

# CRANIAL NERVES

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Twelve pairs of nerves that connect with the brain and pass through foramina in the base of the skull. They are:

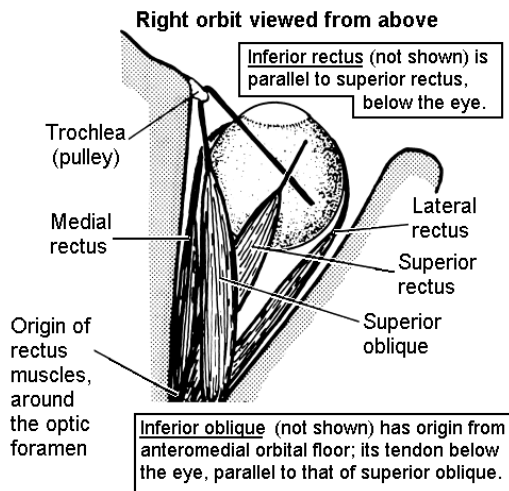
- I. Olfactory (about 20 on each side)
- II. Optic (Not a nerve; part of the brain)
- III. Oculomotor
- IV. Trochlear
- V. Trigeminal
- VI. Abducent (or abducens)
- VII. Facial (= n. intermedius & facial n.)
- VIII. Vestibulocochlear (= vestibular & cochlear)
- IX. Glossopharyngeal
- X. Vagus
- XI. Accessory (also called spinal accessory)
- XII. Hypoglossal.

- I. Olfactory (about 20 on each side)

## SPECIAL VISCERAL AFFERENT

Neurons in the olfactory epithelium send axons through cribriform plate to the olfactory bulb.

Eye movements: III, IV and VI.



- I. Olfactory (about 20 on each side)
- II. Optic (Not a nerve; part of the brain)
- VIII. Vestibulocochlear

## SPECIAL SOMATIC AFFERENT

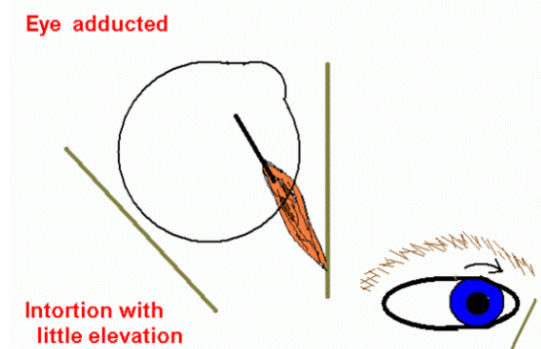
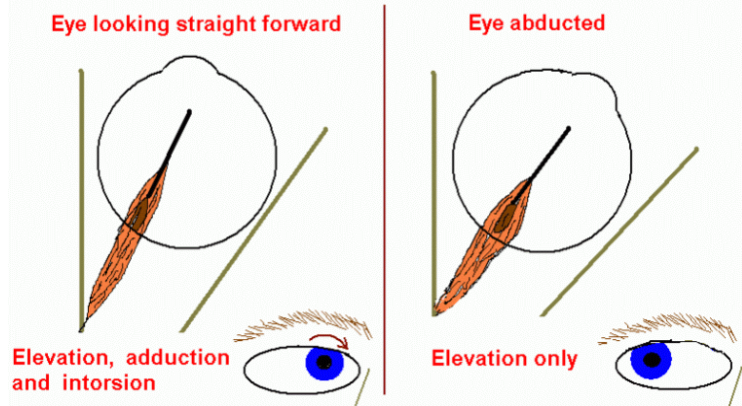
Vestibular nerve. Neurons in vestibular ganglion project to vestibular nuclei and to parts of the cerebellum.

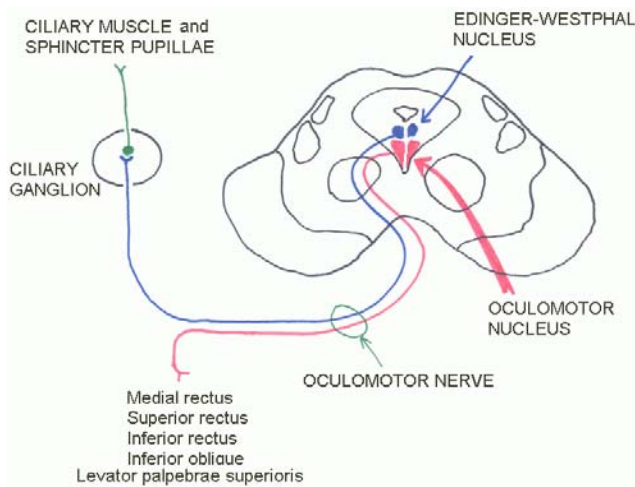
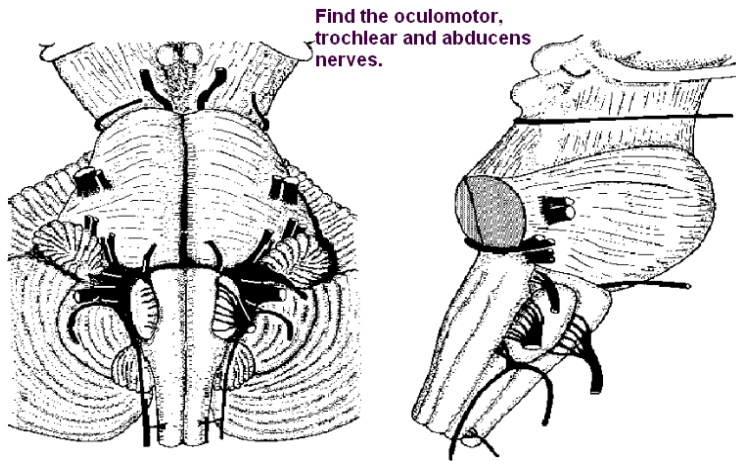
Cochlear nerve. Neurons in spiral ganglion of cochlea project to dorsal and ventral cochlear nuclei of medulla.

See 535vest.pdf and 535audi.pdf

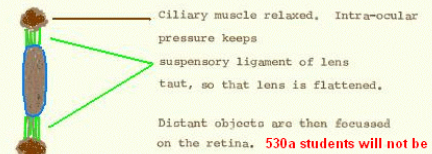
A muscle's action varies with the initial position of the eye.

Example: Right superior rectus

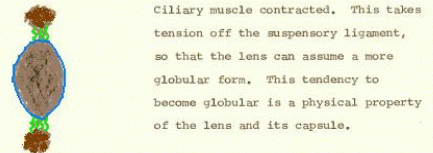




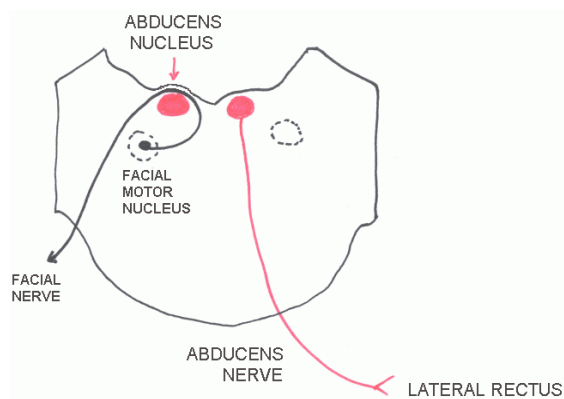
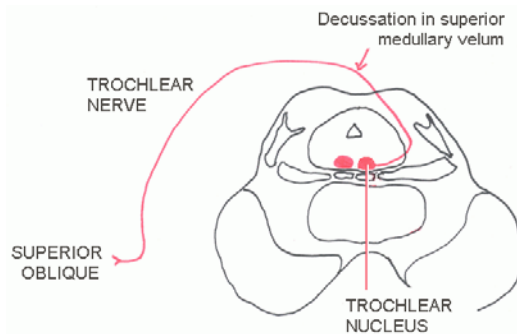
### Accommodation of the lens - 1.



### Accommodation of the lens - 2.



Refraction occurs at the air-cornea and lens-vitreous interfaces. Thickening of the lens in accommodation shortens the focal length of the whole cornea-aqueous-lens system.



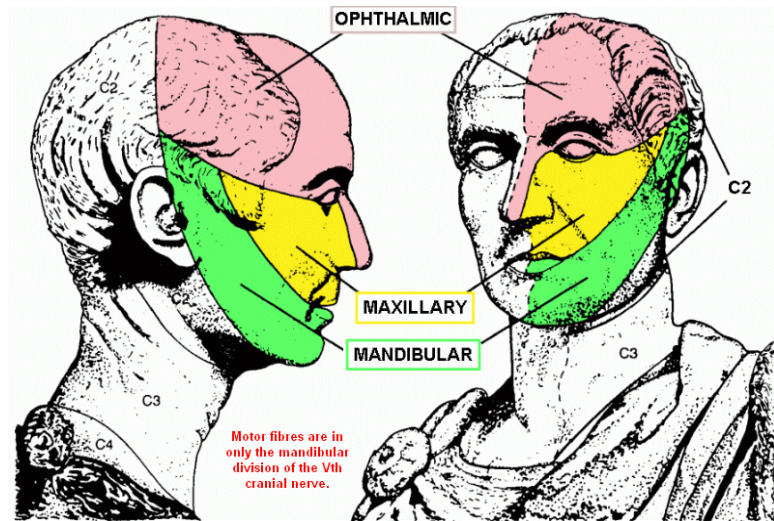


## Trigeminal nerve.

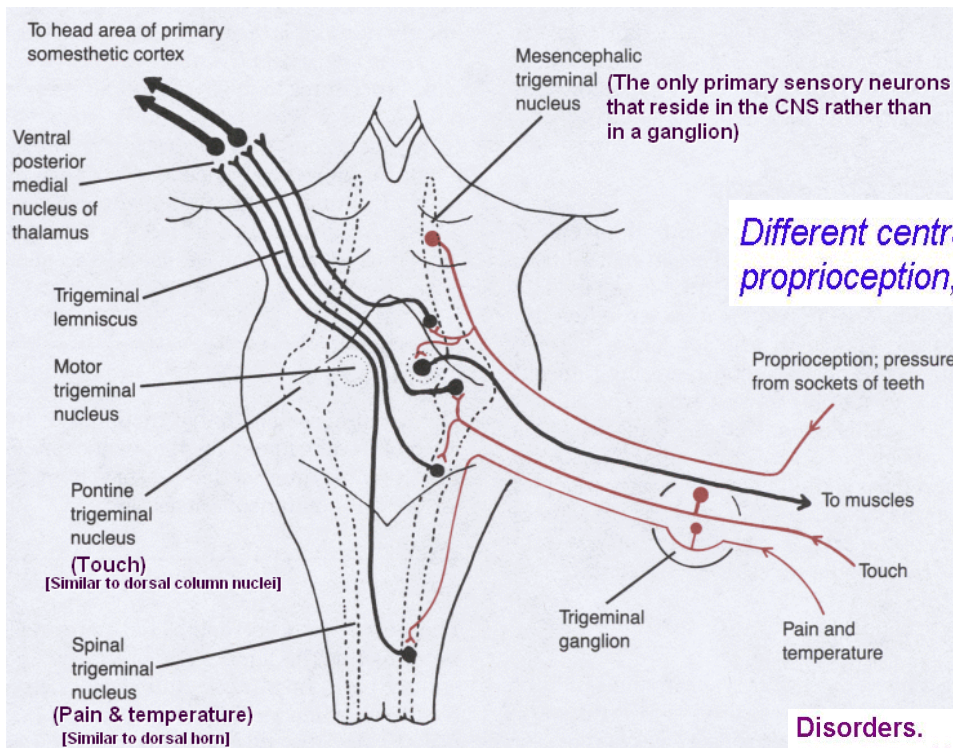
Sensory to skin areas shown; also eye, mucous membranes, teeth, much of dura.

Motor to muscles of mastication & tensor tympani.

No parasympathetic component

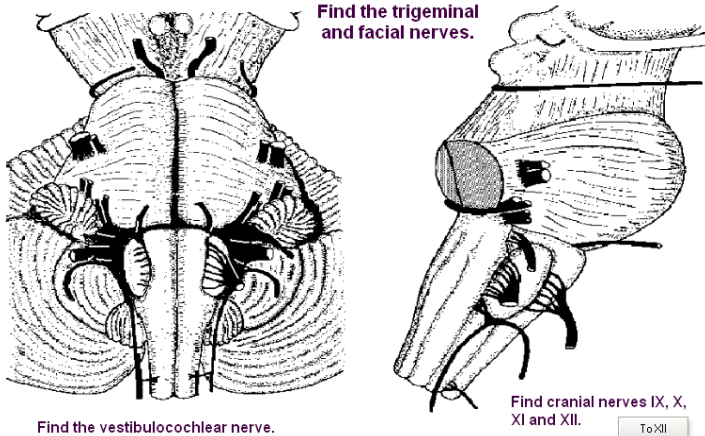


## Central connections:



## Disorders.

Herpes zoster  
Trigeminal neuralgia



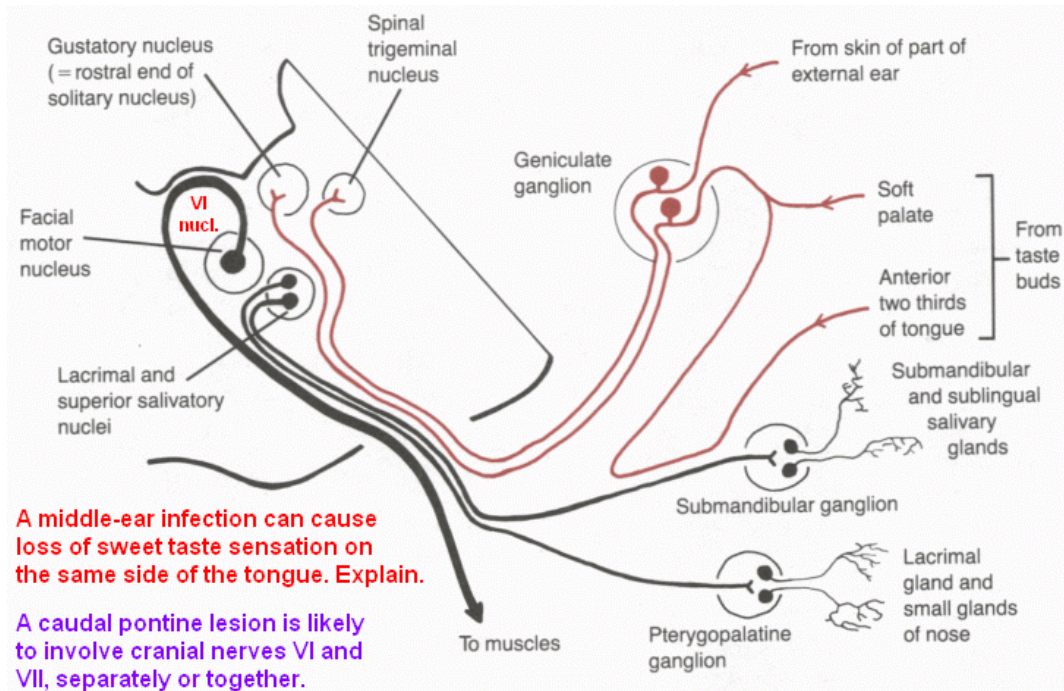
Find the vestibulocochlear nerve.

Find cranial nerves IX, X, XI and XII.

To XII

## Facial nerve - nuclei, sensory &

## parasympathetic ganglia, components.



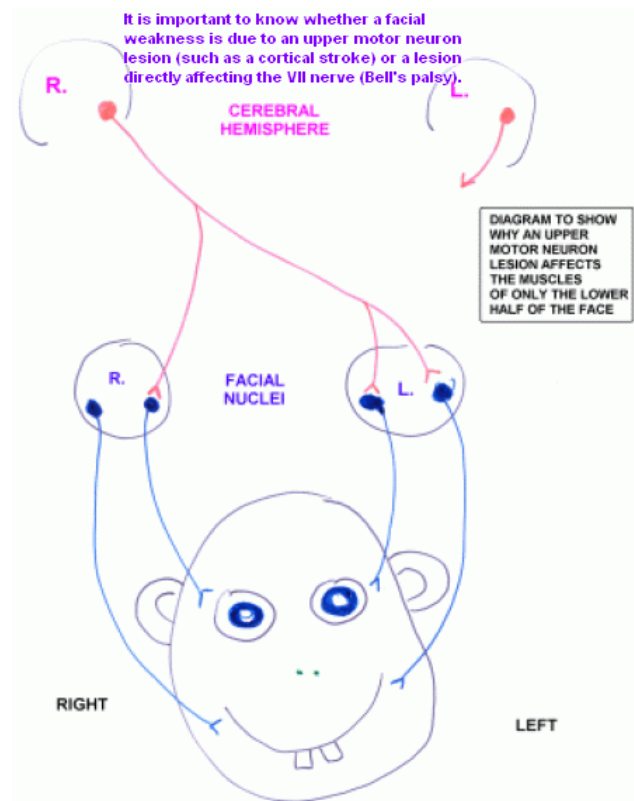
### **Motor - Muscles of face** **Stapedius**

#### **Preganglionic parasympathetic**

- to pterygopalatine ganglion (for lacrimal and nasal glands)
- to submandibular ganglion (for submandibular and sublingual glands)

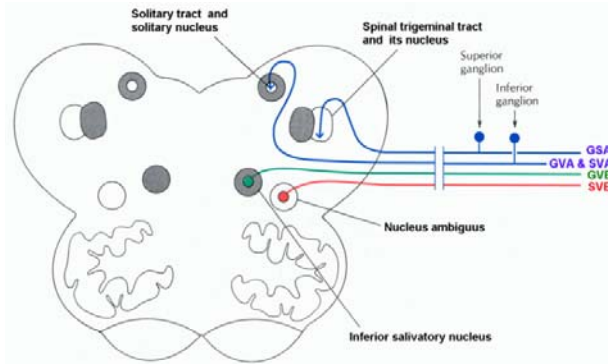
#### **Sensory - Taste, anterior 2/3 of tongue**

- small area of skin of ear





## Glossopharyngeal and vagus nerves.



GSA = Somatic sensory

GVA = Visceral (physiological) afferents

SVA = Taste

GVE = Preganglionic parasympathetic (to otic ganglion)

SVE = Motor to stylopharyngeus muscle

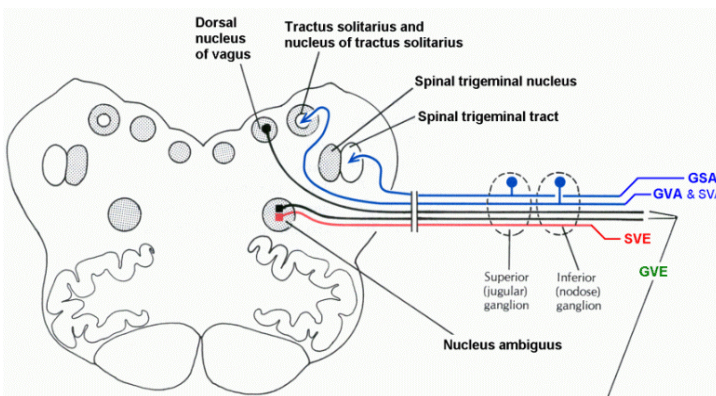
### IX

**Sensory** – Posterior 1/3 of tongue  
Pharynx  
Middle ear

#### **Preganglionic parasympathetic**

– to otic ganglion (parotid gland)

**Motor** – One small muscle (stylopharyngeus)



GSA = General somatic sensation (larynx, oesophagus, trachea, small area of ext. ear)

GVA = Physiological afferents from internal organs

SVA = Taste (epiglottis)

SVE = Motor to larynx, pharynx, upper one third (skeletal muscle) of oesophagus

GVE = Preganglionic parasympathetic (especially to ganglia of heart, stomach).

### X

**Motor** – Muscles of larynx and pharynx

**Sensory** – visceral reflexes  
– small area of skin of ear

#### **Preganglionic parasympathetic**

– small ganglia associated with internal organs.

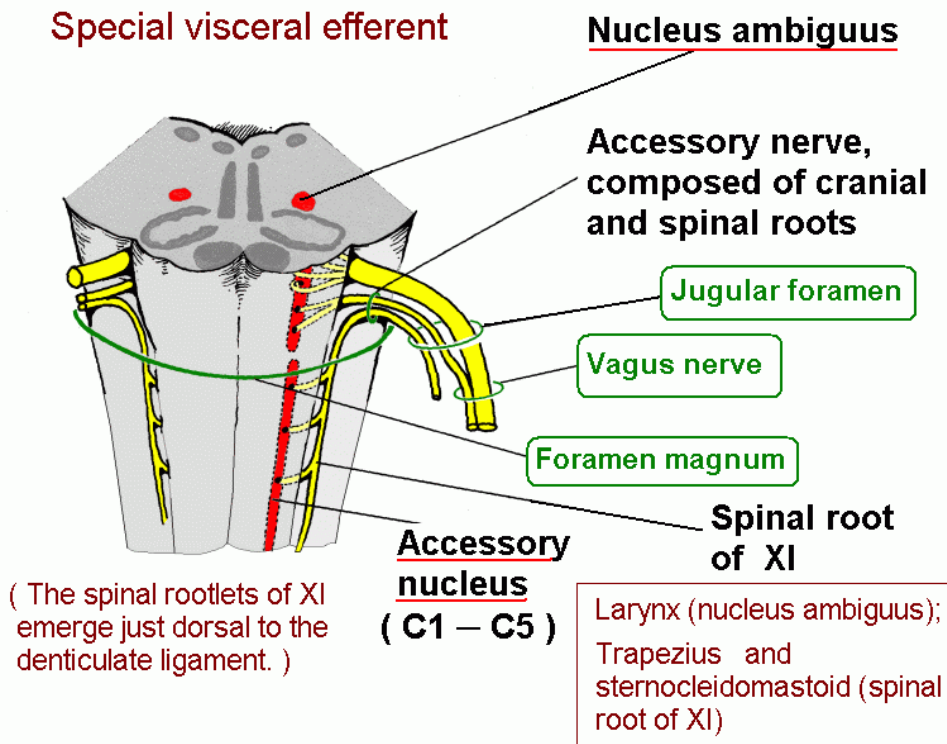
*Slows heart*

*Stimulates gastric secretion*

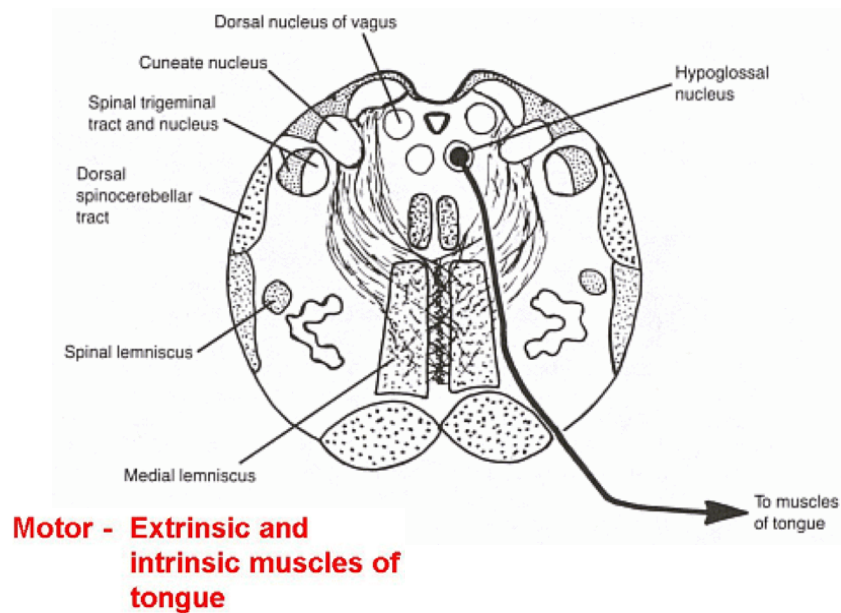
*Empties stomach*

## Accessory nerve.

### **XI Special visceral efferent**



## Hypoglossal nerve.



### Hypoglossal nerve palsy

*When protruded, the tongue deviates towards the paralysed side.*