

Autonomics of the Head and Neck

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College of Osteopathic
Medicine

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Do.
Make.
Heal.
Innovate.
Reinvent the Future.

Sympathetics

External Carotid Plexus

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Branches with maxillary a.

- Parotid gland

Branches with lingual a.

- Sublingual gland
- Submandibular gland

Branches with facial a.

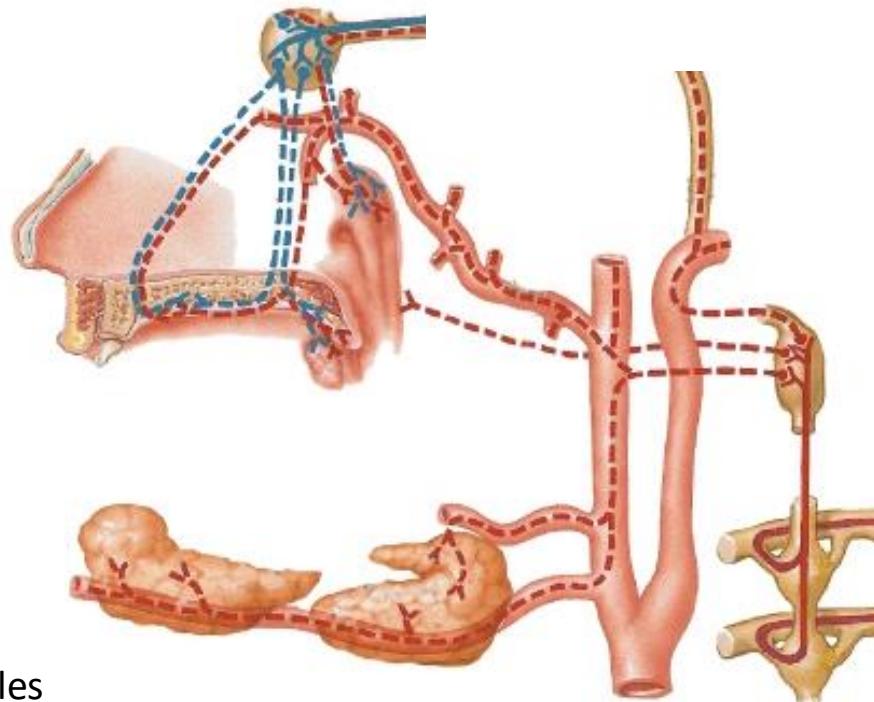
- Submandibular gland

Branches with superior thyroid a.

- Thyroid gland

With all branches

- Vasoconstriction of arterioles
- Facial sweat glands



Sympathetic preganglionic —

Sympathetic postganglionic - - -

Source: Netter, Atlas of Anatomy

Clinical Consideration

Horner's Syndrome

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Cause

- Damage or blockage of sympathetic pathway to head

Symptoms

- **Constricted pupil (miosis)**
- **Drooping upper eyelid (mild ptosis)**
- **Lack of sweating (anhidrosis)**
- Loss of cutaneous vasodilation in face (cannot blush)
- Loss of ocular vasoconstriction ("bloodshot" eye)

Parasympathetics

Ciliary Ganglion

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Preganglionic cell bodies

- Brain (visceral efferent oculomotor nucleus)

Preganglionic axons

- Oculomotor Nerve (CN III)

Postganglionic cell bodies

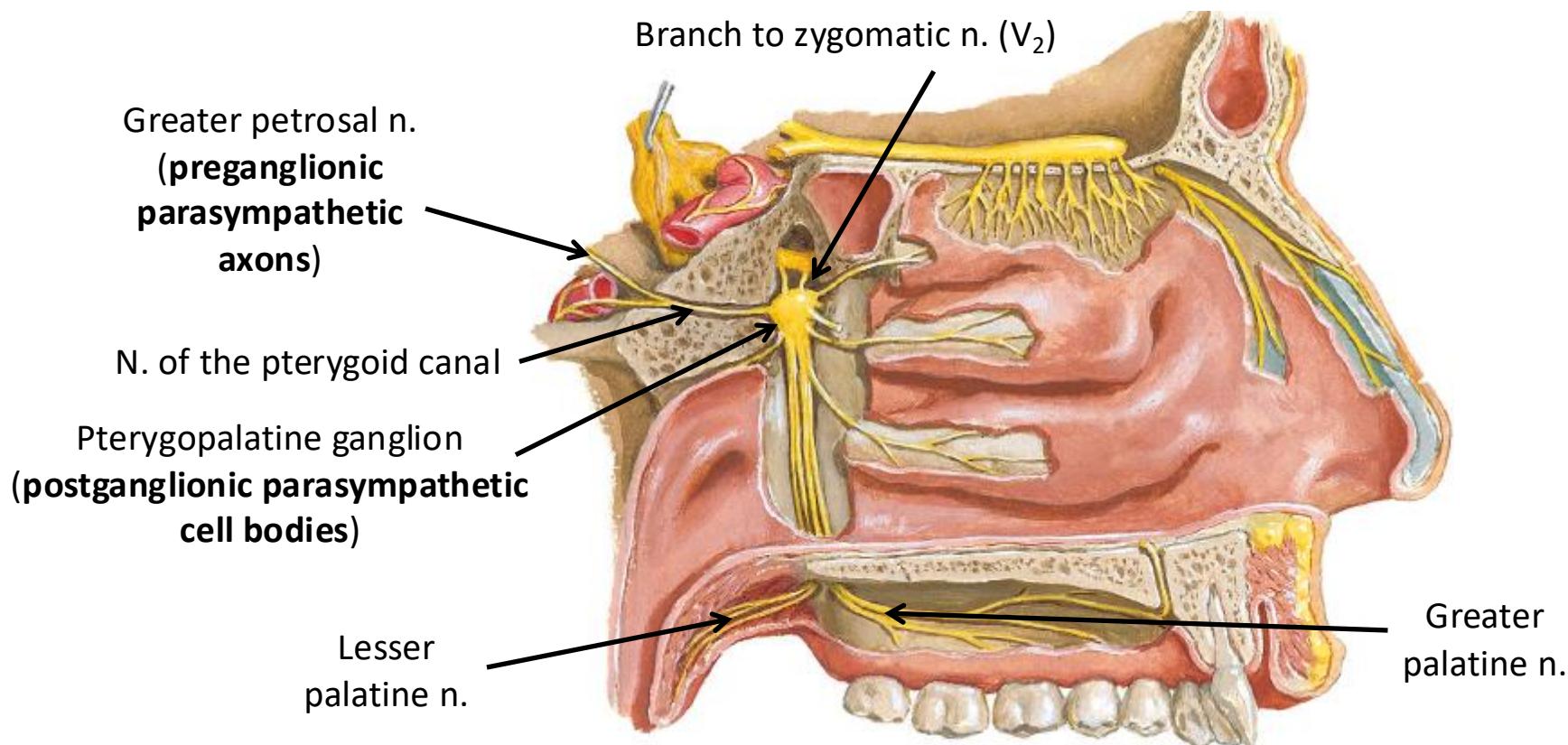
- Ciliary ganglion

Postganglionic axons

- Short ciliary to: ciliary muscle (muscle of accommodation) and constrictor (= sphincter) pupillae

Pterygopalatine Ganglion

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Submandibular Ganglion

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Preganglionic cell bodies

- Brain (superior salivary nucleus)

Preganglionic axons

- Facial Nerve (CN VII) > chorda tympani > lingual n (V_3)

Postganglionic cell bodies

- Submandibular ganglion

Postganglionic axons

- Submandibular gland: direct branches
- Sublingual gland: Lingual n.

Otic Ganglion

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Preganglionic cell bodies

- Brain (inferior salivary nucleus)

Preganglionic axons

- Glossopharyngeal n (IX) > tympanic nerve > tympanic plexus > lesser petrosal

Postganglionic cell bodies

- Otic ganglion

Postganglionic axons

- Parotid gland: Auriculotemporal n. (V_3)

Vagus n.

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Preganglionic cell bodies

- Brain (dorsal motor vagus nucleus)

Preganglionic axons

- Vagus n.

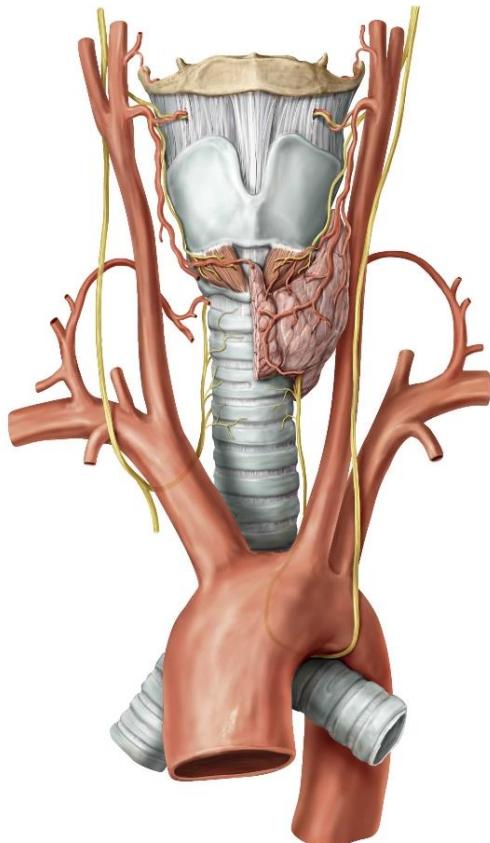
Postganglionic cell bodies

- Close to target organ

Postganglionic axons

- Glands and blood vessels in pharynx
- Mucous glands and blood vessels in larynx

Vagus n.



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Pharyngeal branches

- Pharyngeal glands

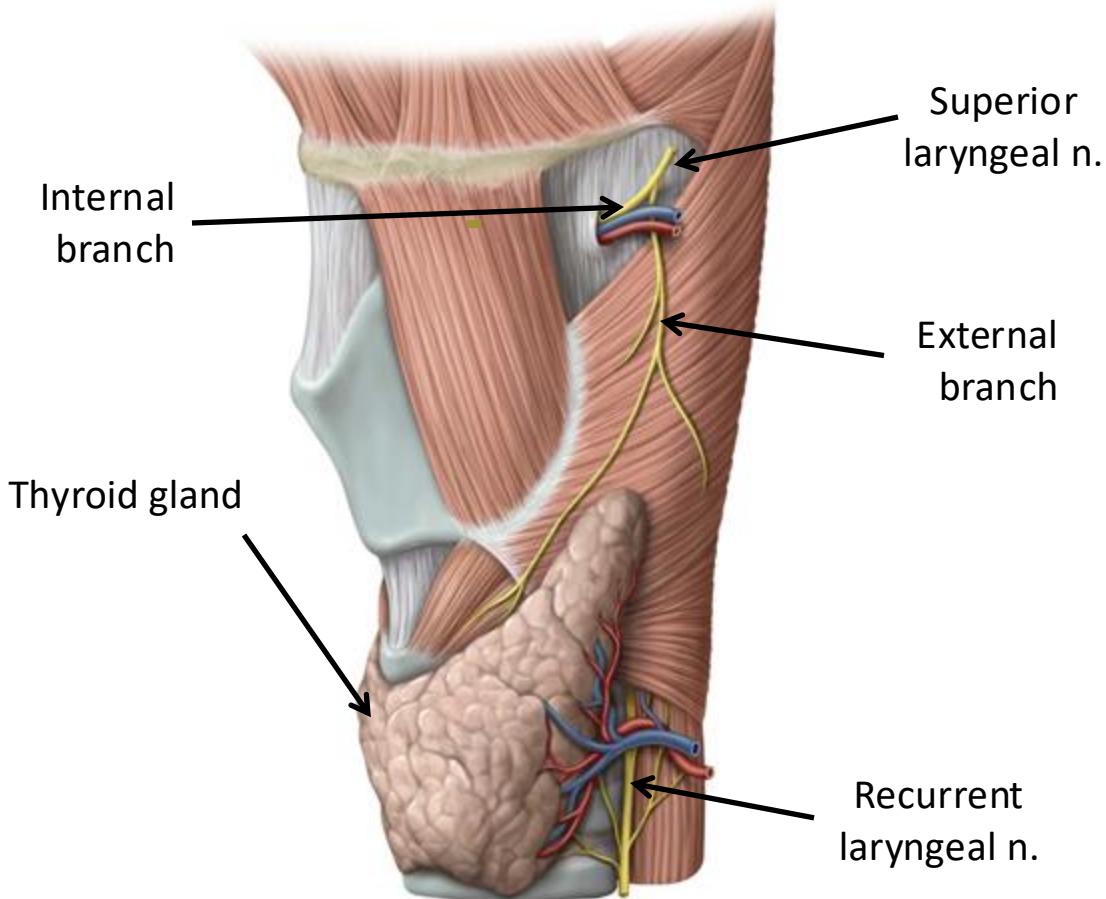
Superior laryngeal n.

- Larynx above vocal fold

Recurrent laryngeal n.

- To thyroid and parathyroid glands
- Larynx below vocal folds

Vagus n.



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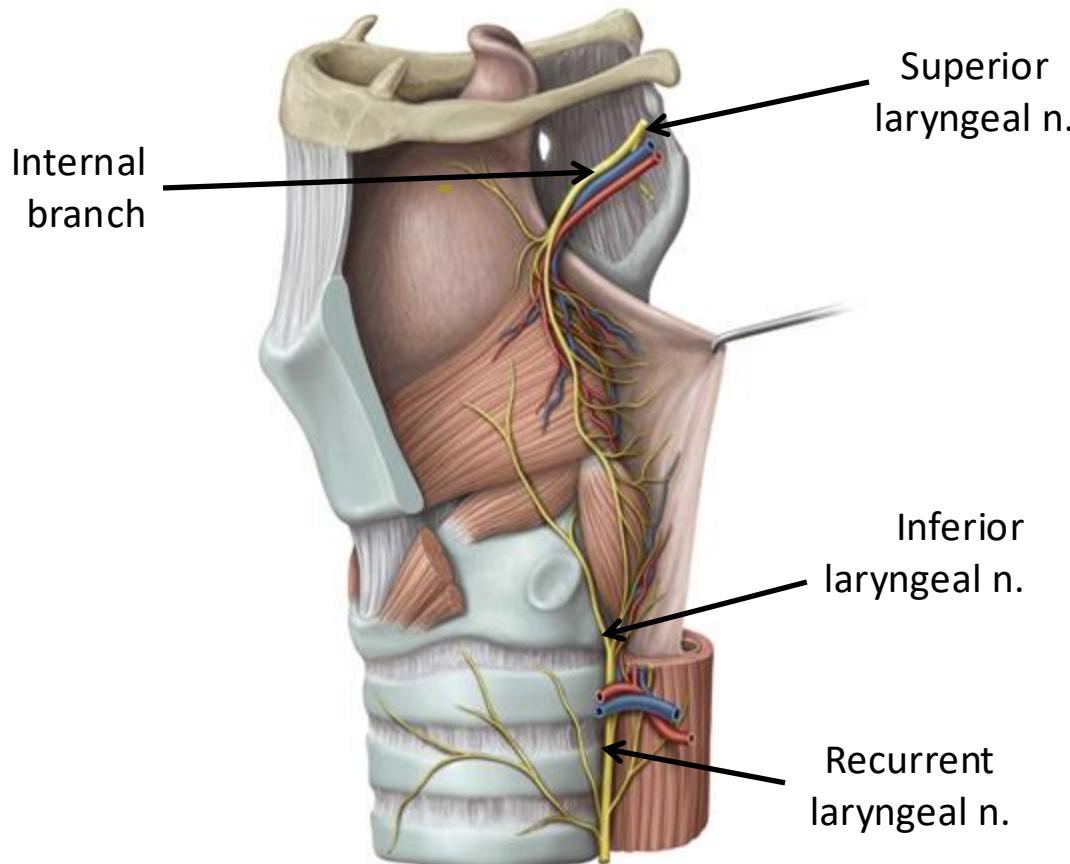
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