

Salivary glands

anatomy ,histology and physiology

Introduction

- Salivary Gland is any cell or organ discharging a secretion into the oral cavity.

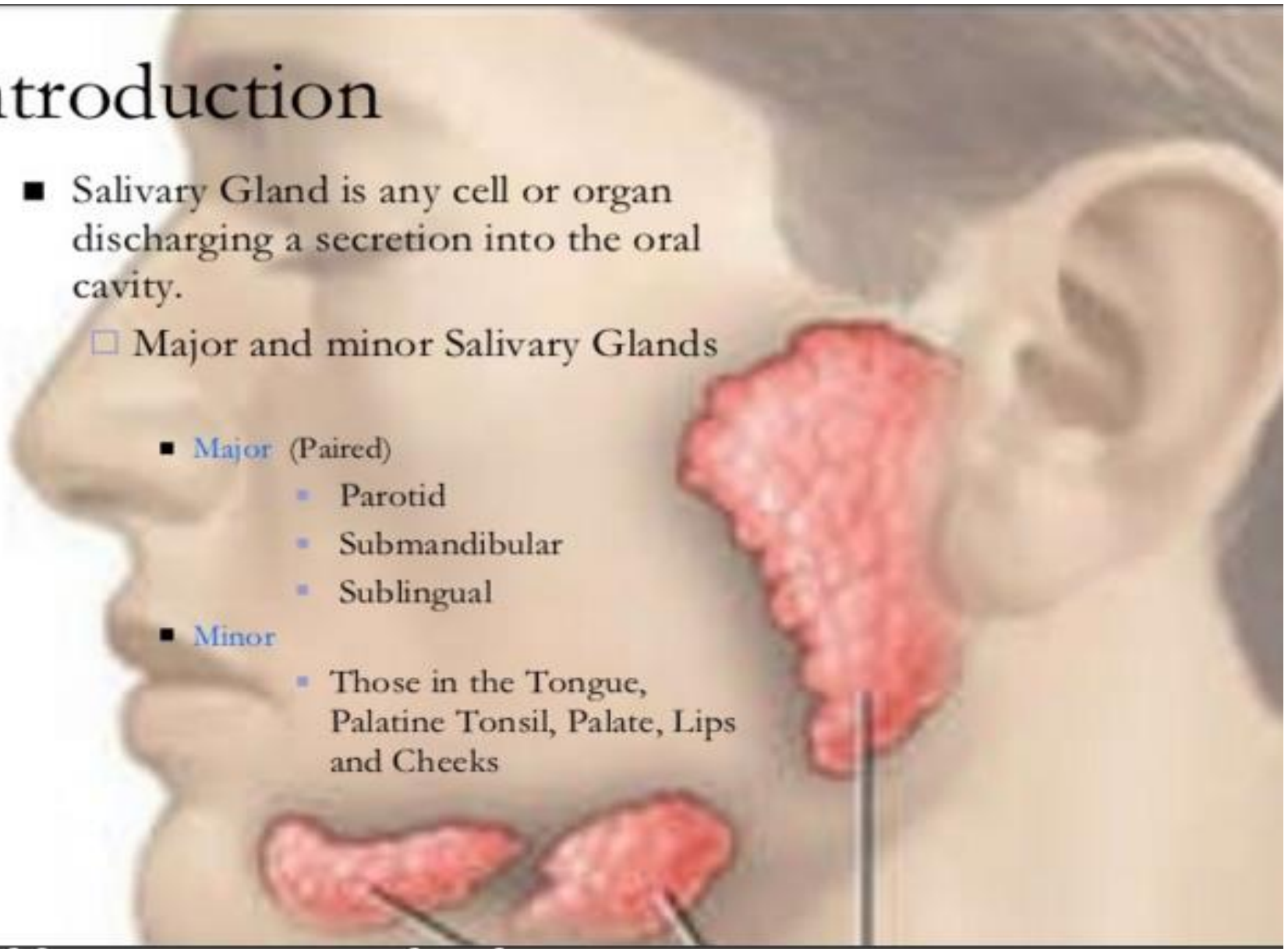
- Major and minor Salivary Glands

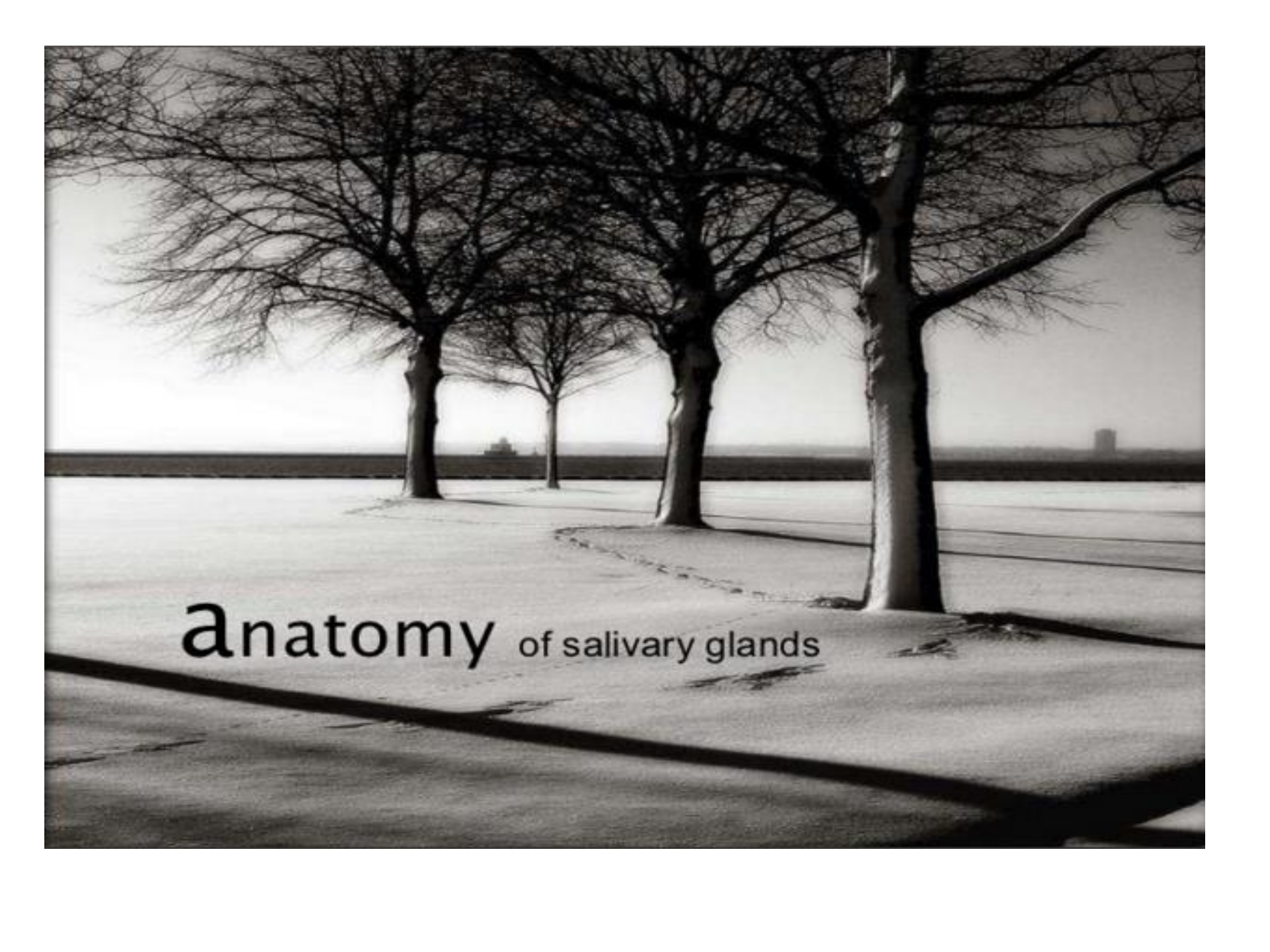
- Major (Paired)

- Parotid
- Submandibular
- Sublingual

- Minor

- Those in the Tongue, Palatine Tonsil, Palate, Lips and Cheeks

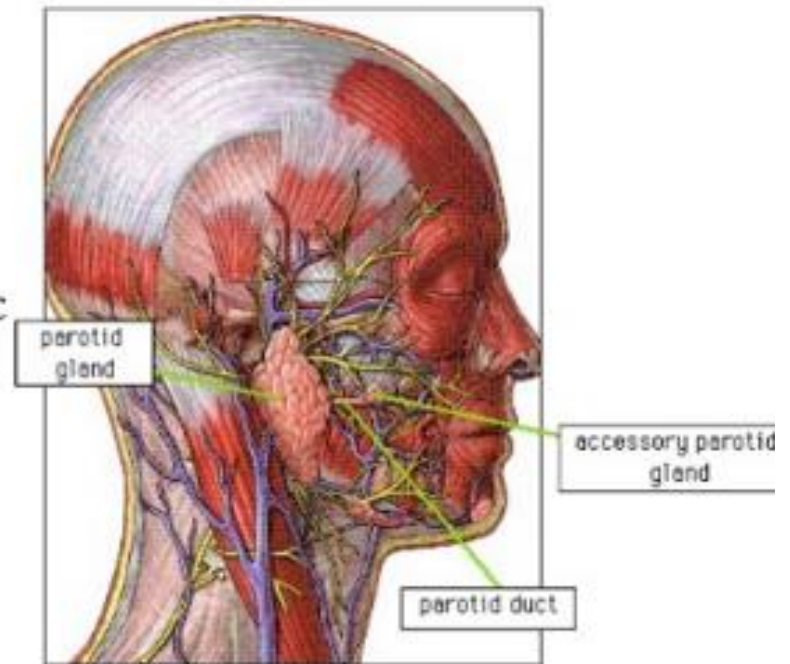




anatomy of salivary glands

Parotid Gland

- Largest
- Average Wt - *25gm*
- Irregular lobulated mass lying mainly below the external acoustic meatus between mandible and sternomastoid.
- On the surface of the masseter, small detached part lies b/w zygomatic arch and parotid duct- accessory parotid gland or '*socia parotidis*'

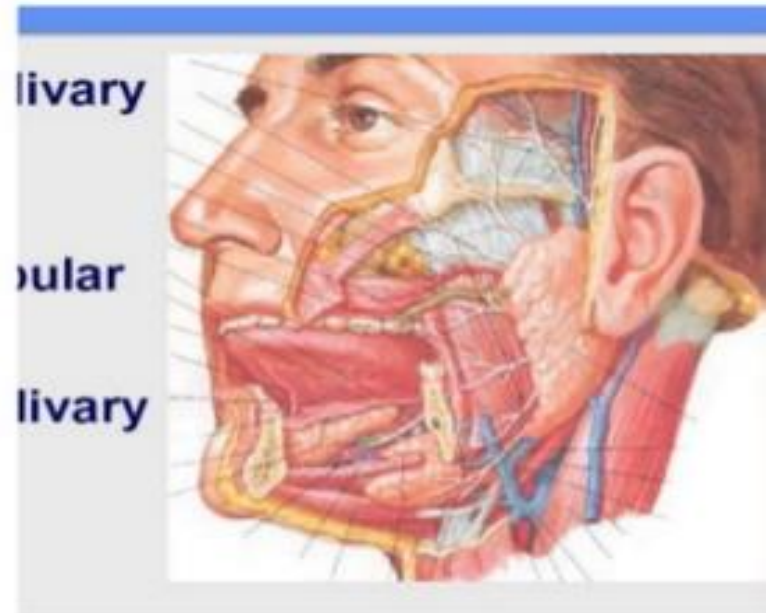


Parotid Capsule

- Derived from investing layer of deep cervical fascia.
- Superficial lamina-thick, closely adherent-sends fibrous septa into the gland.
- Deep lamina-thin- attached to styloid process,mandible and tympanic plate.
- Stylomandibular ligament.

External Features

- Resembles an inverted 3 sided pyramid
- Four surfaces
 - Superior(Base of the Pyramid)
 - Superficial
 - Anteromedial
 - Posteromedial
- Separated by three borders
 - Anterior
 - Posterior
 - Medial



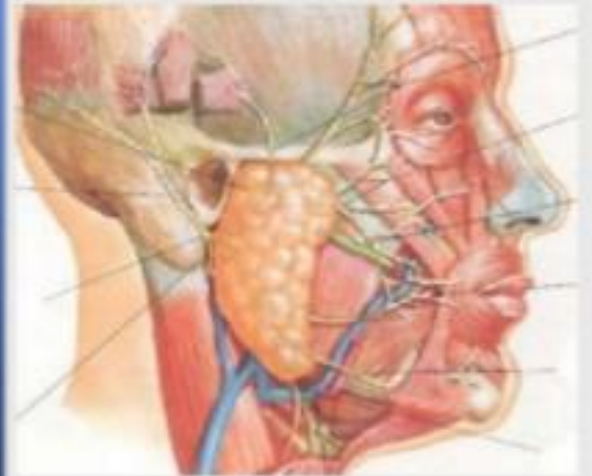
Relations

■ Superior Surface

- Concave
- Related to
 - Cartilaginous part of ext acoustic meatus
 - Post. Aspect of temporomandibular joint
 - Auriculotemporal Nerve
 - Sup. Temporal vessels

■ Apex

- Overlaps posterior belly of digastric and adjoining part of carotid triangle



■ Superficial Surface

■ Covered by

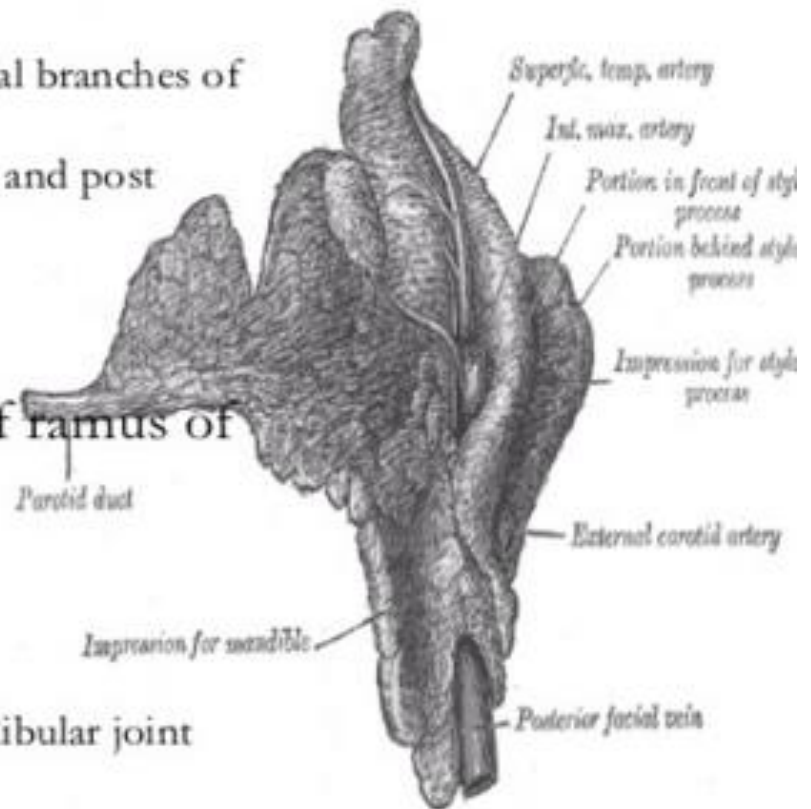
- Skin
- Superficial fascia containing facial branches of great auricular N
- Superficial parotid lymph nodes and post fibers of platysma

■ Anteromedial Surface

- Grooved by posterior border of ramus of mandible

■ Related to

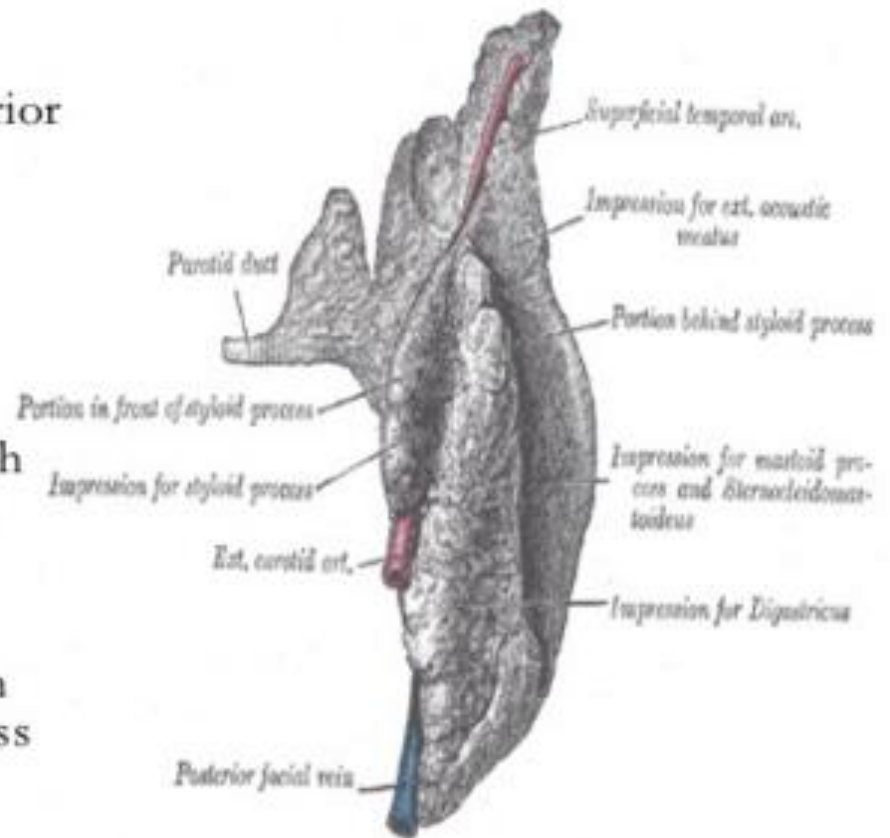
- Masseter
- Lateral Surface of temporomandibular joint
- Medial pterygoid muscles
- Emerging branches of Facial N



■ Posteromedial Surface

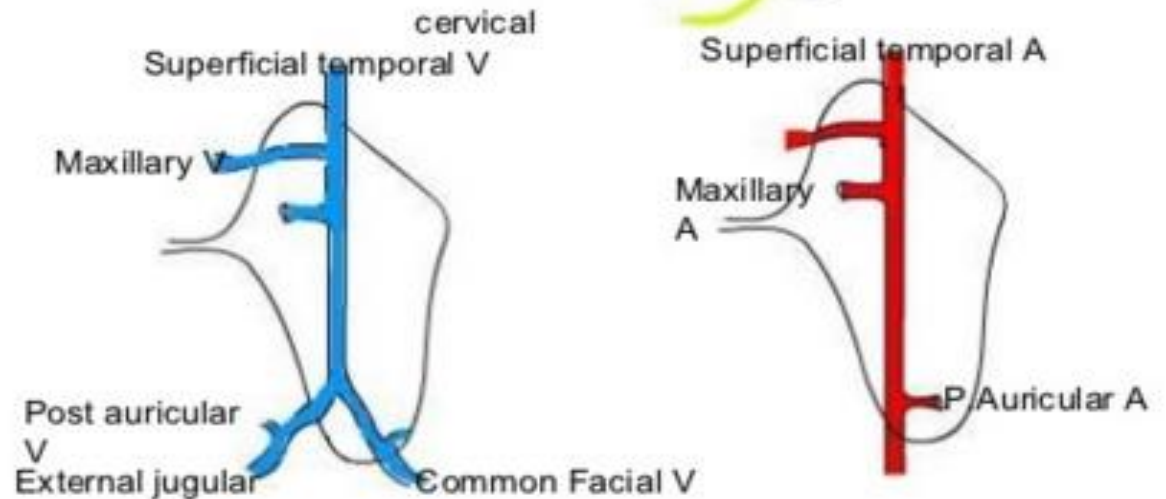
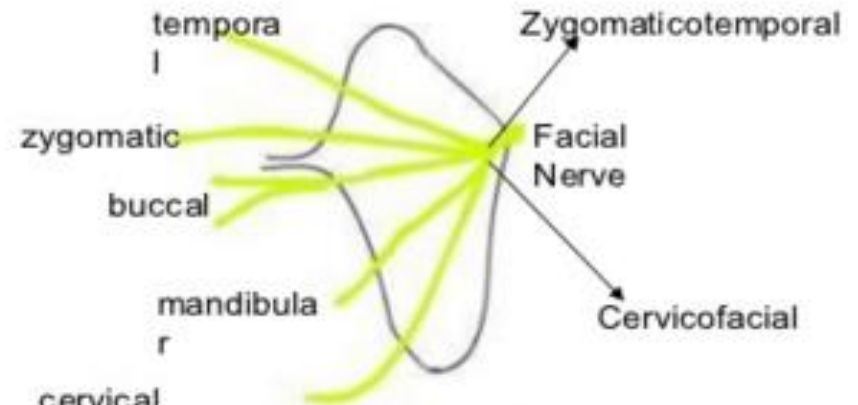
□ Related

- to mastoid process with sternomastoid and posterior belly of digastric.
- Styloid process with structures attached to it.
- External Carotid A. which enters the gland through the surface
- Internal Carotid A. which lies deep to styloid process



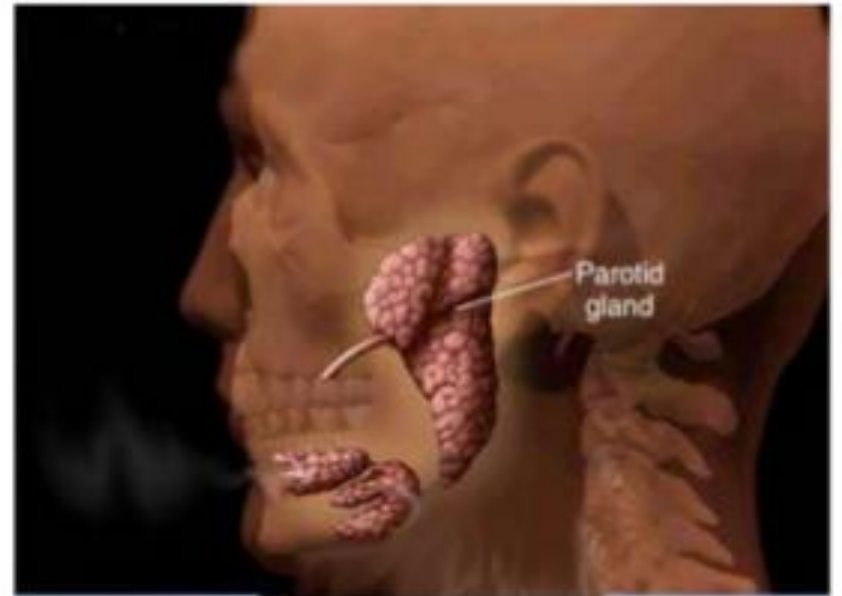
Structures within Parotid Gland

- External carotid A
- Retromandibular Vein
- Facial Nerve



Parotid Duct

- *ductus parotideus; Stensen's duct*
- 5 cm in length
- Appears in the anterior border of the gland
- Runs anteriorly and downwards on the masseter b/w the upper and lower buccal branches of facial N.



- At the anterior border of masseter it pierces
 - Buccal pad of fat
 - Buccopharyngeal fascia
 - Buccinator Muscle
- It opens into the vestibule of mouth opposite to the 2nd upper molar



Blood supply

■ Arterial

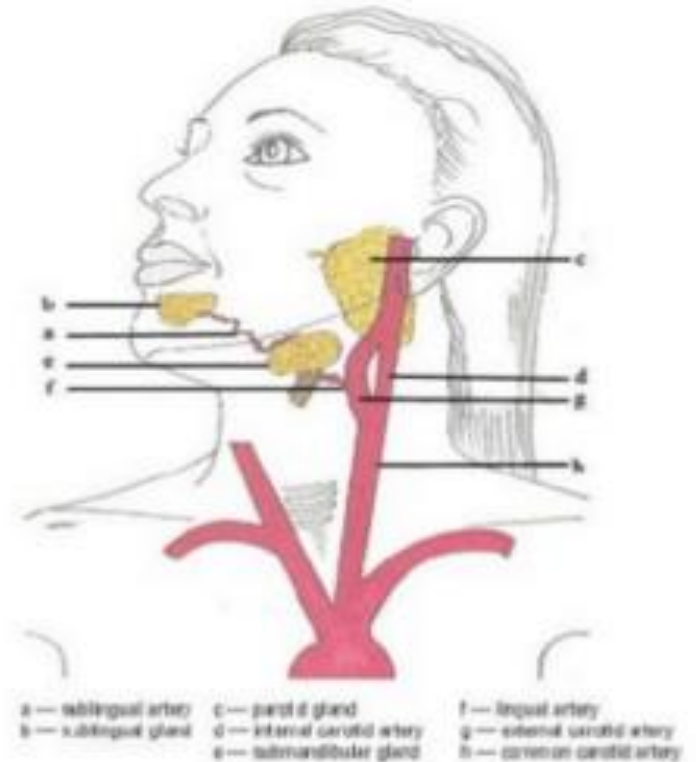
- Branches of Ext. Carotid A

■ Venous

- Into Ext. Jugular Vein

Lymphatic Drainage

- Upper Deep cervical nodes
via Parotid nodes



Nerve Supply

■ Parasympathetic N

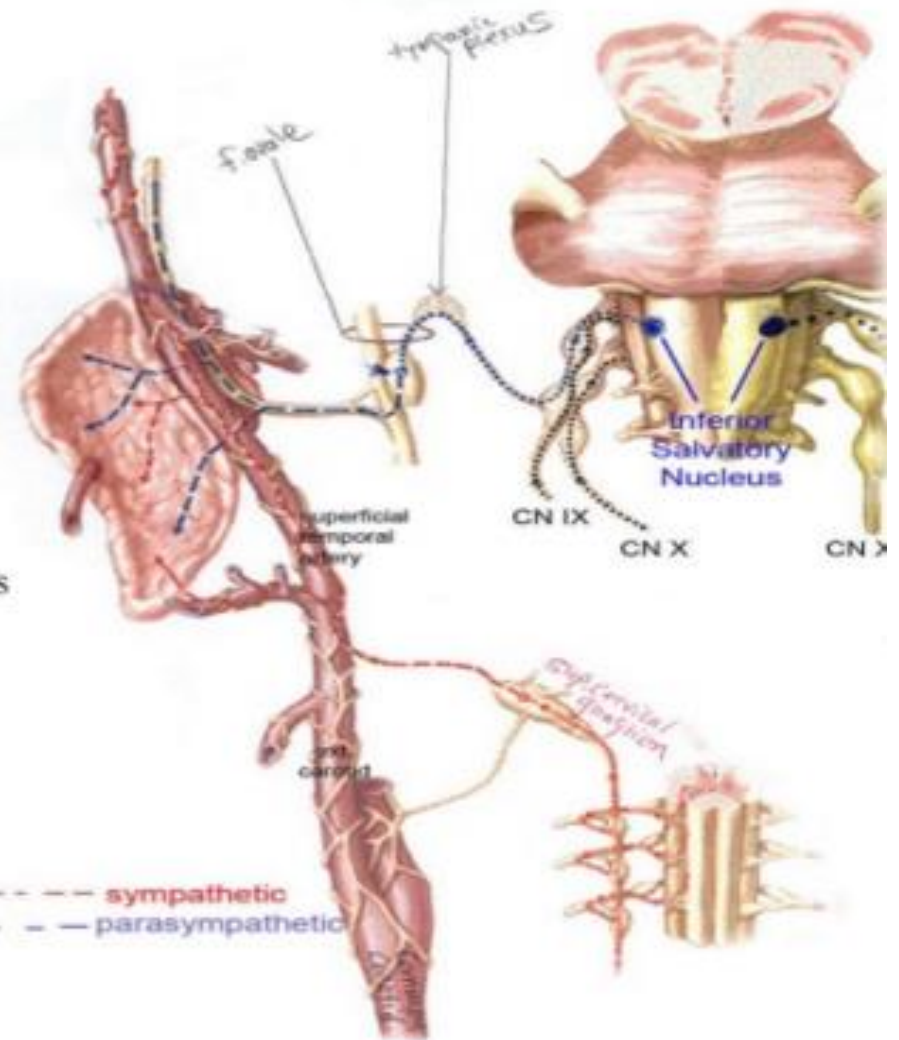
- Secretomotor via auriculotemporal N

■ Sympathetic N

- Vasomotor
- Delivered from plexus around the external carotid artery

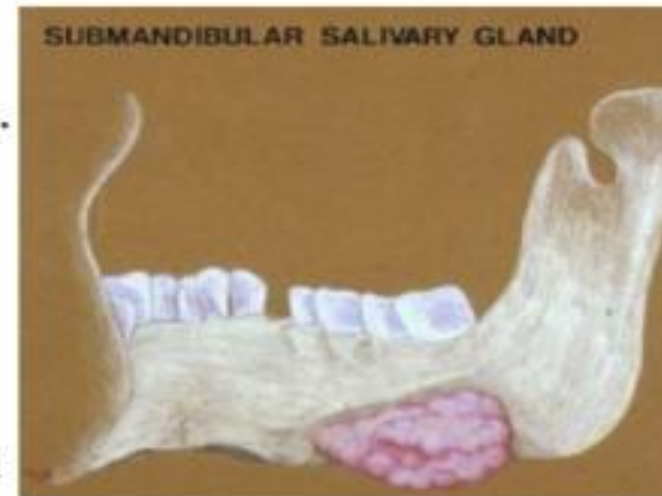
■ Sensory N

- Reach through the Great auricular and auriculotemporal N



Submandibular Salivary Glands

- Irregular in shape
- Large superficial and small deeper part continuous with each other around the post. Border of mylohyoid
- Superficial Part
 - Situated in the digastric triangle
 - Wedged b/w body of mandible and mylohyoid
 - 3 surfaces
 - Inferior, Medial, Lateral



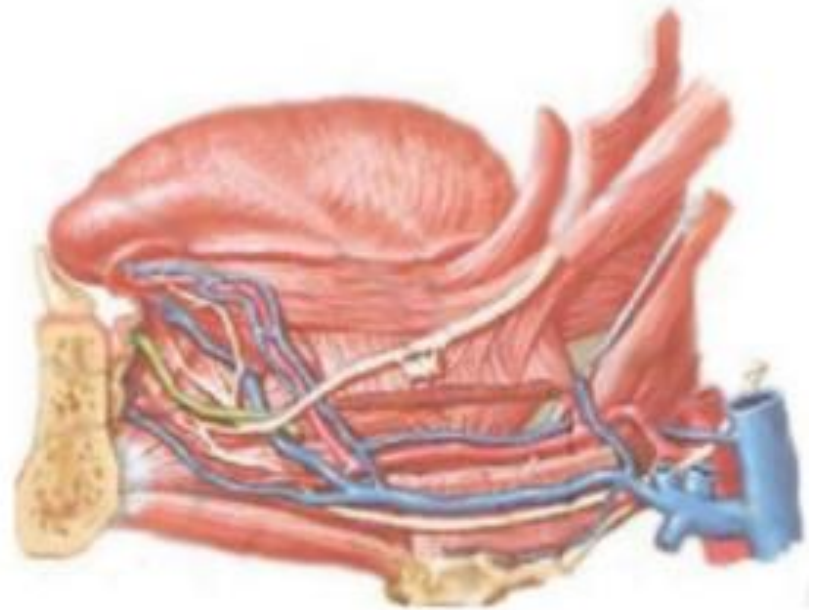
■ Relations

■ Inferior- covered by

- Skin
- Superficial fascia containing platysma and cervical branches of facial N
- Deep Fascia
- Facial Vein
- Submandibular Nodes

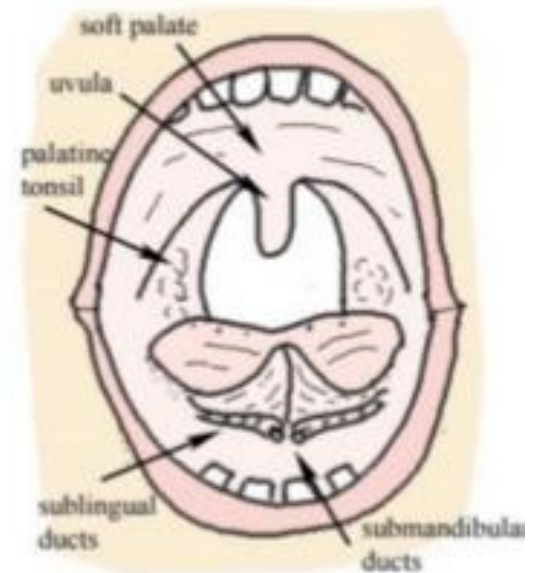
■ Lateral surface

- Related to submandibular fossa on the mandible
- Mandibular attachment of Medial pterygoid
- Facial Artery



■ Submandibular duct

- Wharton's duct
- 5 cm long
- Emerges at the anterior end of deep part of the gland
- Runs forwards on hyoglossus b/w lingual and hypoglossal N
- At the ant. border of hyoglossus it is crossed by lingual nerve
- Opens in the floor of mouth at the side of frenulum of tongue



Blood Supply

- Arteries

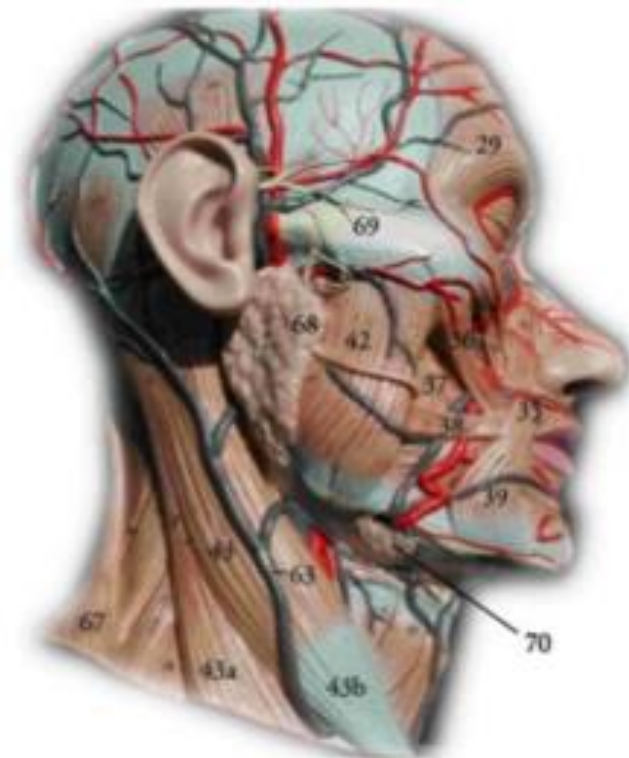
- Branches of facial and lingual arteries

- Veins

- Drains to the corresponding veins

- Lymphatics

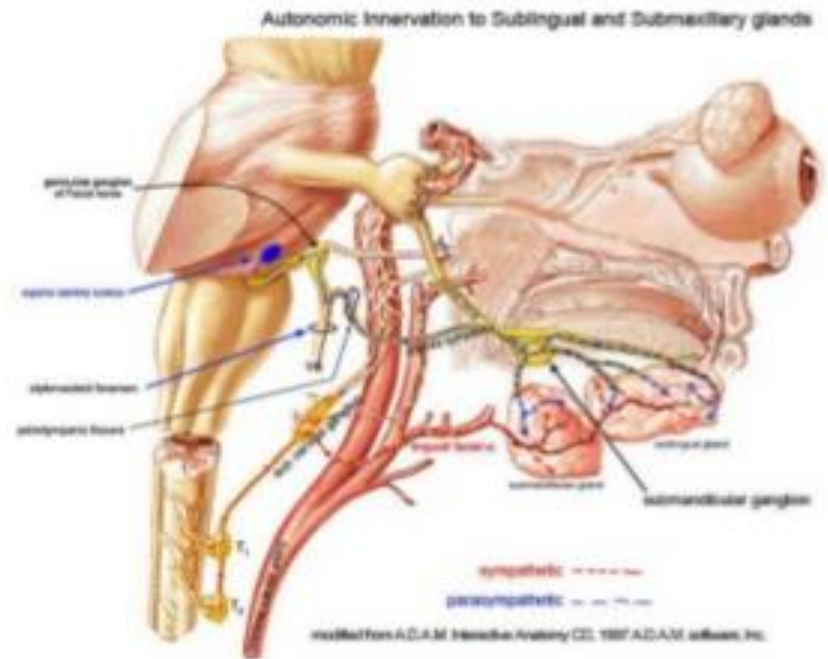
- Deep Cervical Nodes via submandibular nodes



■ Nerve Supply

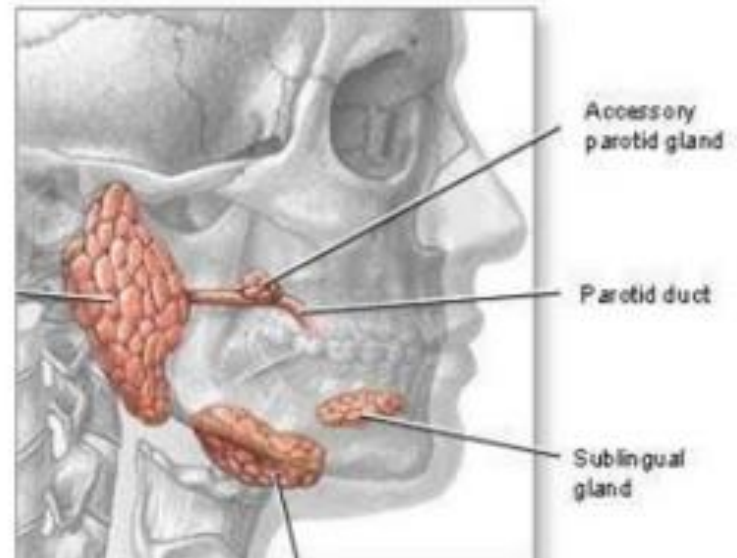
□ Branches from submandibular ganglion, through which it receives

- Parasympathetic fibers from chorda tympani
- Sensory fibers from lingual branch of mandibular nerve
- Sympathetic fibers from plexus on facial A



Sublingual Salivary Glands

- smallest of the three glands
- weighs nearly 3-4 gm
- Lies beneath the oral mucosa in contact with the sublingual fossa on lingual aspect of mandible.



■ Relations

□ Above

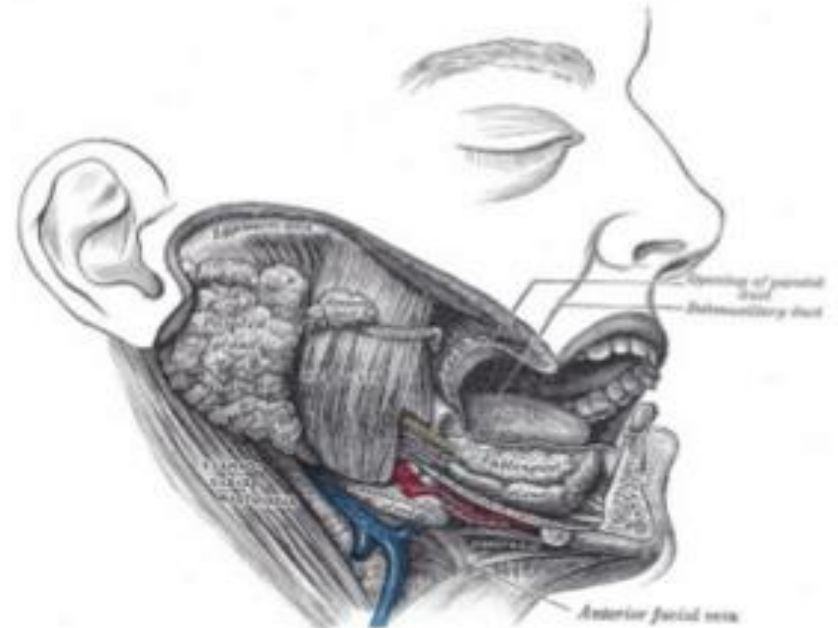
- Mucosa of oral floor, raised as sublingual fold

□ Below

- Mylohyoid Infront
- Anterior end of its fellow

□ Behind

- Deep part of Submandibular gland

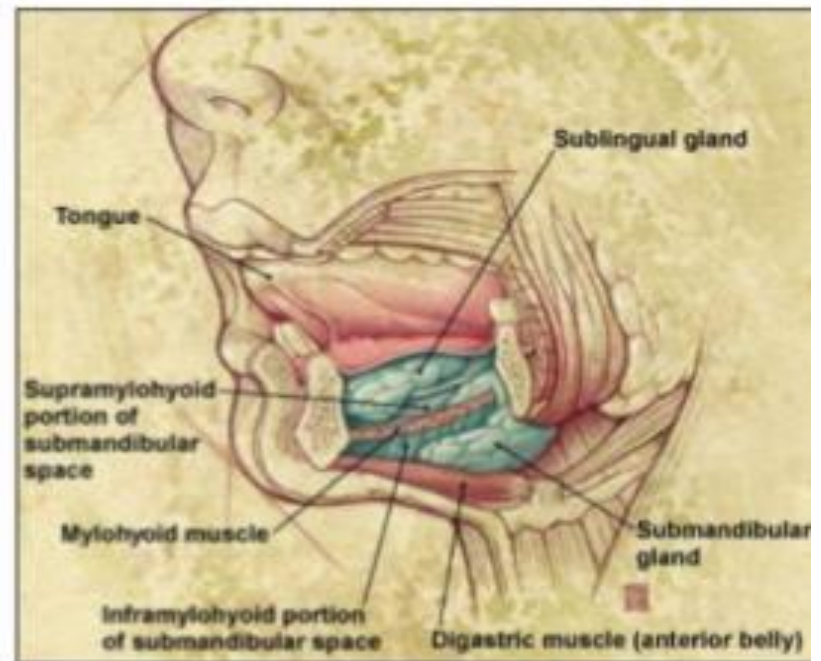


□ Lateral

- Mandible above the anterior part of mylohyoid line

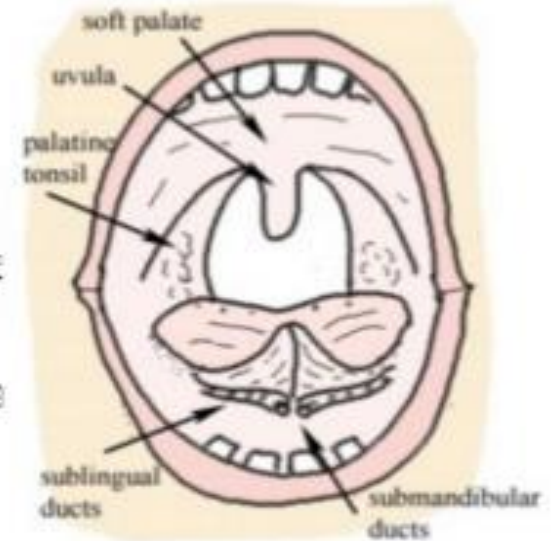
□ Medial

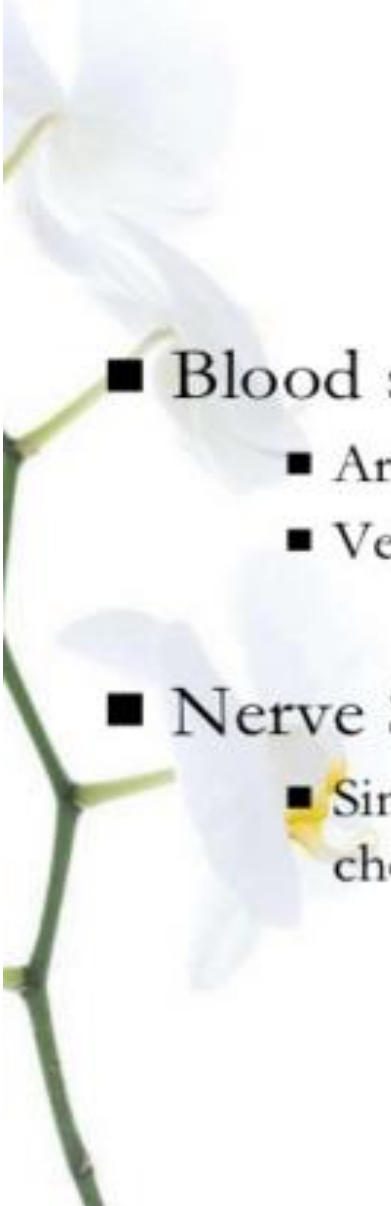
- Genioglossus and separated from it by lingual nerve and submandibular duct



■ Duct

- *Ducts of Rivinus*
- 8-20 ducts
- Most of them open directly into the floor of mouth
- Few of them join the submandibular duct





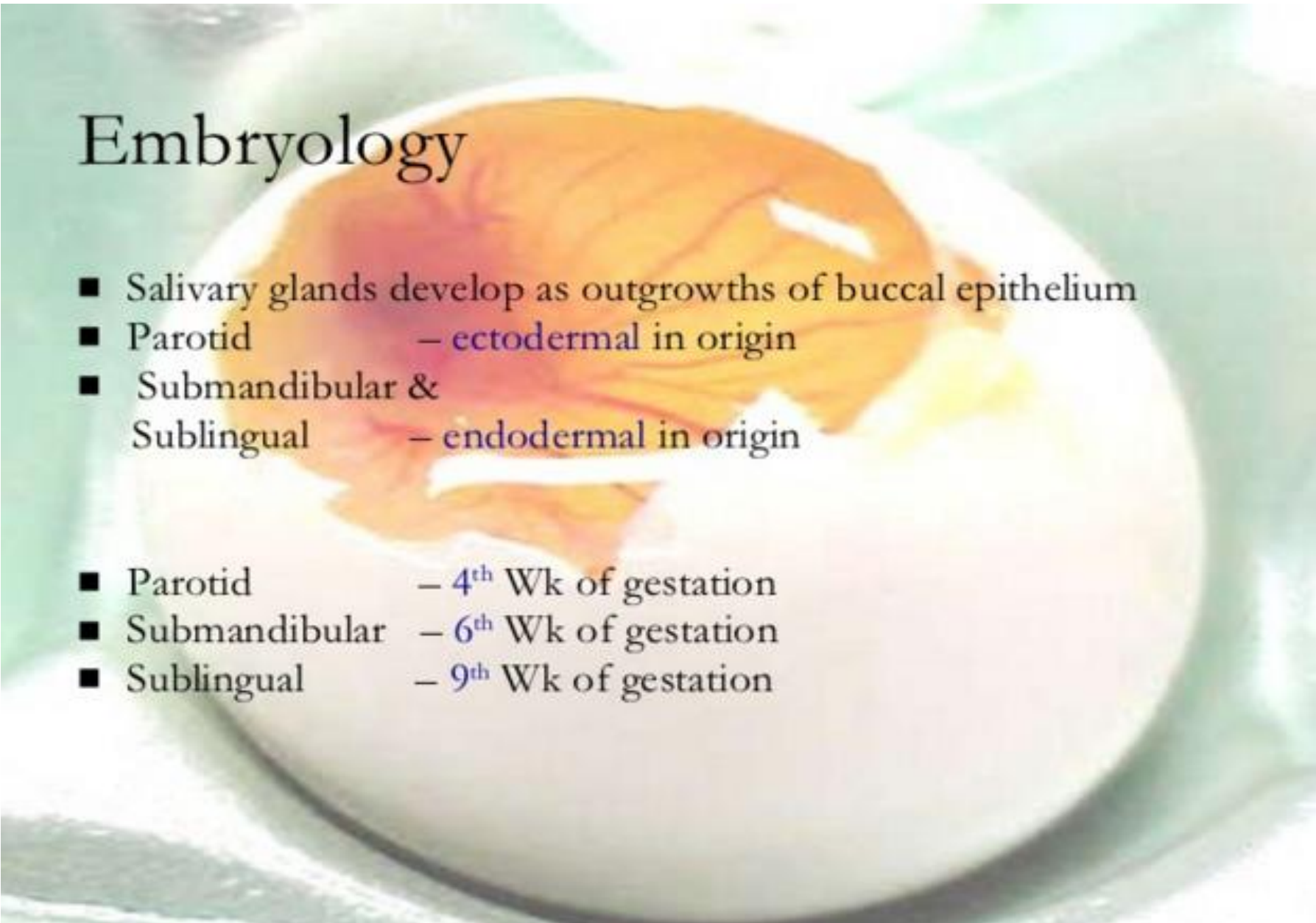
- Blood supply

- Arterial from sublingual and submental arteries
- Venous drainage corresponds to the arteries

- Nerve Supply

- Similar to that of submandibular glands(via lingual nerve , chorda tympani and sympathetic fibers)

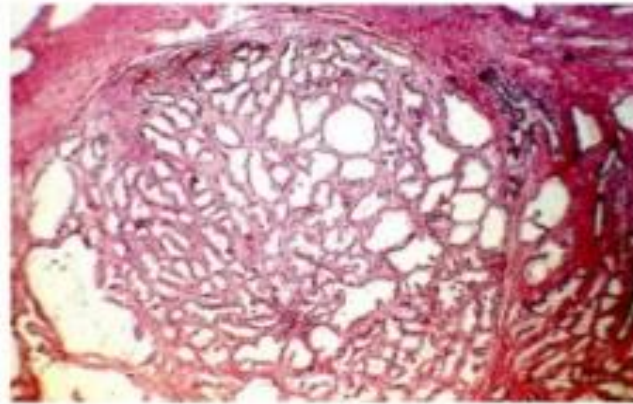
Embryology



- Salivary glands develop as outgrowths of buccal epithelium
 - Parotid – ectodermal in origin
 - Submandibular & Sublingual – endodermal in origin
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- Parotid – 4th Wk of gestation
 - Submandibular – 6th Wk of gestation
 - Sublingual – 9th Wk of gestation



histology



- Compound Tubuloalveolar glands

- Structure

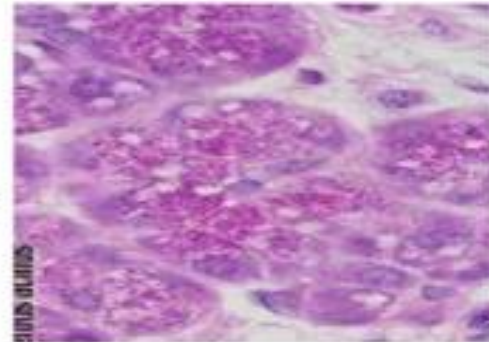
- Closely packed acini or alveoli with ducts scattered in between
- Supported by connective tissue which divides the gland into lobules

- Cells lining the alveoli

- Serous or mucous

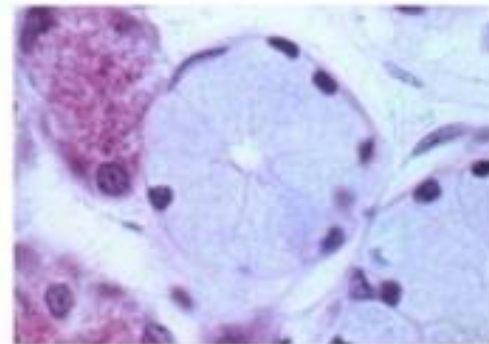
- Serous

- Stain darkly (zymogen granules)
- Wedge shaped with round nucleus, lying towards the base



- Mucous

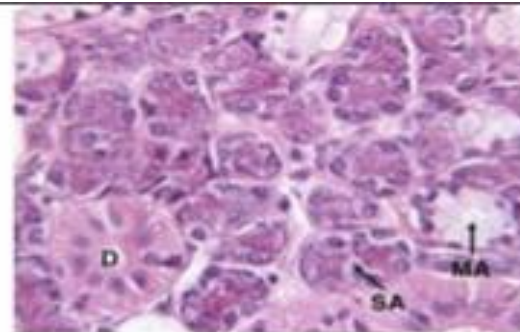
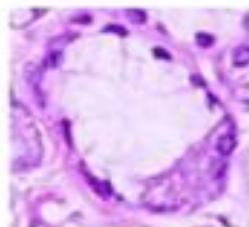
- Lightly stained
- Appears empty
- Polyhedral
- Contain mucinogen granules
- Nucleus flattened, close to the basement membrane



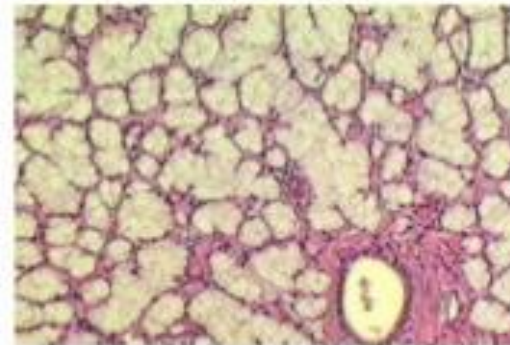
- Parotid
 - Serous type

- Sublingual
 - Mucous

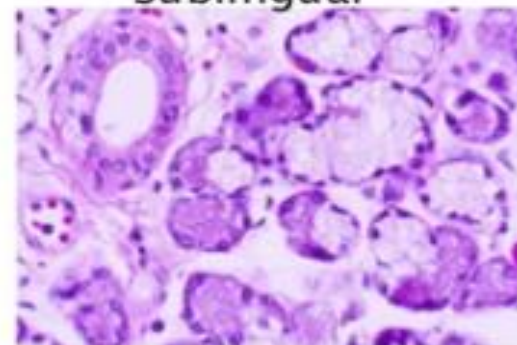
- Submandibular
 - Mixed type –some mucous alveoli capped by serous crescents –
'Demilunes'



Parotid

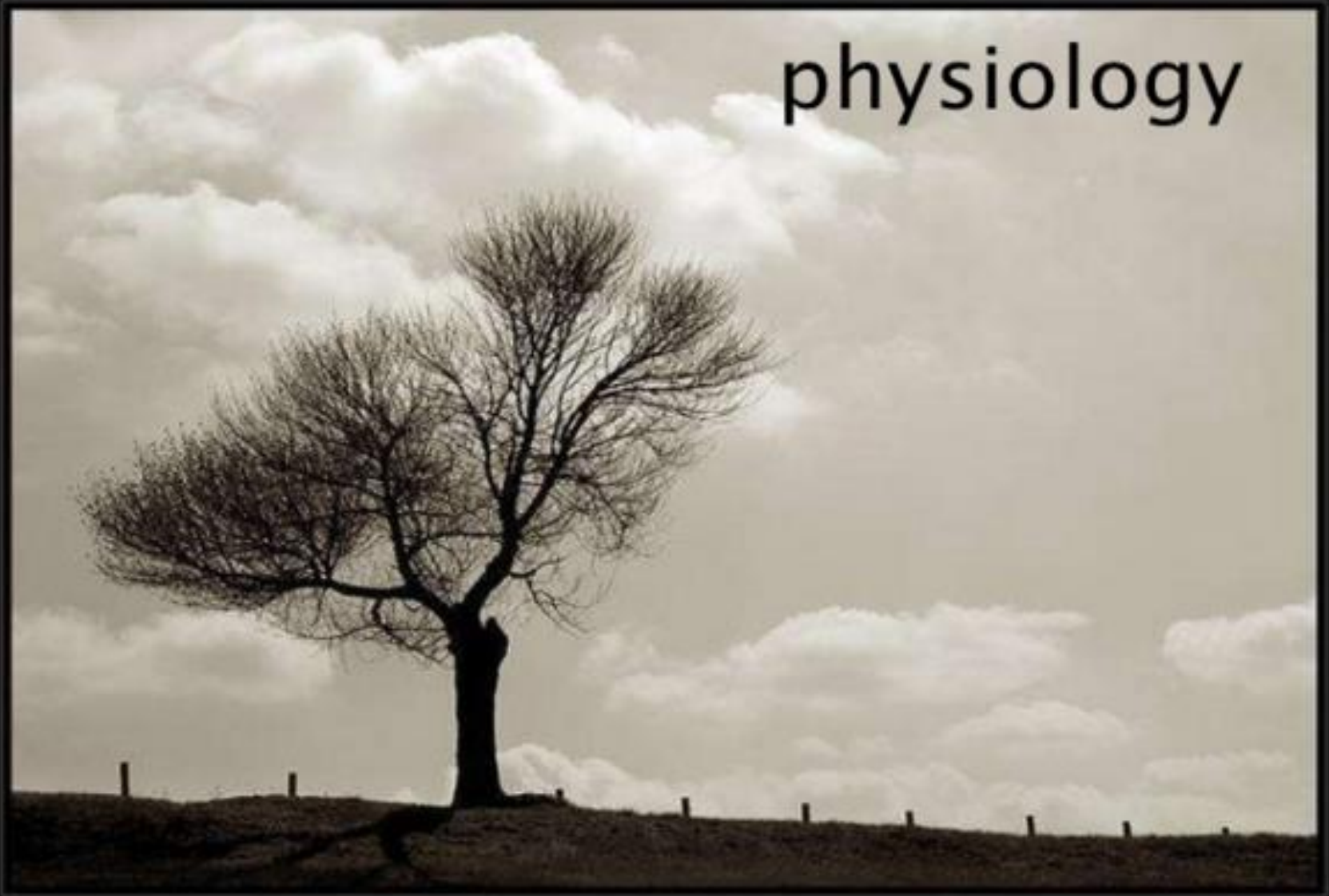


Sublingual



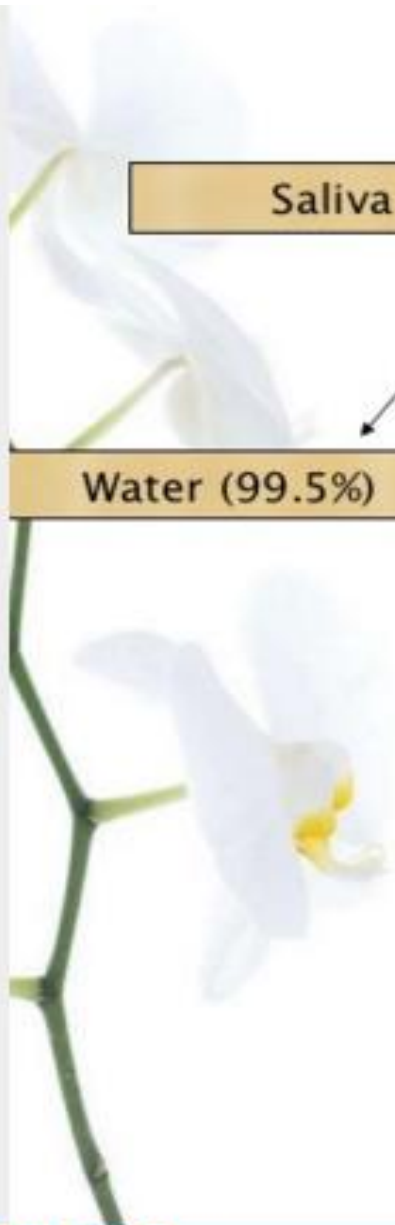
Submandibular

physiology



- Main function of Salivary Gland-secretion of saliva
- Daily secretion -800 to 1500 ml
- pH : 6-7





Saliva Compositon

Water (99.5%)

Solid (0.5%)

Organic

Inorganic

- Ptyalin
- Mucin
- Lysozyme
- IgA
- Lactoferrin

- Na+
- K+
- Ca+
- Cl-
- HCO₃
- Mg





■ Ionic Composition

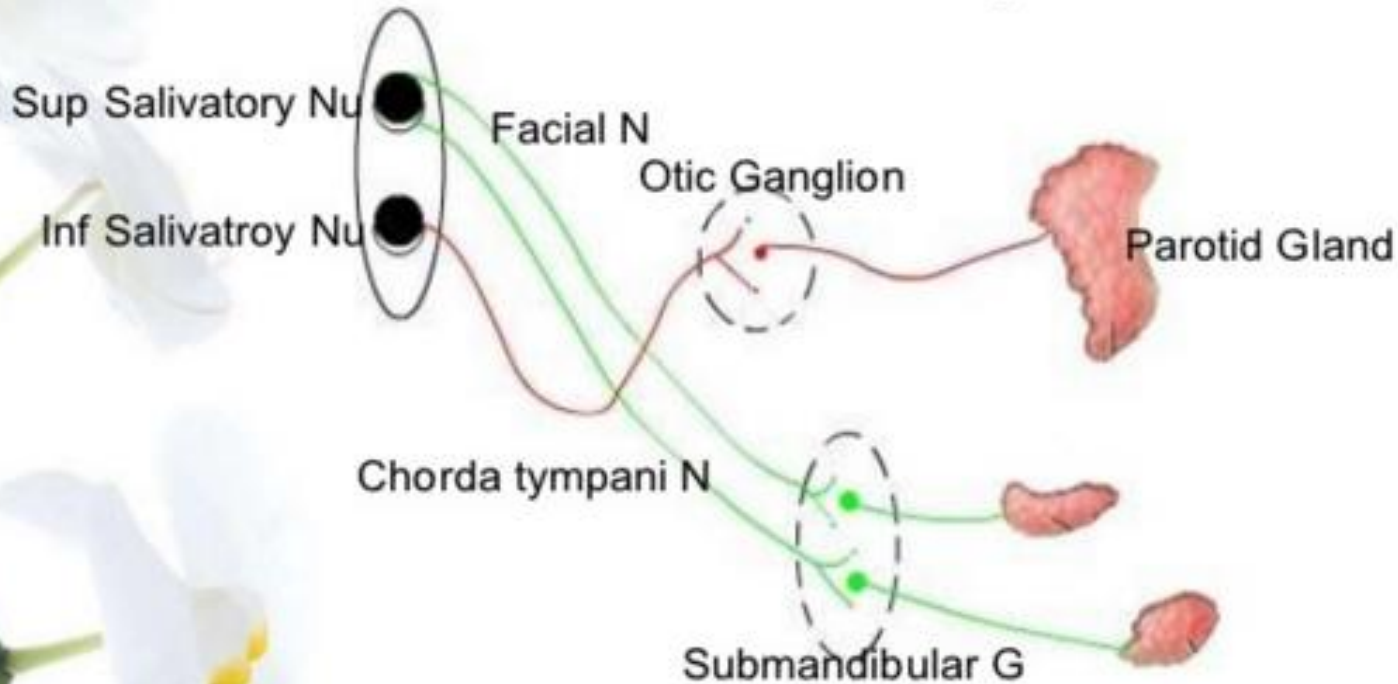
- Saliva in the acini-isotonic with plasma
- Under resting condition ionic composition of saliva reaching the mouth
 - Na^+ and Cl^- 15 mEq/l (1/7 to 1/10 conc of Plasma)
 - K^+ 30 mEq/l (7 times that of Plasma)
 - HCO_3^- 50-70 mEq/l (2-3 times that of plasma)
- During maximal salivation
 - Na^+ and Cl^- (1/2 to 2/3 conc of Plasma)
 - K^+ (4 times that of Plasma)
 - HCO_3^- 50-70 mEq/l (2-3 times that of plasma)

Functions of Saliva


- Keep the mouth moist
- Aids in swallowing
- Aids in speech
- Keeps the mouth and teeth clean
- Antimicrobial action
- Digestive function
- Bicarbonate acts as buffer



Control of Salivary Secretion



- Under neural control
- Mainly by parasympathetic signals from Sup & Inf salivatory nuclei

- 
- Parasympathetic stimulation-
profuse secretion of watery saliva

- Sympathetic stimulation-
scanty viscid secretion
 - Sympathetic supply comes from cervical sympathetic chain along the blood vessels
-

- Salivatory nuclei are excited by
 - Taste and tactile stimuli from tongue and other areas of mouth and pharynx
 - Stimuli from esophagus and stomach (due to stimulation of vagal afferent fibers)
 - (unconditioned reflex)
 - Stimuli arising from higher centers of brain due to sight, smell or thought of food
 - (conditioned reflex).





thank you