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COURSE TITLE: RENAL PHYSIOLOGY, BODY FLUID & TEMPERATURE REGULATION AND AUTONOMIC NERVOUS SYSTEM.

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ASSIGNMENT: DISCUSS THE SOMATOSENSORY PATHWAY

SOMATOSENSORY PATHWAY

Somatosensory pathway is also referred to as somatosensory system or somatosensory tract. This system processes information about somatic sensation such as pain, temperature, proprioception, touch, position and vibration. This information is received through receptors inside or at the surface of the body. It is then processed by one of a number of complex systems of neurons and pathways depending on the information that has been received. The somatosensory pathway is the part of the sensory system concerned with the conscious perception of touch, pressures, pain, temperature, position, movement and vibration which arises from the muscles, joints, skin and fascia. The somatosensory pathway is a 3-neuron system that relays sensation detected in the periphery and conveys them via pathways through the spinal cord, brainstem and thalamic relay nuclei to the sensory cortex in the periatal lobe. The somatosensory system is a part of the sensory nervous system. The somatosensory sytem is a complex system of sensory neurons and neural pathways that responds to changes at the surface or inside the body. The axon as the afferent nerve fibres of sensory neurons connect with or respond to various receptor cells. These sensory receptor cells are activated by different stimuli such as heat and nociception, giving a functional name to the responding sensory neuron, such as a thermoreceptor which carries information about temperature changes. Other types include mechanoreceptors, chemoreceptors and nociceptors which send signals along a sensory nerve to the spinal cord where they may be processed by other sensory neurons and then relayed to the brain for further processing. Sensory receptors are found all over the body including the skin, epithelial tissue, muscles, bones

and joints, internal organs and the cardiovascular system. A somatosensory pathway consist of three neurons: primary, secondary and tertiary. The primary neuron is the sensory stimuli like touch or temperature. The cell body of the primary neuron is housed in the dorsal root ganglion of a spinal nerve or if sensation is in the head or neck, the ganglia of the trigeminal or cranial nerves. The secondary neuron acts as a relay and is located in either the spinal cord or the brainstem. This neuron's ascending axons will cross or decussate to the opposite side of the spinal cord or brainstem and travel up the spinal cord to the brain where most will terminate in either the thalamus or the cerebellum. The tertiary neuron have cell bodies in the thalamus and project to the post-central gyrus of the parietal lobe, forming a sensory homunculus in the case of touch. Regarding posture, the tertiary neuron is located in the cerebellum.

MAJOR SOMATOSENSORY PATHWAY

- **Posterior column-medial lemiscal (DCLM) pathway:**Conveys proprioception, vibration sense and fine discriminative touch.

  Decussation is in the lower medulla.

- **Anterolateral pathways:** includes

  The spinothalamic tract and other associated tracts that convey pain, temperature sense and crude touch.

  Anterior commisure of the spinal cord.