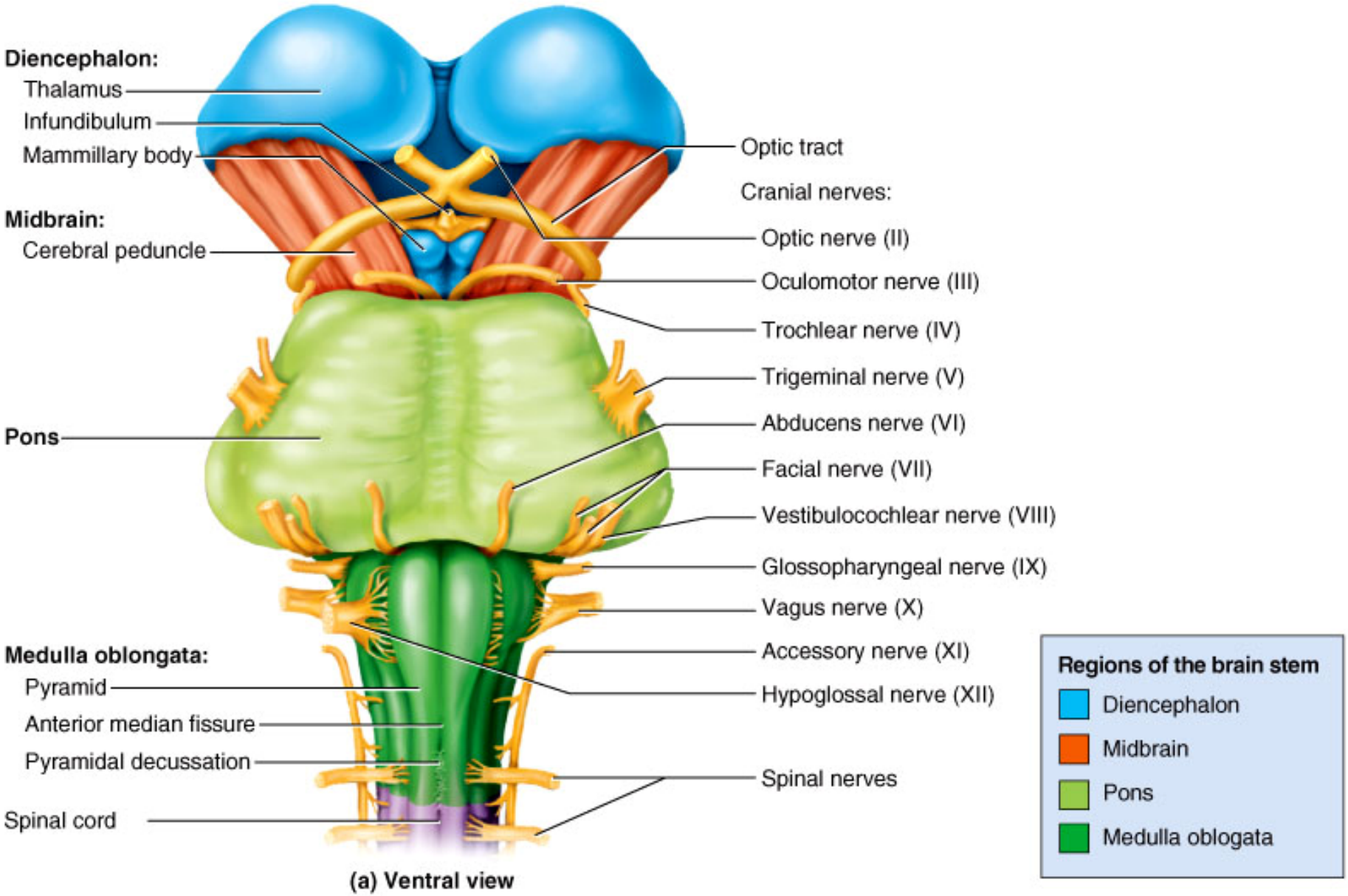
Cranial Nerves

Cranial Nerves

- **12 pair of nerves**
  - **arise from brain**
  - **exit through foramina leading to muscles, glands and sense organs in head and neck**
  - **Input and output ipsilateral except CN II and IV**

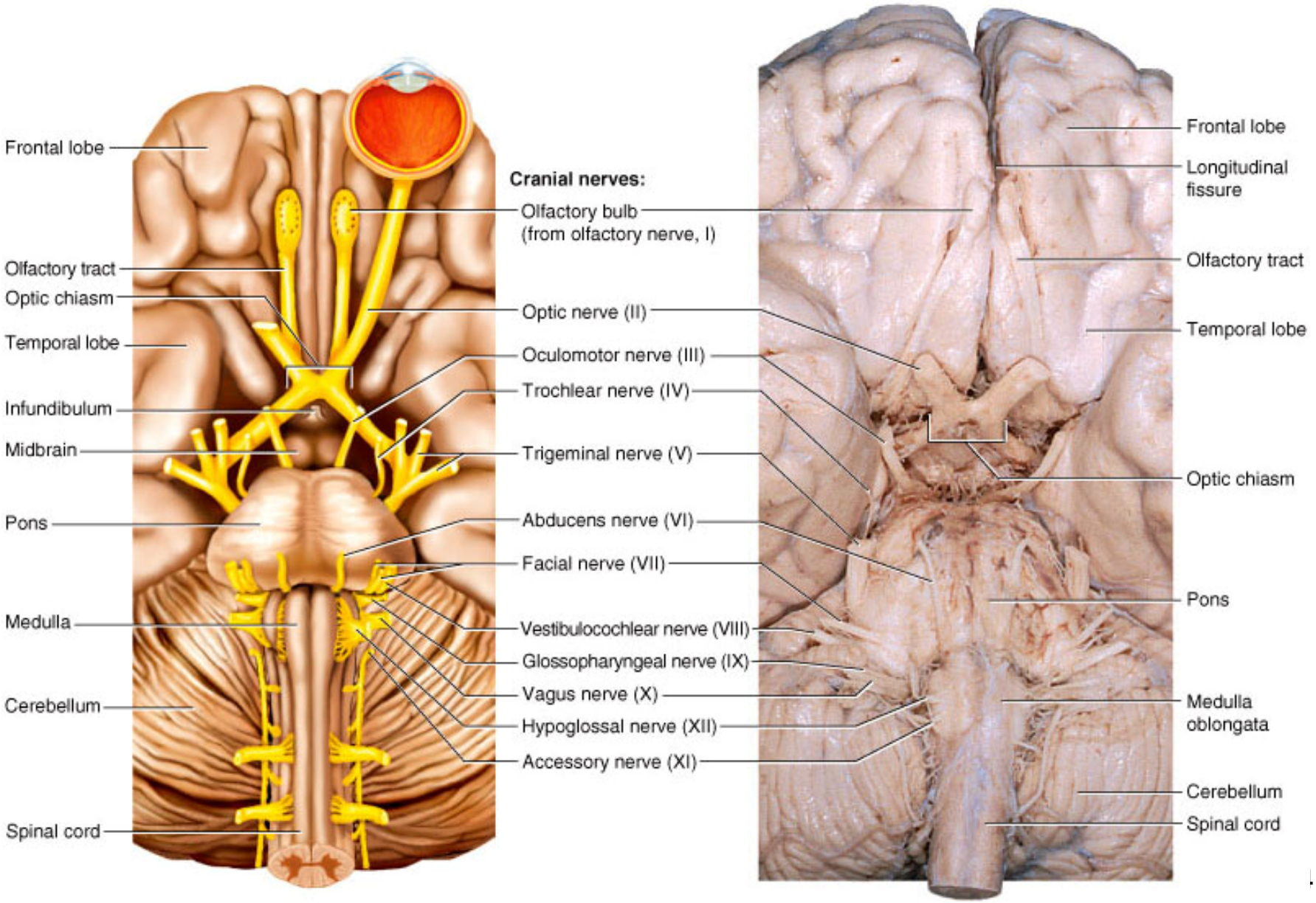
- **CN1 / Olfactory Nerve**
- **CN2 / Optic Nerve**
- **CN3 / Oculomotor Nerve**
- **CN4 / Troclear Nerve**
- **CN5 / Trigeminal Nerve**
- **CN6 / Abducens Nerve**
- **CN7 / Facial Nerve**
- **CN8 / Vestibulocochlear Nerve**
- **CN9 / Glossopharyngeal Nerve**
- **CN10 / Vagus Nerve**
- **CN11 / Accessory Nerve**
- **CN12 / Hypoglossal Nerve**

Origin of Cranial Nerves from Medulla and Pons

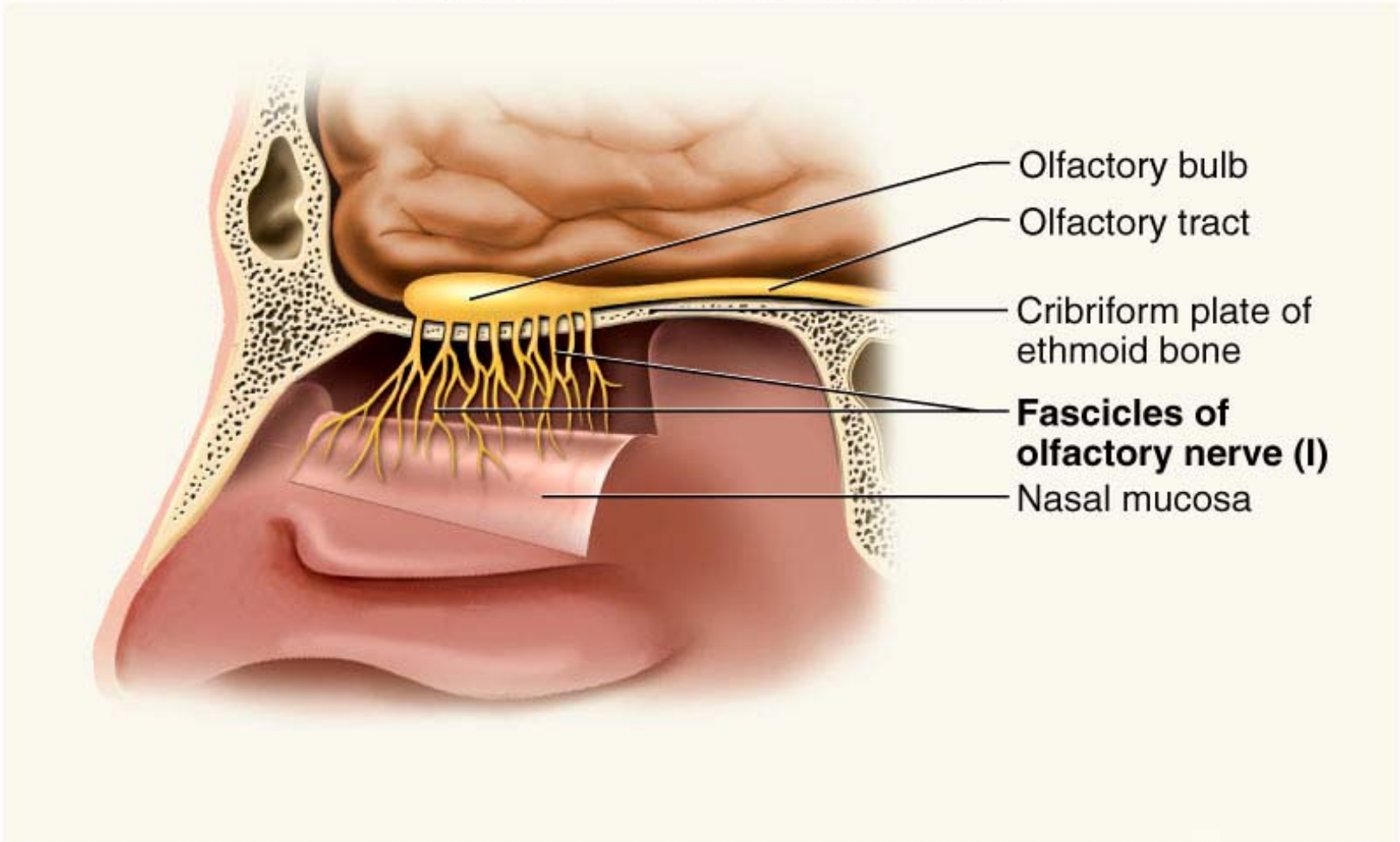


(a) Ventral view

Cranial Nerves

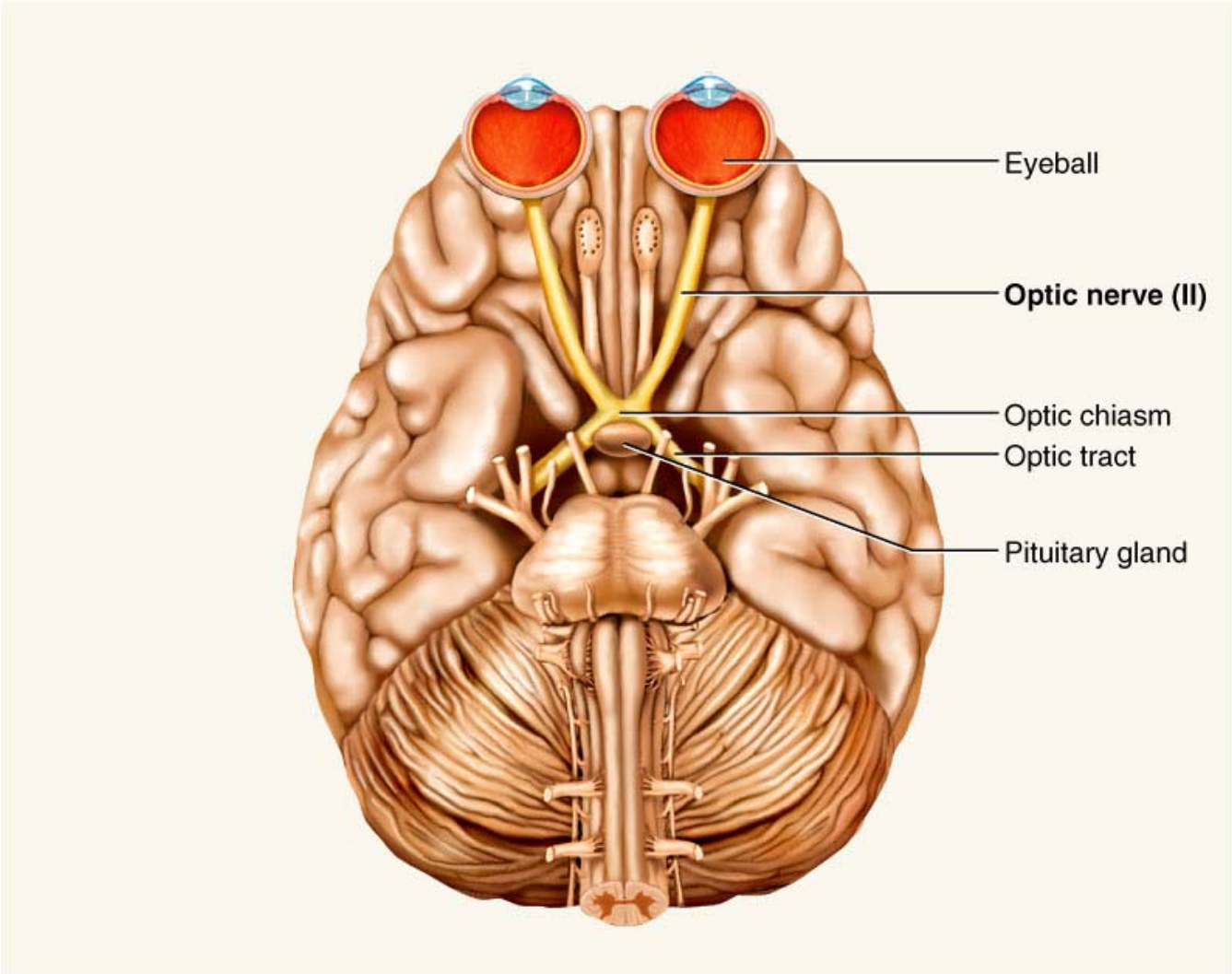


Olfactory Nerve



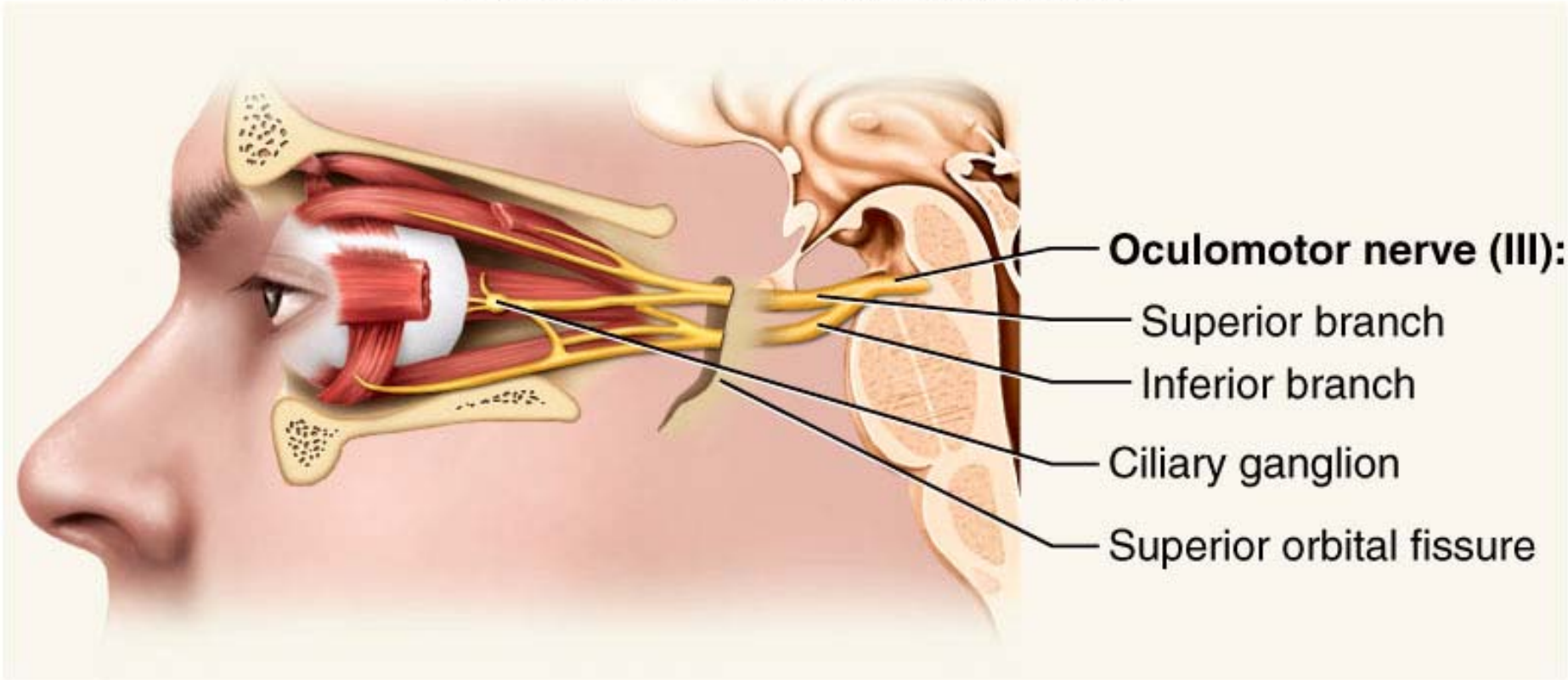
- **Sense of smell**
- **Damage causes impaired sense of smell**

Optic Nerve



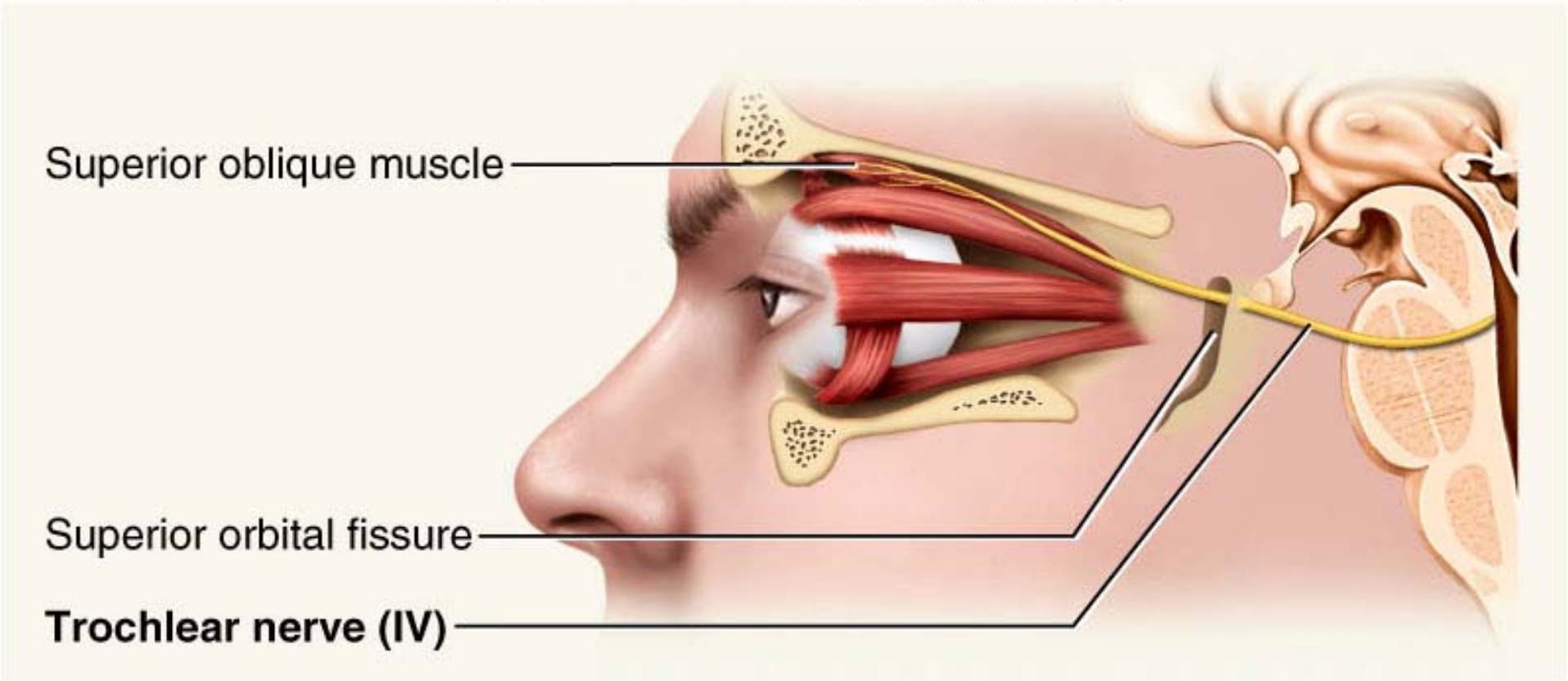
- **Provides vision**
- **Damage causes blindness in visual field**

Oculomotor Nerve



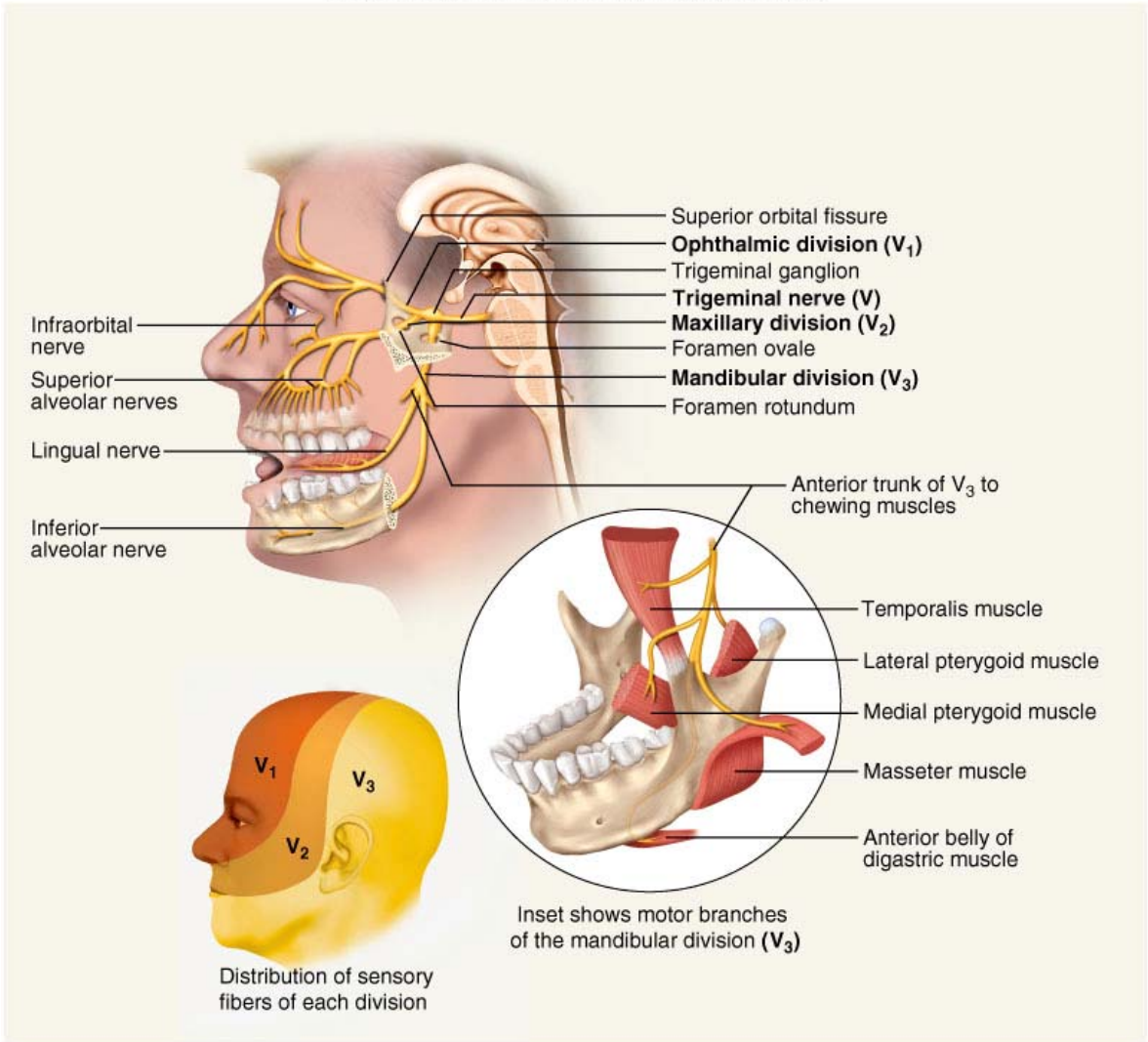
- **Eye movement, opening of eyelid, constriction of pupil, focusing**
- **Damage causes drooping eyelid, dilated pupil, double vision, difficulty focusing and inability to move eye in certain directions**

Trochlear Nerve



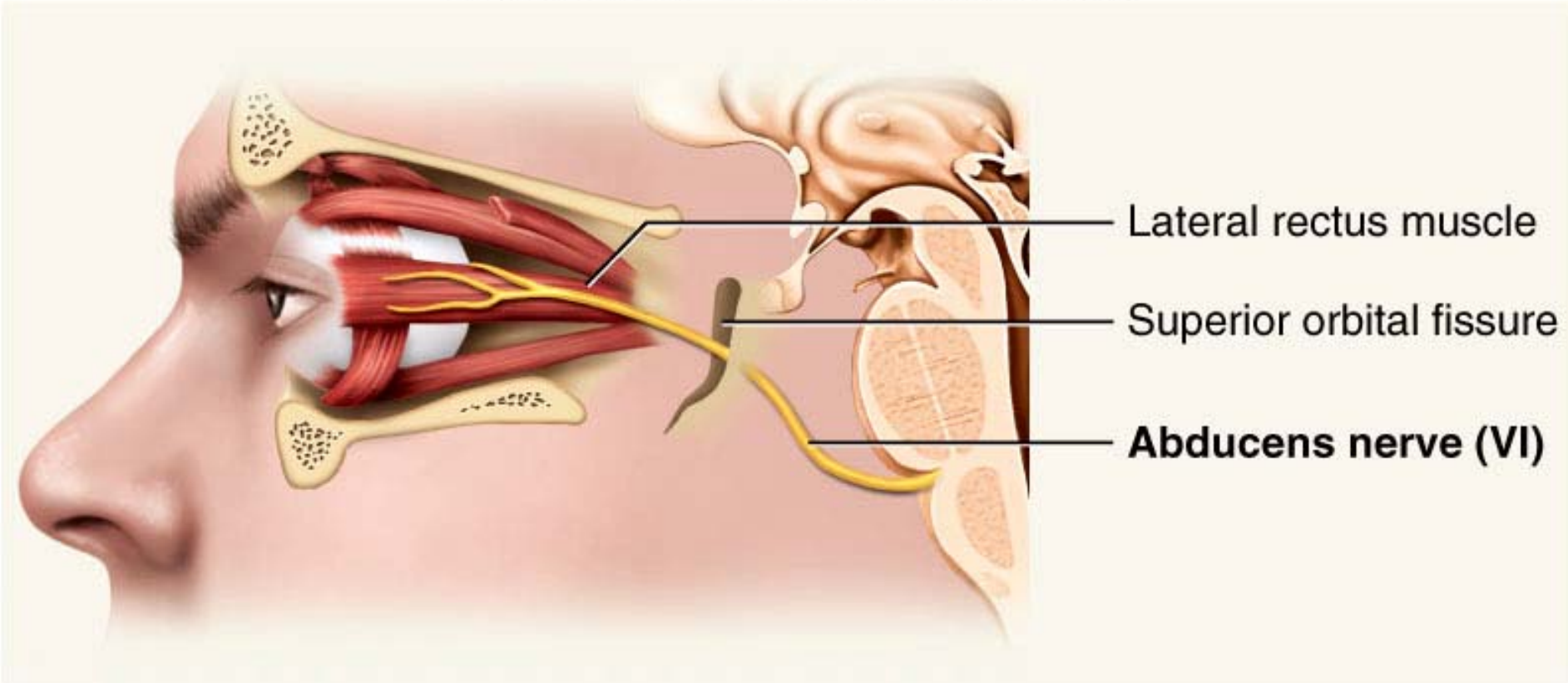
- **Eye movement (superior oblique muscle)**
- **Damage causes double vision and inability to rotate eye inferolaterally**

Trigeminal Nerve



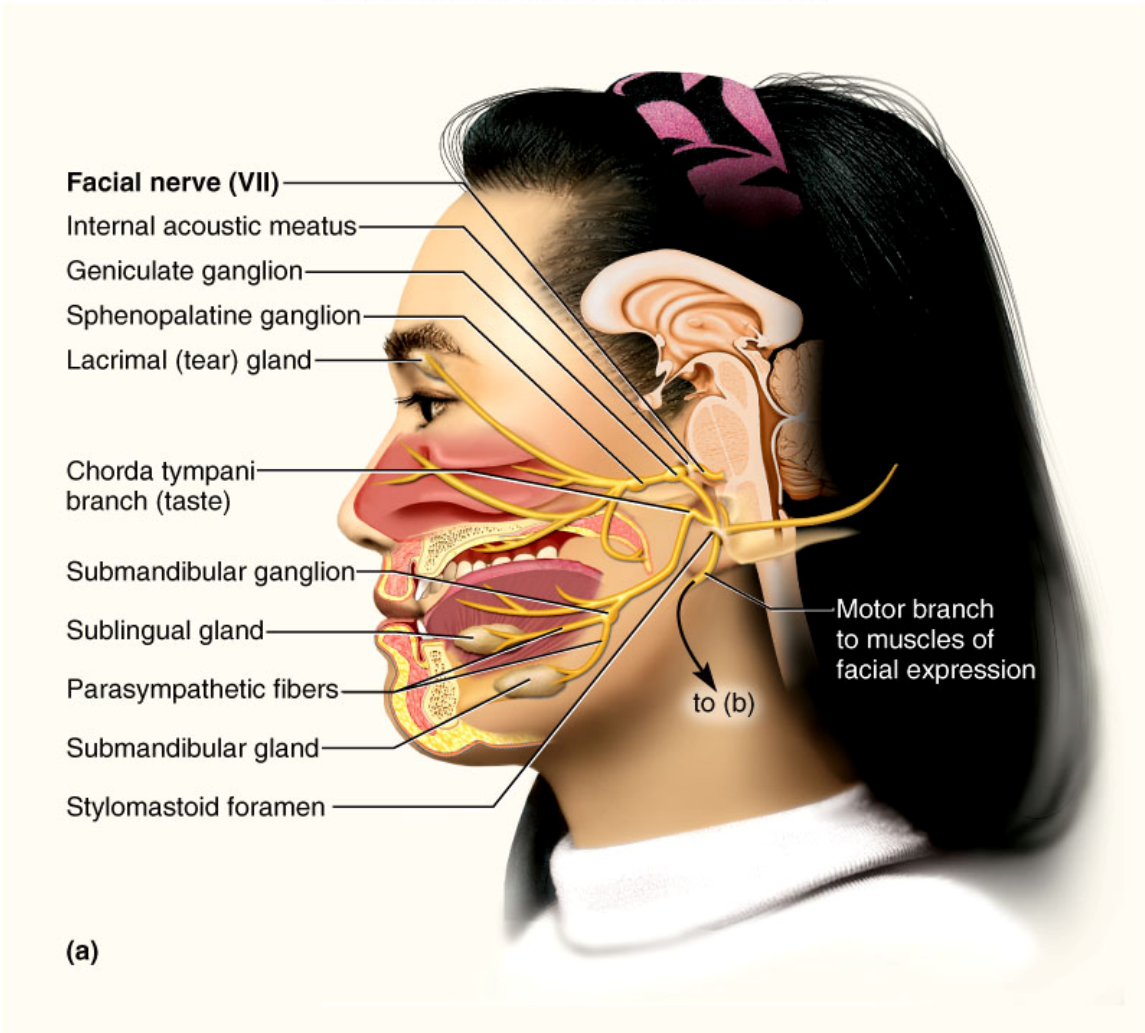
- **Sensory to face (touch, pain and temperature) and muscles of mastication**
- **Damage produces loss of sensation and impaired chewing**

Abducens Nerve



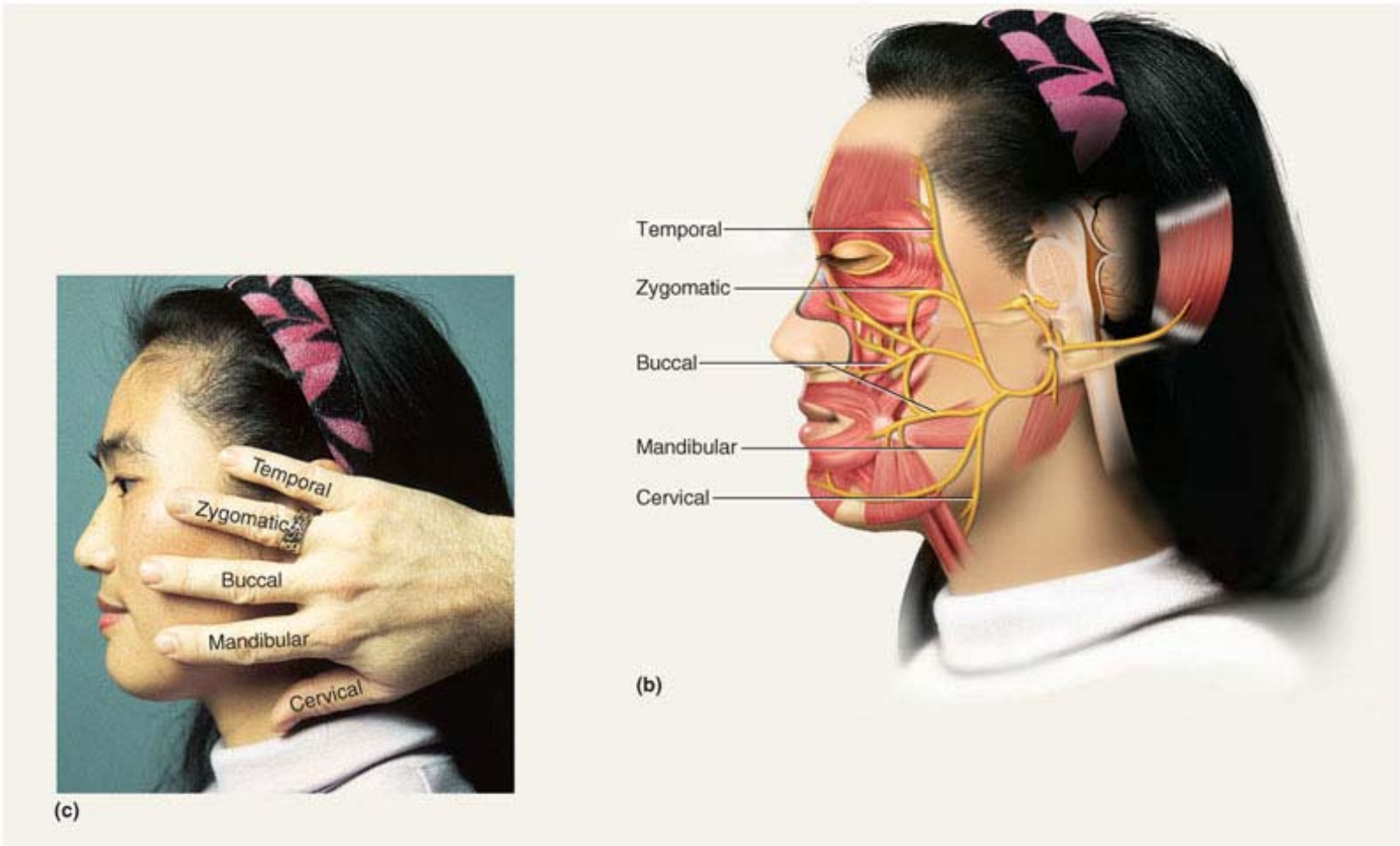
- **Provides eye movement (lateral rectus m.)**
- **Damage results in inability to rotate eye laterally and at rest eye rotates medially**

Facial Nerve



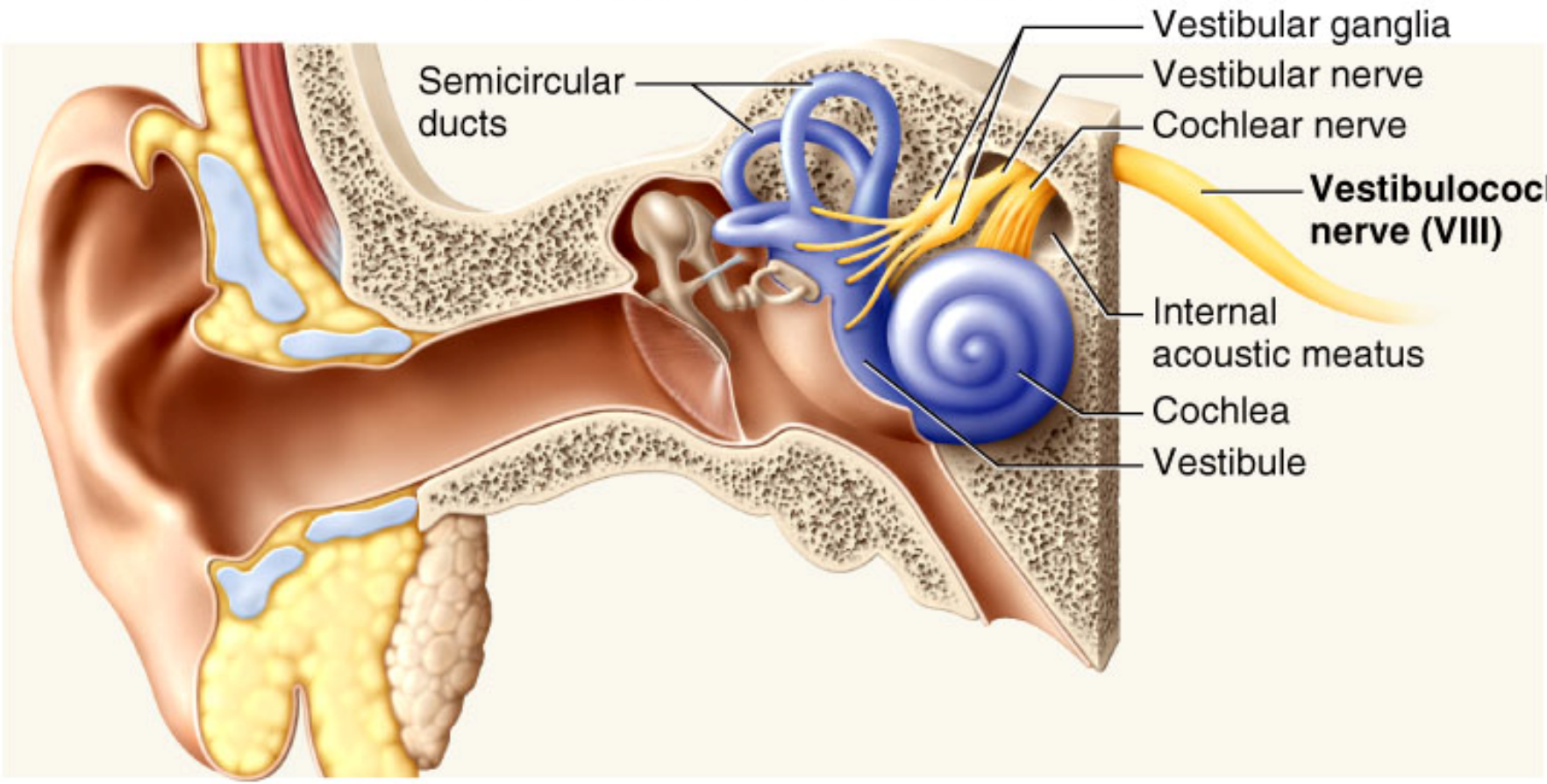
- **Motor - facial expressions; salivary glands and tear, nasal and palatine glands**
- **Sensory - taste on anterior 2/3's of tongue**
- **Damage produces sagging facial muscles and disturbed sense of taste (no sweet and salty)**

Branches of Facial Nerve



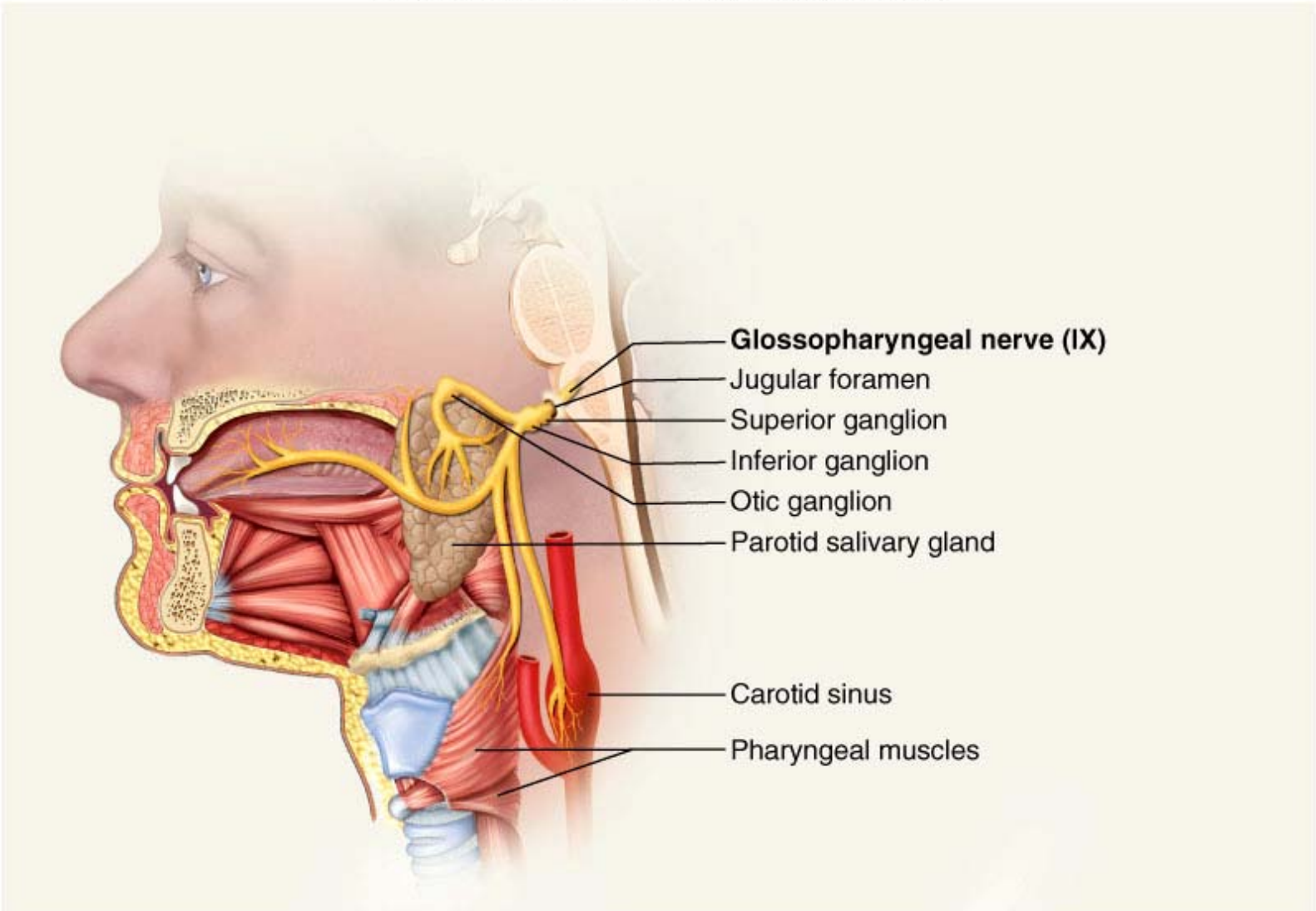
Clinical test: Test anterior 2/3's of tongue with substances such as sugar, salt, vinegar, and quinine; test response of tear glands to ammonia fumes; test motor functions by asking subject to close eyes, smile, whistle, frown, raise eyebrows, etc.

Vestibulocochlear Nerve



- **Provides hearing and sense of balance**
- **Damage produces deafness, dizziness, nausea, loss of balance and nystagmus**

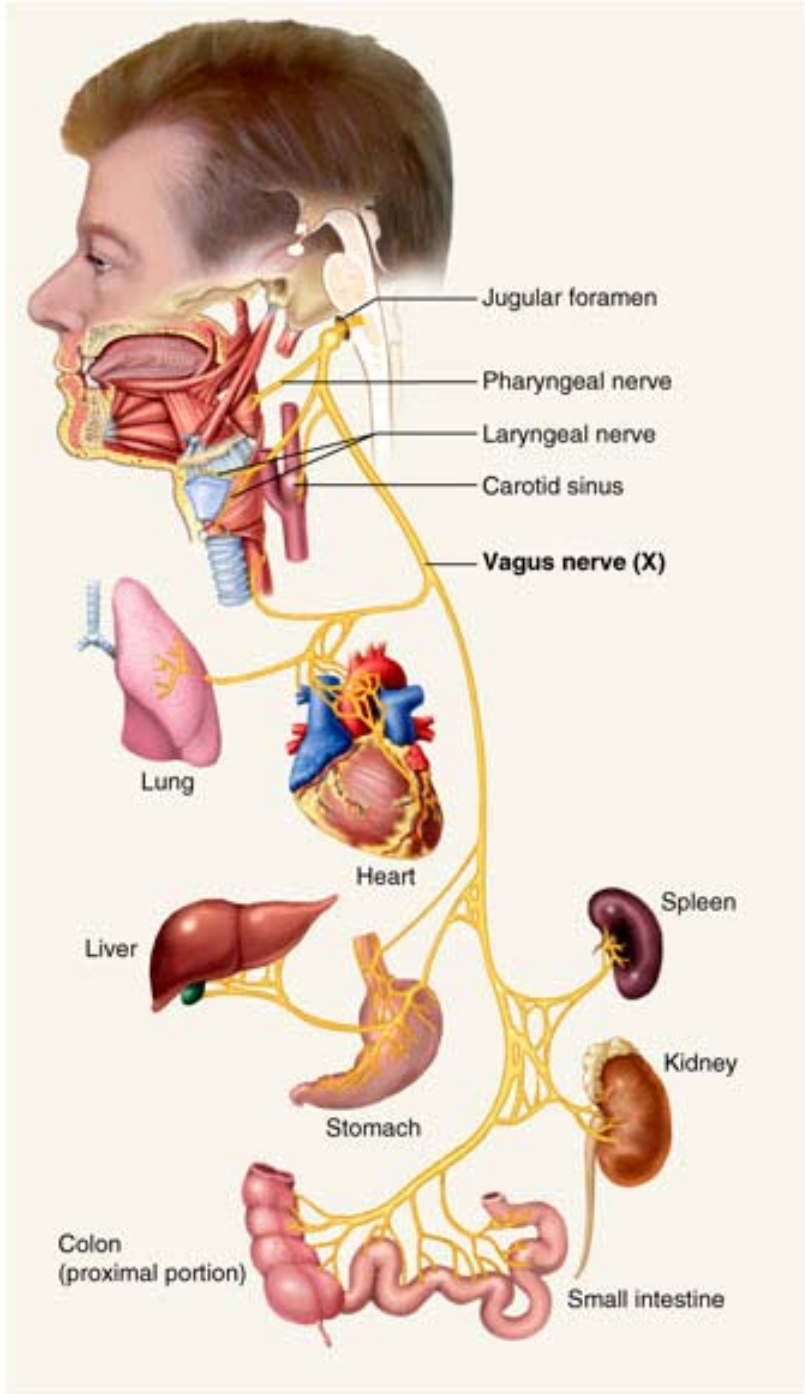
Glossopharyngeal Nerve



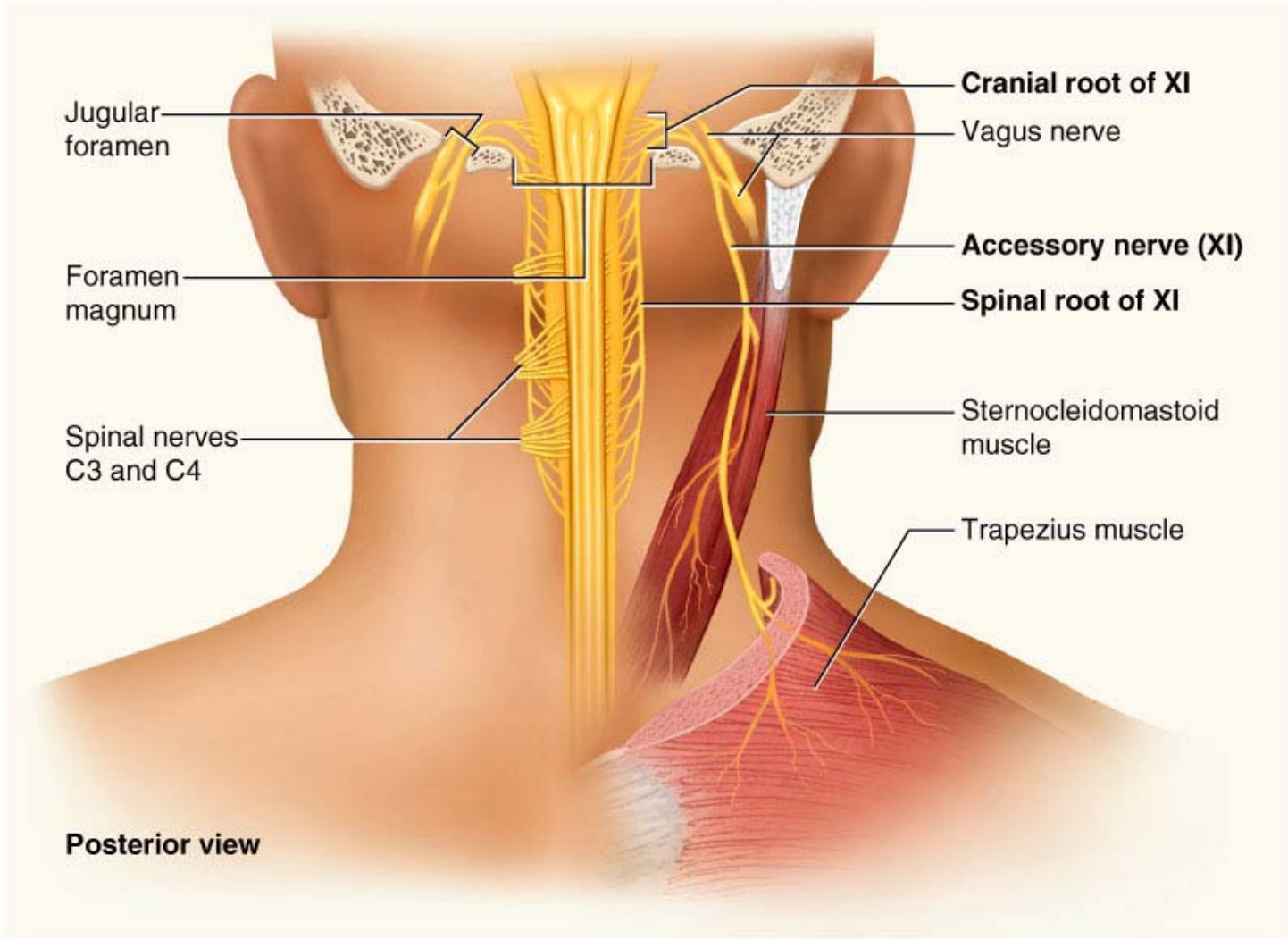
- **Swallowing, salivation, gagging, control of BP and respiration**
- **Sensations from posterior 1/3 of tongue**
- **Damage results in loss of bitter and sour taste and impaired swallowing**

Vagus Nerve

- **Swallowing, speech, regulation of viscera**
- **Damage causes hoarseness or loss of voice, impaired swallowing and fatal if both are cut**

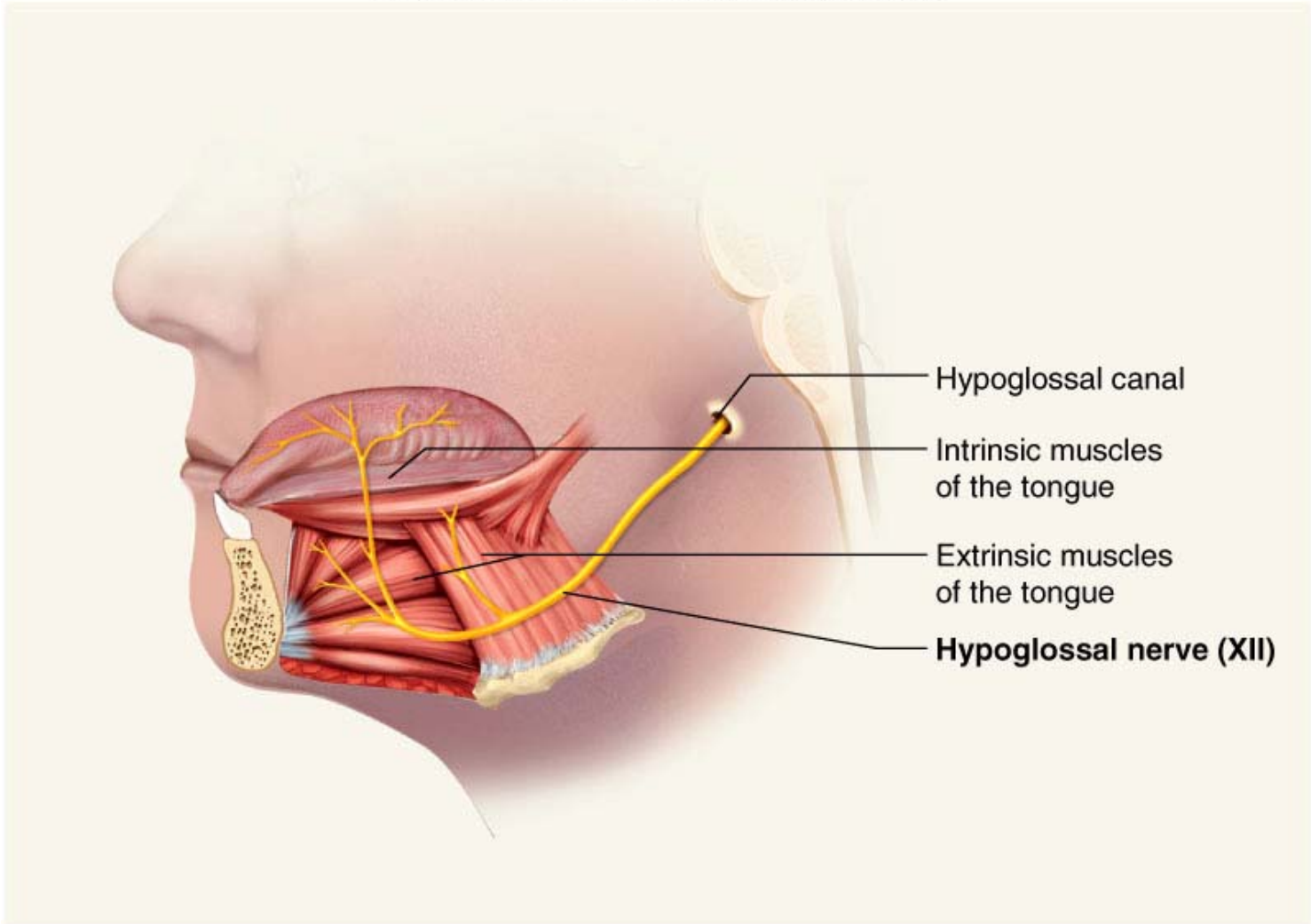


Accessory Nerve



- **Swallowing, head, neck and shoulder movement**
  - **damage causes impaired head, neck, shoulder movement; head turns towards injured side**

Hypoglossal Nerve



- **Tongue movements for speech, food manipulation and swallowing**
  - **if both are damaged – can't protrude tongue**
  - **if one side is damaged – tongue deviates towards injured side; see ipsilateral atrophy**

Cranial Nerve Disorders

- **Trigeminal neuralgia (tic douloureux)**
  - **recurring episodes of intense stabbing pain in trigeminal nerve area (near mouth or nose)**
  - **pain triggered by touch, drinking, washing face**
  - **treatment may require cutting nerve**
- **Bell's palsy**
  - **disorder of facial nerve causes paralysis of facial muscles on one side**
  - **may appear abruptly with full recovery within 3-5 weeks**