

BIO 4432 – Human Anatomy*Resource #7*

The concepts this resource covers are the topics typically covered during this week of the semester. If you do not see the topics your particular section of class is learning this week, please take a look at other weekly resources listed on our website for additional topics throughout the semester.

We also invite you to look at the group tutoring chart on our website to see if this course has a group tutoring session offered this semester.

If you have any questions about these study guides, group tutoring sessions, private 30 minute tutoring appointments, the Baylor Tutoring YouTube channel or any tutoring services we offer, please visit our website www.baylor.edu/tutoring or call our drop in center during open business hours. M-Th 9am-8pm on class days 254-710-4135.

Keywords: Functions of cranial nerves, Reflexes involving cranial nerves

Topic of the Week: Functions of Cranial Nerves

The **cranial nerves** originate from the brainstem in a **segmental pattern**:

Midbrain: CN III, CN IV

Pons: CN V, CN VI, CN VII, CN VIII

Medulla: CN IX, CN X, CN XI, CN XII

The **purely afferent** cranial nerves are:

CN I – olfactory

CN II – optic

CN VIII – vestibulocochlear

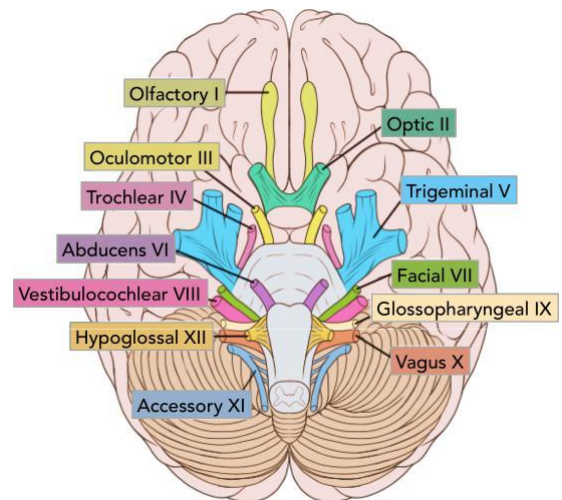
The **purely efferent** cranial nerves are:

CN IV – trochlear

CN VI – abducens

CN XI – accessory

CN XII – hypoglossal



This image was taken from teachmeanatomy.com.

Note: not all cranial nerves and their functions will be covered in this resource. I've included the most complicated ones and the ones Dr. Parizi covers the most.

Cranial nerve III – Oculomotor: innervates the **pupillary sphincter** and the **ciliary muscle** (**Parasympathetic**)

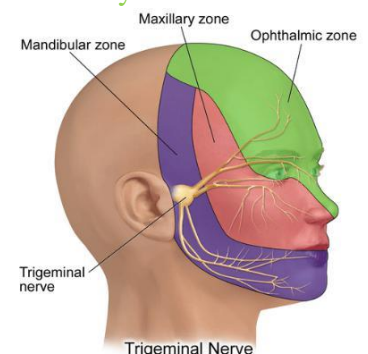
Cranial nerve V – Trigeminal

V₁ – Ophthalmic

- Only **afferent** functions.
- 3 branches: **nasociliary, frontal, and lacrimal** (NFL)

V₂ – Maxillary

- Only **afferent** functions.
- 6 branches: **zygomatic, nasopalatine, superior alveolar** (*next* →)



This image was taken from Biology Dictionary.

Maxillary (cont.) infraorbital, lesser palatine, greater palatine (Zebras
Never, Stay, In, Large, Groups)

V₃ – Mandibular

- Sensory innervation to the lower part of the face and motor innervation to the muscles of mastication and tensor tympani.
- 3 branches: auriculotemporal, inferior alveolar, lingual (AIL)
 - o The auriculotemporal branch of mandibular nerve encircles the middle meningeal artery.

CN VII – Facial

Facial nerve proper: motor innervation of the muscles of facial expression.

- Branches: temporal, zygomatic, buccal, marginal mandibular, and cervical (Ten Zebras
Bit My Clavicle)

Chorda Tympani:

- Visceral motor innervation of the submandibular and sublingual glands (**Parasympathetic**)
- Sensory innervation: taste from the anterior 2/3 of the tongue.

Greater Petrosal:

- Motor innervation of palatine, nasal, and lacrimal glands (**Parasympathetic**)
- Sensory innervation: taste from the palate.

CN IX – Glossopharyngeal

- Motor innervation to the stylopharyngeus muscle (pharynx)
- Sensory innervation to tympanic membrane and taste and general sensation from the posterior 1/3 of the tongue.

Highlight #1: Reflexes

There are 3 important reflexes:

1. **Corneal reflex: blinking**
Afferent nerve involved: nasociliary branch of ophthalmic (V₁)
Efferent nerves involved: temporal and zygomatic branches of facial nerve proper
2. **Pupillary reflex: pupil constriction due to light exposure**
Afferent nerve involved: optic nerve
Efferent nerves involved: oculomotor
3. **Gag reflex**
Afferent nerve involved: glossopharyngeal nerve
Efferent nerves involved: vagus nerve

Week 9 Knowledge Checkpoint:

1. Bell's Palsy is a condition in which the facial muscles are weakened or paralyzed. What cranial nerve may be injured in this condition?

- A. CN V
 - B. CN II
 - C. CN X
 - D. CN VII
2. Which cranial nerve is involved in lacrimation (tear production)?
- A. Oculomotor
 - B. Ophthalmic
 - C. Optic
 - D. Facial
3. List the cranial nerves that are ONLY sensory.
4. A patient expresses to you that he is concerned that he cannot taste anything on the anterior 2/3 of his tongue. What nerve innervates this portion of the tongue?
- A. Chorda Tympani
 - B. Glossopharyngeal
 - C. Vagus
 - D. Mandibular

THINGS YOU MAY STRUGGLE WITH!

1. **Branches:** There are many different branches to remember for this section. I've provided some mnemonics for y'all to study with, but feel free to come up with your own!
2. **Functions of each nerve:** This will (hopefully) become easier to remember once Dr. Parizi covers the parasympathetic pathways. Knowing where each nerve travels will be helpful in remembering their functions.

CONGRATS: You made it to the end of the resource! Thanks for checking out these weekly resources! Don't forget to check out our website for group tutoring times, video tutorials and lots of other resources: www.baylor.edu/tutoring!

Answers

1. D
2. B
3. I, II, VIII
4. A