The Big Three

1. What is a bundle of axonal fibers with similar connections?

Tract/Fasciculus

1. Long, ascending fibers from sc to brainstem, cerebellum, or thalamus are:

Suprasegmental tracts

1. Long, descending fibers from cortex or brainstem to spinal cord are:

Suprasegmental tracts

1. Intersegmental fibers within the spinal cord are:

Segmental tracts

1. A division of spinal cord white matter consisting of fascicule/ tracts is a:

Funiculus

1. What are three funiculi in the spinal cord?

Posterior, Lateral, Anterior

1. What are two fasciculi found in the dorsal column?

Fasciculus Cuneatus and Fasciculus Gracilis

1. What is included in the sensory/ afferent information that is processed in the brain?

Dorsal column includes proprioception, vibration, and discriminative touch

1. What sensory info does the fasciculus gracilis account for? (area of body)

Lower trunk and lower extremities

1. Is it located medially or laterally?

Medially

1. Where does it run?

Length of spinal cord

1. What sensory info does the fasciculus cuneatus account for? (area of body)

Upper trunk and upper extremitites

1. Is it located medially or laterally?

Laterally

1. Where does it run?

T6 and above

1. Medial Lemniscus Pathway:

Afferent fibers from the Dorsal Root Ganglion (DRG) enter dorsal root MEDIALLY and join either the Funiculus Gracilis or the Funiculus Cuneatus. Ascend as Dorsal column to the medulla, but once they cross the medulla at the internal arcuate fibers, becomes medial limniscus and ascends into brainstem. Of course, synapse at the “relay station” or thalamus ascend in the internal capsule and finally synapse at the post central gyrus in the parietal lobe.

1. The laterofuniculus contains the lateral corticospinal tract and the Anterolateral System (ALS) which contains the Spinothalamic tract
2. Lateral Corticospinal Tract:

Descending/Efferent fibers descend from the cerebral cortex to the Spinal Cord

1. The lateral corticospinal tract accounts for 85% of volitional movement of upper and lower extremity muscularture and the other 15% is accounted for by Anterior Corticospinal Tract
2. Lateral Corticospinal Pathway:

Decending/efferent fibers from the precentral gyrus in the Frontal lobe descend through the Internal capsule and continue through the midbrain and pons They cross in the medulla (more specifically the pyramidal dscussation They then synapse at the alpha motor neurons in the anterior horn. Efferent fibers then exit at ventral roots and synapse at neuromuscular junctions with skeletal muscles.

1. T or F: 100% of the fibers in the lateral corticospinal tract cross in the medulla.

F. 85% cross in the medulla. 15% stay ipsilateral and cross at spinal cord segment

1. T or F: All fibers in the lateral corticospinal tract synapse with the alpha motor neurons before exiting at the ventral root.

F. Some synapse on the interneurons in intermediate gray matter.

1. The spinothalamic tract is sensory or afferent therefore the fibers ascend ?
2. The spinothalamic tract is responsible for transmitting sensory info of what three things?

Pain, temperature, and crude touch

1. What are the four components of the anterolateral system?

Spinothalamic, spinoreticular, spinohypothalamic, spinomesencephalic

1. Spinothalamic tract pathway:

Afferent/sensory fibers from the Dorsal Root Ganglion (DRG) cross at the spinal cord specifically the anterior white commussure They ascend as the spinothalamic tract in the anterolateral system (ALS) and synapse at the thalamus They then ascend through the internal capsule and finally synapse at the post central gyrus in the parietal lobe.

1. Axonal tracts carry information in a somatotopic pattern.
2. T or F: All tracts are bilateral.

T.

1. T or F: Neuronal axons give off many collaterals on their way to the primary target.

T.

1. T or F: Ascending and descending tracts each specifically influence one site within the CNS.

F. Typically influence multiple sites

1. T or F: If a single tract is lost, it can be partially compensated for by remaining tracts.

T.

1. When does spinal shock occur?

During the initial period following traumatic injury

1. When does it begin to resolve?

Within 24 hours

1. When does it resolve completely?

Within a few weeks of the injury

1. Three symptoms that result from spinal shock below the lesion are:

Flaccid paralysis, areflexia, and sensory loss

1. T or F: As spinal shock resolves, everything goes back to normal.

F. Monosynaptic stretch reflexes return, but hyper reflexia and spasticity develop