Spinothalamic Tracts

The spinothalamic tracts are ascending pathways, which originate in the spinal cord and are components of the anterolateral system. The anterior spinothalamic tract carries the sensations of pressure and crude touch, while the lateral carries pain and temperature sensation. These pathways decussate at the level of the spinal cord.



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Ascending Pathway (Sensory)
Ascending Escalator with Sensory-satellites
The anterior and lateral spinothalamic tracts are ascending sensory pathways. They begin in the periphery, travel to the spinal cord, and enter 1-2 levels up at the dorsal horn (substantia gelatinosa). From here they decussate at the anterior white commissure. At this point they travel up the spinal cord, synapsing at the contralateral thalamus from where they originally began in the periphery.

Lateral
Ladder
The lateral spinothalamic tract carries the sensory modalities of temperature and pain. It is part of the anterolateral system, which is a bundle of sensory axons ascending through the white matter of the spinal cord, carrying sensory information to the brain.

Temperature
Thermometer
The lateral spinothalamic tract carries temperature sensory information to the thalamus of the brain. It is composed primarily of fast-conducting, sparsely-myelinated A? axons, and slow-conducting, unmyelinated C axons.

Pain
Pain-bolt
Pain is transmitted via the lateral spinothalamic tract, by carrying sensory information to the thalamus of the brain. It is composed primarily of fast-conducting, sparsely-myelinated A? axons, and slow-conducting, unmyelinated C axons.

Anterior
Anteater
The anterior spinothalamic tract contains fibers that convey crude touch and pressure information to the thalamus. It is part of the anterolateral system, which is an ascending sensory system.

Crude Touch
Touching Crude-oil
The anterior spinothalamic tract senses crude touch. This is due to C fibers, which are actually slow pain fibers that are considered polymodal because they can react to various stimuli.

Pressure
Pressure-cooker
Pressure is sensed through the anterior spinothalamic tract because it contains C fibers, which are slow pain fibers, which are considered polymodal due to their response to mechanical stimuli.

Decussates at Anterior White Commisure
Anteater riding White Comet
The spinothalamic tract is unique because it ascends up the spinal cord contralaterally to where stimulation occurs. 1st-order peripheral nerves come from the site of stimulation and terminate at the dorsal horn. From here, a second-order neuron decussates through the anterior white commissure and

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ascends to the thalamus on the contralateral side of the original site of nerve entry.

Lesion

Contralateral Anesthesia

Opposite Side Affected by A-nest

Lesion or injury to the spinothalamic tract gives unique manifestations. Injury to one side of the spinal cord (such as hemisection) yields contralateral anesthesia. This occurs because a nerve inserts into a side of the spinal cord, but decussates at the anterior white commissure before ascending contralaterally. Example: injury to the right spinothalamic tract at T10 would lead to left-sided anesthesia and deficits in temperature, crude touch, and pressure sensations below T10.

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