Posterior Column (Dorsal Column)

The posterior column, or dorsal column, is the segment of white matter at the dorsomedial spinal cord. It is composed of the fasciculus cuneatus and fasciculus gracilis, which make up the dorsal column-medial lemniscus pathway (DCML). This is an ascending pathway which sends sensations of pressure, vibration, touch and proprioception to the brain from the spinal cord.



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Ascending Pathway (Sensory)
Ascending Escalator with Sensory-satellites
The dorsal column-medial lemniscal pathway, or posterior column, is an ascending pathway which conveys sensory information from the spinal cord to the brainstem (medulla). From the medulla, these fibers decussate (cross) in the medial lemniscus to synapse in the thalamus. From the thalamus, a 3rd neuron carries information to the sensory cortex (contralateral to where our fibers entered the cord).

Sensations

Proprioception
Propeller-scepter
The posterior columns work to convey proprioception, which is the sense of the relative position of neighboring parts of the body and strength of effort being used in movement.

Fine Touch
Diver Touching Sensor
The sensation of fine touch with tactile sensation, is carried via the posterior column. This sensation of fine touch helps patients tell exactly where a sensation is localized to, and helps feel textures such as "smooth," "greasy," or "rough." It also conveys discriminative touch, which is telling if the examiner is using 1 vs. 2 fingers to illicit sensation.

Pressure
Pressure-cooker
The dorsal columns carry pressure sensation as well, which helps the patient to tell how hard the examiner is pressing, or how hard the caliper is being pressed.

Vibration Sensation
Vibrating Sensory-tuning-fork
Vibration sensation is also carried through the posterior column.

Anatomy

Dorsal Root
Door Roots
Dorsal root ganglion cells are also known as first-order neurons because they initiate the sensory process, which travels through the dorsal column.

Fasciculus Cuneatus
Fish-cycle Clooney-yeti
The fasciculus cuneatus is the lateral part of the posterior column, which carries signals from the upper body and arms.
Note: The Yeti is a large hairy creature resembling a human or bear, said to live in the highest part of the Himalayas.

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Arms

Arms

The fasciculus cuneatus carries sensory signals from the arms and upper body.

Fasciculus Gracilis

Fish-cycle Grass-zilla

The fasciculus gracilis is located medially in the dorsal column, and carries sensory information from the lower body and legs.

Lower Limbs

Lower Limbs

The fasciculus gracilis carries sensory information from the lower body and legs.

Lesions

Vitamin B12 Deficiency

Down-arrow (12) Dozen Viking (B) Bees

Vitamin B12 deficiency can lead to dorsal column lesions, and patients can have demyelination. This can lead to paresthesias and neuropathy.

Tabes Dorsalis

Table Door

Tabes dorsalis is characterized by demyelination of the dorsal columns, leading to paresthesias, hypoesthesias (abnormally diminished cutaneous, especially tactile, sensory modalities), gait problems, and loss of coordination. This occurs due to an untreated syphilis infection.

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