Spinothalamic tract

Understanding spinothalamic tract anatomy may improve lesioning and outcomes in patients undergoing percutaneous cordotomy.

The spinothalamic tract (also known as anterolateral system or the ventrolateral system) is a sensory pathway from the skin to the thalamus. From the ventral posterolateral nucleus in the thalamus, sensory information is relayed upward to the somatosensory cortex of the postcentral gyrus.

The spinothalamic tract consists of two adjacent pathways: anterior and lateral. The anterior spinothalamic tract carries information about crude touch. The lateral spinothalamic tract conveys pain and temperature.

In the spinal cord, the spinothalamic tract has somatotopic organization. This is the segmental organization of its cervical, thoracic, lumbar, and sacral components, which is arranged from most medial to most lateral respectively.

The pathway decussates at the level of the spinal cord, rather than in the brainstem like the posterior column-medial lemniscus pathway and corticospinal tract.

In the high cervical spinal cord, spinothalamic fibers mediating sharp pain for the arms are located ventromedial to fibers for the legs, and these fibers are spatially distinct from fibers that mediate heat pain [1].

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Vedantam A, Bruera E, Hess KR, Dougherty PM, Viswanathan A. Somatotopy and Organization of Spinothalamic Tracts in the Human Cervical Spinal Cord. Neurosurgery. 2018 Jul 13. doi: 10.1093/neuros/nyy330. [Epub ahead of print] PubMed PMID: 30011044.