

Visceral Reflexes

Visceral reflex arc) consists of a receptor, sensory neuron, processing center, and 2 visceral motor neurons. All visceral reflexes are polysynaptic.

They can be **long reflexes** or **short reflexes**

Long reflexes) are the autonomic equivalents of the polysynaptic reflexes. Typically, they coordinate the action of an entire organ.

Short reflexes) bypass the CNS entirely. They involve sensory motor neurons and interneurons whose cell bodies lie in autonomic ganglia.

Short reflexes control very short motor responses with localized effects.

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Higher-order functions include memory and states of consciousness

Higher-order functions have 3 characteristics:

1. The cerebral cortex is required for their performance. They involve complex interactions among areas of the cortex and between the cerebral cortex and other areas of the brain
2. They involve both conscious and unconscious information processing
3. They are not part of the programmed “wiring” of the brain. For this reason, higher-order functions are subject to adjustment over time.

Memory

Fact memories) specific bits of info, such as color of a stop sign or the smell of perfume.

Skill memories) are learned motor behaviors. With repetition they become incorporated at the subconscious level. (E.X. Playing piano, riding a bike, etc)

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Memory engram) a single circuit that corresponds to a single memory. This definition is based on function rather than structure.

The hippocampus plays a key role in consolidating memories.

States of Consciousness

A conscious individual is alert, and unconscious individual is not.

Conscious) implies an awareness of and attention to external events and stimuli.

Unconscious) can refer to conditions ranging from the deep, unresponsive state induced by anesthesia before major surgery, to deep sleep, to the light drifting some students experience from reading anatomy and physiology textbooks.

Sleep

Protein synthesis increases during sleep

The 2 characteristic patterns of sleep:

1. **Deep sleep:** also called *slow wave* or *non-REM (NREM) sleep*) your entire body relaxes, and activity at the cerebral cortex is at a minimum. Heart rate, BP, respiratory rate, and energy use is decline by up to 30%
2. **Rapid eye movement (REM):** active dreaming, BP and respiratory rate change.