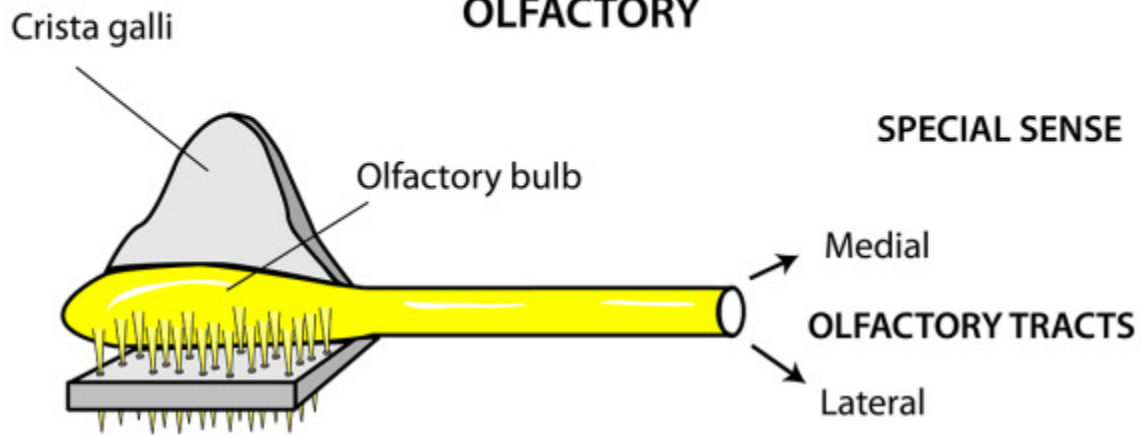


I OLFACTORY



SPECIAL SENSE

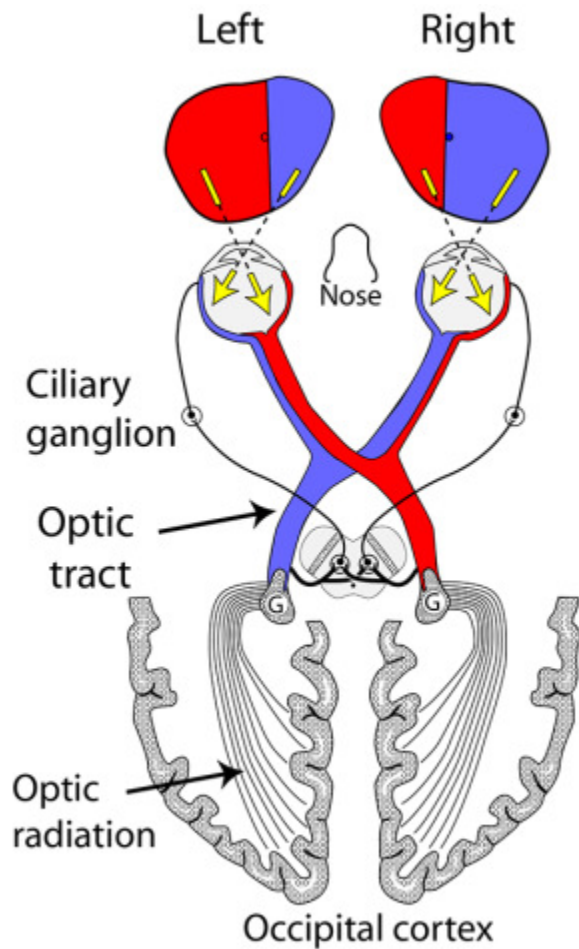
Medial
OLFACTORY TRACTS
Lateral

20 OLFACTORY NERVES

- Under surface of cribriform plate
- Upper med & lat nose

NUCLEI

- Anterior olfactory (in posterior bulb)
- Anterior perforating substance & Uncus (both in the brain)



II OPTIC NERVE

From the lateral geniculate bodies fibres pass in the optic radiations to the left and right occipital cortex where the images arrive inverted (upside down). To initiate rapid reflexes at brain stem level, the incoming fibres from the eye must connect to the mid brain which lies near the optic tracts. These fibres from each optic tracts synapse with both Edinger Westphal nuclei so that all reflexes are bilateral. Parasympathetics from the Edinger Westphal nuclei synapse in the ciliary ganglia and then supply the sphincter pupillae muscles for constricting the pupils.

III

Oculomotor

- Superior rectus
- Inferior rectus
- Medial rectus
- Inferior oblique

III, IV, VI

Somatic motor nerves to eye muscles

IV

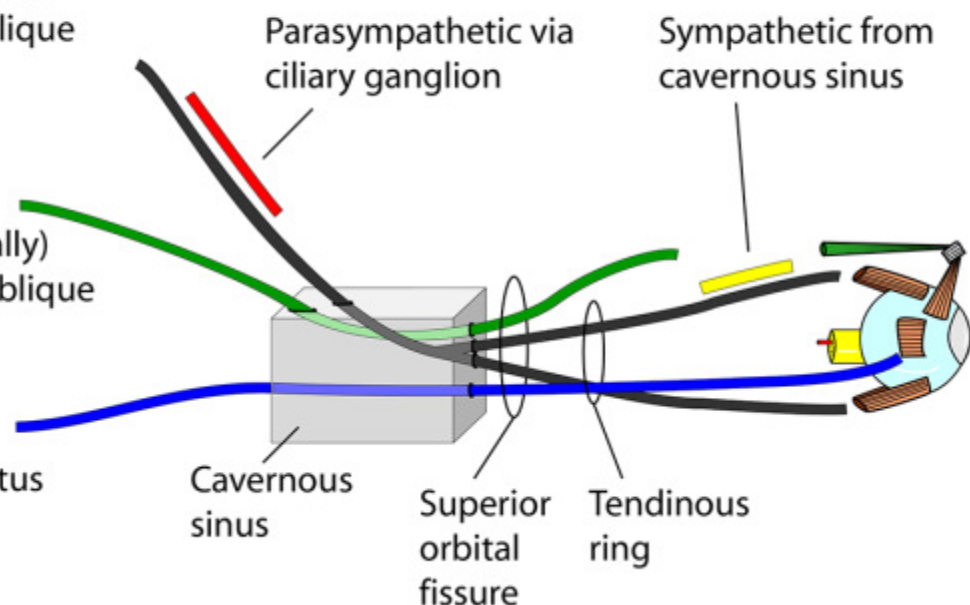
Trochlear

- (arises dorsally)
- Superior oblique

VI

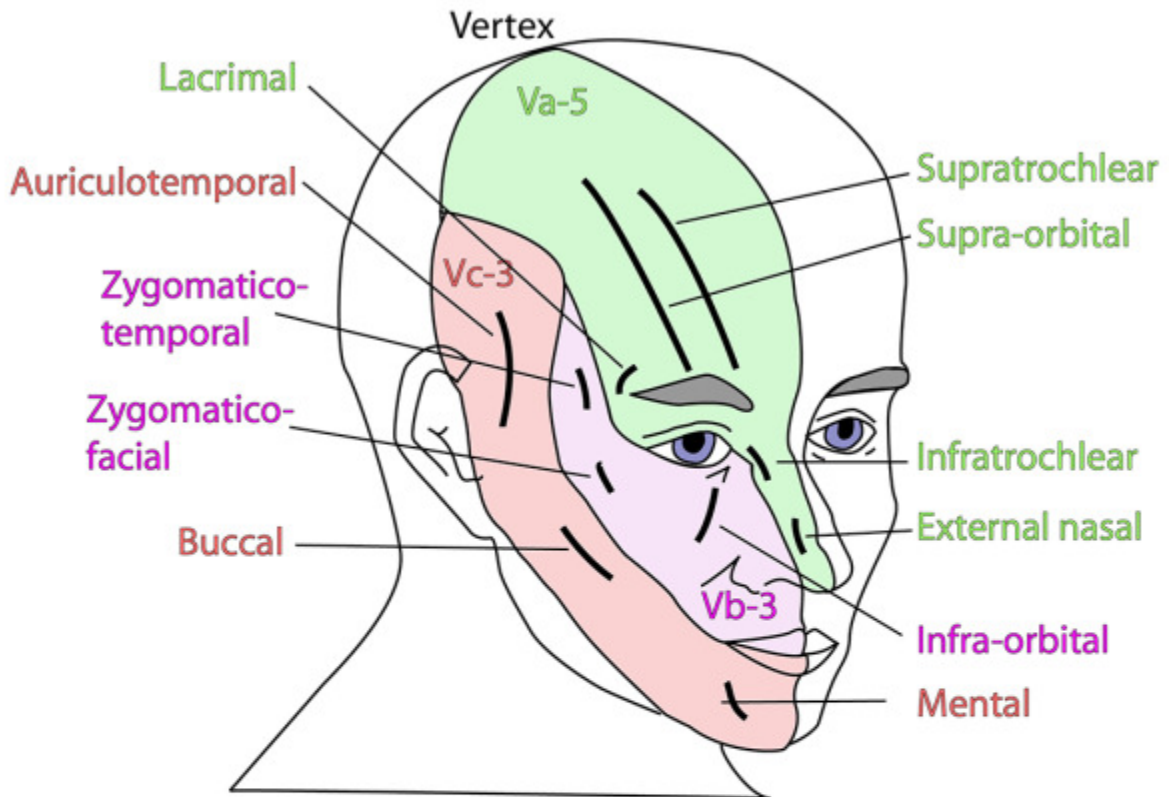
Abducent

- Lateral rectus



Va OPHTHALMIC DIVISION OF TRIGEMINAL

5 SENSORY BRANCHES OF Va (TRIGEMINAL) N ON FACE



Sensory: Scalp, eye, upper face, sinuses (see above)

Carries: Parasympathetics via ciliary ganglion to eye for accommodation and pupil constriction (10 short ciliary nerves), via pterygopalatine ganglion for lacrimal gland.

Sympathetics via cavernous sinus to pupil for dilatation (2 long ciliary nerves)

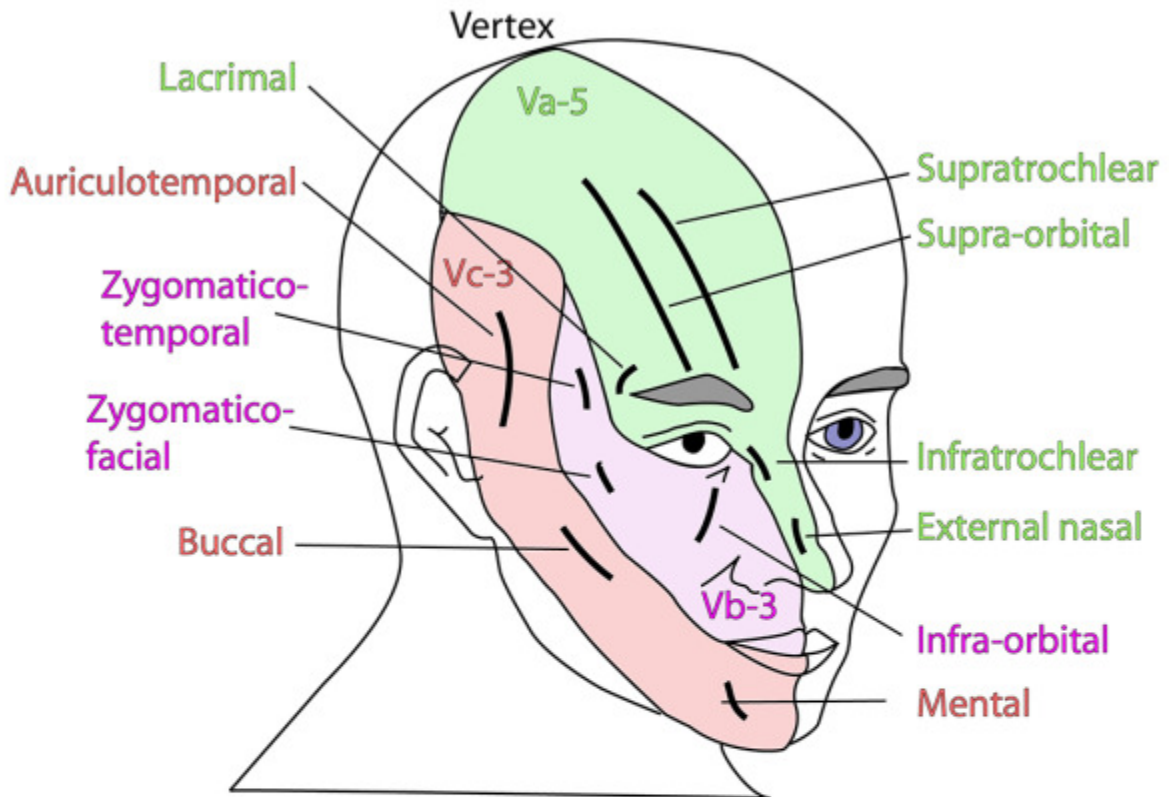
Main Branches:

Frontal
Lacrimal
Nasociliary

V carries all parasympathetics to their end organs

Vc MANDIBULAR DIVISION OF TRIGEMINAL

3 SENSORY BRANCHES OF VC (TRIGEMINAL) N ON FACE



Sensory: Lower face, hairy temple, anterior 2/3 tongue (see above)

Carries: Parasympathetics via submandibular & otic ganglia to submandibular & sublingual glands, & parotid gland

Taste: Anterior 2/3 tongue

Branchiomotor: Muscles of mastication, tensors tympani & palati

Main Branches:

Auriculotemporal

Buccal

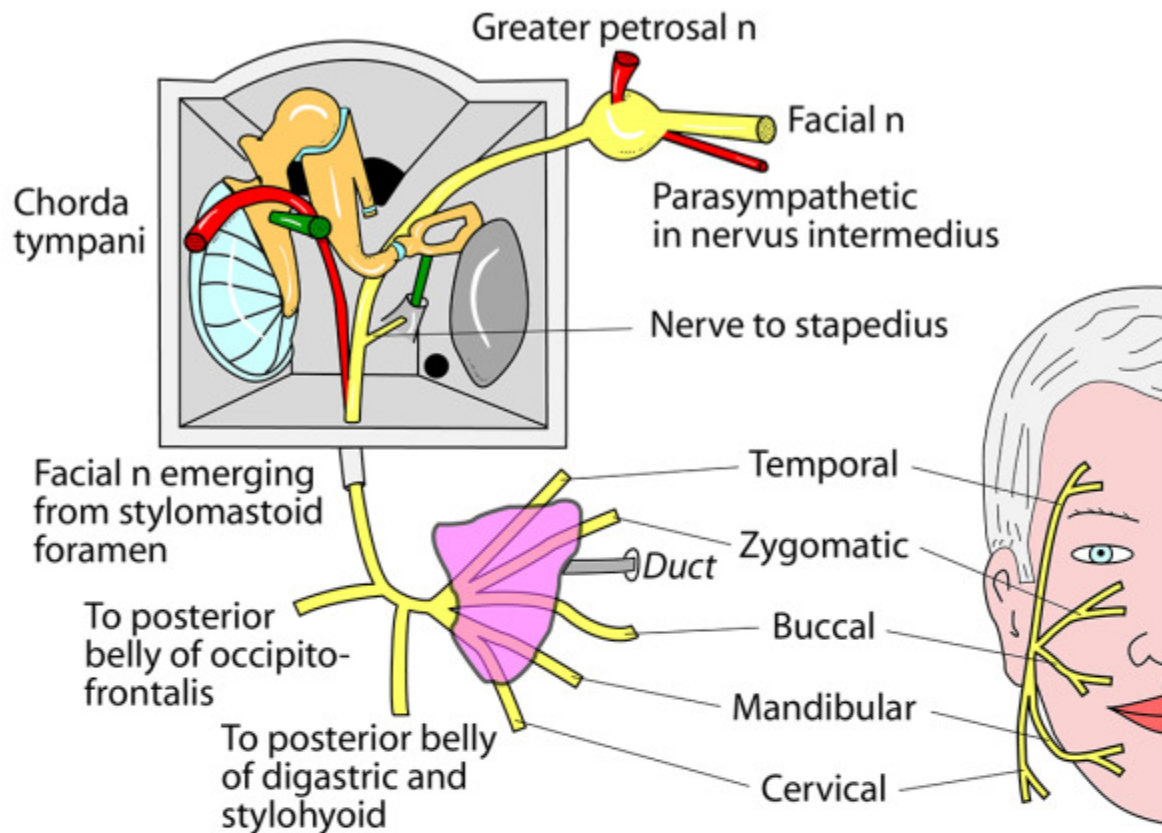
Mental

Lingual

Muscular

V carries all parasympathetics to their end organs

VII FACIAL NERVE



Branchiomotor: Muscles of facial expression, stapedius, posterior belly of digastric, stylohyoid, occipitalis

Carries: Parasympathetic in greater petrosal nerve to pterygopalatine ganglion then via Vb to "hay fever" glands & via Vb and Va to lacrimal gland.

Chorda tympani to submandibular ganglion and then to submandibular and sublingual glands via Vc

Taste: Via nervus intermedius from palate in greater petrosal nerve & from anterior 2/3 tongue via chorda tympani

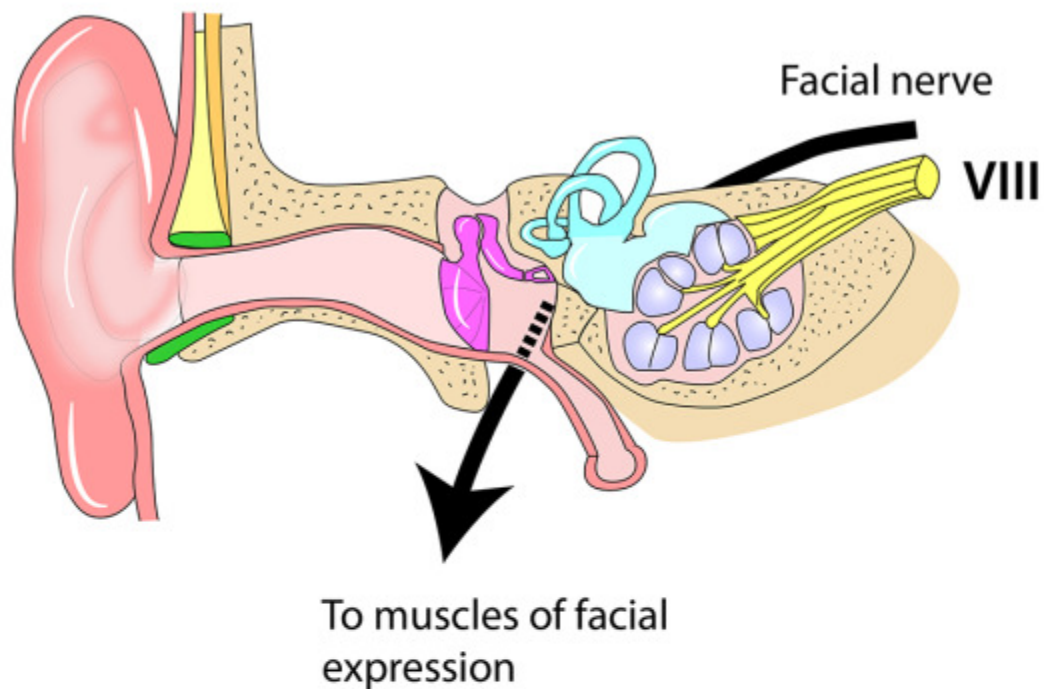
Sensation: Small area in external ear and tympanic membrane

Main branches:

As above
greater petrosal
chorda tympani

V carries all parasympathetics to their end organs

VIII VESTIBULOCOCHLEAR NERVE



SPECIAL SENSE FOR HEARING & BALANCE

HEARING:

From organ of Corti in cochlea

Hair cells to cell bodies in spiral ganglion (in modiolus)

To 2 cochlear nuclei - ventral & dorsal

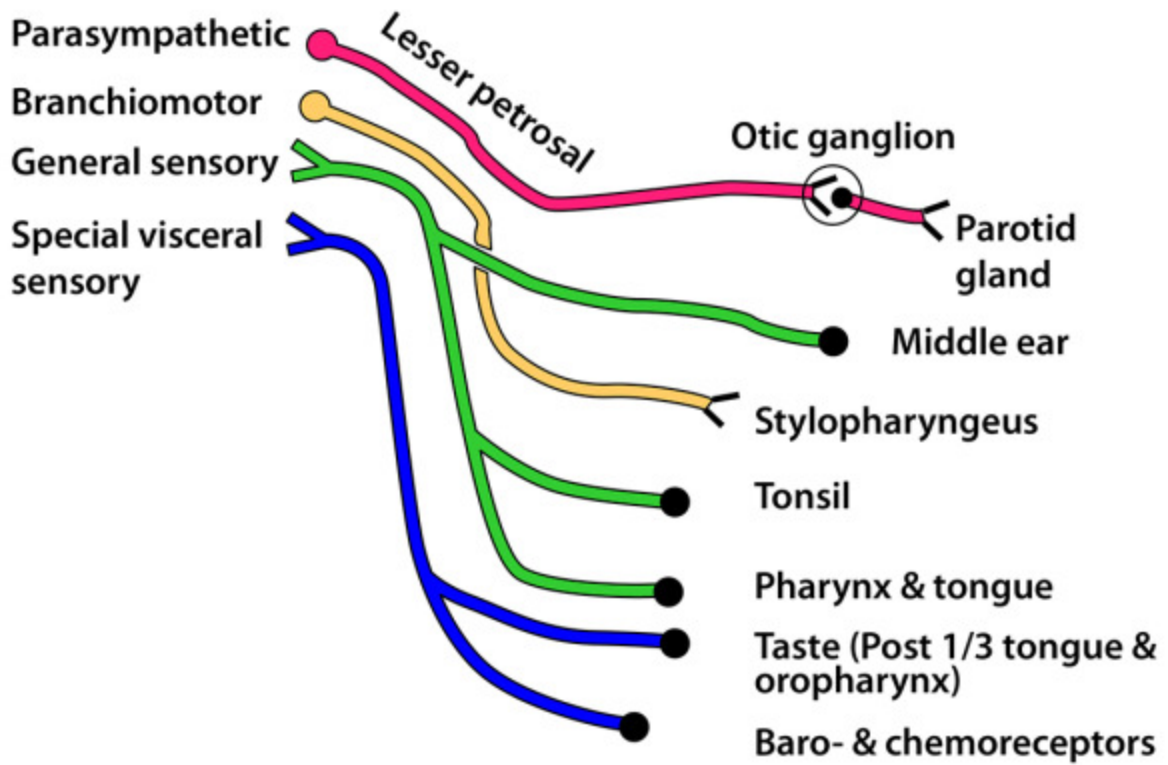
BALANCE:

From semicircular canals, utricle & saccule

Cell bodies in vestibular ganglion in outer part of internal acoustic meatus

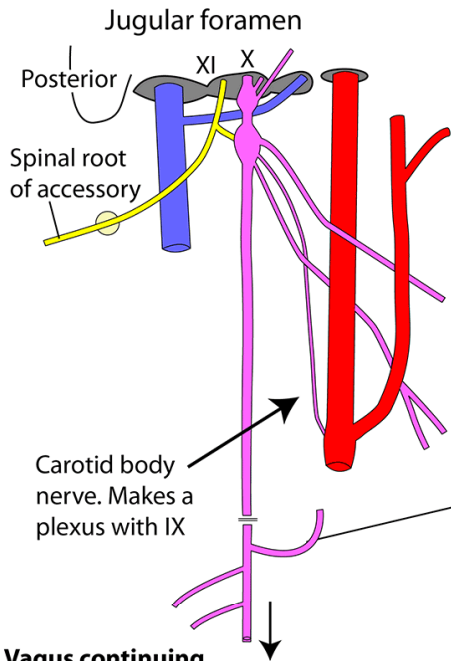
To vestibular nuclei - medial, lateral, superior, inferior

IX GLOSSOPHARYNGEAL NERVE



SENSORY:

- Oropharynx
- Posterior 1/3 tongue
- Tonsil
- Middle ear



VAGUS NERVE 1

Superior vagal ganglion - cell bodies:

1. **Meningeal br.** Sensory to posterior cranial fossa
2. **Auricular br.** Sensory to external auditory meatus & part of eardrum (communicates with VII)

Inferior vagal ganglion - cell bodies:

1. **Special visceral afferent** (baroreceptors & taste)
2. **General visceral afferent** (detects stretch in heart, lungs, abdominal contents, pharynx & larynx)

Recurrent laryngeal n.

1. **Branchiomotor** to muscles of larynx & upper oesophagus
2. **Somatic sensory** to larynx below cords
3. **General visceral afferents** from larynx & pharynx for stretch

Vagus continuing.

Parasympathetic to pulmonary & oesophageal brs & to coeliac, hepatic & renal plexuses.

Carries **general visceral afferents** from all these organs

Vagus arises from 8-10 rootlets on medulla. Associated nuclei are:

1. Dorsal nucleus of vagus.

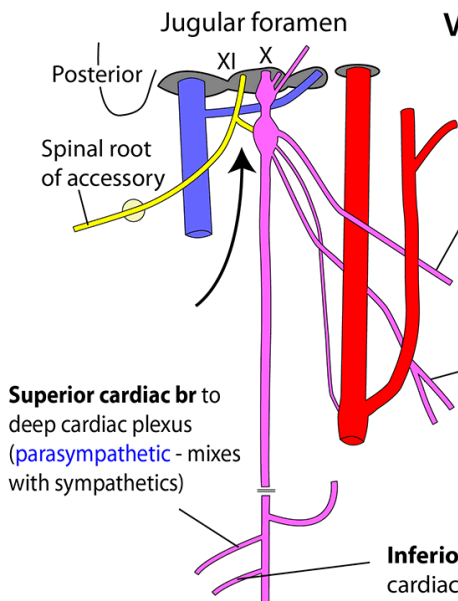
General visceral efferent (parasympathetic) to smooth muscle of bronchi, heart, oesophagus, intestine to transverse colon.

General visceral afferent (sensory) from above organs.

2. Nucleus ambiguus. **Branchiomotor** supply to striated muscle of palate, pharynx, larynx & upper oesophagus (these fibres originate from the cranial root of accessory).

3. Nucleus solitarius. **Sensory** for baroreceptors and taste.

4. Spinal nucleus of trigeminal nerve. All **somatic sensory** fibres in vagus end here.



VAGUS NERVE 2

Pharyngeal br of vagus.

Branchiomotor to pharyngeal plexus for muscles of pharynx & palate (excluding tensor palati).

All these branchiomotor fibres arise in the nucleus ambiguus & are "dumped" onto vagus (See large arrow opposite)

Superior laryngeal n

1. Internal br. **Somatic sensory** above cords. Small amount of **taste** in valleculae
2. External br. **Branchiomotor** to cricothyroid

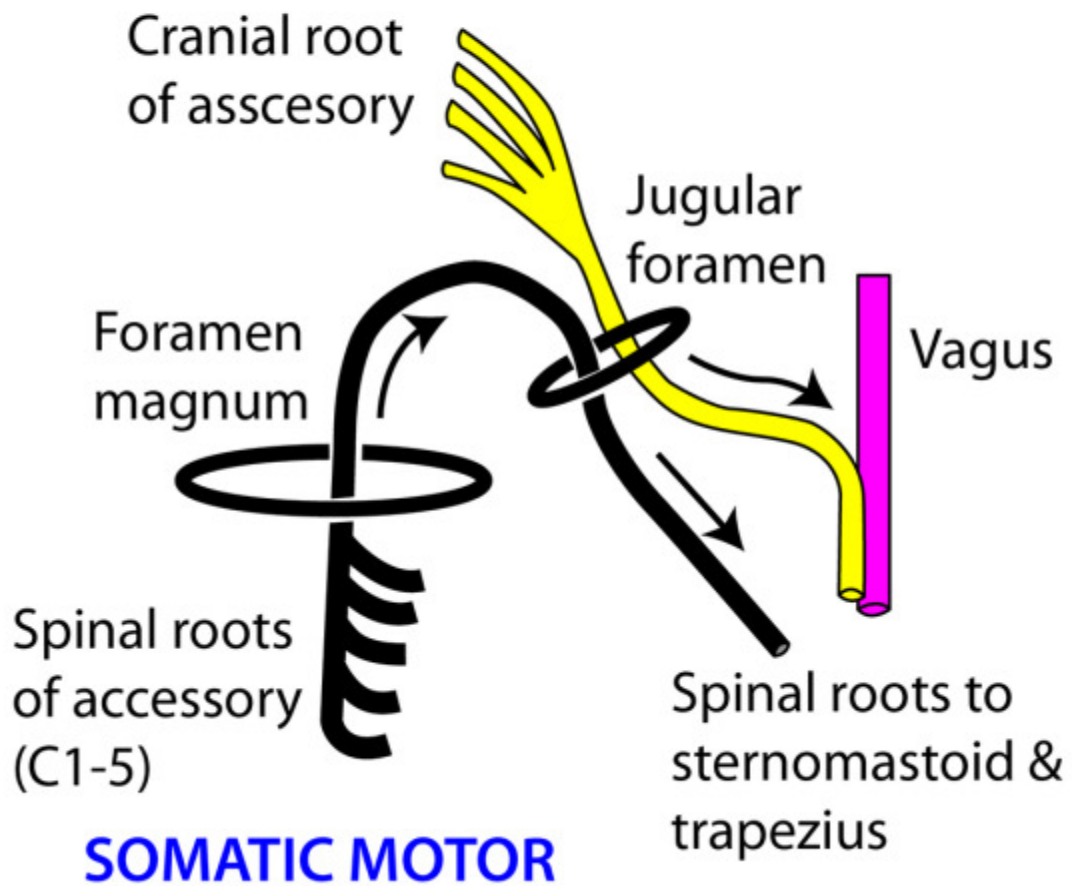
Superior cardiac br to deep cardiac plexus (**parasympathetic** - mixes with sympathetics)

Inferior cardiac br to deep & superficial cardiac plexuses (**parasympathetic**)

XI ACCESSORY NERVE

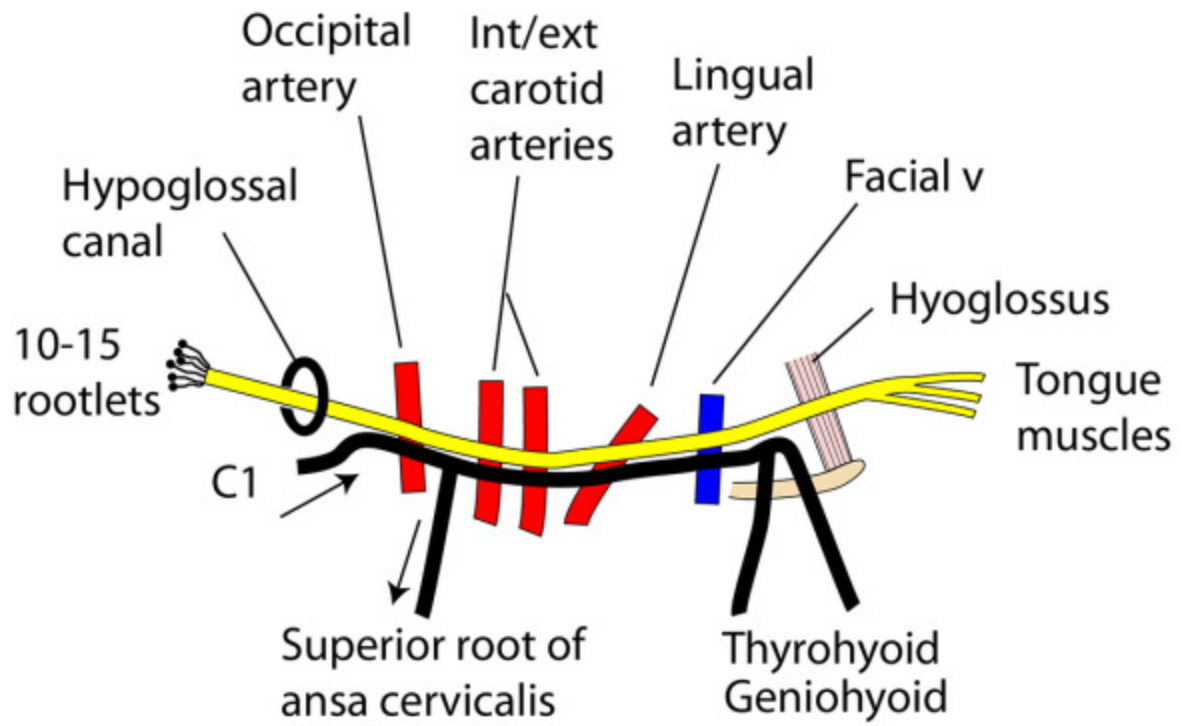
(Accessory to vagus)

BRANCHIOMOTOR



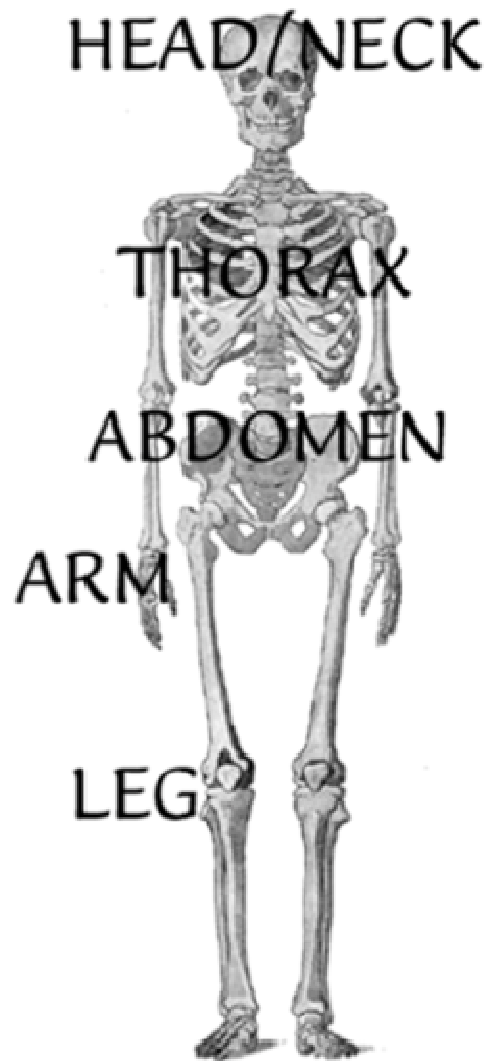
XII HYPOGLOSSAL NERVE

SOMATIC MOTOR



ANATOMY

Instant Anatomy



TONGUE - SENSATION & TASTE

SUMMARY OF NERVE SUPPLY TO TONGUE

	SOMATIC SENSATION	TASTE	SECRETOMOTOR
ANTERIOR 2/3	Lingual (Vc)	Chorda tympani (VII)	Chorda tympani (VII) (anterior lingual glands)
POSTERIOR 1/3 + vallate papillae	Glosso-pharyngeal (IX)	Glosso-pharyngeal (IX)	Glosso-pharyngeal (IX)
VALLECULAE	Glosso-pharyngeal (IX)	Internal branch of superior laryngeal nerve (X)	Glosso-pharyngeal (IX)

Note: Sympathetic supply to tongue is from superior cervical ganglion via lingual artery

For more details & summary of taste please see page 83 in the book - Instant Anatomy, by R H Whitaker & N R Borley. 4th edition. Wiley-Blackwell 2010