

# Connections between the facial and trigeminal nerves: Anatomical basis for facial muscle proprioception

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Proprioception is a quality of sensibility that originates in specialized sensory organs (proprioceptors) that inform the central nervous system about static and dynamic conditions of muscles and joints. The facial muscles are innervated by efferent motor nerve fibers and typically lack proprioceptors. However, facial proprioception plays a key role in the regulation and coordination of the facial musculature and diverse reflexes. Thus, facial muscles must be necessarily supplied also for afferent sensory nerve fibers provided by other cranial nerves, especially the trigeminal nerve. Importantly, neuroanatomical studies have demonstrated that facial proprioceptive impulses are conveyed through branches of the trigeminal nerve to the central nervous system. The multiple communications between the facial and the trigeminal nerves are at the basis of these functional characteristics. Here we review the literature regarding the facial (superficial) communications between the facial and the trigeminal nerves, update the current knowledge about proprioception in the facial muscles, and hypothesize future research in facial proprioception. © 2017 The Author(s)

Facial muscles

Proprioception

Proprioceptors

Trigeminal-facial nerve connections

central nervous system

face muscle

facial nerve

proprioception

sensory nerve

trigeminal nerve