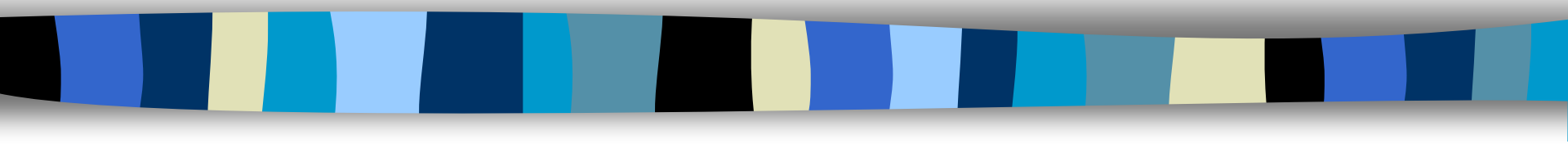
CORD INJURY



Cord injury

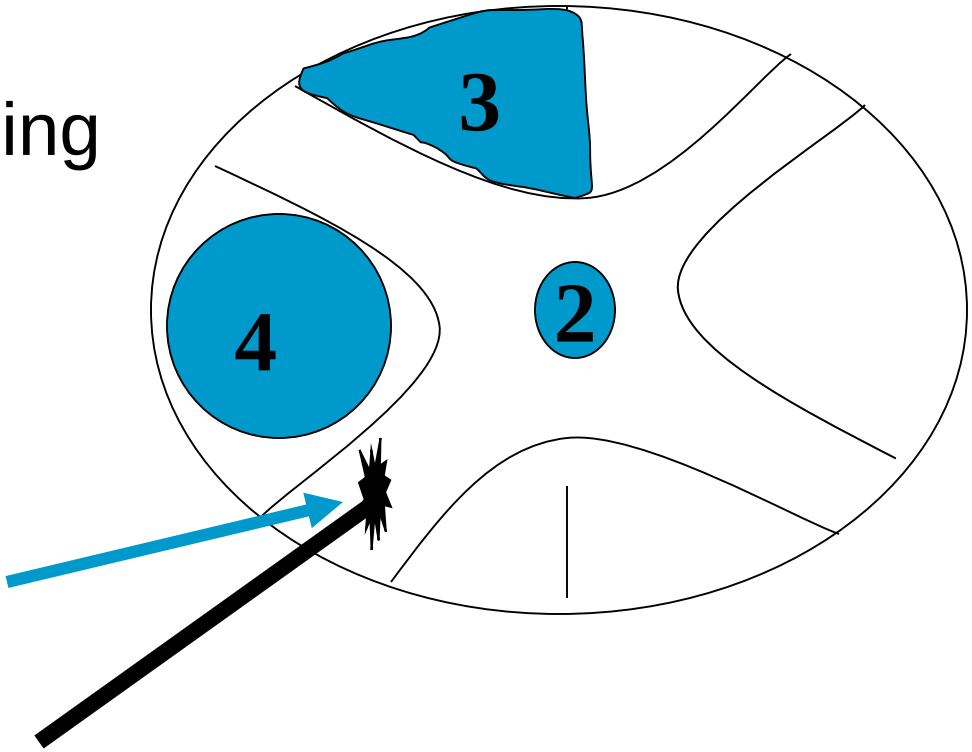
- Spinal cord damage results from
  - Ischaemia
  - infections
  - Trauma
  - Tumors
  - Degeneration

Effects of cord injury

- Effects are due to damage to the
  - 1. Ascending tracts
  - 2. Descending tracts
  - 3. Dorsal and ventral horns

Lesions involves

1. Anterior horn cells
2. Central gray matter
3. Dorsal columns
4. Lateral descending and ascending tracts



1.Anterior horn cell

Anterior horn cell lesions

- Classically seen with
  - poliomyelitis
  - motor neuron disease
- Results LMN lesion of the ipsilateral body with
  - 1. Flaccid paralysis
  - 2. Atrophy
  - 3. Fasciculations
  - 4. Absent reflexes
  - 5. Hypotonia

Central gray matter lesions

- Seen with Syringomyelia
  - Progressive enlargement of the central canal with cavitation
  - forms a syrinx
  - commonly involves the cervical cord
  - Interrupts the crossing lateral spinothalamic tracts
  - ascending and descending tracts are not affected initially

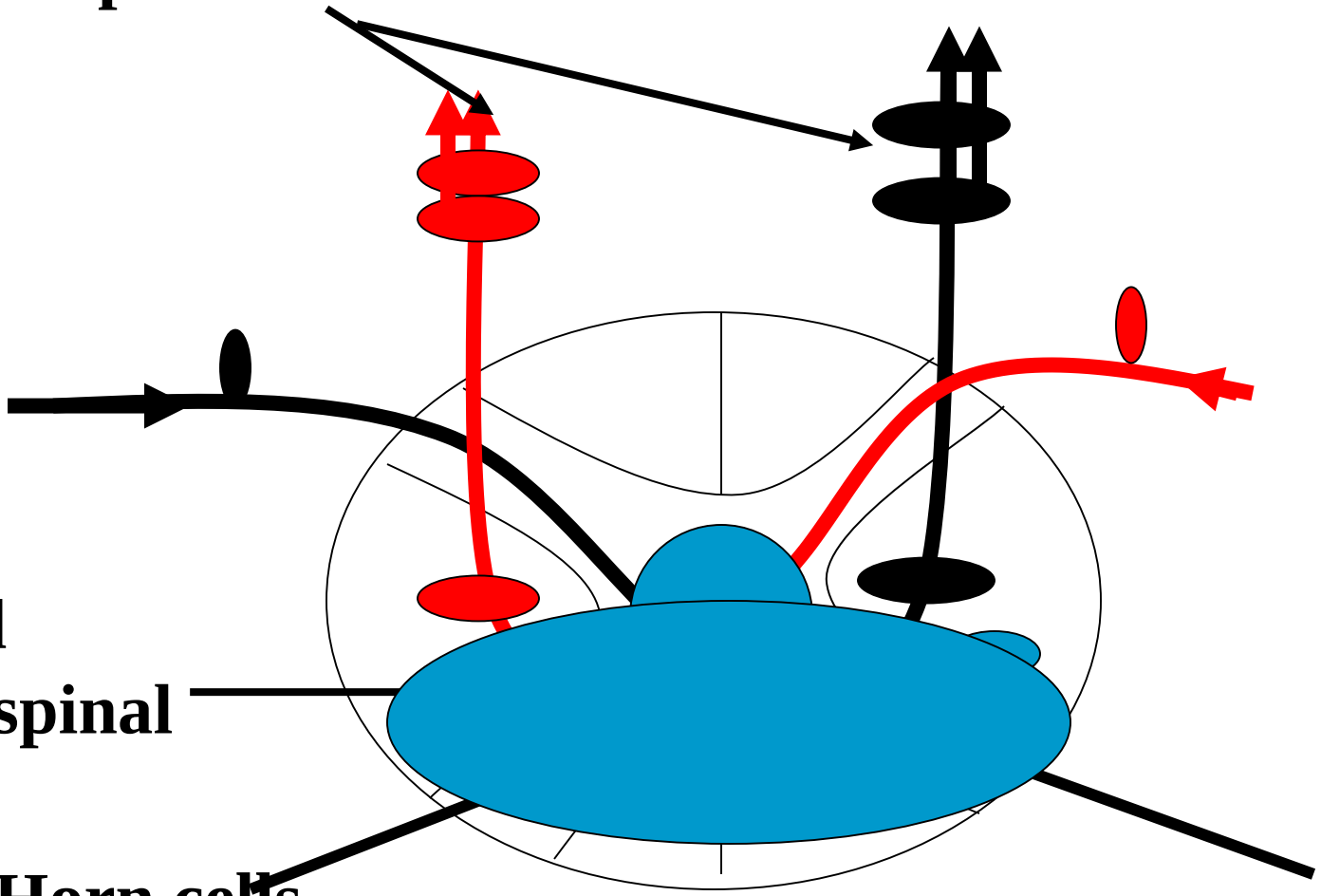
Central gray matter lesions

- Syringomyelia
- Results
  - loss of pain and temperature of the both side of the body
  - on the affected dermatomes in the upper limbs
  - known as dissociative sensory loss
  - since the ascending lateral spinothalamic tract is not affected pain and temperature sensation of the lower extremities are intact

Central gray matter lesions

- Syringomyelia
- With time cavity expands and involvement of the
  - anterior horn cells results atrophy of small muscles of the hand
  - Lateral corticospinal tract results upper motor neuron lesion of the lower extremity

Central gray matter lesions

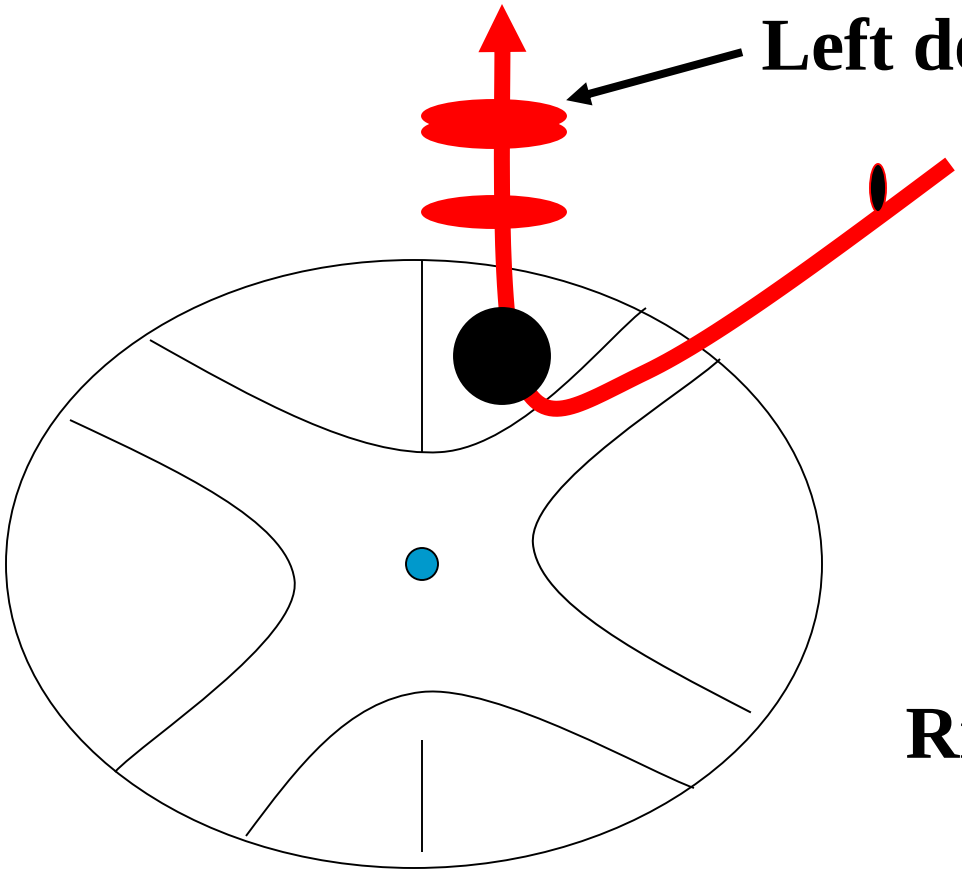


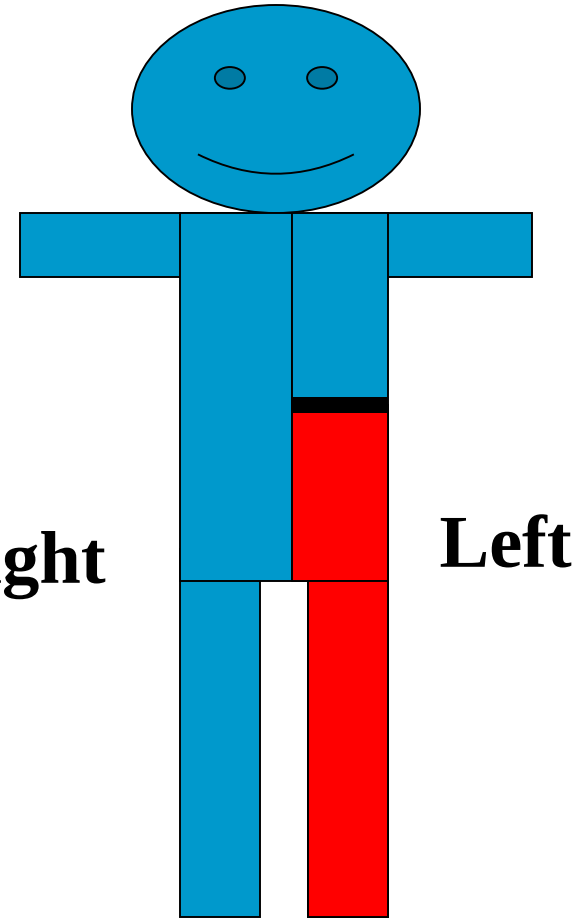
Damage to Dorsal columns

- Results ipsilateral
  - i. loss of
    1. Joint position sense
    2. Vibration sense
    3. Two point discrimination
    4. Stereognosis
  - ii. Positive Romberg sign

- loss of stereognosis - Astereognosis

Damage to Dorsal columns





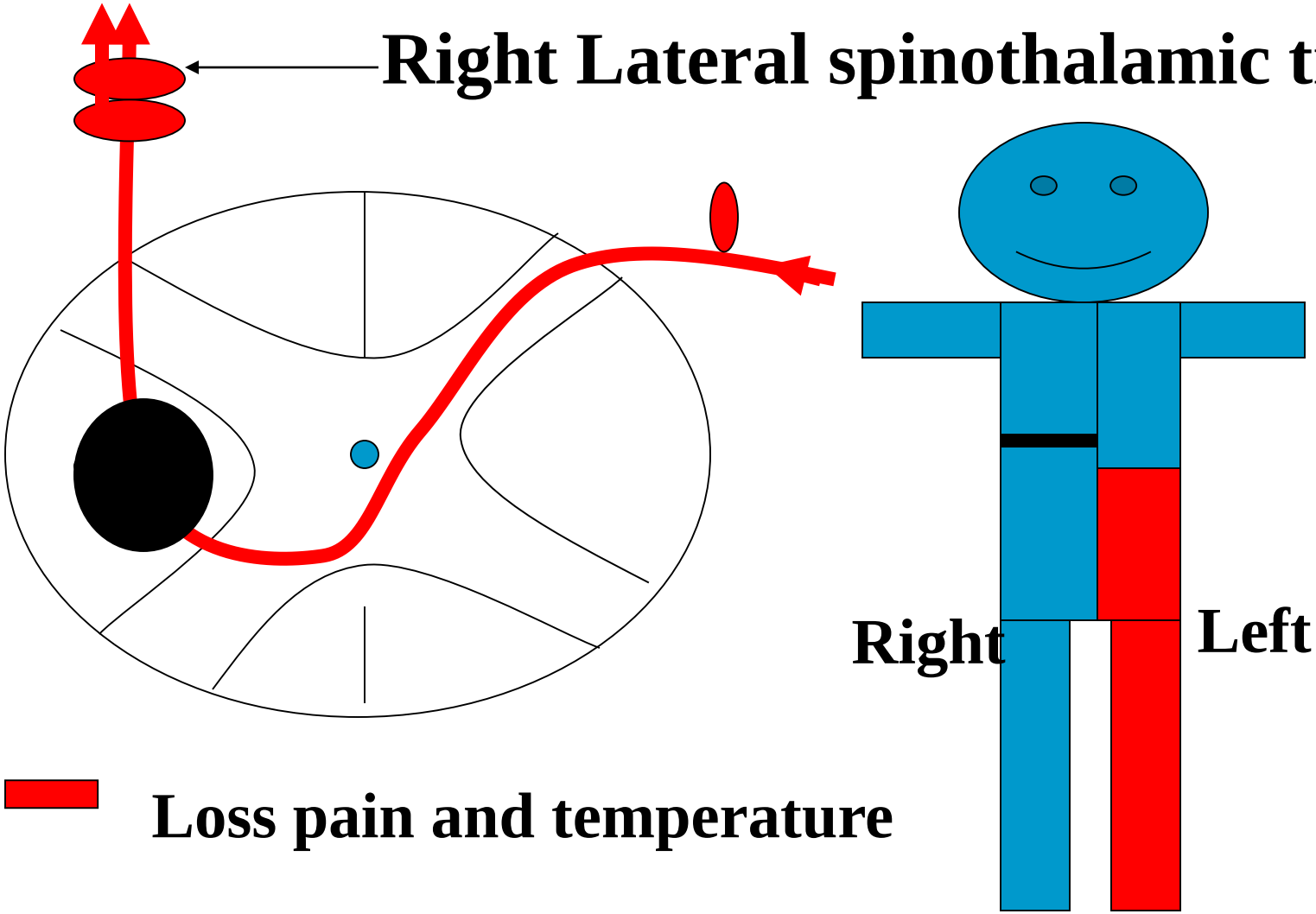
Loss of proprioception

Damage to the lateral spinothalamic tracts

- Results loss of pain and temperature
- Of the contralteral body I-2 segments below the level of the lesion

*** fibers cross obliquely while they are crossing and effects will be 1-2 segments below

Damage to the lateral spinothalamic tracts



Damage to corticospinal tract

- Results UMN lesion of the ipsilateral body with
  - 1. Weakness(paresis)
  - 2. Spasticity
  - 3. Exaggerated tendon reflexes
  - 4. Clonus
  - 5. Positive Babinski sign
  - 6. Absent superficial abdominal reflexes

Spinal shock

- Occurs following acute spinal injury
- Immediate and profound
- All cord functions become depressed **below the level of the lesion**
- Mechanism
  - possibly due to loss of tonic facilitatoy influences from higher centers

Immediate effects of spinal shock

- Total flaccid paralysis
  - both voluntary and involuntary
- Areflexia
  - loss stretch reflex
  - loss of genital reflex
  - loss of micturition and defecation reflexes
- Bladder and bowels become atonic
- Loss of autonomic functions
  - vasomotor tone- fluctuation of blood pressure
  - sweating

Late effects of spinal shock

- Period of spinal shock varies
- Usually subsides after 1-6 weeks
- Reflex activities recovers in stages
  - Spontaneous reflex emptying of bladder and bowels
  - vasomotor reflexes

    appears first
  - later muscle tone increases-Hypertonia
  - still later stretch reflexes become exaggerated

Late effects of spinal shock

- Exaggerated reflexes possibly due to
  - reduction of inhibitory influences on alpha and gamma neurons
  - denervation hyper sensitivity to the mediators released by remaining excitatory endings
  - increased number of postsynaptic receptors

Brown-Sequard syndrome

- Lateral hemisection of the cord
- After the period of spinal shock
- Following effects are seen
- Due to anterior horn cell damage at the level of the lesion
  - Ipsilateral LMN lesion of the affected segment
  - hypotonia/atrophy/fasciculation

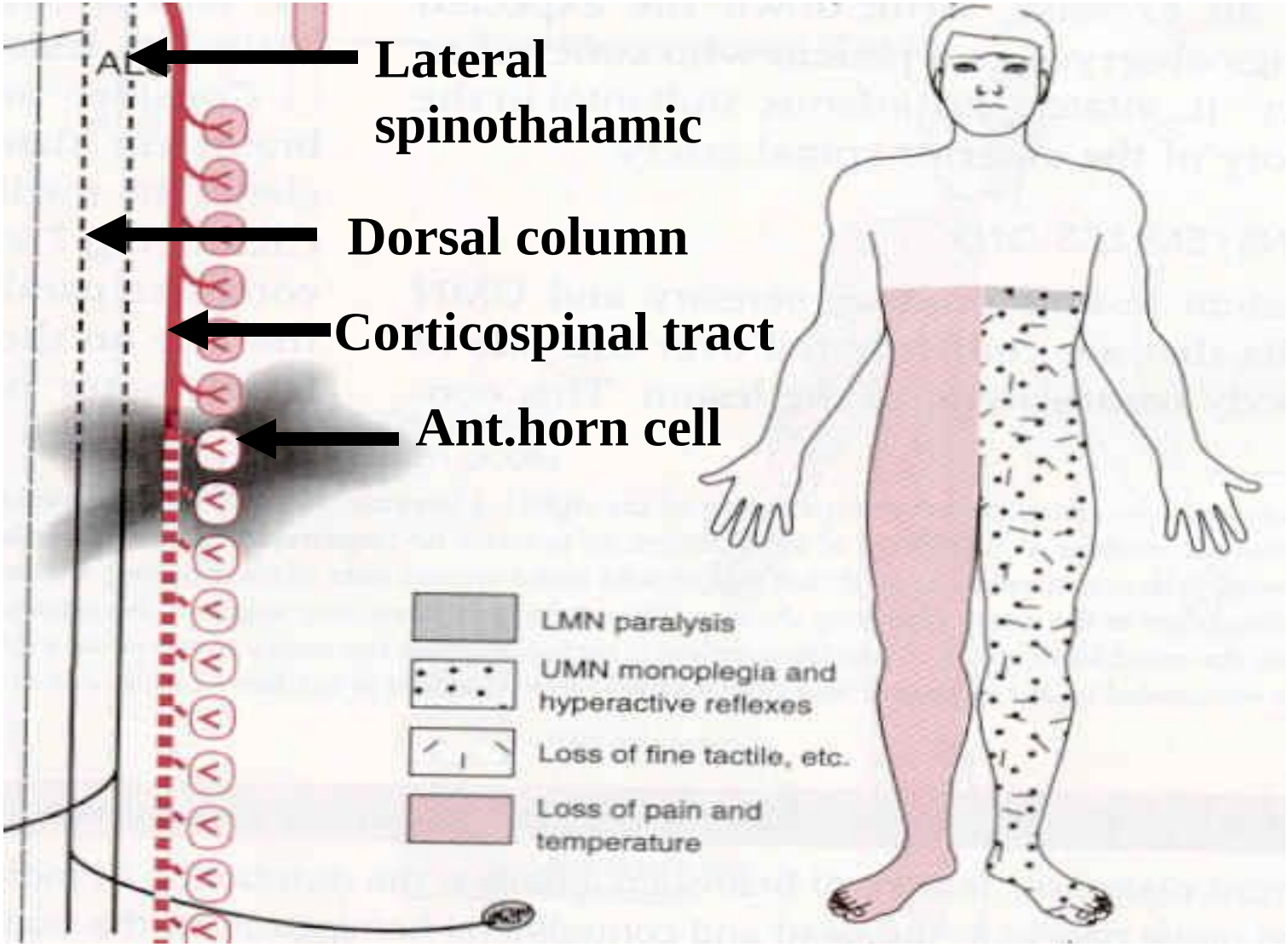
Brown-Sequard syndrome

- Damage to the corticospinal tract results ipsilateral
  - Spastic paresis
  - Increased tendon reflexes
  - Positive Babainski sign
  - Loss of abdominal reflexes
  - Clonus

Brown-Sequard syndrome

- Damage to the lateral spinothalamic tract results
  - Contralateral loss of pain and temperature
- Damage to the dorsal columns results
  - Ipsilateral loss of proprioception,vibration sense, stereognosis
- Damage to the dorsal horn results
  - band of anaesthesia at the level of the damaged segment on the ipsilateral body

Brown-Sequard syndrome



Complete spinal cord damage

- Effects seen after spinal shock
- Below the level of lesion
  - complete loss of all sensations-anaesthesia
  - Complete loss of voluntary movements
  - muscle spasticity and exaggerated reflexes
  - Positive Babinski sign
  - Loss of voluntary bladder and bowel control
  - Absent erection and ejaculation reflexes
  - Loss of superficial abdominal reflexes
- At the level
  - Bilateral LMN lesion causing paralysis