

SPINES AND NERVES

Useful stuff in no particular order



NERVES - THE BASICS



- focal**
- multi-focal**
- diffuse**
- acute**
- sub-acute**
- chronic**
- motor**
- sensory**
- autonomic**

FOCAL

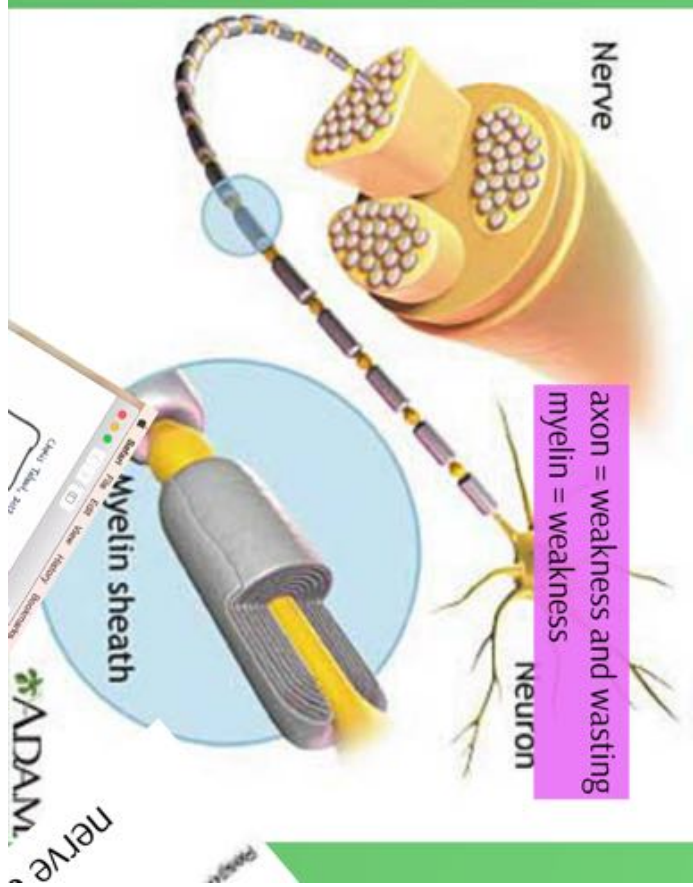
- Multiple sclerosis
- Stroke
- Trauma
- Tumor
- Vascular disease

DIFFUSE

- Alcohol
- Diabetes
- Hypertension
- Kidney disease
- Liver disease
- Lupus
- Multiple sclerosis
- Sickle cell anemia
- Systemic sclerosis
- Vitamin B12 deficiency

If in doubt, look it up!

Nerve



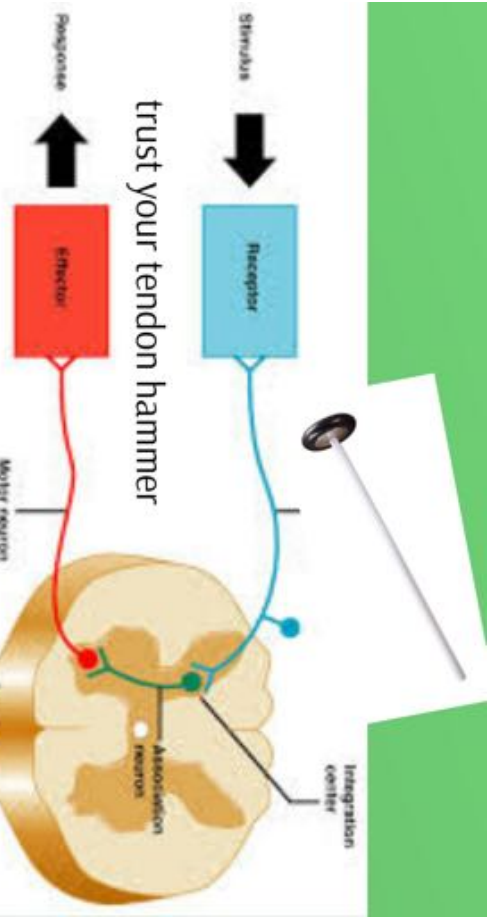
axon = weakness and wasting
myelin = weakness

Myelin sheath

Neuron

trust your tendon hammer

nerve or nerve root damage



Stimulus

Receptor

Effector

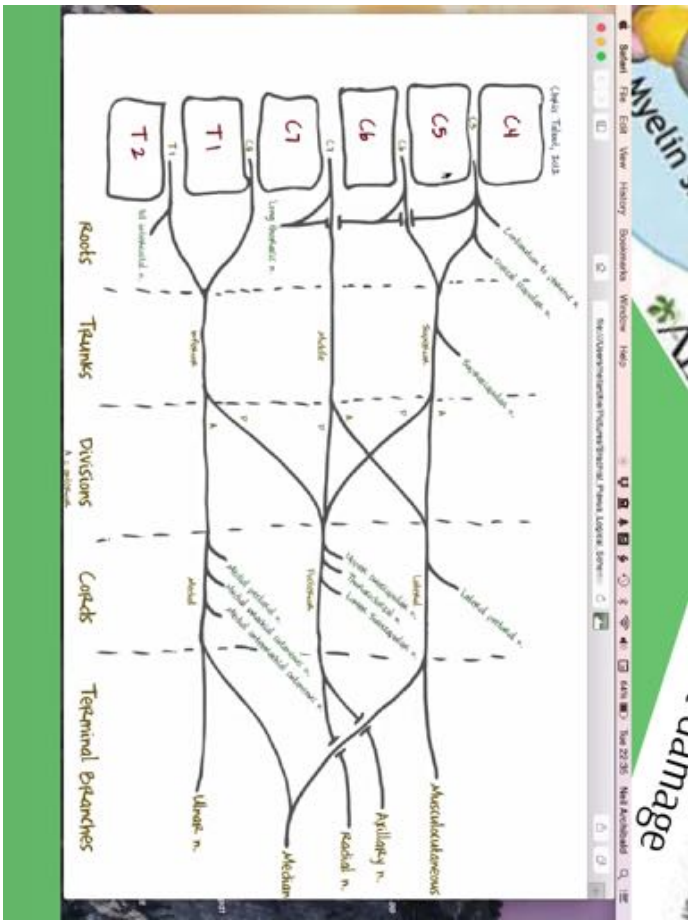
Motor neuron

Spinal cord (CNS)

Association neuron

Integration center

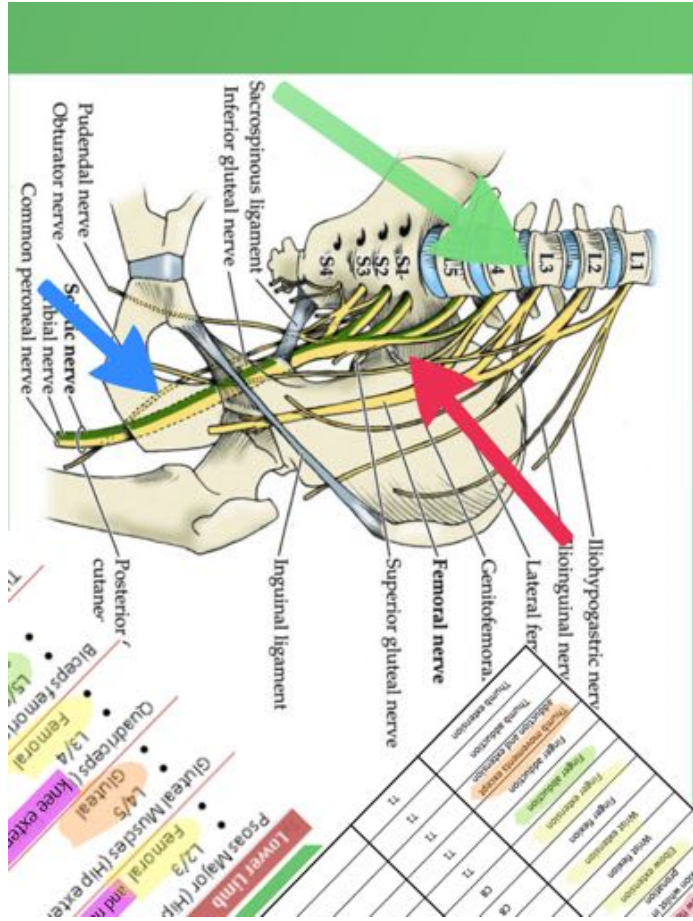




Movement	Nerve root	Nerve(s)	Muscle(s)
Shoulder abduction	C5 (C6)	First 90°: suprascapular nerve, second 90° axillary nerve	Suprascapular then deltoid
Shoulder adduction	(C5 C6) C7 (C8)	Multiple	Latissimus dorsi and pectoralis major
Elbow flexion	(C5) C6	Musculobrachioradial	Biceps
Elbow flexion whilst in 90 degree pronation	(C5) C6	Radial	Brachioradialis
Elbow extension	(C5 C6) C7 (C8)	Radial	Triceps
Wrist flexion	C7 (C8)	Ulnar and median	flexor carpi ulnaris and flexor carpi radialis
Wrist extension	C7	Radial	Extensor carpi radialis longus and extensor carpi ulnaris
Finger flexion	C8	Ulnar (ring and little) and median (middle and index)	Flexor digitorum profundus (DFP) and flexor digitorum superficialis (DFS)
Finger extension	C8	Radial	extensor digitorum
Finger abduction	T1	Ulnar	Dorsal interossei
Finger adduction	T1	Ulnar	Palmar interossei
Thumb movements except abduction and extension	T1	Median	Opponens pollicis, abductor pollicis brevis and flexor pollicis brevis
Thumb abduction	T1	Ulnar	Abductor pollicis
Thumb extension	T1	Radial	Extensor pollicis longus

of femora.
Femoral nerve
superior gluteal nerve

Lower Limb
Psoas Major (Hip Flexion)
• L2/3
• Femoral and nerve roots directly



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Lower Limb
Psoas Major (Hip Flexion)
• L2/3
• Femoral and nerve roots directly
Gluteal Muscles (Hip extension)
• L4/5
• Gluteal
Quadriceps (Knee extension)
• L3/4
• Femoral
Biceps femoris (Knee Flexion)
• L5/S1
• Somatic
Tibialis anterior (Ankle dorsiflexion)
• L4/5
• Peroneal
Gastrocnemius/Soleus (Ankle plantar flexion)
• S1/2
• Tibial Nerve
Extensor Hallucis Longus (Extension of the big toe)
• L5
• Deep Fibular

focal
multi-focal
diffuse

acute
sub-acute
chronic

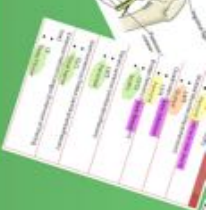
motor
sensory
autonomic

FOCAL

- bell's palsy
- median
- ulnar
- radial
- common peroneal

DIFFUSE

- diabetic - sensory
- drug - sensory
- booze - sensory
- CMT - mixed
- CIDP - motor



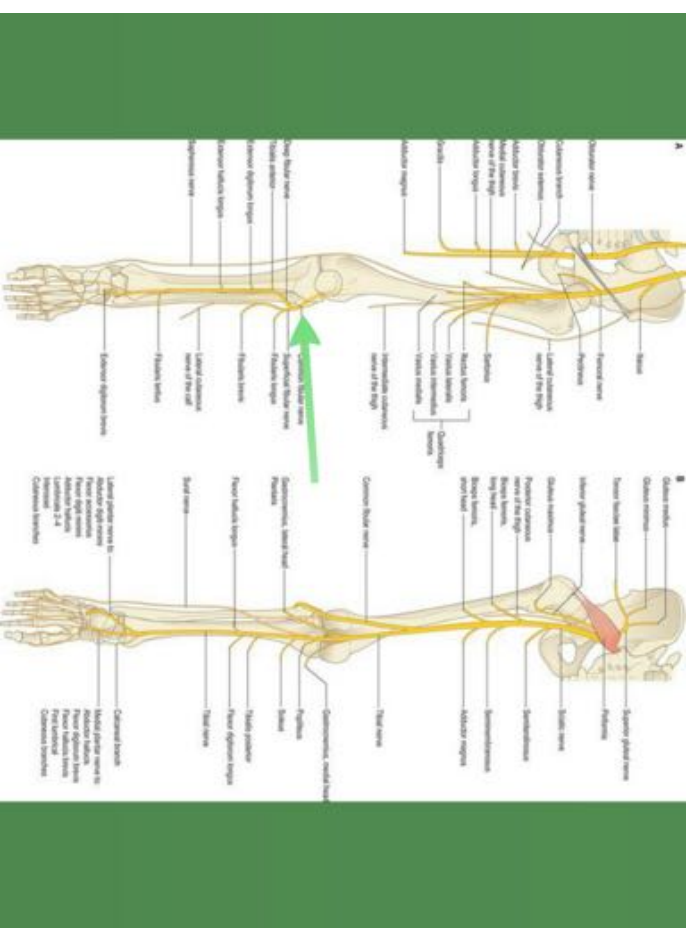
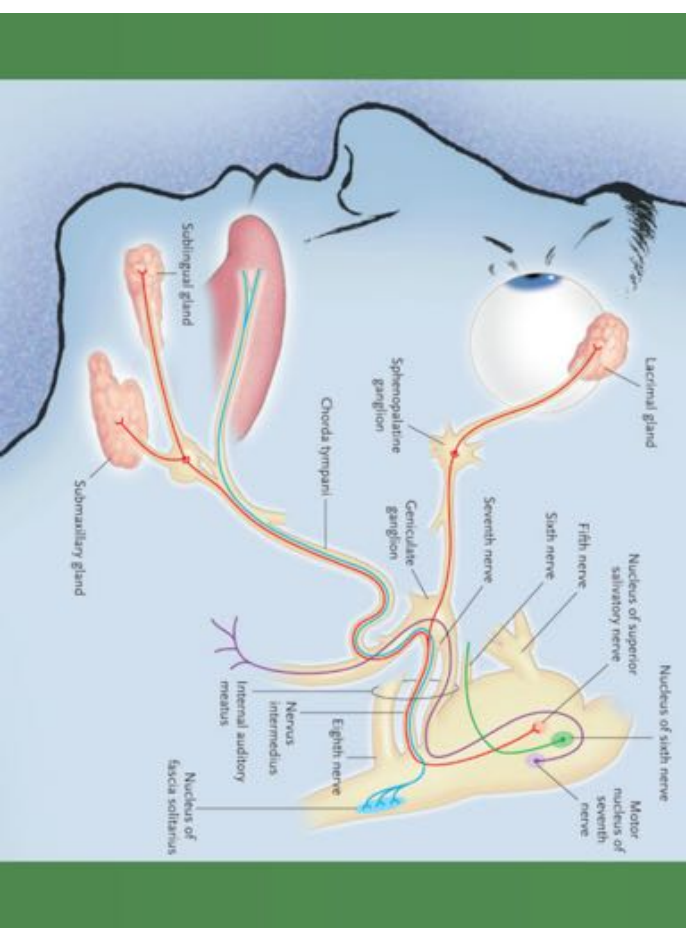
FOCAL

- Bell's palsy
- median
- ulnar
- radial
- common peroneal



The Common Peroneal Nerve

- Motor functions
- Dorsal peroneal nerve
- Tibial nerve, toe
- Foot abduction, toe extension



The Common Peroneal Nerve

- Superficial peroneal nerve
 - Motor functions
 - Foot eversion
- Deep peroneal nerve
 - Motor functions
 - Foot dorsiflexion, toe extension

ankle jerk normal
(cf L5/S1 root lesion)

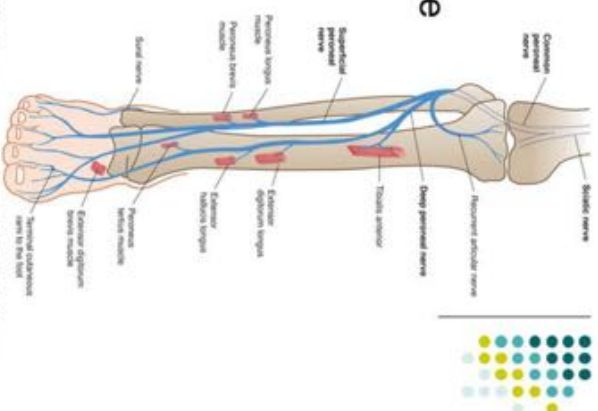


Figure 26-16. The common peroneal nerve. (A, 5, S1, S2). In: Waxman SG. *Clinical Neuroanatomy*. 29th ed. New York, NY: McGraw-Hill; 2010. <http://www.accessmedicine.com>. Accessed March 22, 2012.

DIFFUSE

- diabetic - sensory
- drugs - sensory
- booze - sensory
- CMT - mixed
- CIDP - motor

if in doubt, sieve it out

USEFUL PERIPHERAL PATTERNS

weak grip++



finger abduction



weak thumb



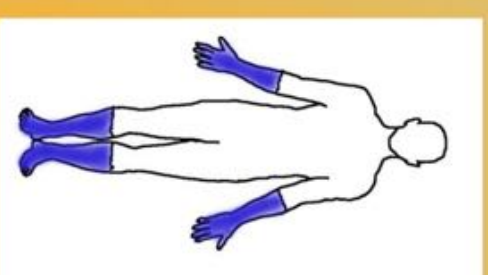
finger extension



weak wrist++

Radial Nerve Sensory Innervation

BELIEVE YOUR PATIENT



HOW TO DO A SENSORY EXAM

quick screen with neurotip - sharp end

- sternum
- finger tips and up
- toes and up
- (back down via dermatomes)

tuning fork for temp
tuning fork for vibration

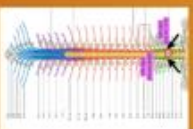
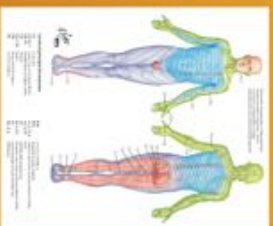
- sternum
- finger tips
- toes and up

joint position

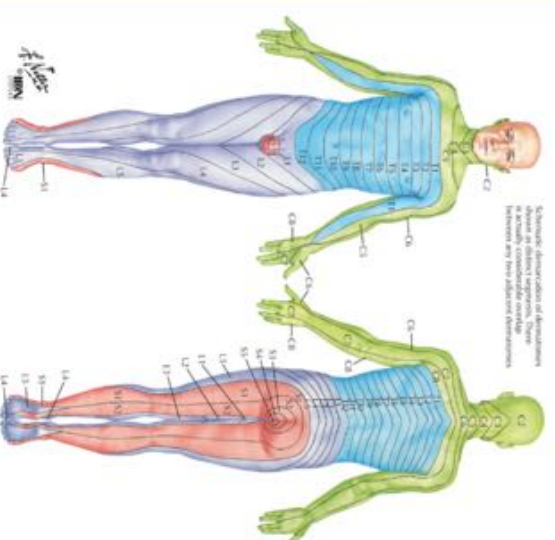
- don't wiggle the toe off

(light touch if you are insane - or your examiner is

ROOT, SCHMOOT



Characteristic distribution of dermatomes in healthy individuals (normal overlap between adjacent dermatomes)

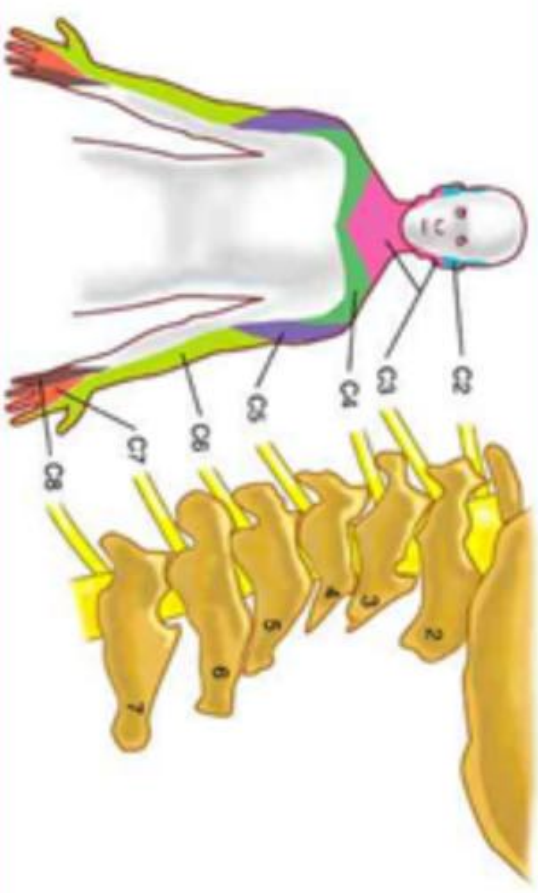


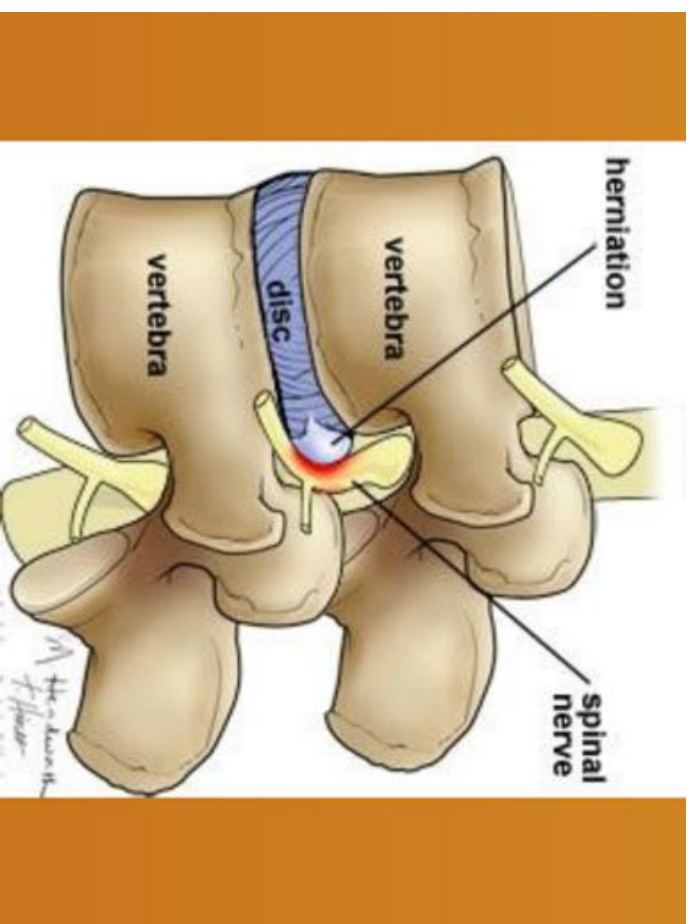
Levels of dermatome distribution

C3 Cervical
C5, C6 Lateral parts of upper limbs
C6, C7 Medial parts of upper limbs
C8 T1 Hand
C8, T1 Medial thigh region
S1 Lateral thigh region
S2 Level of inguine

Levels of analgesia

T12 Thoracic
L1, L2, L4 Anterior and lower surfaces of lower limbs
L2, L3, S1 Medial side of great toe
L2, L3, S1 Posterior and outer surfaces of lower limbs
S1, S2, S5 Lateral surface of foot and little toe
S2, S3, S4 Medial surface



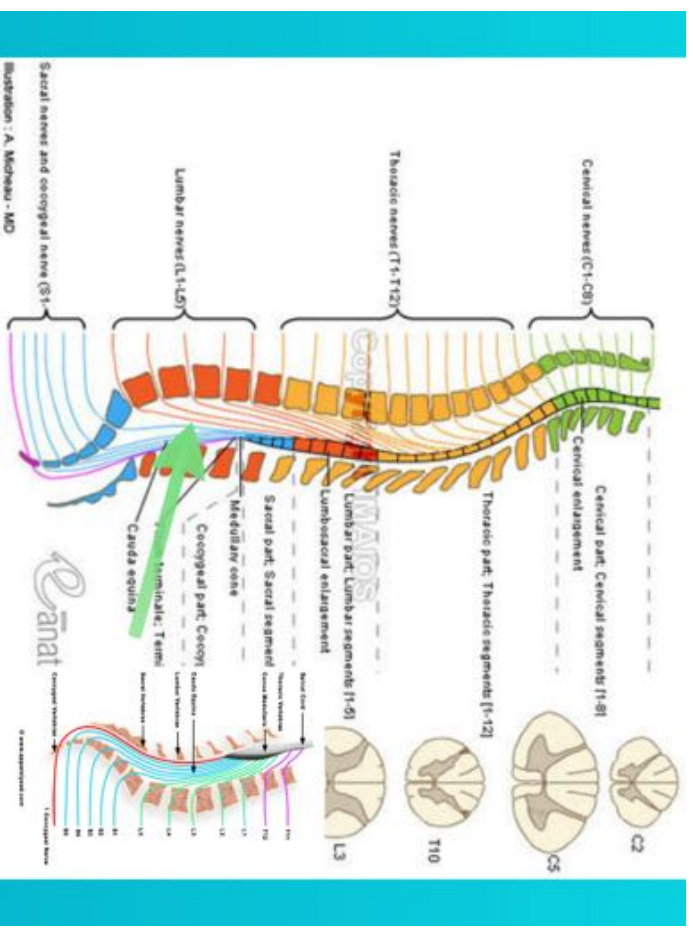
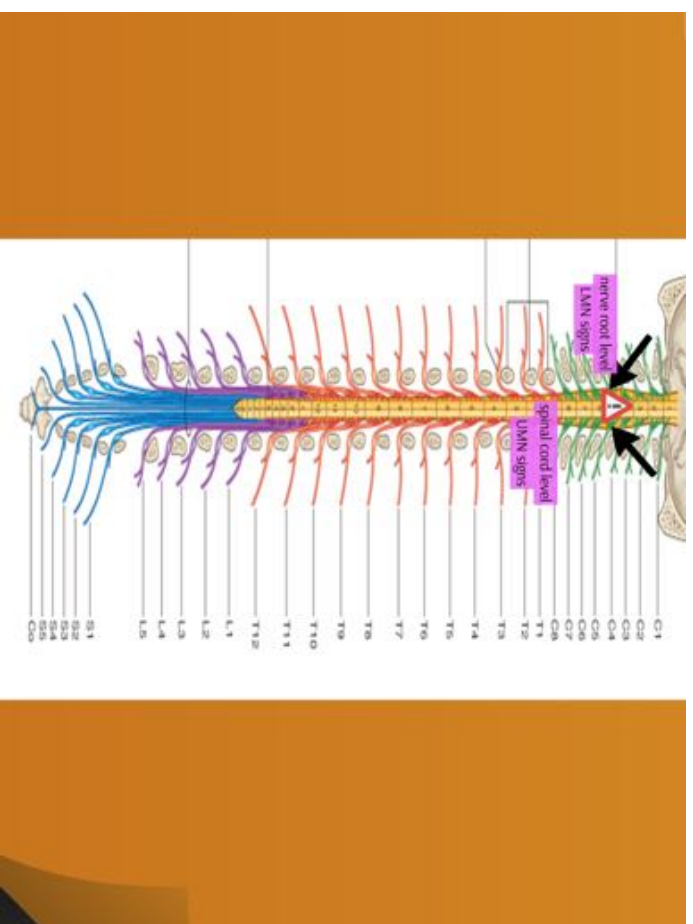


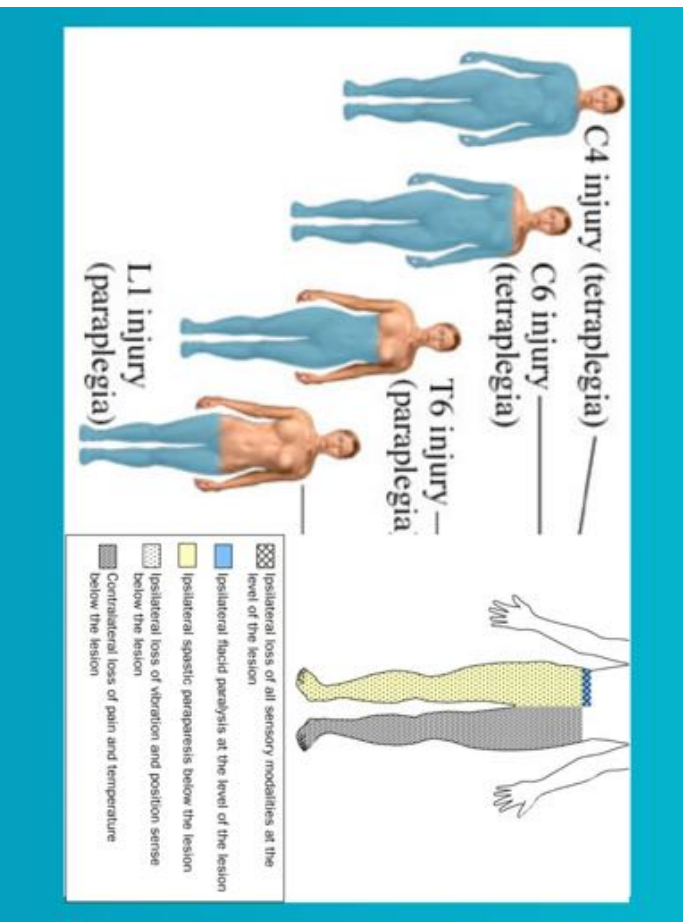
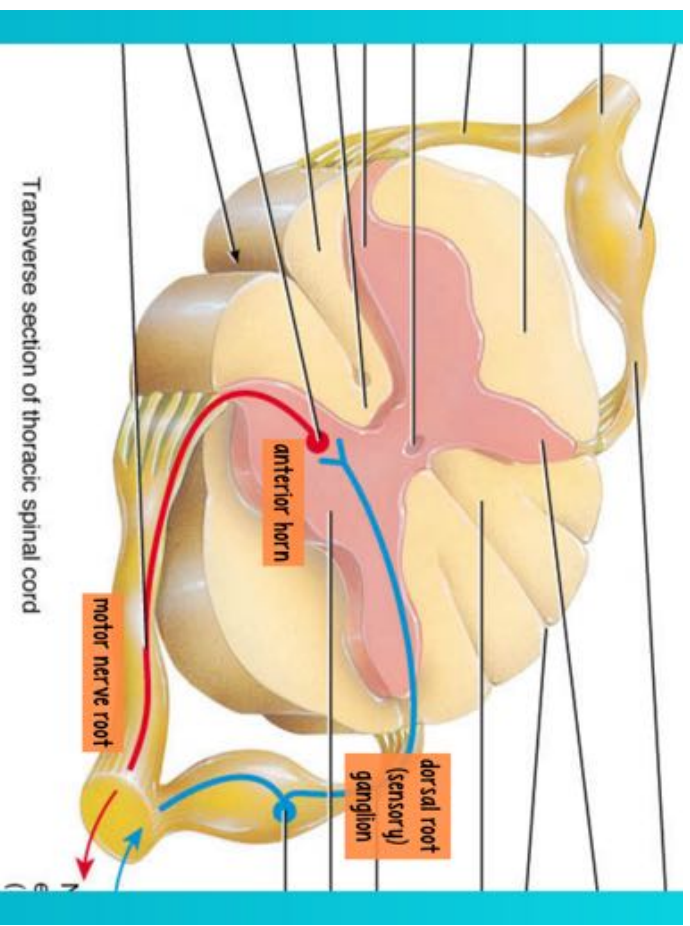
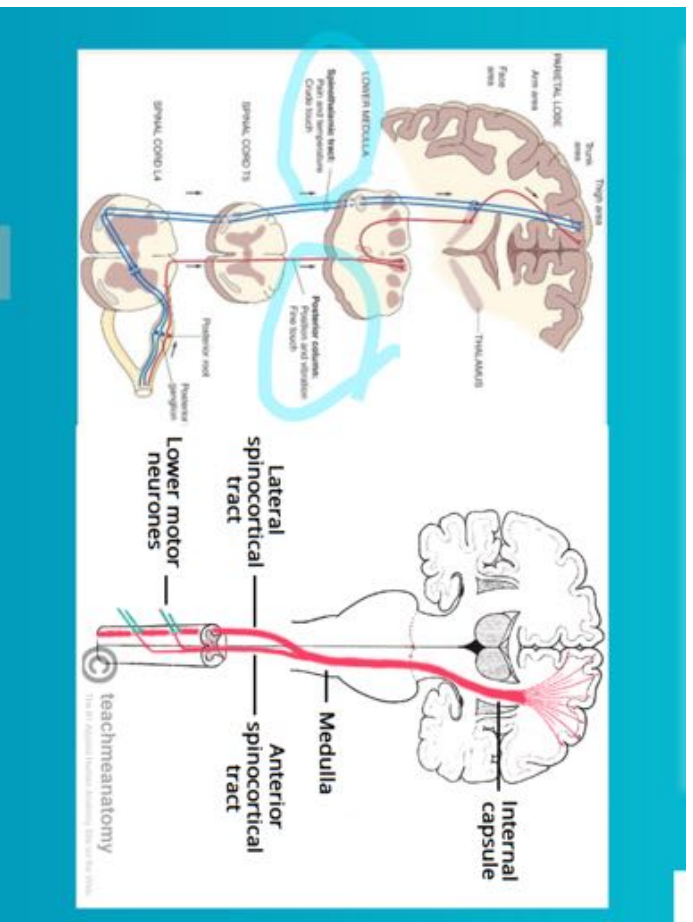
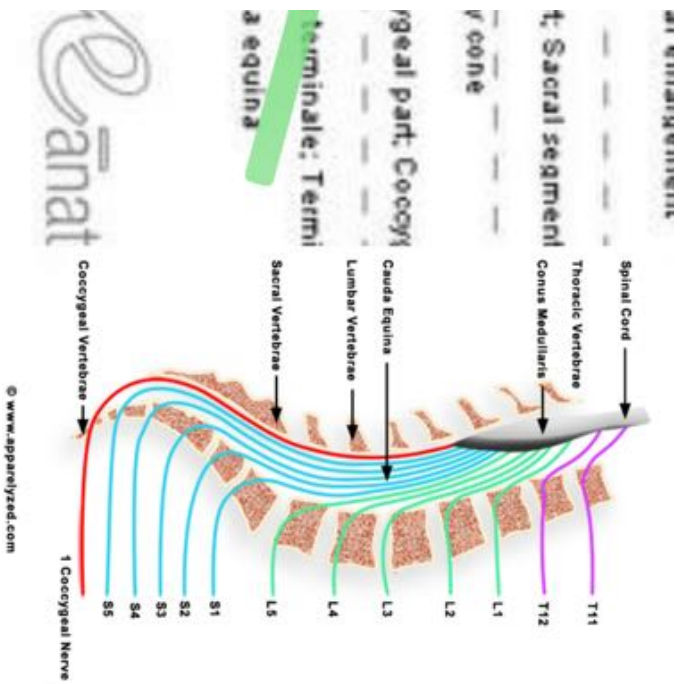
SPINAL CORD (NOT CHORD!)

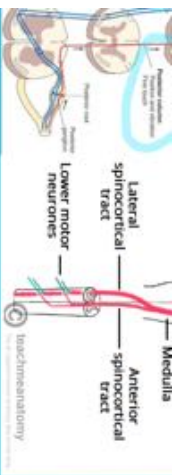
trauma/Herpes Zoster
neoplasia
infection
vascular
metabolic
immunologic
genetic
nutritional

Structure of the Spinal Cord:
 - **Spinal Cord:** Contains the central nervous system, including the gray matter and white matter.
 - **Spinal Nerve:** Composed of afferent (sensory) and efferent (motor) fibers.
 - **Rootlets:** Small bundles of axons that merge to form the spinal nerve.
 - **Roots:** The ventral root carries motor fibers, and the dorsal root carries sensory fibers.

Spinal Cord Segments:
 - **Cervical:** C1-C8
 - **Thoracic:** T1-T12
 - **Lumbar:** L1-L5
 - **Sacral:** S1-S5
 - **Cauda Equina:** A bundle of nerve roots at the end of the spinal cord.



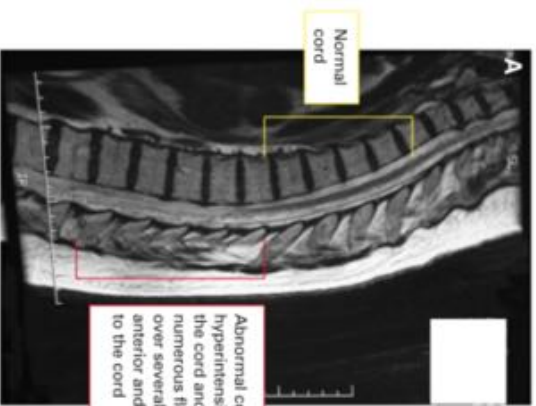




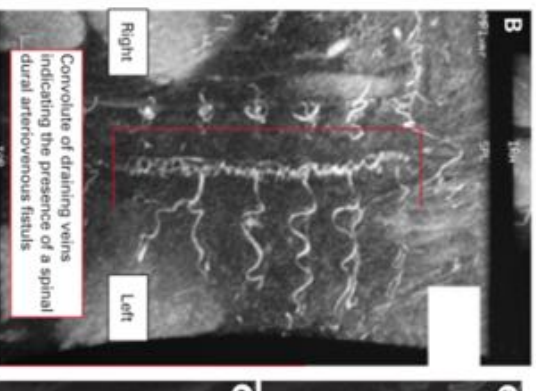
infection
vascular
neoplasm
EXTRINSIC
trauma/stress
neoplasms
OR
hereditary
metabolic



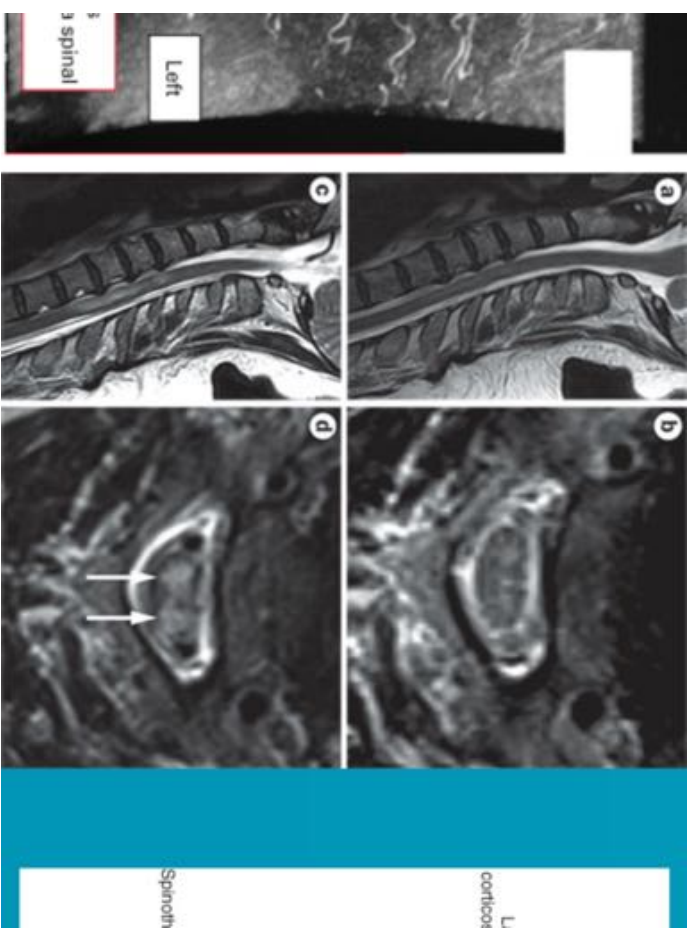
infection
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Abnormal cord with hyperintensity within the cord and numerous flow voids over several segments anterior and posterior to the cord

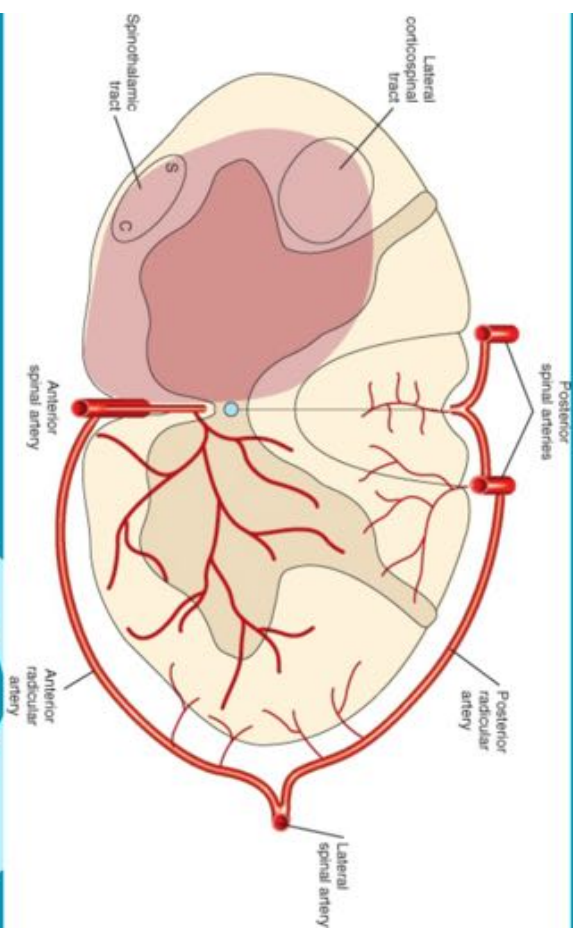


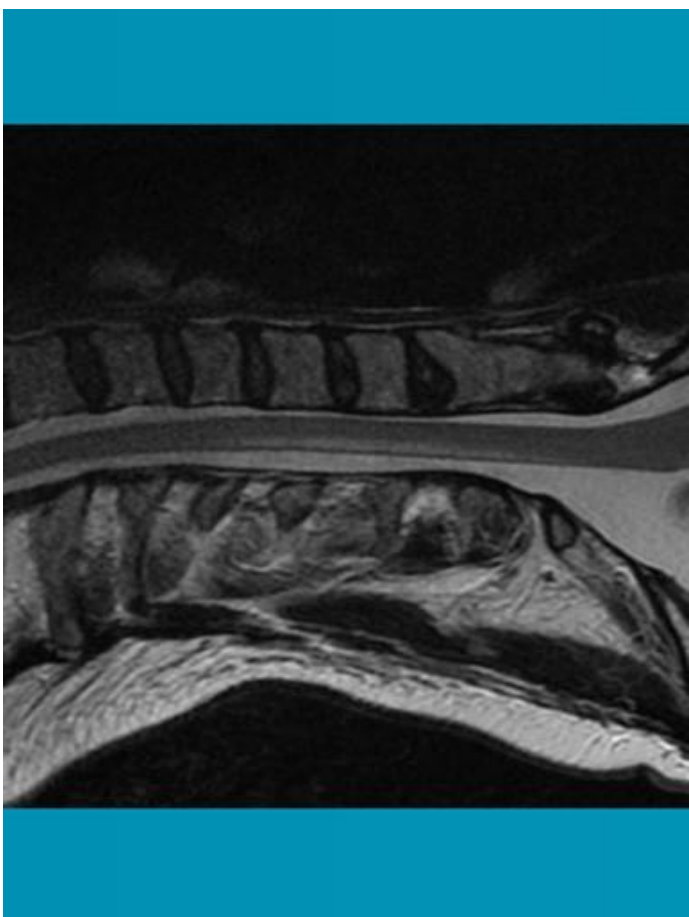
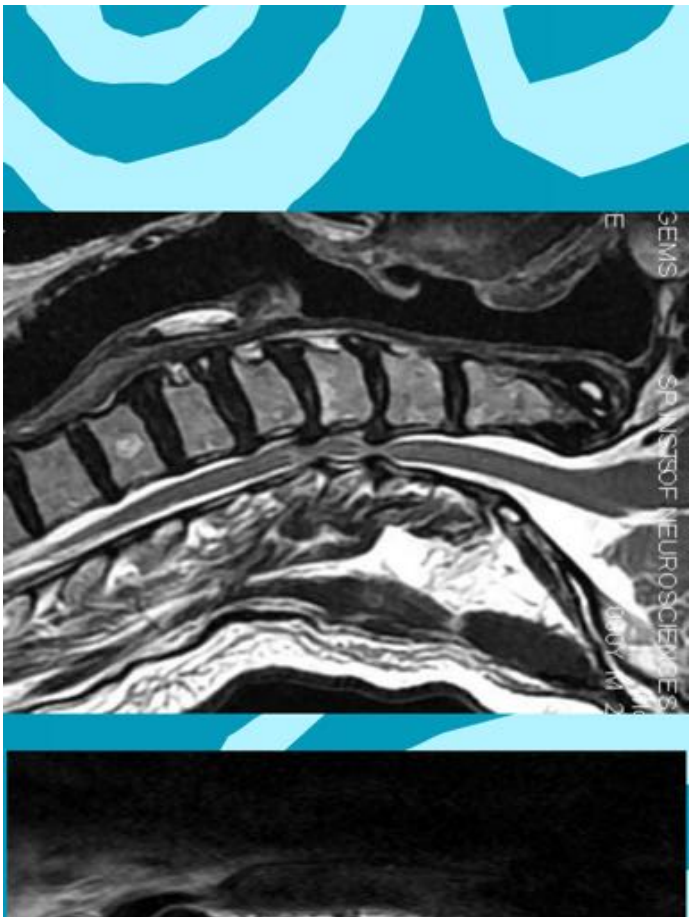
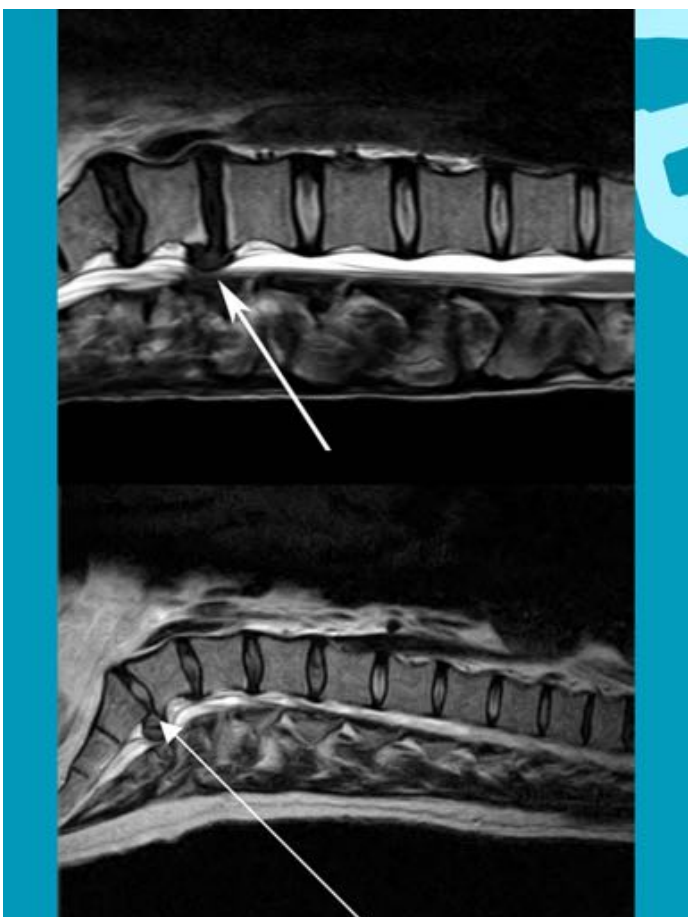
Convolute of draining veins indicating the presence of a spinal dural arteriovenous fistula



L
corticostri

Spinoth





SPINES AND NERVES

Useful stuff in no particular order

