

Ascending

Tracts

• Lateral Spinothalamic Tract

- From posterior root ganglion
- Proceed to tip of posterior gray column
- Form posterolateral tract of Lissauer
- Posterior Gray column — Substantia Gelatinosa
- Cross in anterior gray & white commissures
- Medial to anterior spinothalamic tract
- As ascend through medulla, b/w inferior olivary nucleus & nucleus of spinal tract of trigeminal nerve
- Spinal lemniscus
- Posterior part of pons
- MB - in tegmentum, lateral to medial lemniscus
- VPL of thalamus
- Post. limb of IC & Corona radiata
- Somesthetic area in postcentral gyrus in cerebral cortex
- Most incoming slow fibers probably take part in additional relays involving several neurons in post. horn before ascending in SC
 - ↳ Terminate in reticular formation
 - ↳ Activate entire NS

- Postcentral Gyrus - Interpretation of pain related to post
- Cingulate Gyrus - Emotional aspect of pain
- Insular Gyrus - Interpretation of pain from internal organ, autonomic response

★ Pain, Temperature

• Anterior Spinothalamic Tract

- Pathway all same as lateral
- After decussation, move in anterolateral white column rather than lateral

★ Crude Touch, Pressure

• Posterior White Column

- Posterior root ganglion
- Posterior white column of same side
- Descending synapse with cell in post. gray horn
 - ↳ Intra-segmental reflex
- Gracilis - Sacral, Lumbar, lower 6 } Septum
- Cuneatus - Upper thoracic, Cervical
- Nuclei gracilis & cuneatus in medulla
- Internal arcuate fibre decussate
 - ↳ Sensory decussation (with corresponding of opposite)
- medial Lemniscus
- MO, P, MB
- VPL of thalamus
- Post. limb of IC, Corona radiata
- Somesthetic area in postcentral gyrus

★ Discriminative Touch

muscle, Joint

• Cuneocerebellar

- Nucleus cuneatus → ICP → Cerebellum
- Post. ext. arcuate fibers

★ Unconscious info from muscle, joint, skin, subcutaneous

• Posterior Spinoerebellar Tract

- DRG
- Posterior Gray Column — Nucleus Dorsalis (Clarke Column)
- Enter posterolateral of lateral white column on same side
- Medulla → ICP → Cerebellum

} Same as
Cuneo-
cerebellar

• Anterior Spinoerebellar Tract

- DRG
- Nucleus Dorsalis
- Cross in contralateral white column
- ↳ minor - same
- medulla → SCP → Cerebellum
- cross back within ↓

• Spinotectal tract - Pain, Thermal, Tactile

- DRG - Grey matter
- cross median plane
- Anterolateral WC - Close to lateral spinothalamic
- medulla, Pons
- Superior Colliculus of MB

• Spinoreticular tract - muscles; Joint, skin to reticular formation

- DRG - Lateral WC
- majority uncrossed
- medulla, Pons, MB
- Affrent for reticular

• Spinogligular tract → Indirect for afferent to cerebellum

- DRG
- Cross midline in white matter at junction of anterior ↓ lateral
- Inf. olivary nucleus in medulla
- Cross midline → ICP → Cerebellum

Descending

Tracts

Corticospinal Tract

- Axon of pyramidal cell (5th layer of cerebral cortex)
 - ↳ Area 4, 6, 3, 2 (2/3 - Precentral gyrus, 4/3 - Postcentral gyrus)
- Corona Radiata - Posterior limb of IC
- middle 3/5 of basis pedunculi of MB
- on entering pons, broken into bundles by transverse pontocerebellar fibres
- medulla - Pyramid
 - * Voluntary, Discrete, skilled movements
- Decussate at junction of medulla & SC
- Lateral WC - Lateral corticospinal
- X-Cross - Ant. WC - Ant. Spinothalamic
 - ↳ Eventually cross
 - ↳ Terminate in ant. grey column

Reticulospinal Tract

- Reticular Formation (MB + Pons + medulla)
- Uncross, pons, Pontine Reticulospinal Tract
- Cross, uncross, medulla, medullary Reticulospinal
- Pons - Anterior WC
 - * +1 - of L & R motor neuron
 - ↳ +1 - of voluntary or reflex activity
- Medulla - Lateral WC

Tectospinal Tract

- * Reflex Postural Movements
- Arise from superior colliculus of MB
 - ↳ Pupillo-Dilation Reflex
- Cross soon after origin
- Close to medial longitudinal fasciculus
- Anterior WC - Terminate anterior GC

Sub-oespinal Tract

- Red Nucleus - Tegmentum of midbrain at sup. colliculus
- Cross midline at nucleus
 - + → Flexor
 - → Extensor / Anti-Gravity
- Pons, medulla
- Lateral WC of SC
- Terminate anterior GC

• Vestibulospinal tract

- Nuclei → Pons, medulla — beneath 4th ventricle
 - ↳ Affrent from inner ear (vestibular nerve)
 - ↳ Cerebellum
- Uncross — medulla → Anterior LC
- Terminate anterior GC
 - + — Extensor
 - — Flexor
 - ↳ Postural Activity (Balance)

• Olivospinal Tract

- Arise from inferior olivary nucleus
- Lateral LC — muscular Activity