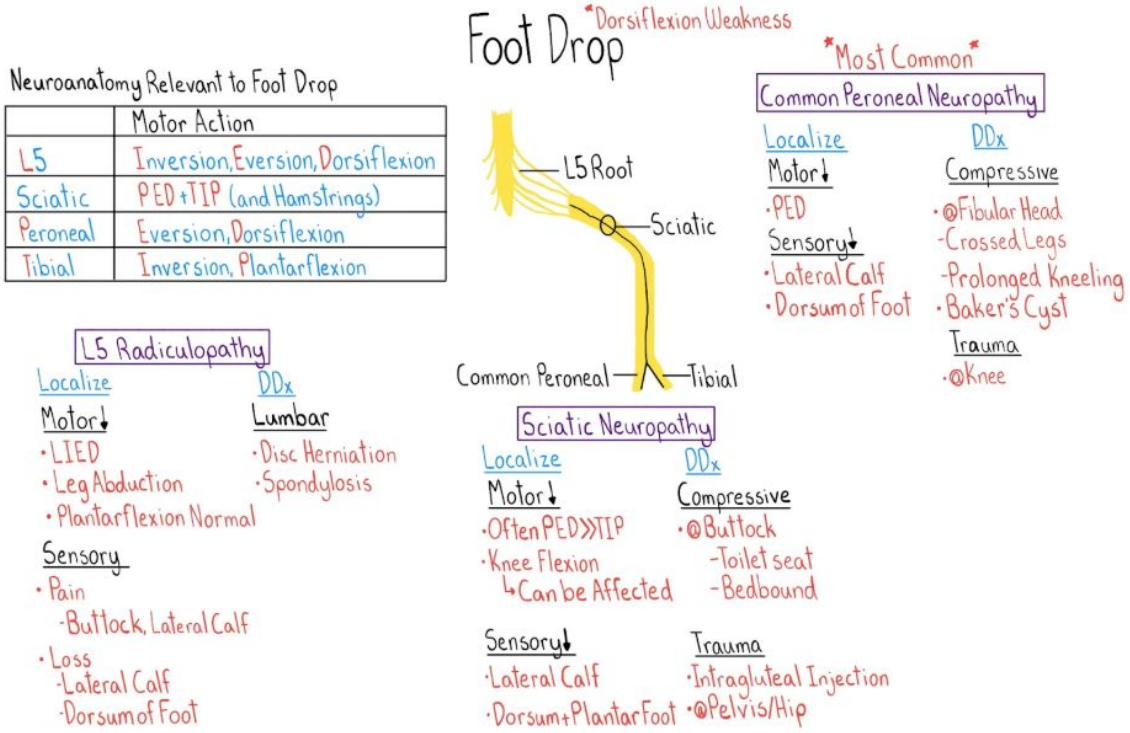


We will start at the most common cause of foot drop - neuropathy of the common peroneal nerve. Neuropathy of this nerve leads to weakness in foot eversion and dorsiflexion. The sensory deficits would occur in the region of the lateral calf & dorsal foot. We can divide the differential for common peroneal neuropathies into compressive and trauma associated. The common peroneal nerve can be impinged at the fibular head or popliteal fossa. Compression at the fibular head can occur with crossed legs or prolonged kneeling or squatting. Compression at the popliteal fossa can occur with a Baker's cyst. The second bucket is trauma associated particularly at the knee.

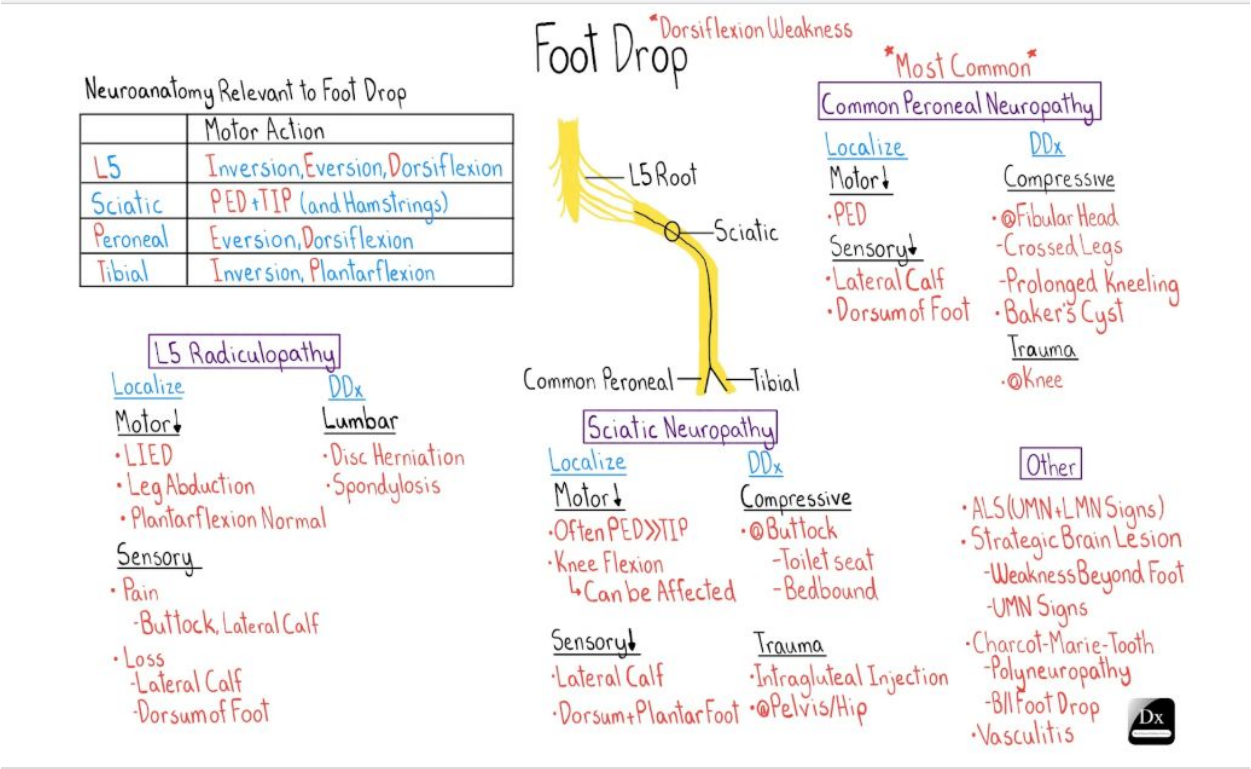


Moving proximally, we arrive at the sciatic nerve (L4-S3). A sciatic neuropathy can lead to motor deficits in the peroneal nerve and tibial nerve distributions. A complete sciatic neuropathy would affect both distributions (PED + TIP), but sometimes the peroneal division can be preferentially

affected. The two buckets of sciatic neuropathy are compressive and trauma associated. Sciatic nerve compression typically occurs in the buttock region as the nerve passes between the piriformis muscle and hip bones. We see this in “toilet seat” sciatic neuropathy when patients fall asleep sitting on the toilet and also in bedbound patients. Trauma associated causes include intragluteal injection. It is recommended you give gluteal injections in the upper outer quadrant of the buttock for this reason. Pelvis and hip trauma can also lead to sciatic neuropathies.



Moving further proximally, we arrive at the L5 root. An L5 radiculopathy would present with foot drop along with deficits in foot inversion and eversion. Leg abduction, mediated by nerve roots L4-S1, would also be weak. However, foot plantarflexion would be spared as it is supplied by nerves S1-S2. The sensory deficits in L5 radiculopathy can include pain radiating into the upper buttock and lateral calf with sensory loss in the lateral calf and dorsum of the foot. But sensory deficits may be absent if only ventral (motor) root is affected. The differential for L5 radiculopathy includes disc herniation and lumbar spondylosis, which is a degenerative disease of the vertebrae and discs in the lumbar spine.



Lastly, we have the “other” bucket for foot drop. This bucket includes a combined UMN & LMN disease - ALS, which can present as a foot drop. It also includes central causes of isolated foot drop such as small strategic brain lesions affecting the foot area of the homunculus on the medial aspect of the motor cortex. Lesions could exist elsewhere along the corticospinal tract, however it would be rare to just present as an isolated foot drop. Charcot Marie Tooth is an inherited polyneuropathy that can initially present as a bilateral foot drop. Finally, we have vasculitis. Inflammation of the blood vessels supplying nerves is a common cause of mononeuritis multiplex, a rare peripheral neuropathy causing painful sensory and motor deficits in multiple individual nerve distributions. When this deficit involves the peroneal nerve, it can cause foot drop, usually acutely.

That’s all for this schema. Be sure to use the nerve acronyms to help anchor your memory. To recap, it’s LIED for L5 root function; PED for peroneal nerve function; TIP for tibial nerve function; and, PED + TIP for sciatic nerve function.Thanks for watching and I hope you enjoyed the schema!