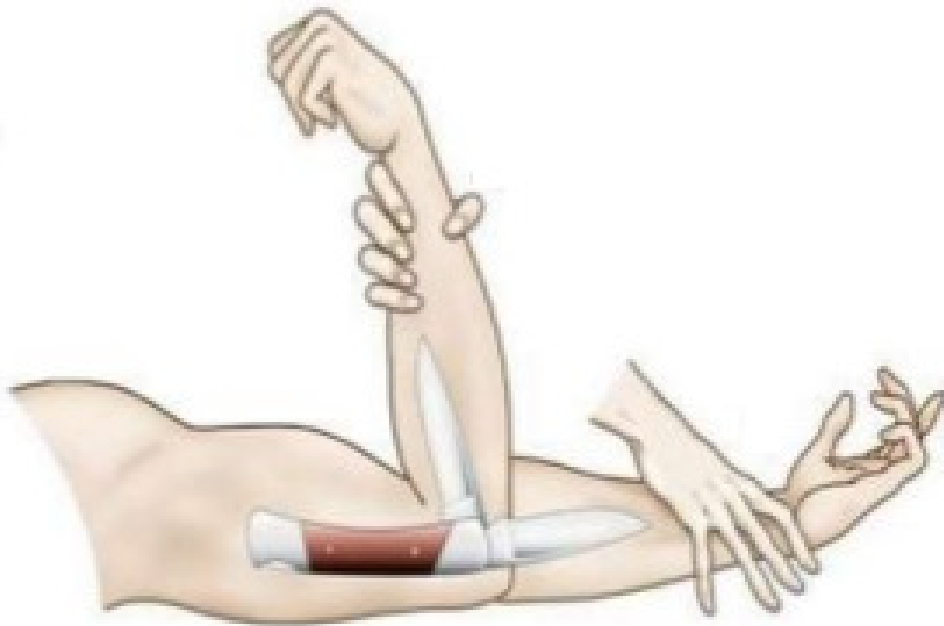


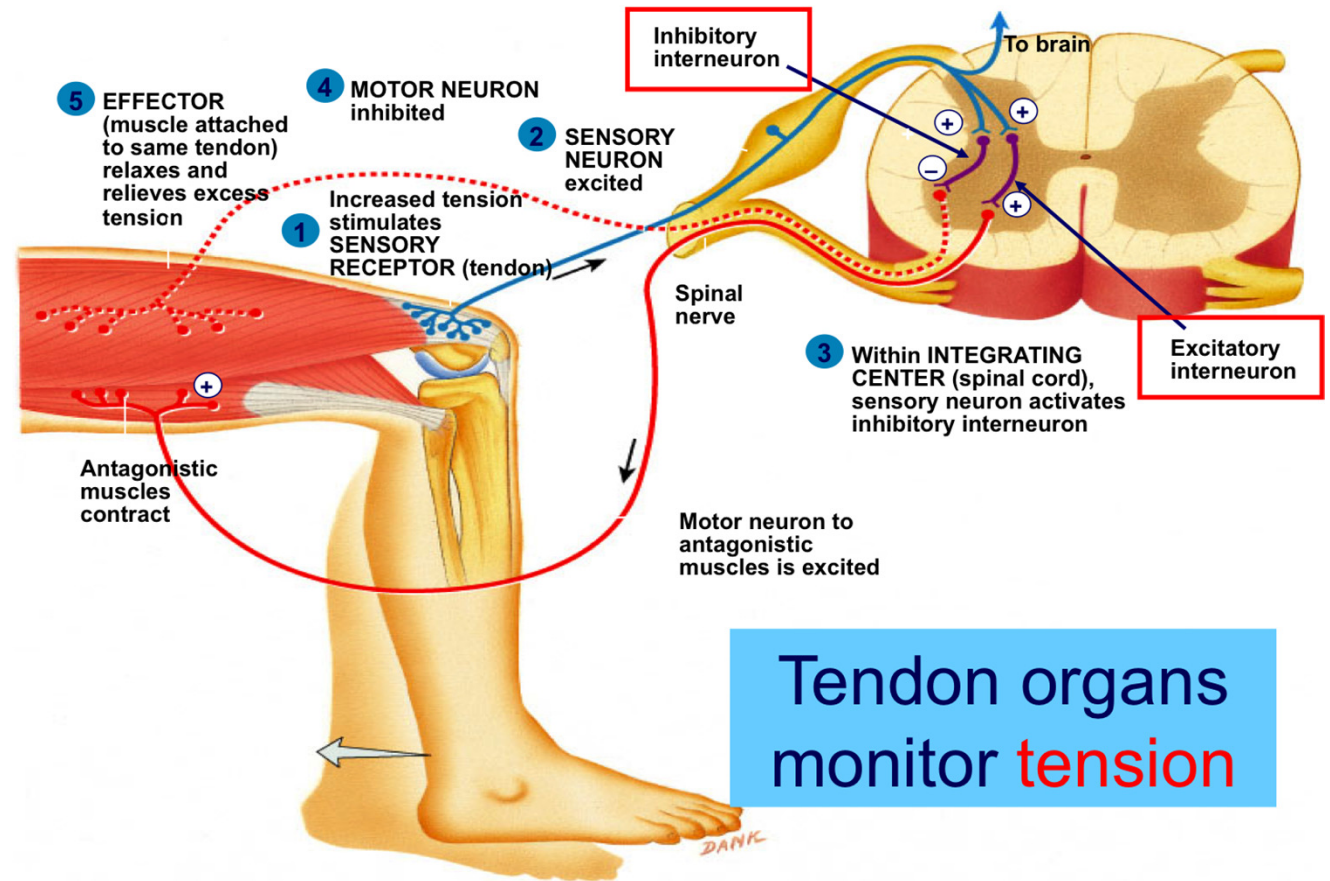
Clasp knife reaction

- Overactivity of the pointine excitatory system (spasticity)
- **Initial resistance:** Exaggerated stretch reflex
- **Sudden release:** After applying pressure, the tension in the muscle will increase and will be enough to activate the **Golgi tendon organs** which will cause the relaxation

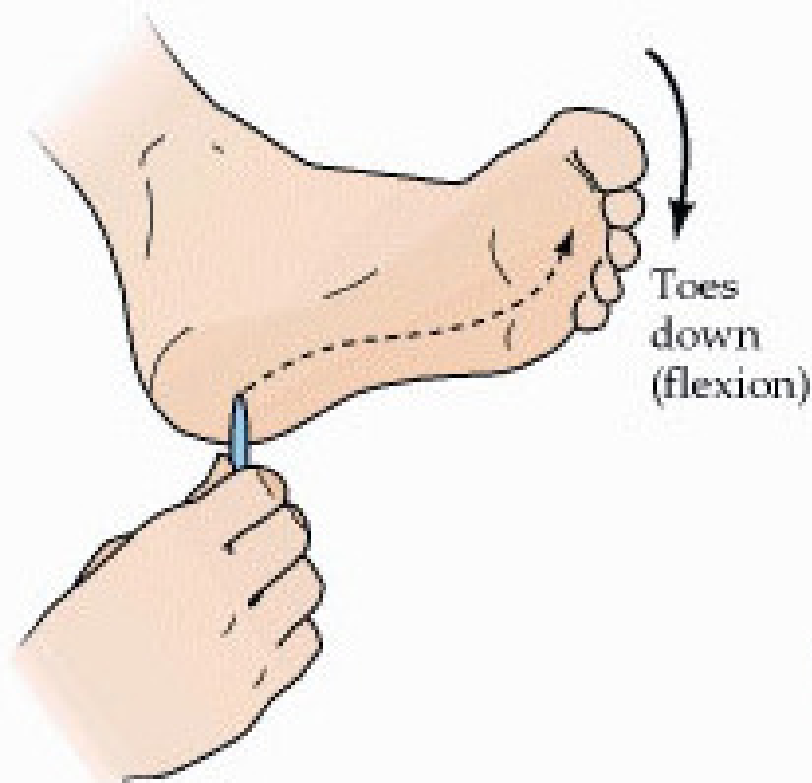


Tendon reflex

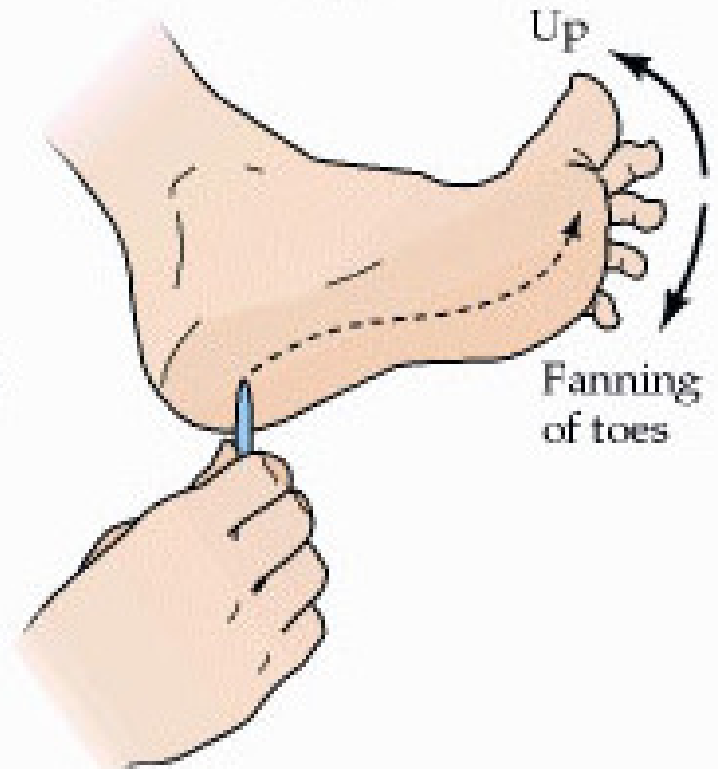
- Polysynaptic reflex arc
- law of reciprocal innervation



(A) Normal plantar response

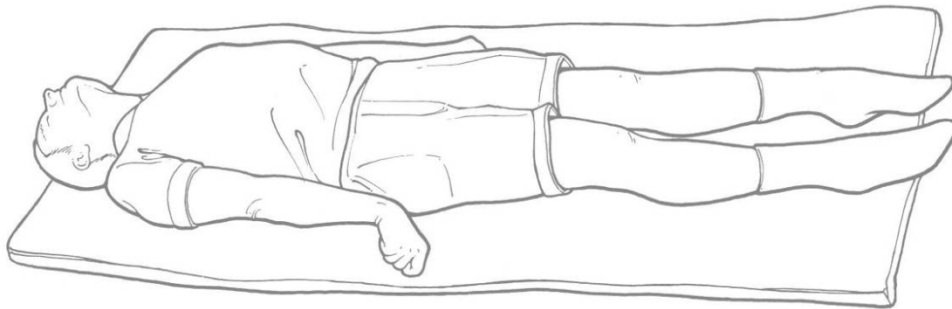
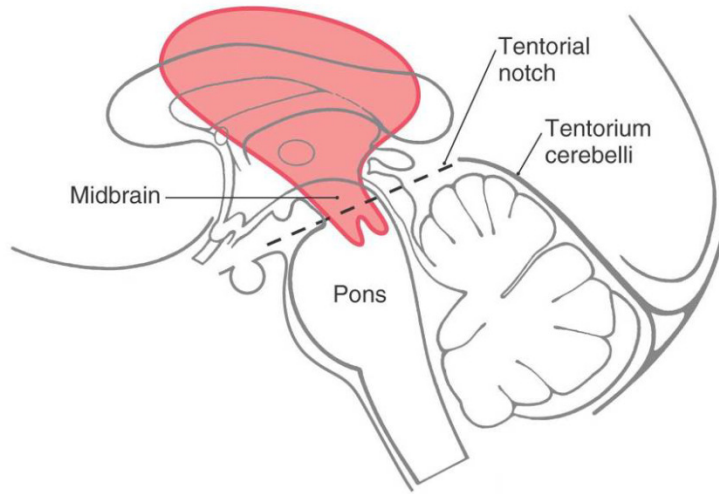


(B) Extensor plantar response (Babinski sign)

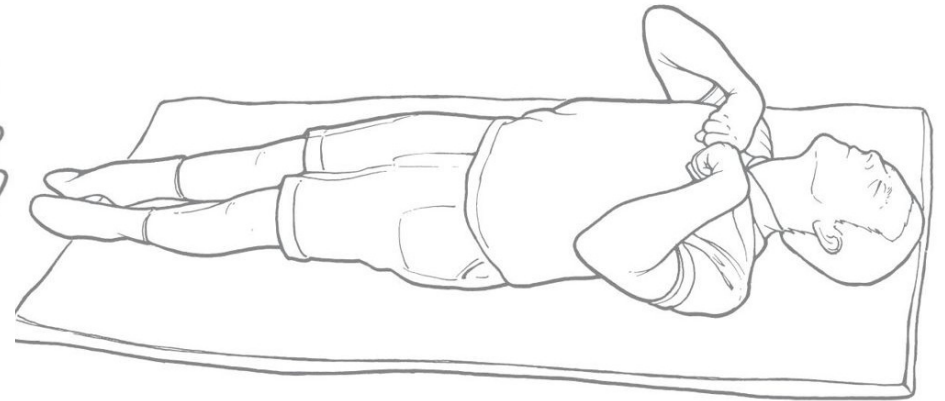
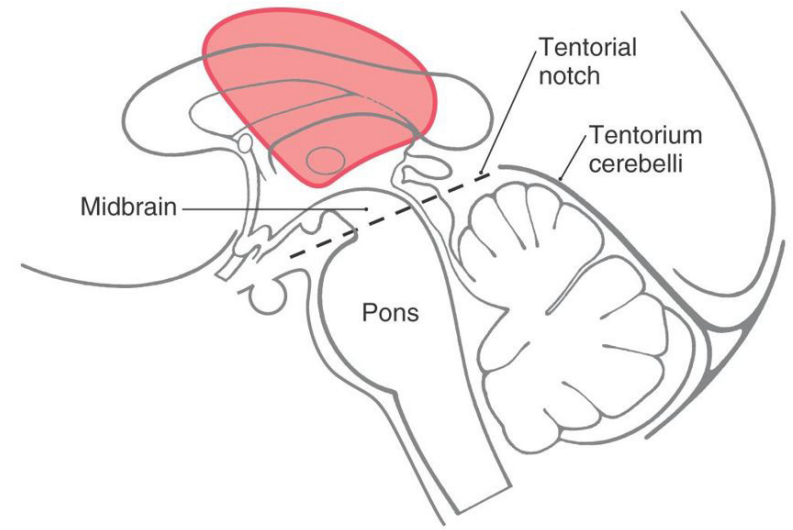


When the corticospinal tracts are nonfunctional, the influence of the other descending tracts on the toes becomes apparent, and a kind of withdrawal reflex takes place in response to stimulation of the sole, with the great toe being dorsally flexed and the other toes fanning out.

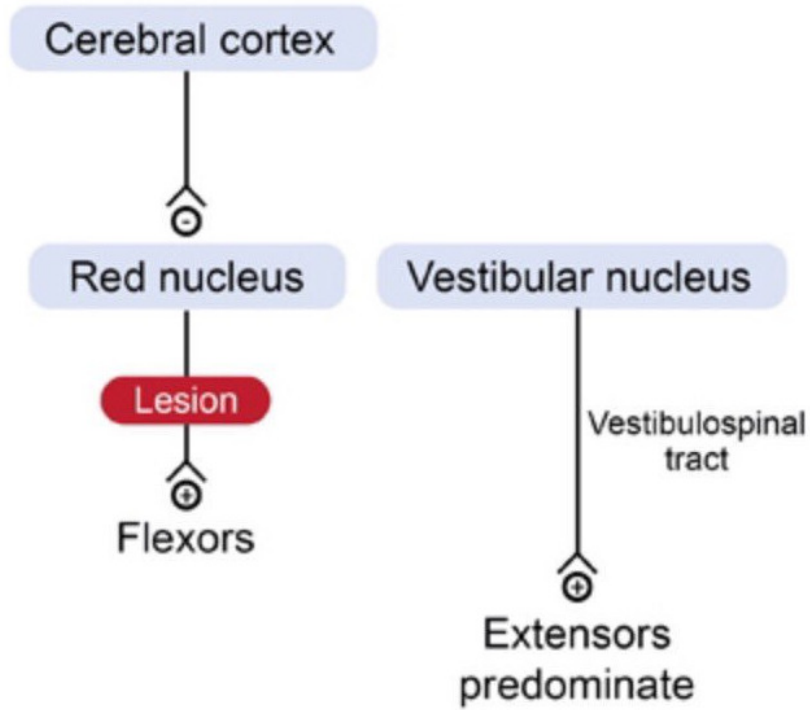
Decerebrate rigidity



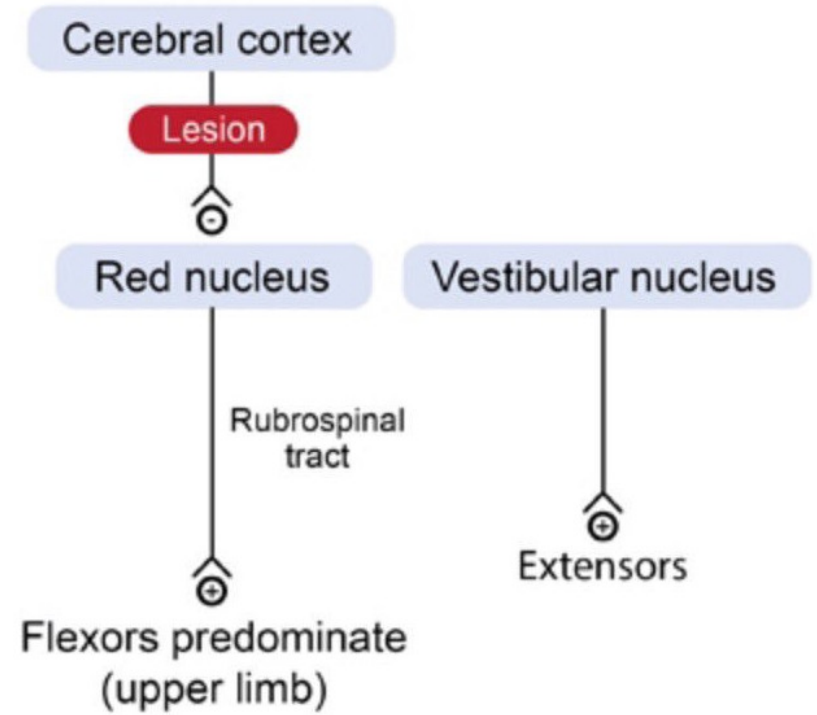
Decorticate rigidity



Decerebrate posture



Decorticate posture



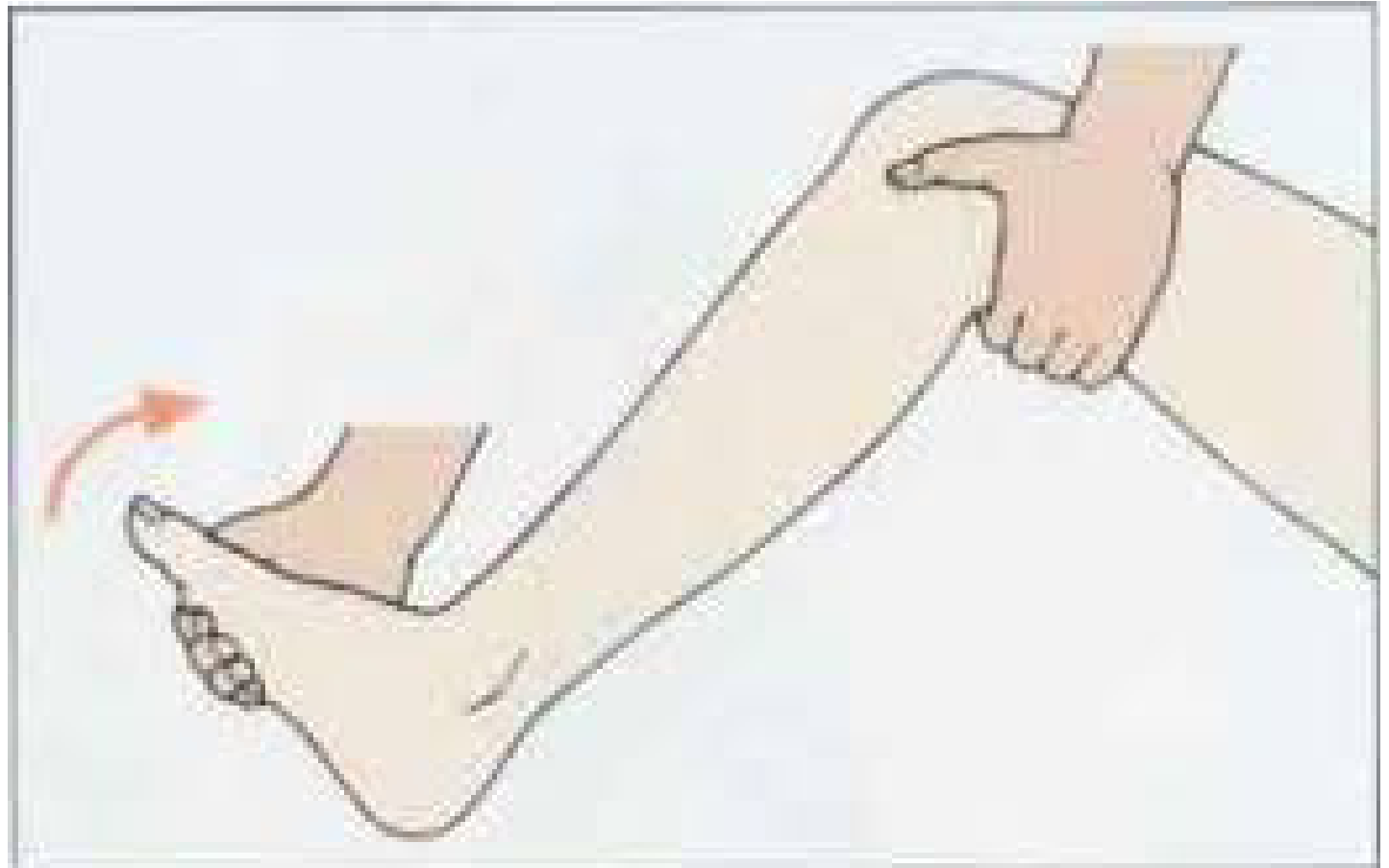


Fig. 6.29 Testing for ankle clonus.

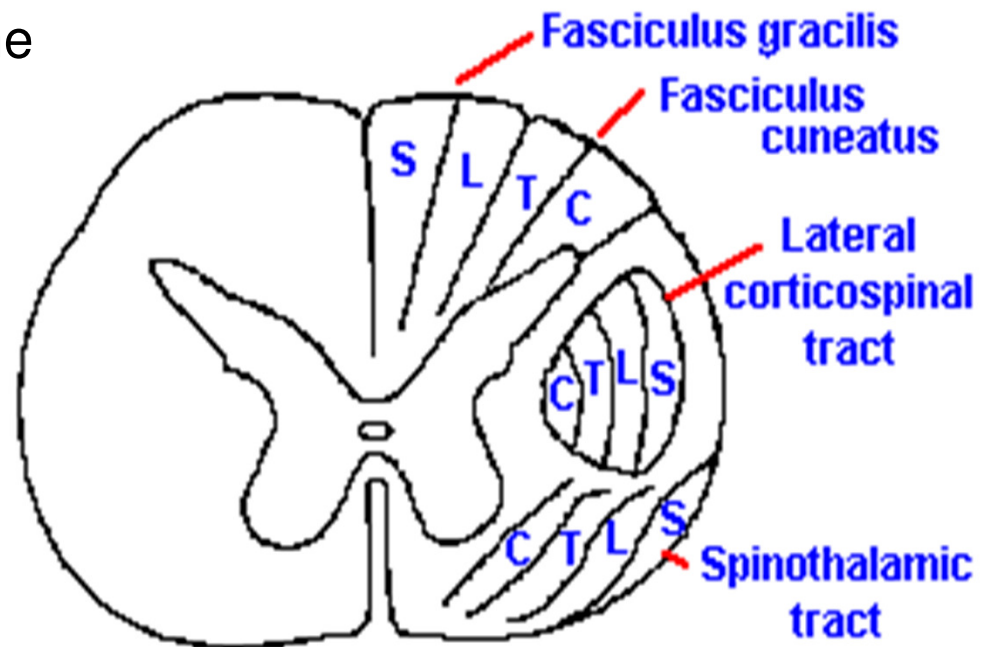
Rhythmic contractions and relaxation of muscles when they are subjected to sudden sustained stretch

Clinical significance of lamination of the ascending tracts

- Any external pressure exerted on the spinal cord in the region of the spinothalamic tracts will first experience a loss of pain and temperature sensations in the sacral dermatome of the body
- If pressure increases the other higher segmental dermatomes will be affected

❖ Remember that in the spinothalamic tracts the cervical to sacral segments are located medial to lateral

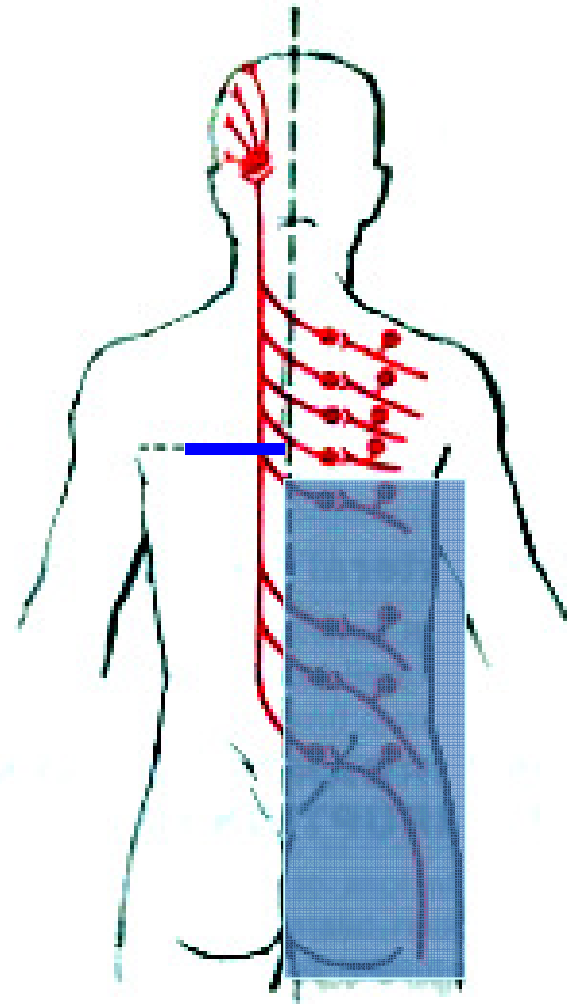
- **Intramedullary tumor:** affect the cervical fibers (Medial)
- **Extramedullary tumor** would affect lower limb fibers (lateral).
- ❑ **Sacral sparing:** Occur at intramedullary tumor



Clinical application destruction of LSTT

- loss of
 - pain and thermal sensation
 - on the contralateral side
 - below the level of the lesion

patient will not
recognize hot and cold

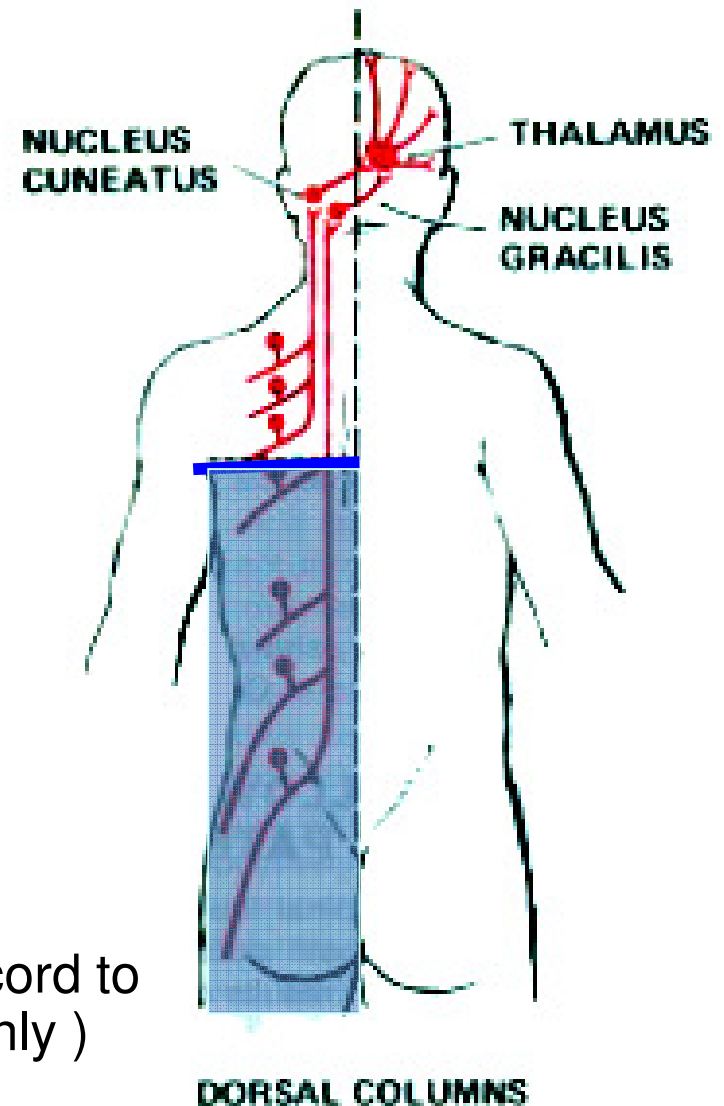


**LATERAL SPINOTHALAMIC
TRACT**

Clinical application
destruction of
fasciculus gracilia and cuneatus

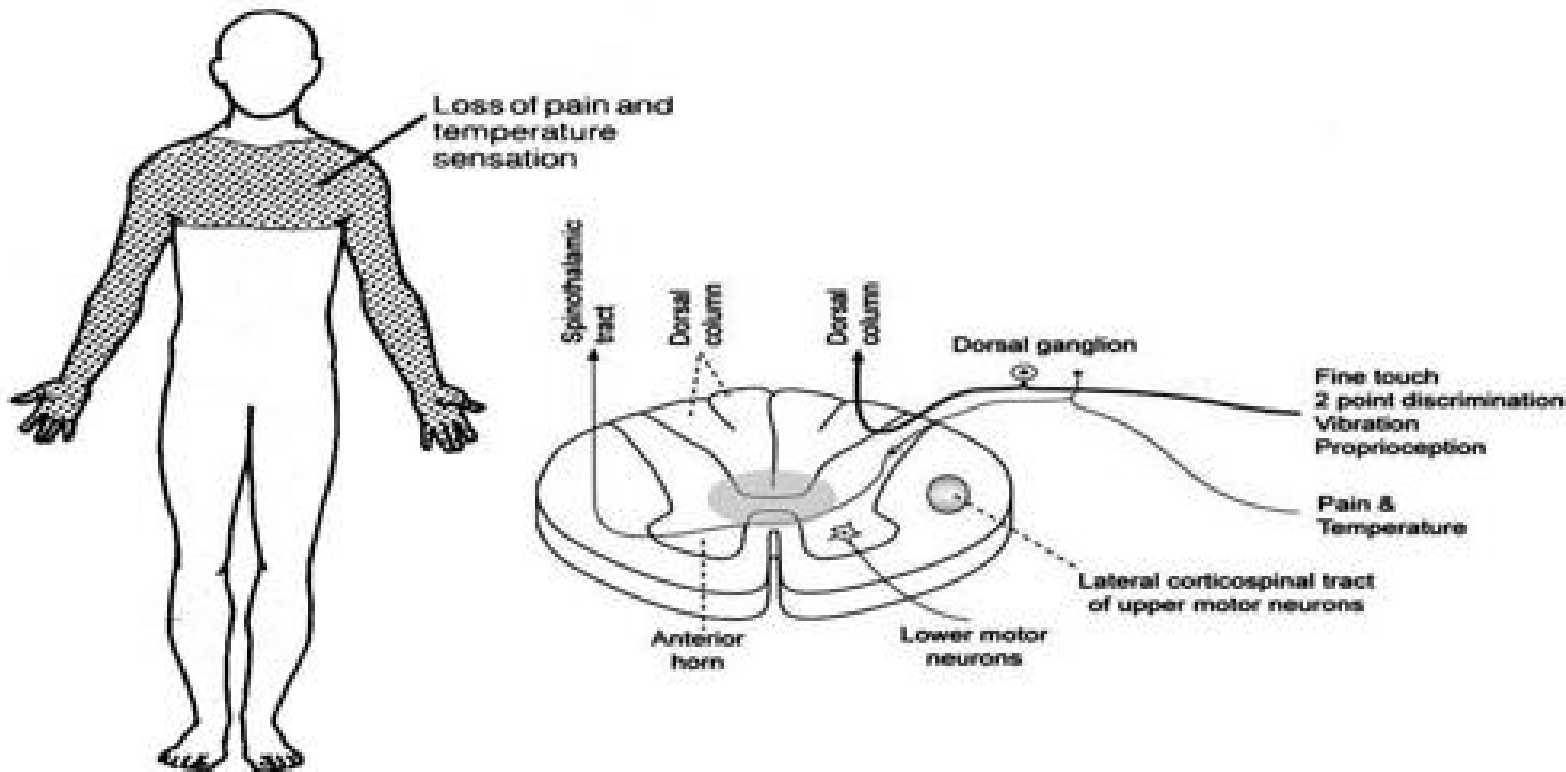
- loss of muscle joint sense, position sense, vibration sense and tactile discrimination
- on the same side
- below the level of the lesion

(extremely rare to have a lesion of the spinal cord to be localized as to affect one sensory tract only)



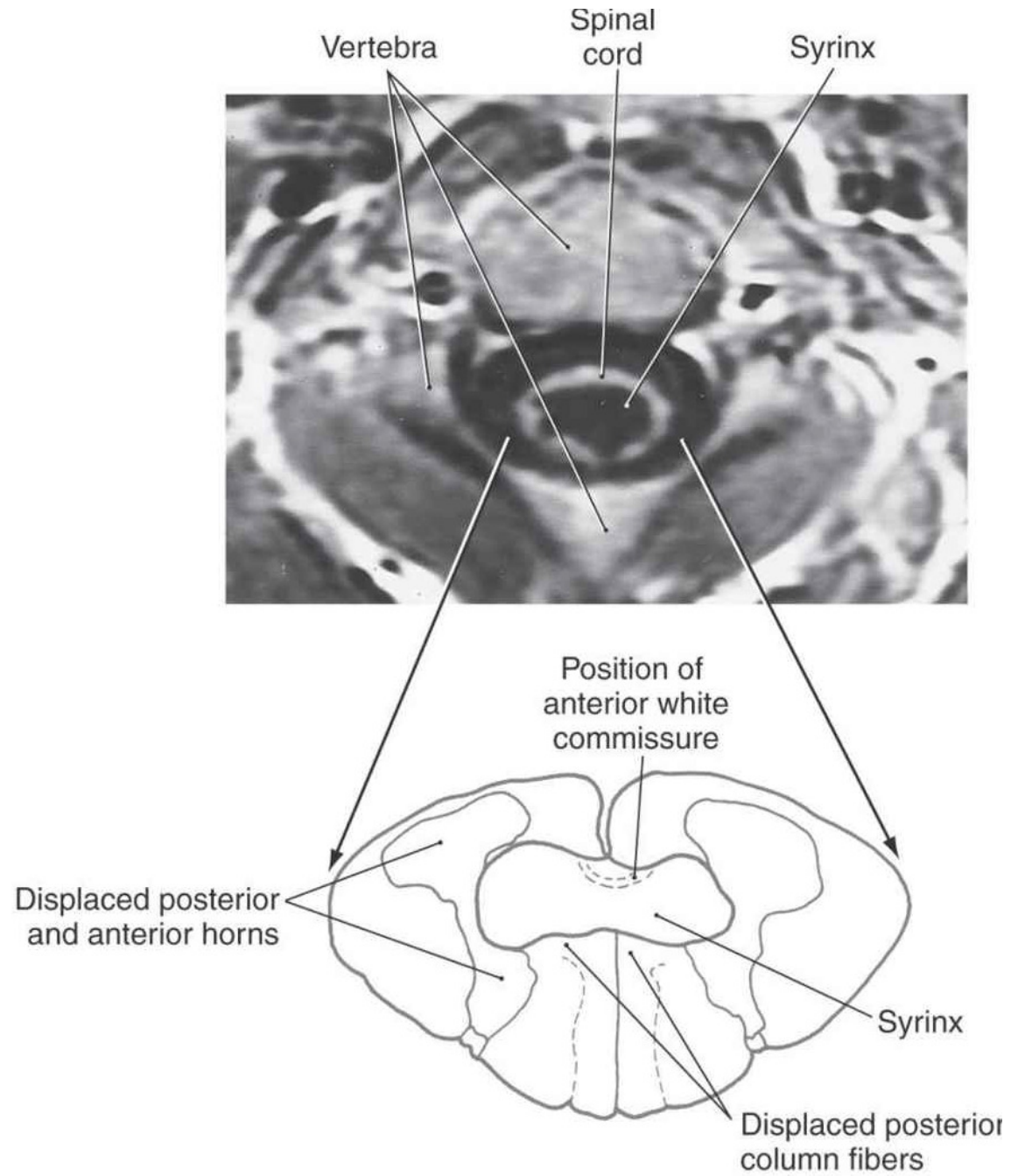
Syringomyelia

- Cavitation of the central regions of the spinal cord
- Damage fibers crossing in the anterior white commissure in both directions
- Bilateral loss of pain and thermal sensations
- When it is located at the C4 to C5 levels of the spinal cord sensory losses in the configuration of a cape draped over the shoulders and extending down to nipple level



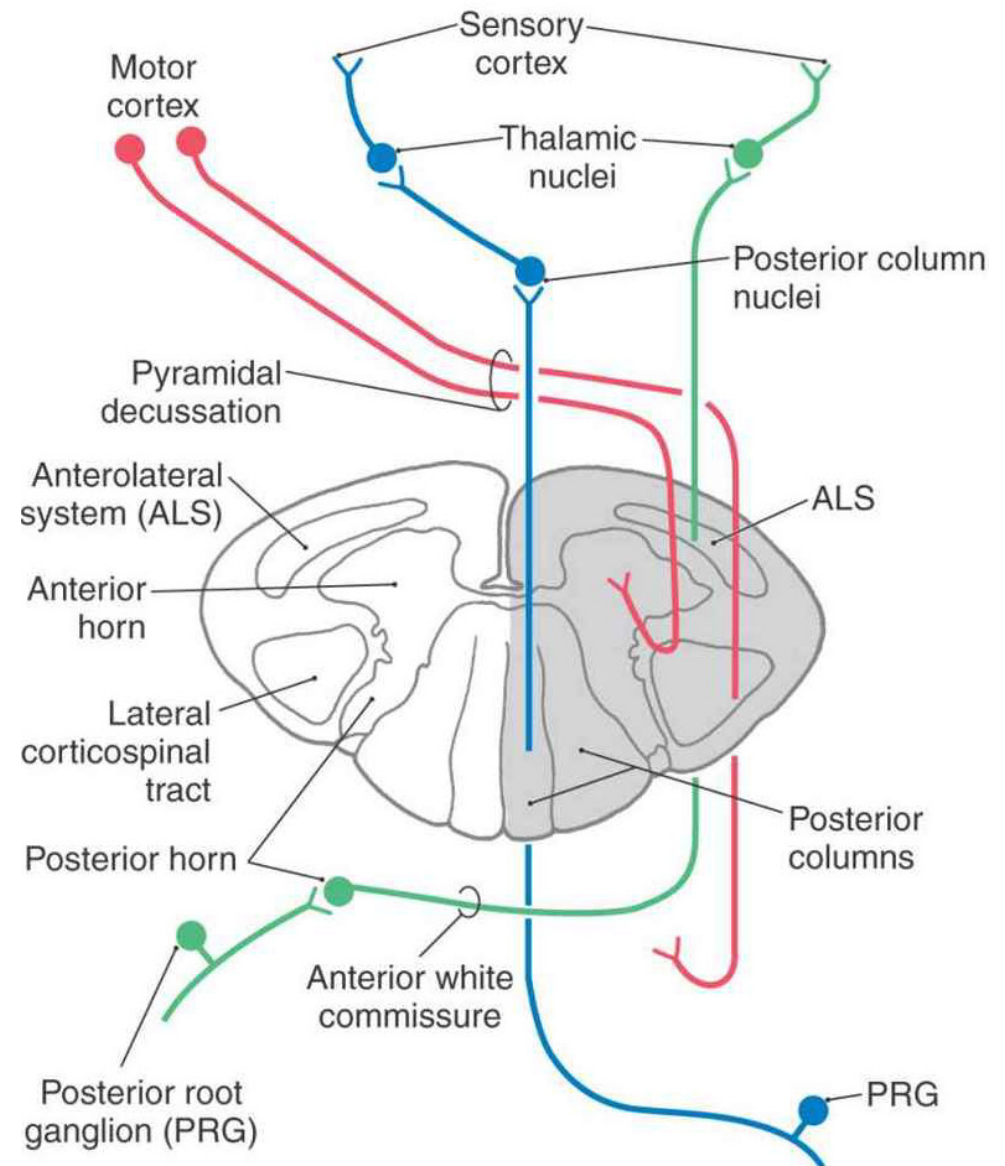
Syringomyelia

- If a **cyst extends into** the anterior horn results it will cause:
 - bilateral sensory loss
 - weakness of the corresponding extremity
- extension of the syrinx into one anterior horn results in an ipsilateral weakness of the upper extremity
- if both anterior horns are involved, the weakness is bilateral



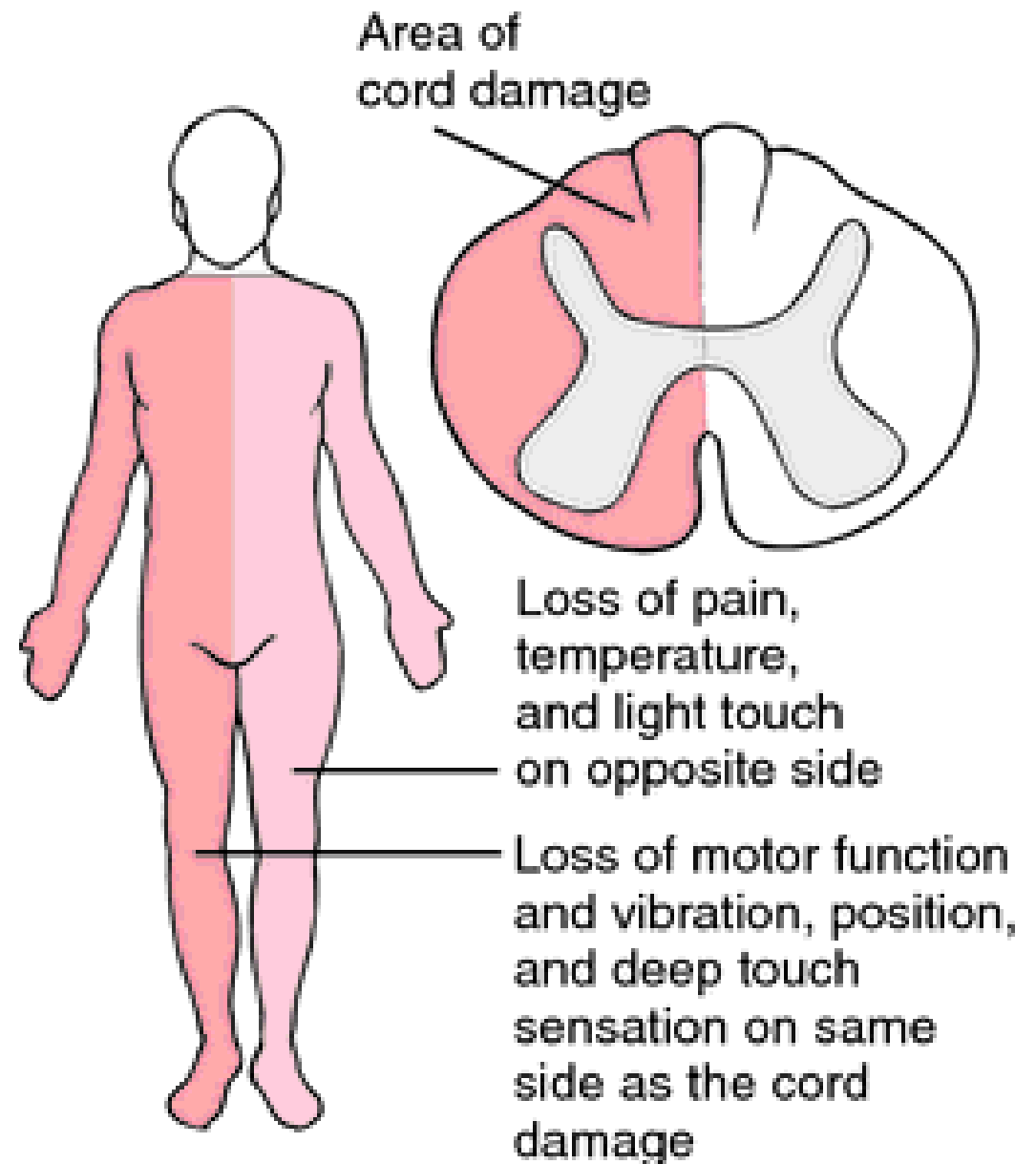
Brown-Séquard Syndrome

- Functional hemisection of the spinal cord results in:
 - ❖ damage to the lateral corticospinal tract, ALS, posterior columns
- Example: A lesion on the right at C4 to C5 will result in:
 - muscle weakness or paralysis (hemiparesis, hemiplegia) on the right side
 - loss of pain and thermal sensations on the left side
 - loss of proprioception, vibratory sense, and discriminative touch on the right

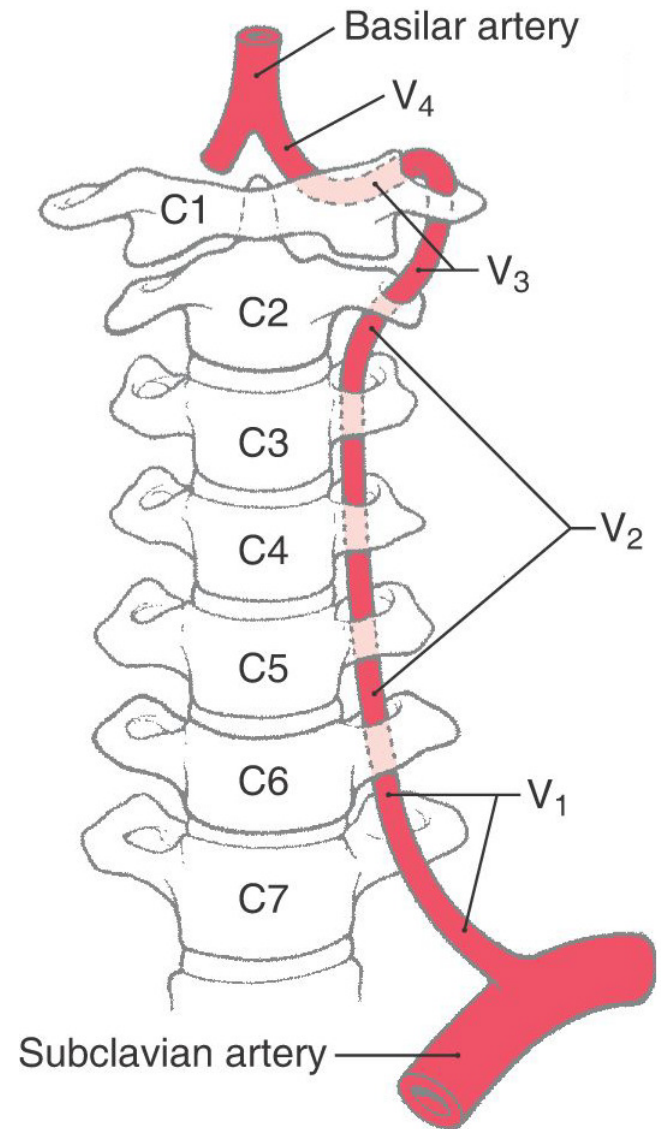
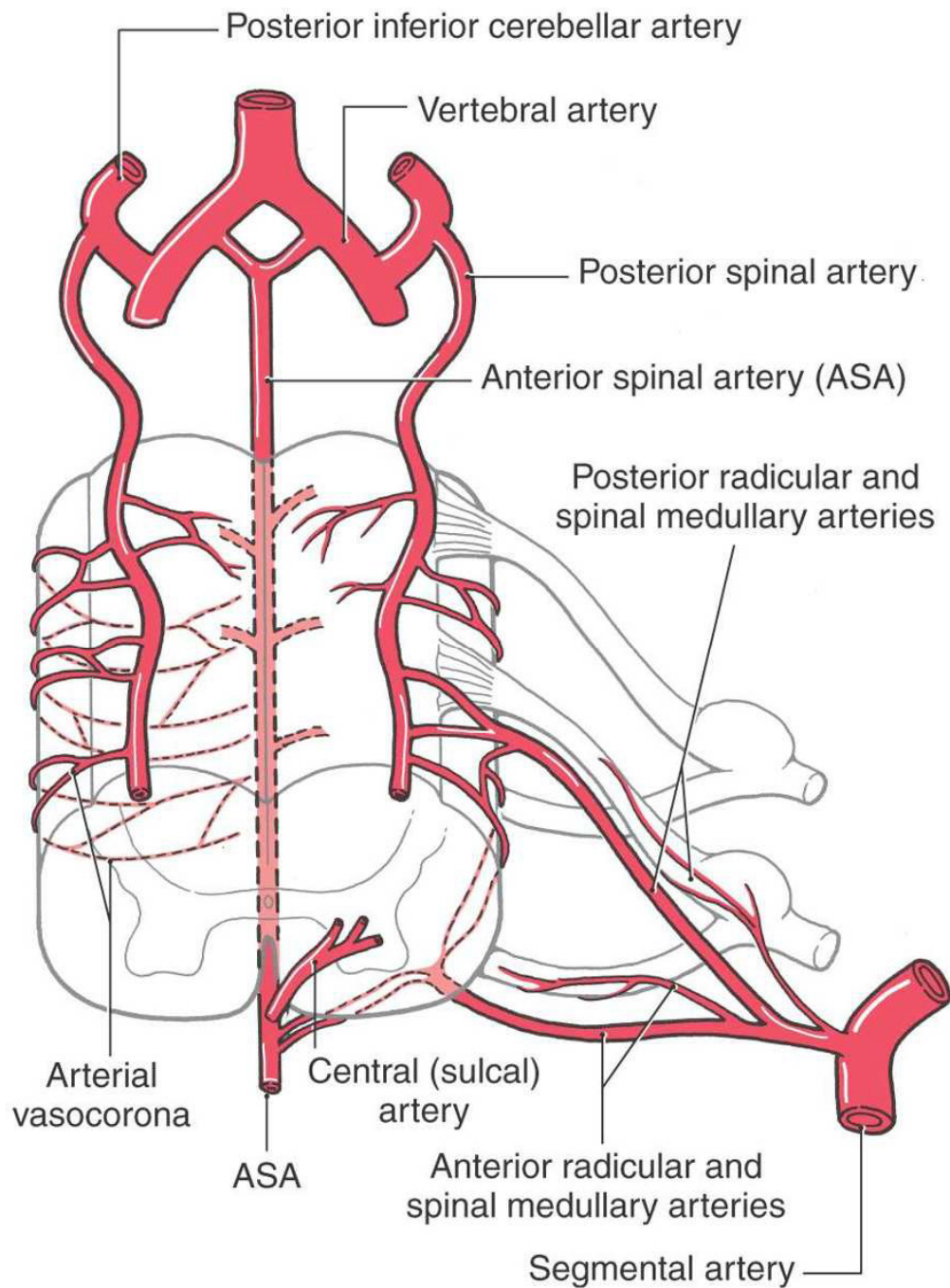


Brown-Séquard Syndrome

- **Contralateral** loss of nociceptive and thermal sensations over the body below the level of the lesion
- **Ipsilateral** loss of discriminative tactile, vibratory, and position sense over the body below the level of the lesion
- **Ipsilateral** paralysis of the leg or leg and arm, depending on the level of the hemisection

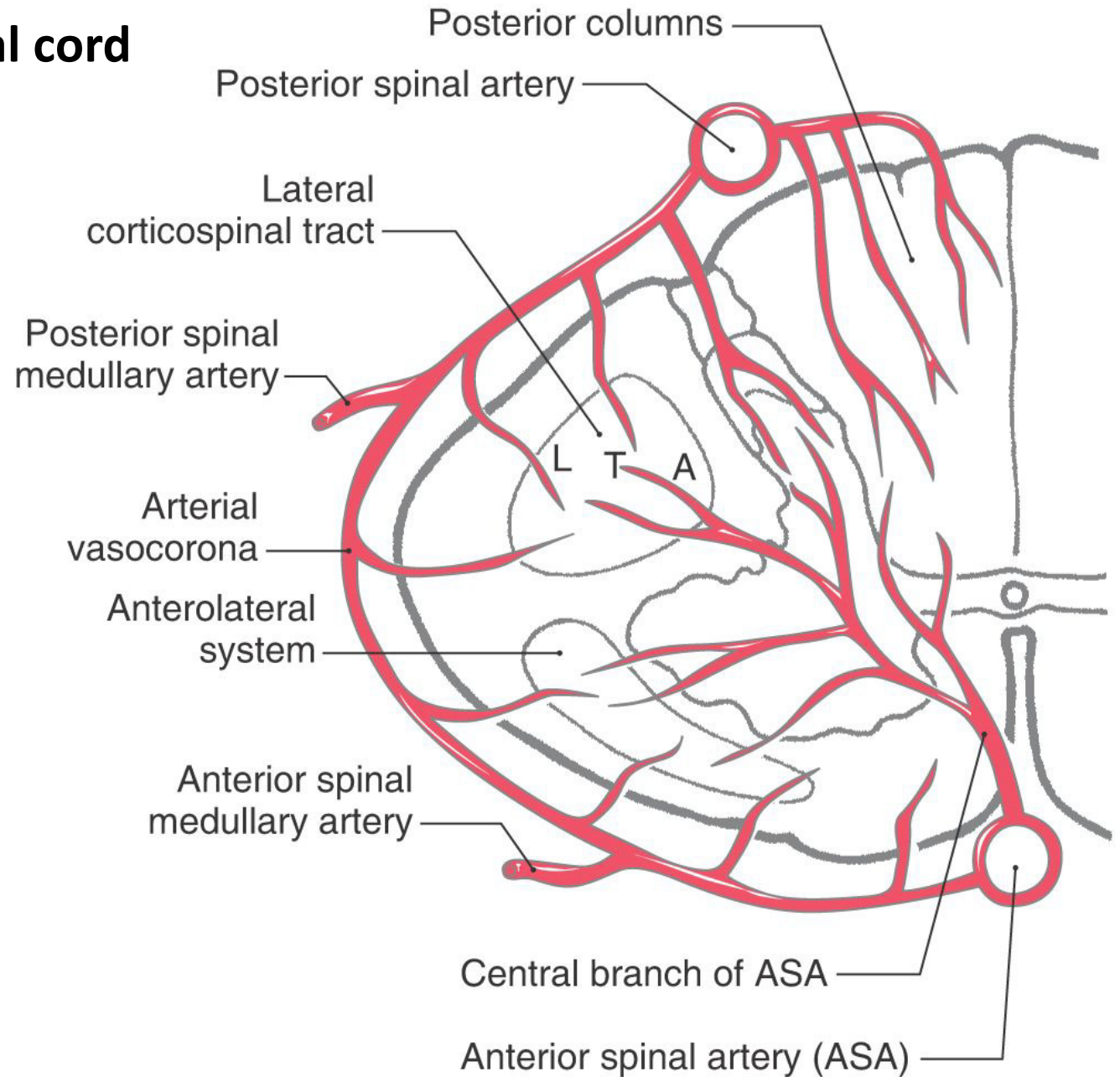


Blood supply of spinal cord



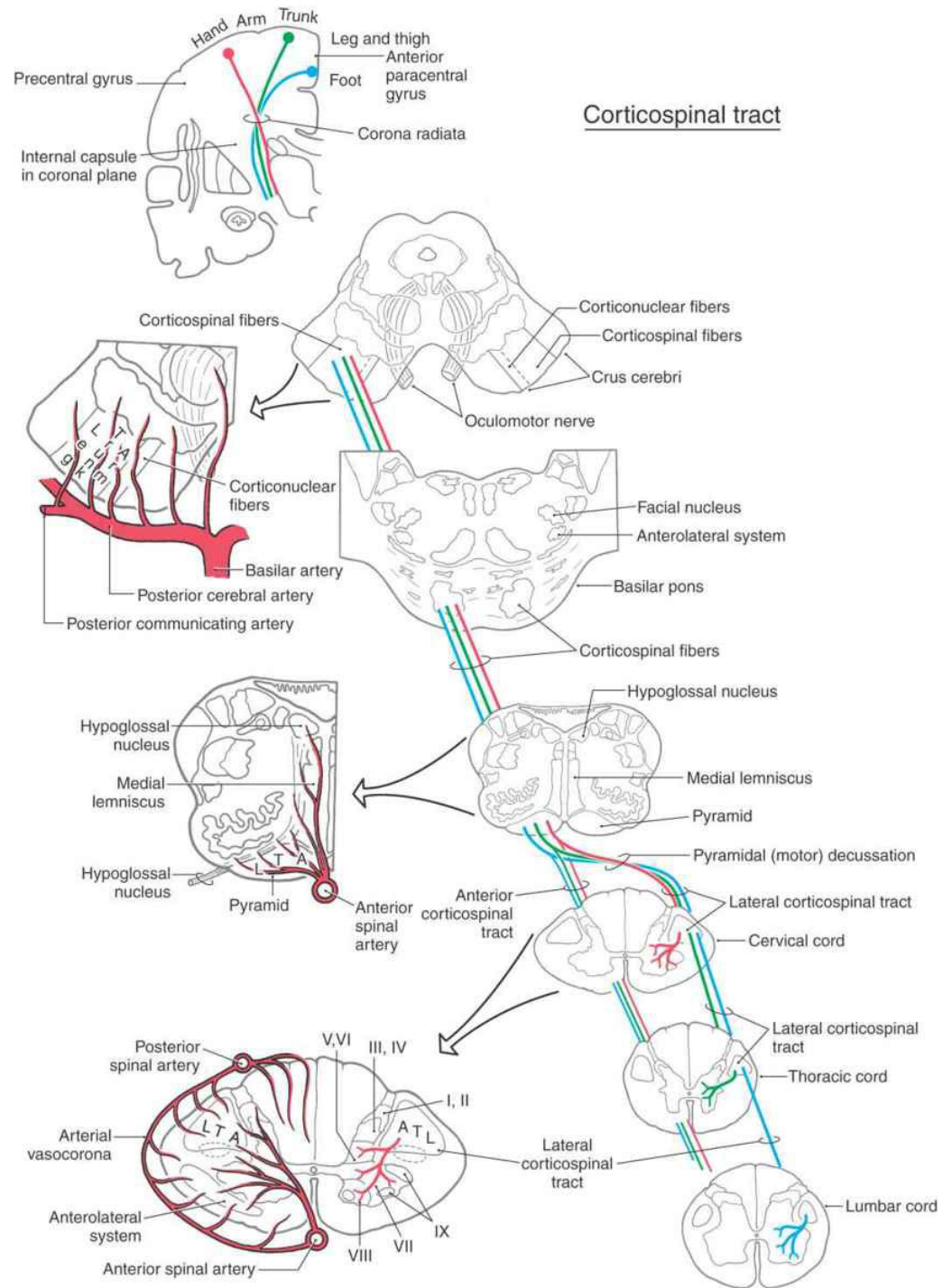
Blood supply of spinal cord

- Terminal branches of the spinal medullary arteries join to form **arterial vasocorona**.
- **The posterior spinal arteries and arterial vasocorona** : The posterior columns and peripheral parts of the lateral and anterior funiculi
- **The anterior spinal artery**: Most of the gray matter and the adjacent parts of the white matter



Central Cord Syndrome

- may result from hyperextension of the neck
- Occludes blood supply to the cord via the anterior spinal artery
- bilateral weakness of the extremities (more so of the upper than of the lower)
- pain and thermal sensation loss, and bladder dysfunction



- Compromise of blood flow in the **posterior spinal artery** results in:
- **Ipsilateral reduction or loss of discriminative, positional, and vibratory tactile sensations at and below the segmental level of the injury**

