CNS: Brain + Spinal cord

31 spinal nerves in total: 8 cervical + 12 Thoracic + 5 lumbar + 5 sacral + 1 coccygeal

- Spinal cord regional variation:
    - Decreasing amount of grey matter descending down the spine (reduced amount of cell bodies)
    - More white matter at brachial and lumbar region: more myelinated neuron innervate limbs.

Spinal cord structure:

- Dorsal medial sulcus, Dorsal funiculus, Dorsal horn
- Lateral funiculus, Lateral horn
- Ventral funiculus, Ventral horn, Ventral fissure, Ventral white commissure

Dorsal root ganglion outside the spinal cord contain cell body of dorsal root ganglions (DRG), DRG transmits sensory infomation into the spinal cord. E.g. somatosensory, pain, heat, cold, pressure, proprioception

Ventral horn contains the cell body of motor neurons.

Layers in the spinal cord

Rexed's laminae, separate the spinal cord from dorsal to ventral into different layers, each layer contains different types of neurons.

E.g. supeficial layers responsible for receiving nociception inputs from Aδ and C fibre, while deep layers desponsible for receiving input from Aα(type I) and Aβ(Type-II) fibres

Simple reflex reaction

Sensory input relayed via interneuron, causes monosynaptic stimulation of motor neuron (e.g. patellar tendon tap lead to quadracep contraction). And inhibition of contralateral muscle via inhibitory commissural interneuron CINi or CINe innervating an inhibitory interneuron,

Decussation is the crossing of spinal cord before entering the brain

Ascending tracts:

- Dorsa column does not decussate at spinal cord level, travel in the dorsal funiculus
- Lateral Spinalcerebellar tract does not decussate, travel lateral margin to the dorsal horn
- Anterior spinocerebellar tract decussate at spinal cord level, travel lateral margin to the lateral horn.
- Spinothalamic tract mostly decussate at the spinal cord travel ventralateral to the ventral horns

Descending tracts

- Corticospinal tract: decussate at the brainstem, majority cross into lateral corticospinal tract (lateral to the lateral horn), remaining froms anterior corticospinal tract (ventral to the ventral horn)