



Soton

Brain Hub



Sensory Pathways

1. Spinothalamic
2. Dorsal Column/Medial Lemniscal
3. Spinocerebellar

Sensory Pathways



Name	Function	Origin	Ending	Location in Cord
Spinothalamic Tract	Sharp pain, crude touch and temperature	Skin	1 st order terminates in Dorsal Gray Column, 2 nd order decussates in spinal cord close to entry level and projects to contralateral VPL nucleus of thalamus, 3 rd order projects to sensorimotor cortex	Ventral and Lateral Column
Dorsal Column/Medial Lemniscal	Fine touch, conscious proprioception, two point discrimination	Skin, joints, tendons	1 st order ascends spine on ipsilateral side and terminates in brainstem nuclei, 2 nd order decussate and project to the VPL of thalamus, 3 rd order neurons project to sensorimotor cortex	Dorsal Column

Spinocerebellar

System	Function	Origin	Ending	Location in Cord
Spinocerebellar Tract	Unconscious proprioception	Muscle spindle cells, Golgi tendon organs, touch and pressure receptors	1 st order neurons synapse in spinal cord, 2 nd order neurons ascend on the ipsilateral side and project to the cerebellar cortex	Lateral Column

Motor Pathways

1. Corticospinal
2. Extrapyramidal

Corticospinal

System	Function	Origin	Ending	Location in Cord
Lateral Corticospinal Tract	Fine motor function (distal musculature)	Motor and pre-motor cortex	Motor neurons of ventral grey column	Lateral column Decussates in pyramids of medulla
Anterior Corticospinal Tract	Gross and postural motor function (proximal and axial musculature)	Motor and pre-motor cortex	Motor neurons of ventral grey column	Anterior column Decussates after the fibres has descended

Extrapyramidal Extrapyramidal



System	Function	Origin	Ending	Location in Cord
Rubrospinal Tract	Fine motor control of upper limb flexors	Red nucleus	Motor neurons of upper limb flexors	Lateral column
Vestibulospinal Tract	Maintenance of posture	Lateral and medial vestibular nucleus	Motor neurons of axial musculature and limb extensors	Anterior column
Reticulospinal Tract	Co-ordination of extensor motor neuron activity for locomotion and postural control	Reticular formation	Motor neurons of axial musculature and limb extensors	Anterior column
Tectospinal Tract	Coordination of head and eye movements	Midbrain	Motor neurons controlling head movement	Anterior column

Spinal Pathology

1. Syringomyelia
2. Brown-Sequard Syndrome
3. Sub Acute Combined Degeneration

Spinal Pathology



Condition	Pathology	Tracts Involved	Signs/Symptoms
Syringomyelia	Cyst or cavity around central cord	Spinothalamic Tract	Loss of pain and temperature sensation
Brown-Sequard Syndrome	Hemisection of the spinal cord	Spinothalamic tract, Dorsal Column, Corticospinal tract	Contralateral loss of pain and temperature, ipsilateral loss of joint position sense, ipsilateral UMN signs
Sub Acute Combined Degeneration	Vitamin B12 deficiency	Dorsal Column, Corticospinal tract, Spinocerebellar tract	Bilateral loss of vibration and joint position sense, bilateral UMN signs and ataxia