**Chapter 13 Study Guide: Touch**

* Field size, rate and function of the four mechanoreceptor (SA1, SA2, FA1, FA2)

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|  | Merkel (SA I) | Ruffini (SA II) | Meissner (FA I) | Pacinian (FA II) |
| Recept field size | Small | Large | Small | Large |
| Adaptation rate | Slow | Slow | Fast | Fast |
| Primary Function | Texture perception /pattern/form detection | Finger position and stable grasp | Low-Frequency vibration detection | High-Frequency vibration detection |

* What do each receptor/fiber responds to (i.e. Tactile, Kinesthetic, Thermal, Nociceptors)
  + Tactile: chart above.
  + Kinesthetic receptors: muscle spindle. Alpha and gamma motor fibers. Type Ia and II sensory fibers. Extra and intrafusal muscle fibers.
  + Thermal: warm fibers and cold fibers.
  + Nociceptors: A-delta fibers respond to strong pressure or extreme heat. C fibers respond to intense stimuli
* Know the pathway for touch from the skin to the brain
  + Two pathways
    - Spinothalamic pathway: Slower. Carries information from temperature (thermoreceptors) and pain, (nociceptors)
    - Dorsal column-medial lemiscal pathway: Wider diameter axons and faster. Tactile and kinesthetic information used for planning and excuting movements.
  + In the brain the information is received in two areas
    - Somatosensory area 1
      * Primary touch area
      * Parietal lobe behind postcentral gyrus
    - Somatosensory area 2
      * Secondary touch area
      * Upper lateral sulcus
      * Enhances communication between sensory and motor cortexes.
* Know the areas of the brain that perceive pain and pleasant/unpleasant touch
  + Nociceptive signal arrives at the substantia gelatinosa of the dorsal horn.
* Vocab:
  + Body image- our impression of our body in space
  + Haptic- The process of recognizing objects through touch. Haptic feedback can be used to help surgeons feel the force of their incision when they use robotics.
  + neural plasticity- the brains ability to reorganize itself by forming new neural connections.
* gate control theory- nociceptive signals can be blocked by the feedback circuit in the dorsal horn. Excitatory signals allow sensory information through to the brain. Inhibitory signals block sensory information. Anterior cingulate cortex (ACC) is the region of the brain associated with the perception and unpleasantness of pain. Secondary pain effects (remembering painful events) are associated with the prefrontal cortex
  + homunculus- physical representation of the human body located within the brain.
  + Egocenter- the center of reference frame used to represent locations relative to the body.
  + Proprioception- mediation of the kinesthetic and vestibular perceptions
  + Somatotopic- point for point correspondence of an area of the body to a specific point on the CNS.
  + kinesthetic- referring to perception involving sensory mechanoreceptors in muscles, tendons and joints.
  + endogenous opiate-chemical released to block the release of uptake of pain sensation neurotransmitter.
  + Analgesia- decreasing of pain while conscious.
* What is tactile agnosia and what causes it
  + The inability to identify objects by touch
  + Causes: lesions in the parietal lobe.
* Phantom Limb syndrome.
  + When an amputee can still “feel” their missing body part, caused by extra activity in the brain being recruited by areas of the brain being starved of normal activity.