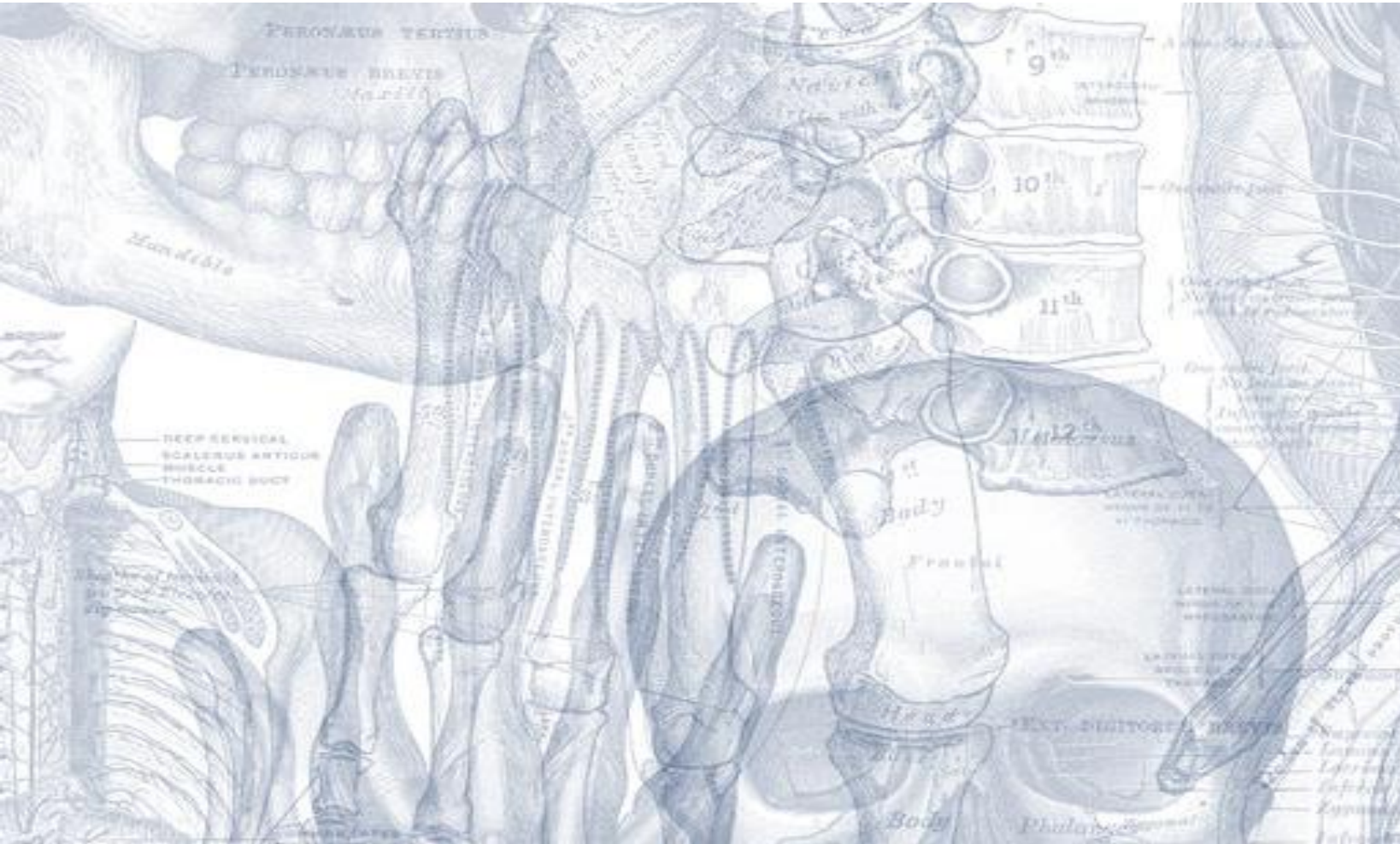


بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



Anatomy of Salivary Glands

Please view our [Editing File](#) before studying this lecture to check for any changes.

Color Code

- Important
- Doctors Notes
- Notes/Extra explanation

Objectives

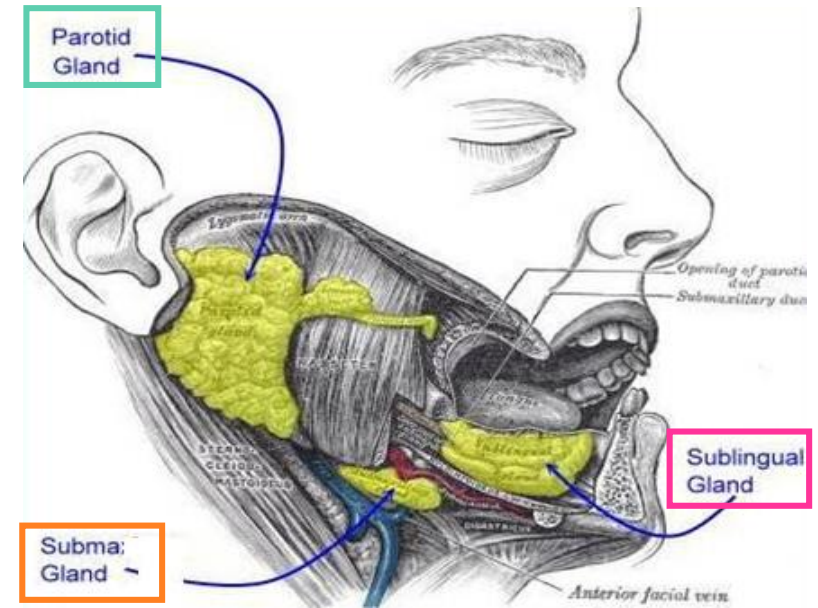
By the end of this lecture the student should be able to:

- ✓ Describe the anatomy of the parotid gland: position, shape, structures within it , innervation and parotid duct.
- ✓ Describe the anatomy of the submandibular and sublingual salivary glands: location, shape, parts, ducts and innervation of the glands.

المحاضرة فيها اختلاف كبير بين محتوى الطلاب والطالبات وبعد ما استفسرنا من د. جميلة ود. وليد قالوا لنا نعتد نسخة الطالبات والمعلومات اللي فيها. التيم شامل كل المحتوى وسوينا نسخه بس فيها محتوى الطالبات موجود [هنا](#)

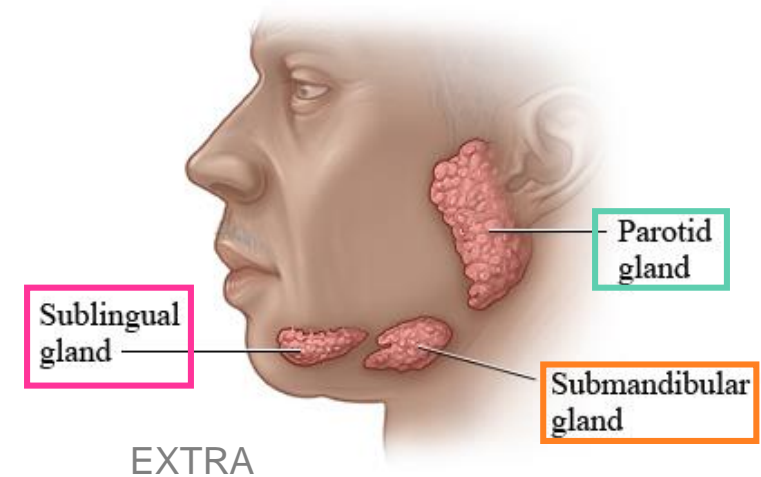
Salivary glands

- Are exocrine glands, that produce saliva.
- There are **3 large named pairs** of salivary glands and multiple minute unnamed glands in the submucosa of the oral cavity (lips, palate & under surface of the tongue).



The three NAMED PAIRS are:

Parotid:	produces a serous watery secretion.
Submandibular:	produces a mixed serous & mucous secretion.
Sublingual:	secretes saliva that is predominantly mucous in character.



Parotid gland

- It is the largest salivary gland formed entirely of **serous** acini.
- It has 2 borders: anterior convex, and straight posterior border.

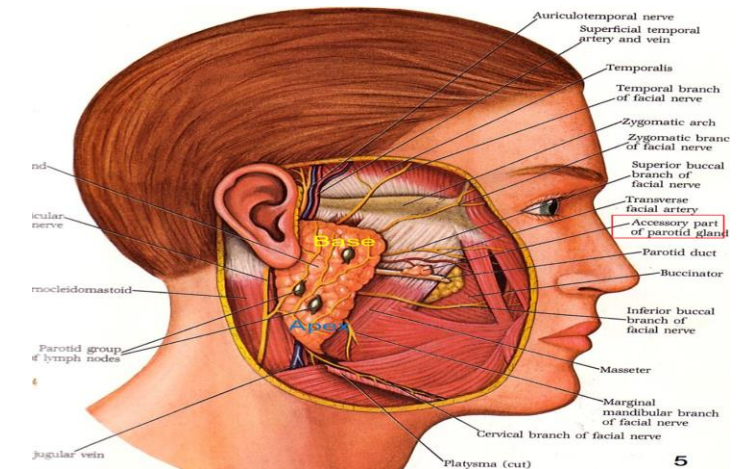
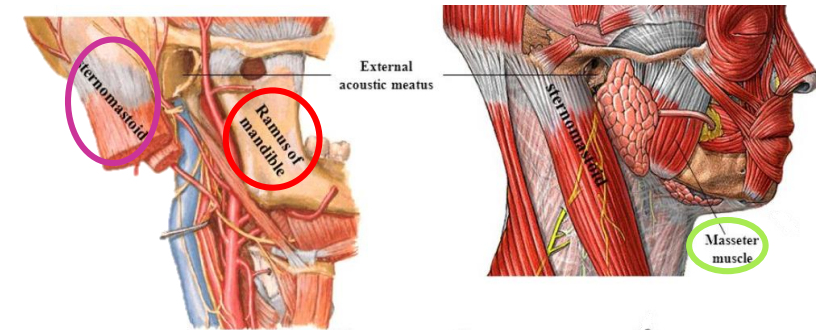
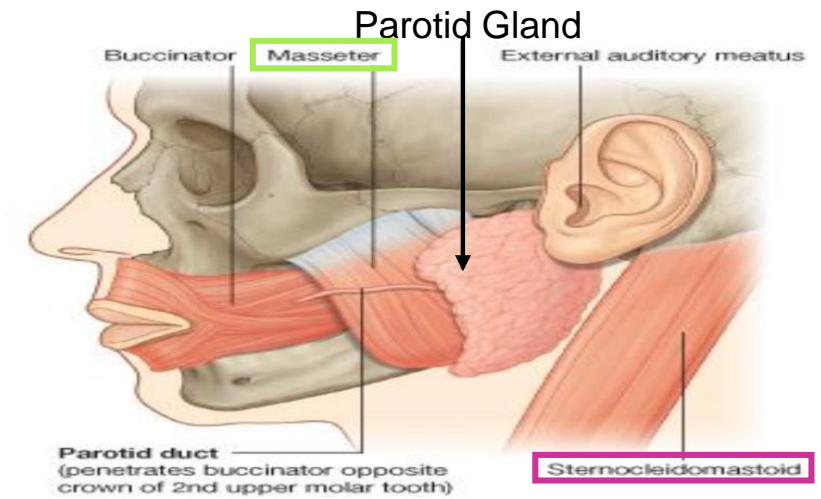
Position: located in a deep space and is wedged between

- Anteriorly: mandibular ramus & masseter
(the parotid gland is **behind** them)
- Posteriorly: Mastoid process & sternomastoid muscle
(the parotid gland is **in front of** them)

هي تكون في الوسط وفوقها شيء وتحتها شيء زي السندويتس

Shape: triangular/wedged, and has:

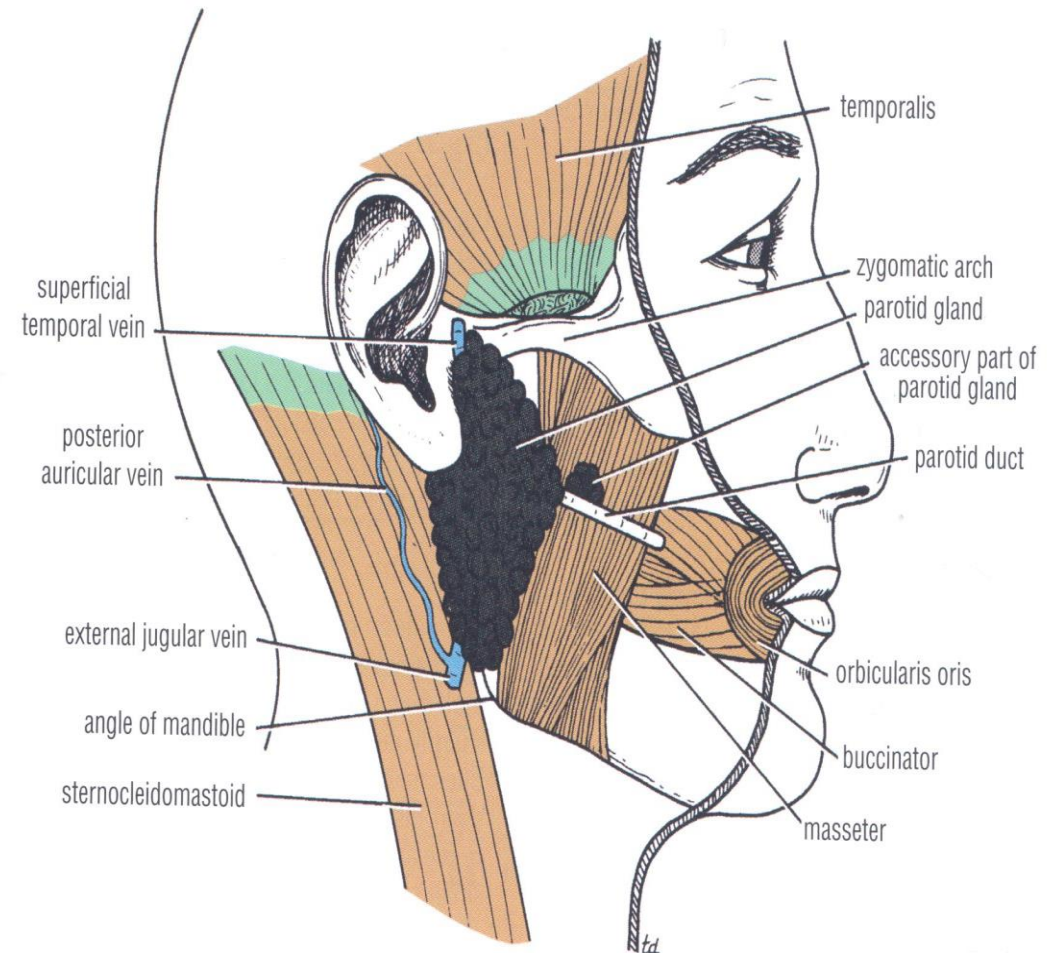
- Apex (lower end): below & behind angle of the mandible
- Base (concave upper end): lies above and related to cartilaginous part of external auditory meatus, the zygomatic arch, & TMJ (temporomandibular joint).



Parotid Gland Processes

It has 4 processes:

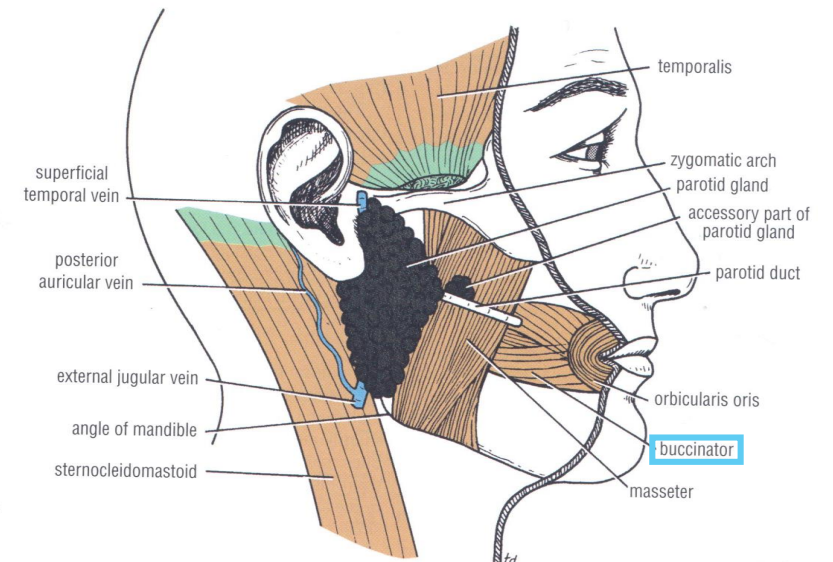
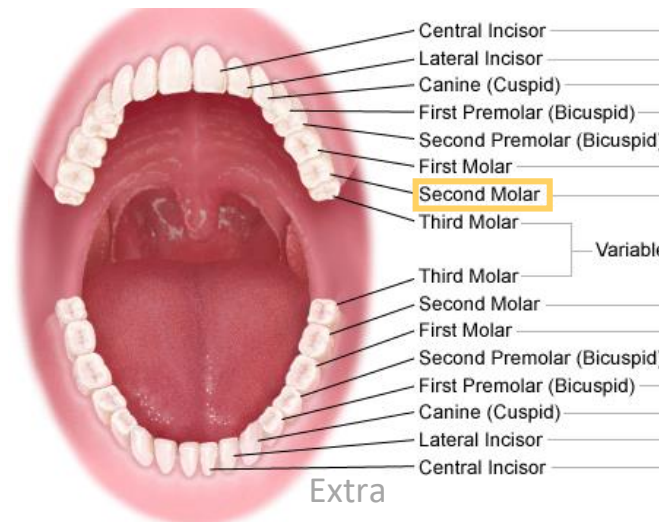
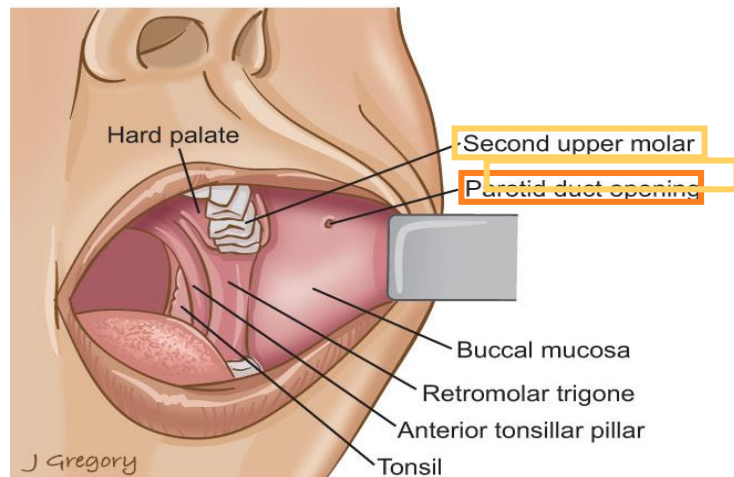
1. Superior margin of the gland extends upward behind temporo-mandibular joint into mandibular fossa of skull **Glenoid process.**
2. Anterior margin of the gland extends forward superficial to masseter ... **facial process.**
3. A small part of facial process may be separate from main gland... **accessory part of gland**, that lies superficial to masseter. (also in girls' slides)
4. Deep part of gland may extend between medial pterygoid & ramus of mandible ... **pterygoid process.**



Parotid Gland

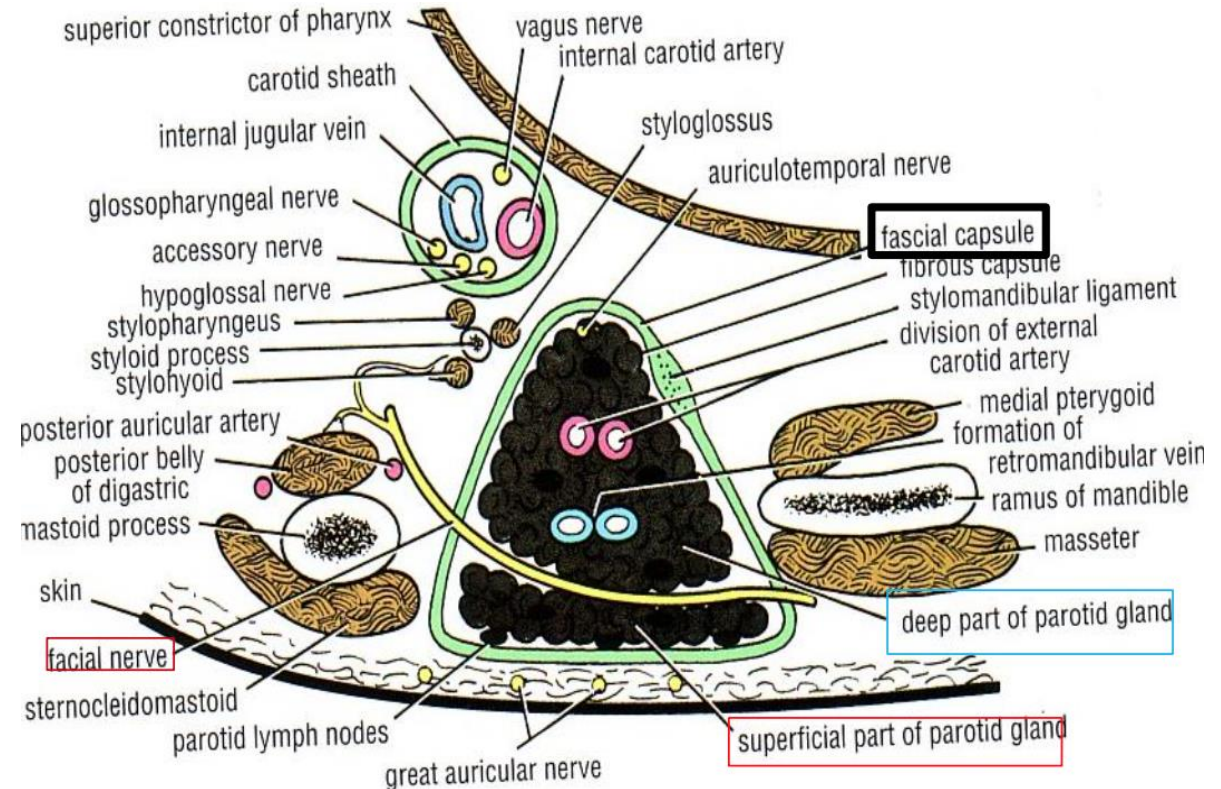
Parotid Duct

- It opens into the vestibule of the mouth on a **small papilla**, opposite the upper **second molar** (maxillary) tooth.
- Parotid duct 5 cm long, passes from anterior border of gland , superficial to masseter one fingerbreadth, below zygomatic arch, then it pierces buccal pad of fat & buccinator muscle.
- It passes obliquely between **buccinator** & m.m.of mouth (serves as valve-like mechanism to prevent inflation of duct during violent blowing) and finally opens into vestibule of mouth ,opposite upper 2nd molar tooth.



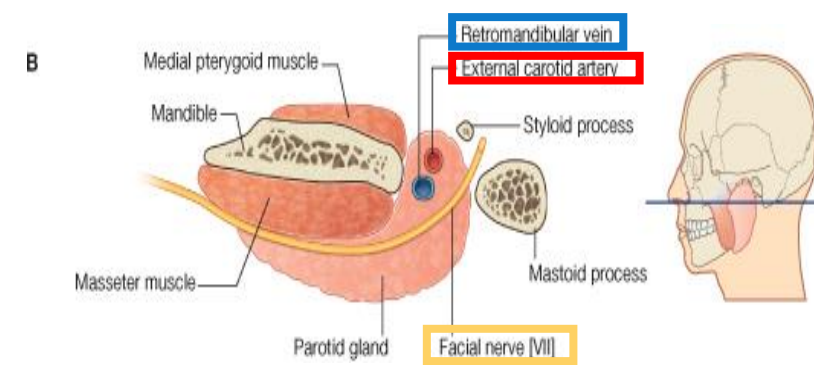
Parotid Gland Capsule

- It is surrounded by 2 tight capsules:
 1. the first is C.T. (connective tissue) capsule,
 2. the second is the dense fascial capsule of investing layer derived from deep cervical fascia of the neck, (part of it is thickened to form stylomandibular ligament).
- The gland is divided into superficial & deep parts, by the facial nerve fibers.



Structures within Parotid Gland

From superficial to deep OR lateral to medial (horizontal section)
 (you have to know **both**)



1. Facial Nerve
most superficial structure

2. Retromandibular vein
intermediate in position

3. External Carotid artery
Most deep

4. Parotid group
 of lymph nodes

- The facial nerve it divides the gland into superficial & deep parts.
- It emerges from stylomastoid foramen to enter the gland at its posteromedial surface.

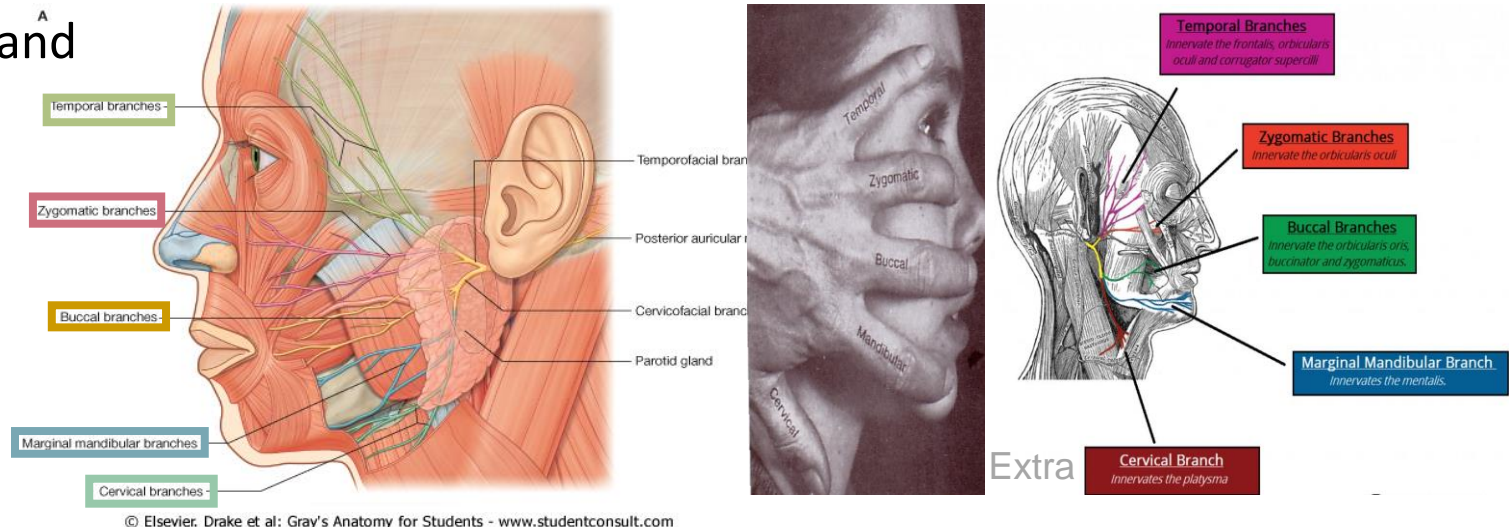
• It gives:

TWO Branches **before** it enters the gland

FIVE Branches **within** the parotid

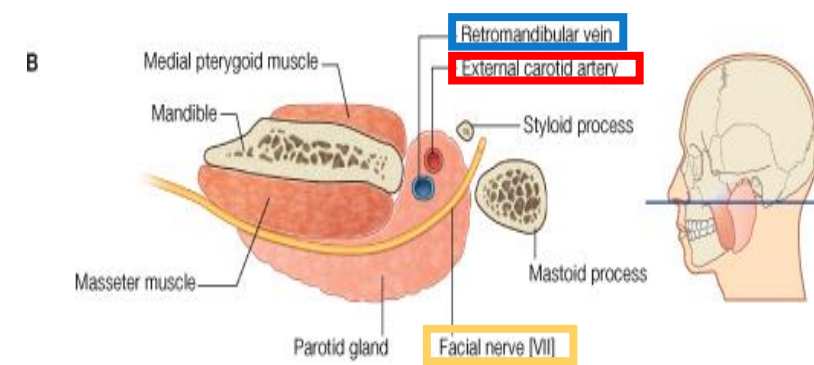
which leave anteromedial surface of the gland:

- 1- Temporal
- 2- Zygomatic
- 3- Buccal
- 4- Mandibular
- 5- Cervical.



Structures within Parotid Gland

From superficial to deep OR lateral to medial (horizontal section)
(you have to know **both**)



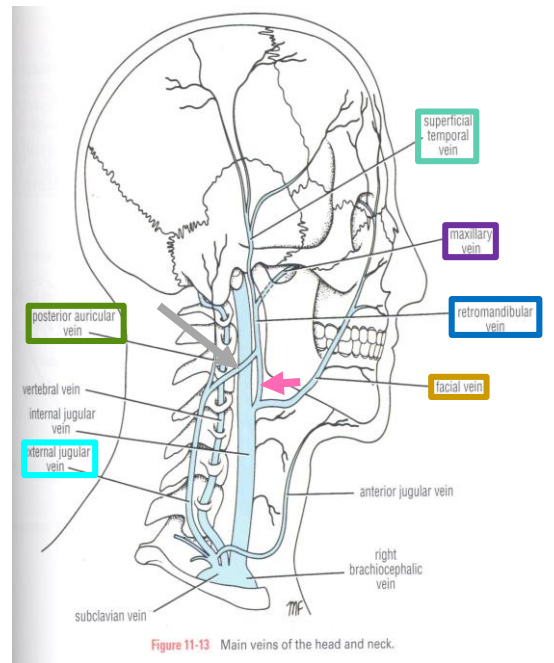
1. Facial Nerve
most superficial structure

2. Retromandibular vein
intermediate in position

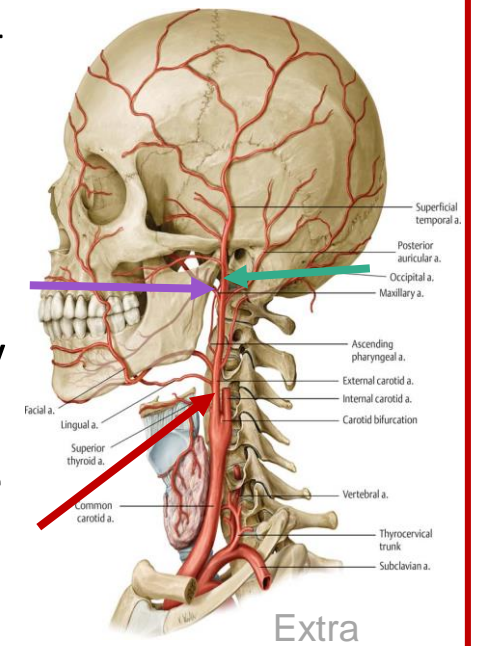
3. External Carotid artery
Most deep

4. Parotid group
of lymph nodes

- Formed within the gland by the union of **maxillary** & **superficial temporal** veins.
- It leaves lower end of the gland.
- Before it leaves the gland it is divided into 2 division/branches:
 - anterior** (joins **facial vein**) &
 - posterior** (joins **posterior auricular vein** to form **external jugular vein**).



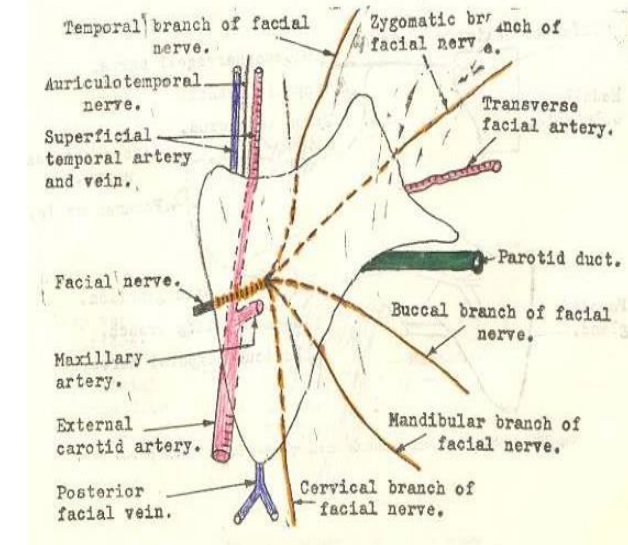
- It is divided into its 2-terminal branches **maxillary** and **superficial temporal** arteries at neck of mandible, which they leave upper end & anteriomedial surface of gland.



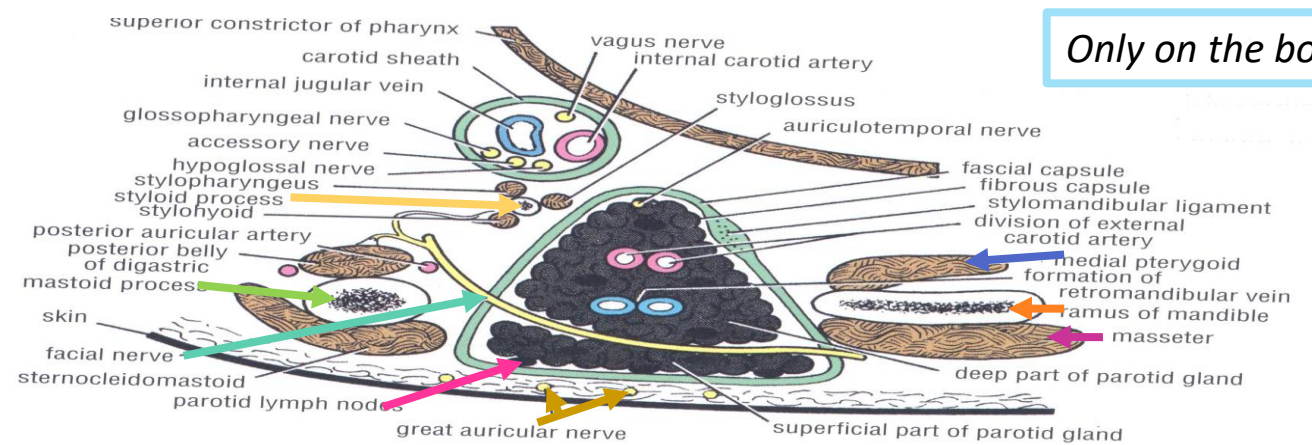
Structures which enter & leave Parotid Gland

Only on the boys' slides

	enter	Leave
Upper end	superficial temporal vein	1- superficial temporal artery. 2- auriculotemporal nerve 3- temporal branch of facial nerve
Lower end	-	1- cervical branch of facial nerve 2- retromandibular (posterior facial) vein & its 2 division.
Posteromedial surface	1-external carotid artery. 2-facial nerve	-
Anteromedial surface	maxillary vein	maxillary artery
Anterior border	-	1- zygomatic branch of facial nerve 2- buccal branch of facial nerve 3- mandibular branch of facial nerve 4- parotid duct. 5- transverse facial artery (branch of external carotid artery)



Parotid Gland Relations

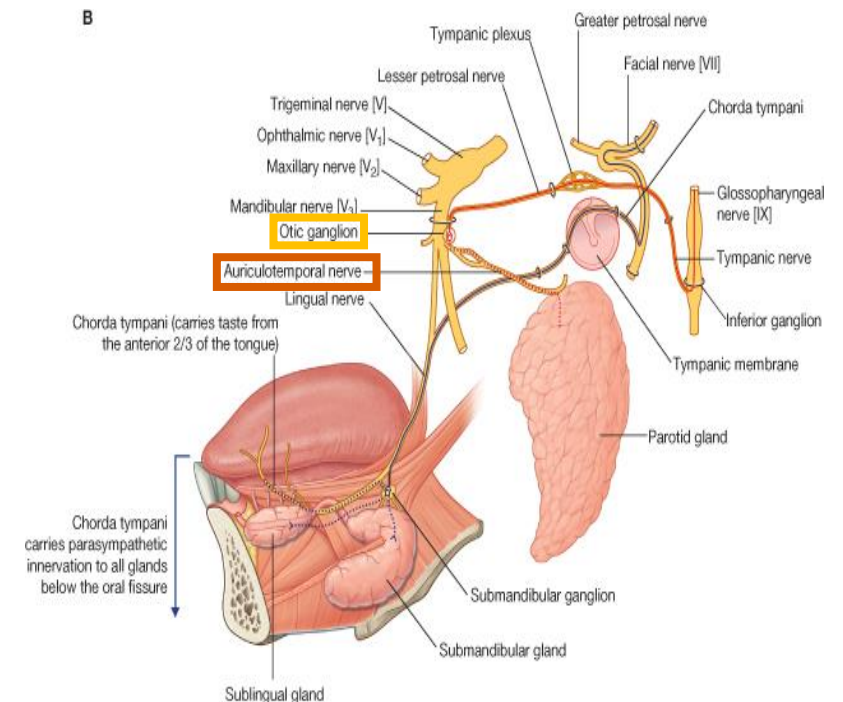
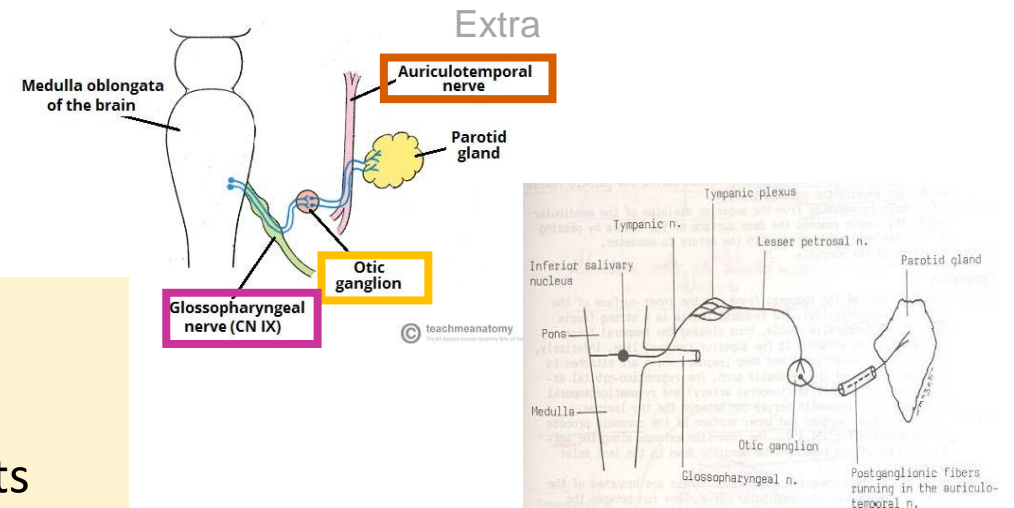


<i>Antero-medial relations</i>	<i>Postero-medial relations</i>	<i>Superficial (lateral) relations</i>	<i>Superior relations</i>
<ol style="list-style-type: none"> 1. <u>Ramus of mandible</u> 2. Temporomandibular joint 3. <u>Medial pterygoid</u> 4. <u>Masseter.</u> 	<ol style="list-style-type: none"> 1. <u>mastoid process</u> & attached muscles 2. <u>styloid process</u> & its attached muscles 3. carotid sheath & its contents 4. <u>Facial nerve</u> enters gland from its postero-medial surface 5. External carotid artery grooves gland at its posteromedial surface, then passes inside it. 	<ol style="list-style-type: none"> 1. Skin, 2. Superficial fascia containing platysma & <u>great auricular nerve</u> 3. Deep fascia (parotid fascial capsule) 4. <u>Parotid lymph nodes</u> 	<ol style="list-style-type: none"> 1. External auditory meatus & 2. posterior surface of temporo-mandibular joint.

Parotid Gland Nerve supply

○ Parasympathetic (secretomotor):

- from **inferior salivary nucleus** (of 9th cranial nerve "glossopharyngeal nerve" in medulla oblongata) → via its branch: **tympanic nerve** → forms **tympanic plexus** in middle ear → then via **lesser petrosal nerve** (preganglionic fibers) to **otic ganglion**
- The postganglionic fibers running in **auriculotemporal nerve** supply the parotid gland.
- Otic ganglion: is a small parasympathetic ganglion that is functionally associated with glossopharyngeal nerve it is located in the infratemporal fossa, just below foramen ovale, medial to mandibular nerve.



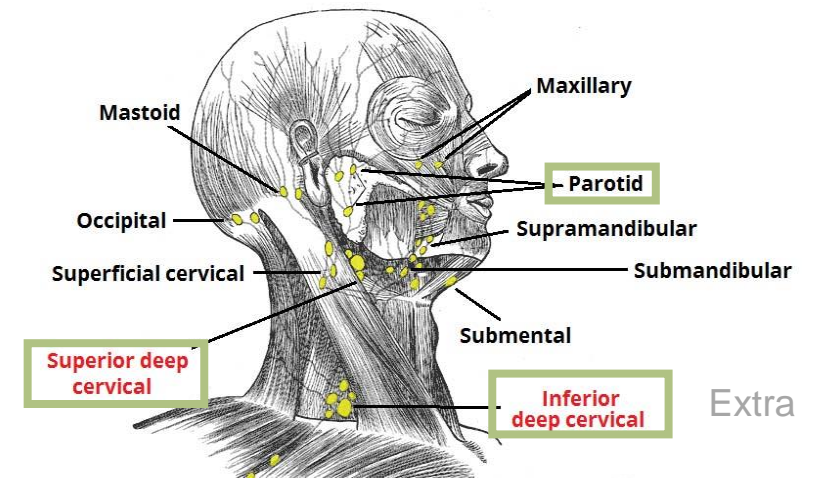
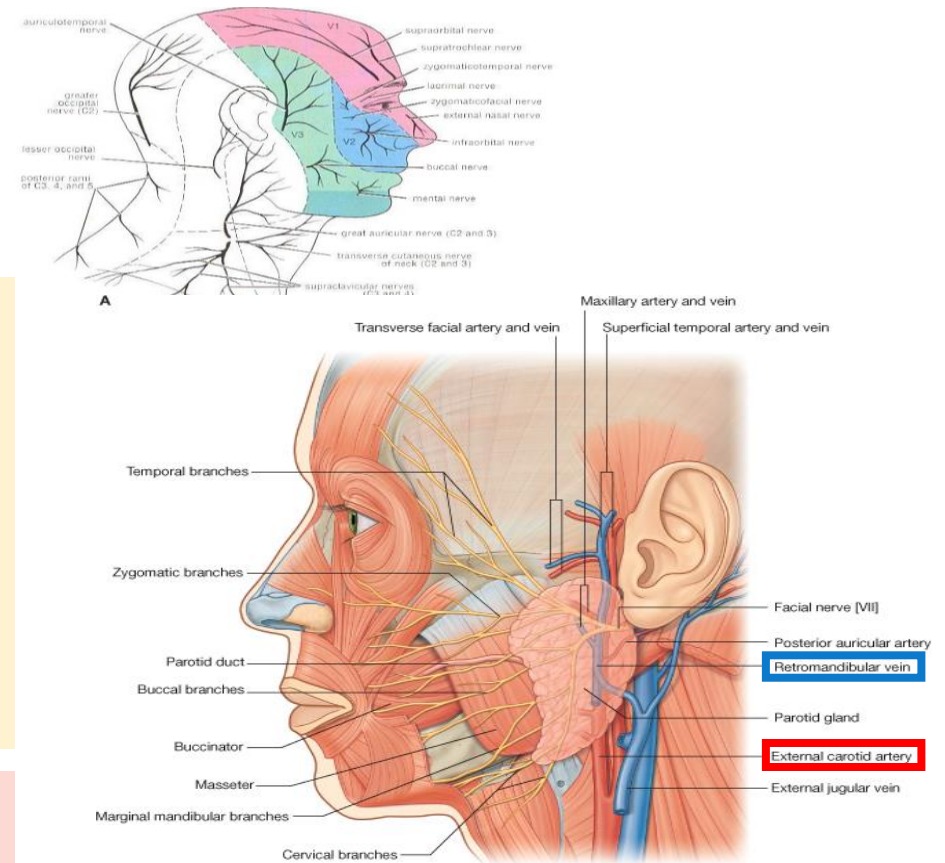
Parotid Gland Nerve + Blood supply

- *Sympathetic:*
 - from plexus around **external carotid artery**.
- *Sensory supply:*
 - **Auriculo-temporal** nerve (a branch of posterior division of **mandibular** nerve) ascends from upper end of parotid gland to supply skin of scalp above auricle + **Great auricular** nerve. (C2,3).

- *Arterial supply:*
 - **external carotid artery** + its 2-terminal branches (maxillary artery + superficial temporal artery)

- *Venous drainage:*
 - The 2-veins (maxillary & superficial temporal veins) drain into the **retromandibular vein**.

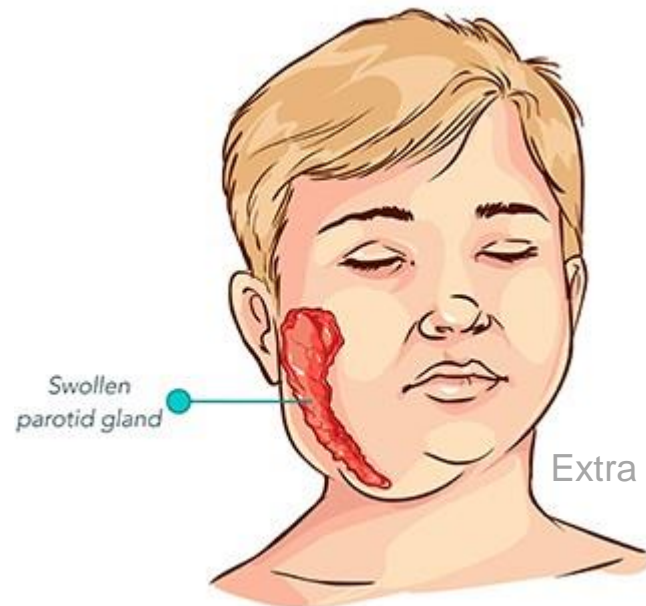
- *Lymphatic:*
 - **parotid** lymph nodes which finally drain into **deep cervical** lymph nodes.



Parotid Gland Clinical Notes

1- Parotid gland infection: Mumps

Gland becomes *swollen, painful* because fascial capsule derived from investing layer of deep cervical fascia is strong and limits the swelling of gland.

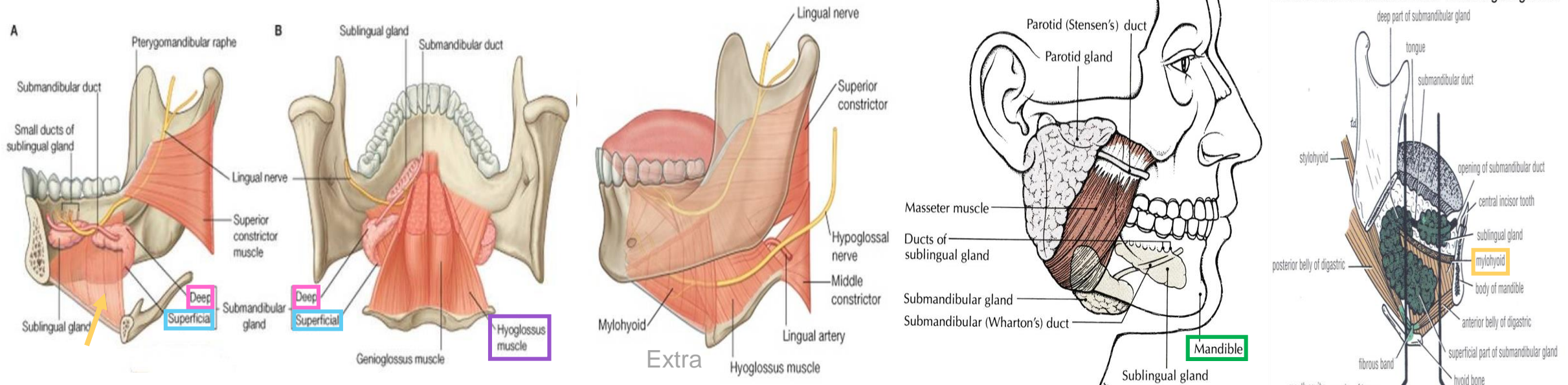


2-Frey's Syndrome :

- it is an interesting complication that sometimes occurs after penetrating wounds of parotid gland.
- When patient eats, beads of perspiration (sweat) appear on the skin of parotid.
- It is caused by damage to **auriculotemporal & great auricular nerves**.
- During healing, parasympathetic secretory fibers in **auriculotemporal** nerve grow out and join distal end of **great auricular** nerve (C2,3) supplying skin over parotid. These fibers reach the sweat glands in skin of face so, there is sweating on skin covering parotid, instead of salivation during eating.

Submandibular Gland

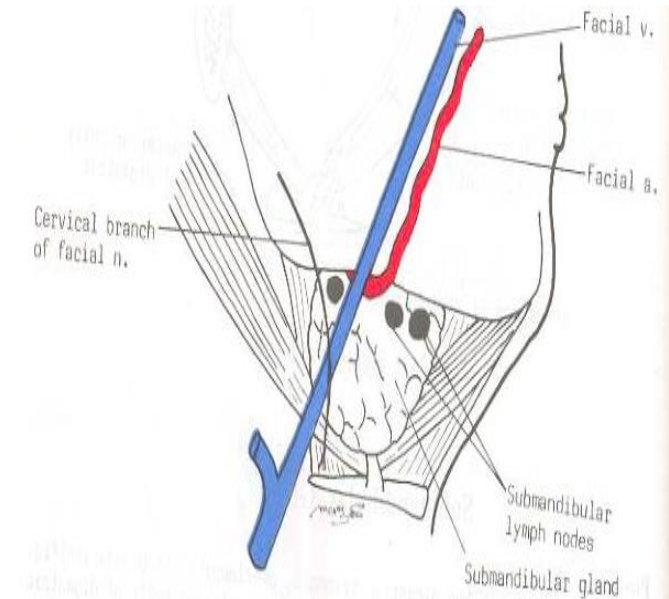
- It is a lobulated mass, composed of **serous & mucous acini**, located deep to the body of the mandible.
- It is surrounded by C-T capsule + dense fascial capsule derived from investing layer of deep cervical fascia.
- Formed of two parts:
 - Large Superficial Part: lies in digastric triangle between mylohyoid & body of mandible (superficial to mylohyoid).
 - Small Deep Part: lies deep to mylohyoid and superficial to hyoglossus.
- Its deep part is continuous with superficial part around posterior border of mylohyoid muscle.



Submandibular Gland Relations

Only on the boys' slides

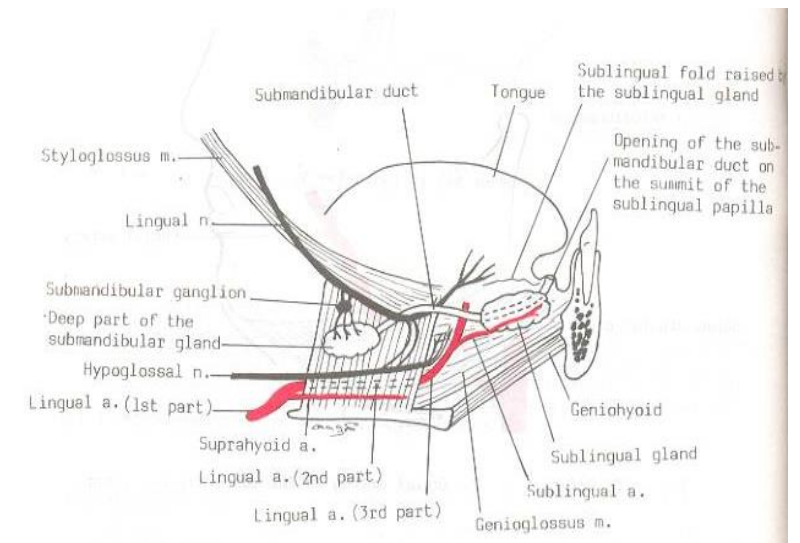
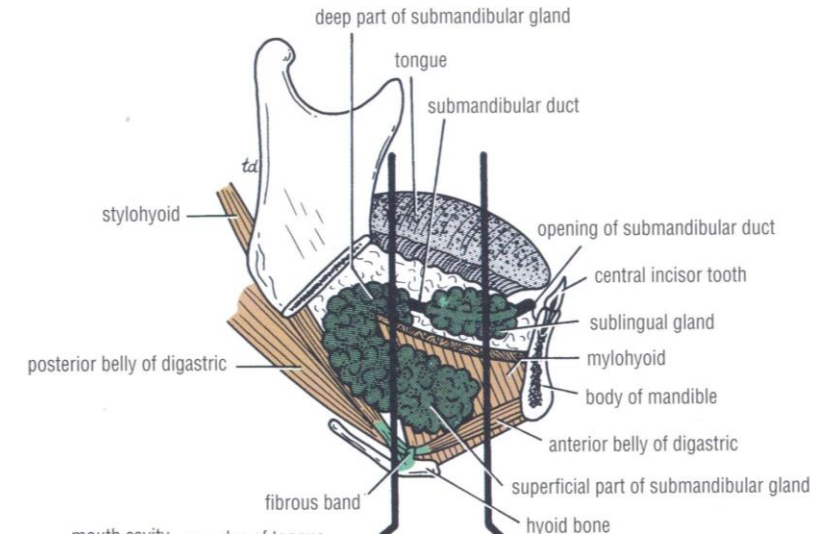
	Superficial part
<i>Anteriorly</i>	anterior belly of digastric
<i>Posteriorly</i>	posterior belly of digastric + stylohyoid muscle.
<i>Medially (deep)</i>	mylohyoid
<i>Laterally</i>	it lies in contact with submandibular fossa on medial surface of mandible.
<i>Inferolaterally (superficial)</i>	<p>-<u>skin, superficial fascia, platysma & investing layer of deep cervical fascia + submandibular lymph nodes</u></p> <p>-it is crossed by <u>facial vein</u> & <u>cervical branch of facial nerve</u>.</p> <p>-<u>facial artery</u> ascends into digastric triangle, it <u>deeply grooves posterior end of the gland</u>, then passes between lateral surface of gland & the bone <u>to reach base of mandible</u> where it pierces deep fascia to ascend to face.</p>



Submandibular Gland Relations

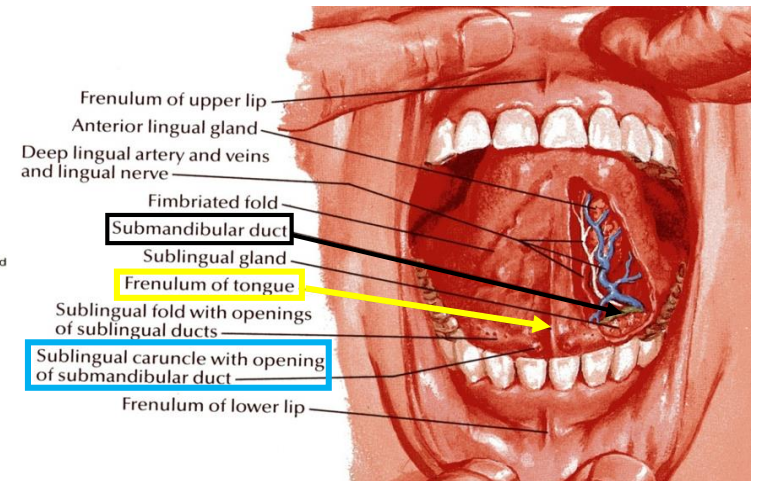
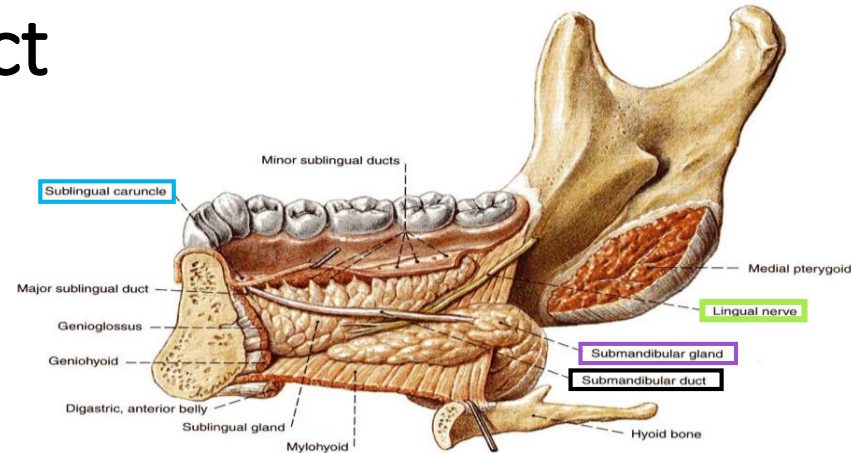
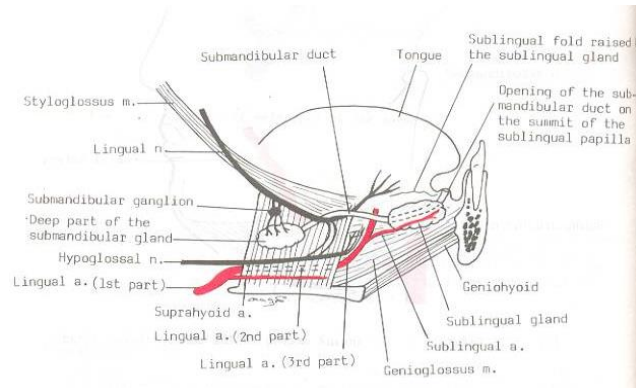
Only on the boys' slides

	Deep part
<i>Medially (deep)</i>	hyoglossus & styloglossus.
<i>Laterally (superficial)</i>	mylohyoid & superficial part of gland.
<i>Superiorly</i>	lingual nerve & submandibular ganglion.
<i>Inferiorly</i>	hypoglossal nerve.



Submandibular Gland

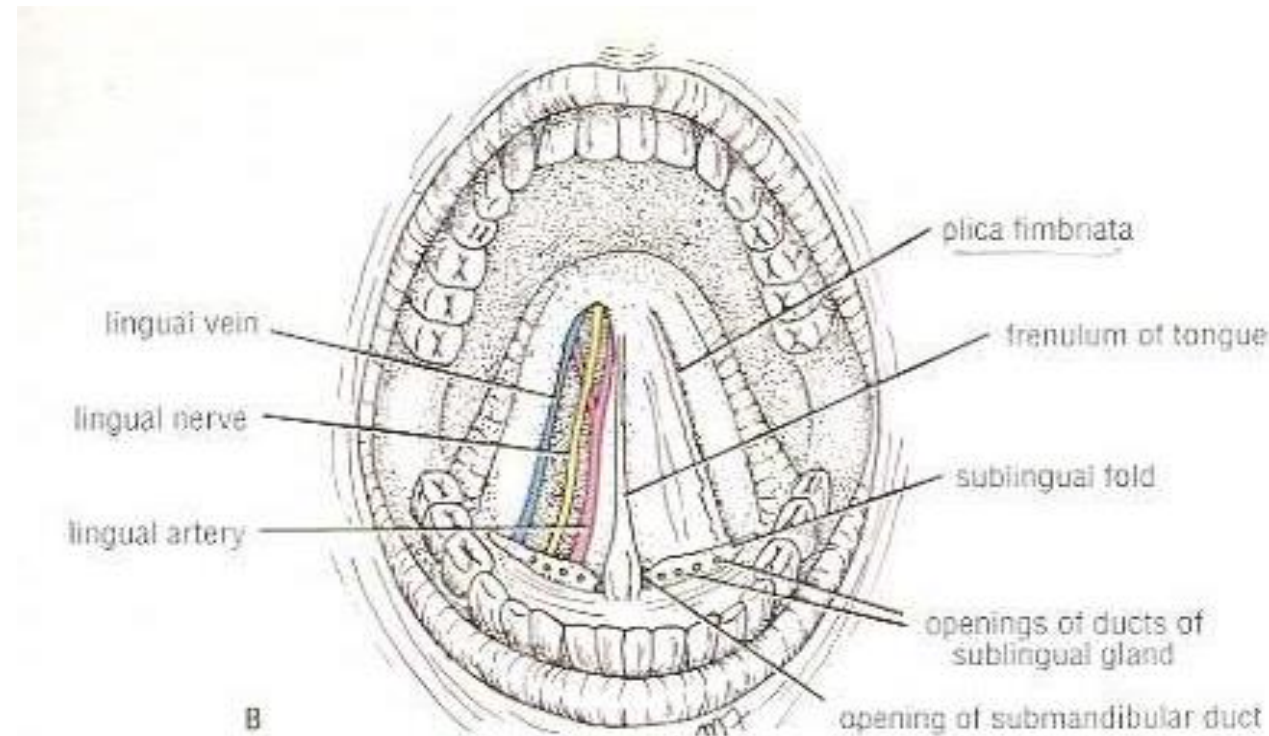
Submandibular Duct



- The duct emerges from the *anterior* end of the *deep* part of the gland.
- It passes forward along the side of the tongue, *under* the mucous membrane of the floor of the mouth.
- It is crossed laterally by the lingual nerve, then lies *between* sublingual gland & genioglossus muscle.
- It opens into floor of mouth on the summit (highest point) of a small sublingual papilla (the sublingual caruncle*), which lies at the side of the frenulum of the tongue.
- **Clinically, it is important to remember that the submandibular duct can be palpated through the floor of the mouth alongside the tongue.**
- **Saliva can usually be seen emerging from the orifice of the duct.**

* **Sublingual caruncle:** an eminence on either side of the frenulum of the tongue, on which the major duct of the sublingual gland and the duct of the submandibular gland open.

Submandibular Gland Submandibular Duct

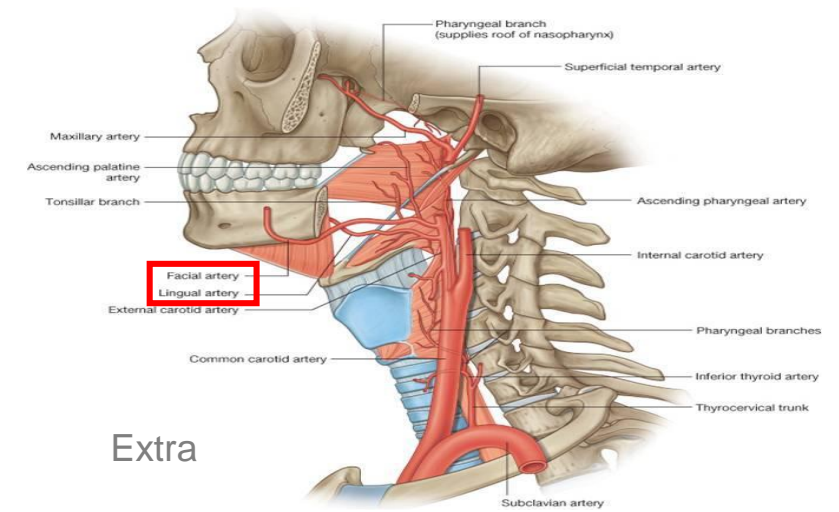


- Note the frenulum of the tongue in midline = it is a fold of mucous membrane connects undersurface of tongue to the floor of mouth.
- Note, opening of submandibular duct into floor of mouth at the side of frenulum of tongue.

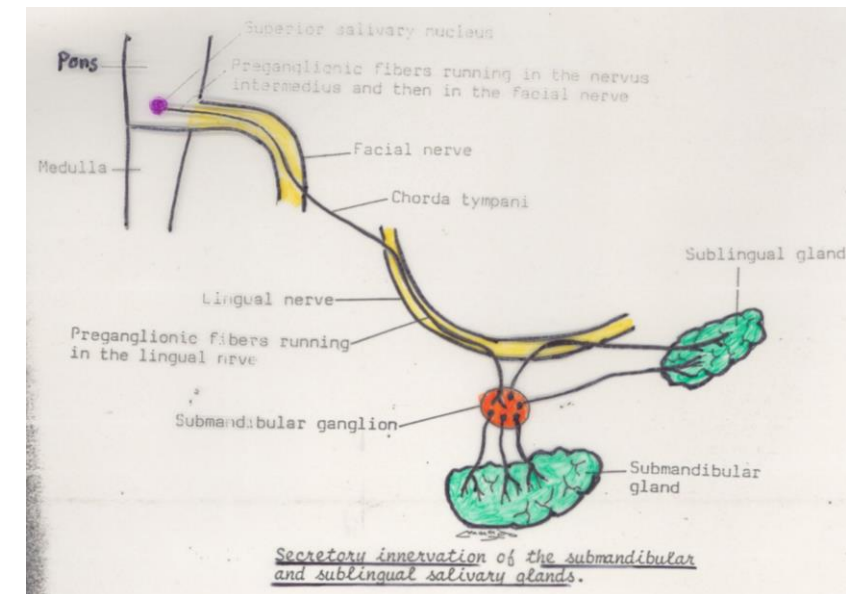
Submandibular Gland Supply

- *Blood Supply* :
branches of **facial** & **lingual** arteries.
- *Lymph drainage* :
submandibular + **deep cervical** lymph nodes
- *Nerve supply* :
 - 1- Parasympathetic: secretomotor fibers from **superior salivary nucleus** of 7th C.N. (facial nerve) → via **chorda tympani** nerve → to join **lingual** nerve and pass into **submandibular ganglion**, then postganglionic parasympathetic secretory fibers from ganglion via lingual nerve into gland.
 - 2- Sympathetic fibers: from plexus of nerves around **Facial** + **Lingual** arteries.
 - 3- Sensory: **lingual** nerve

Only on the boys' slides



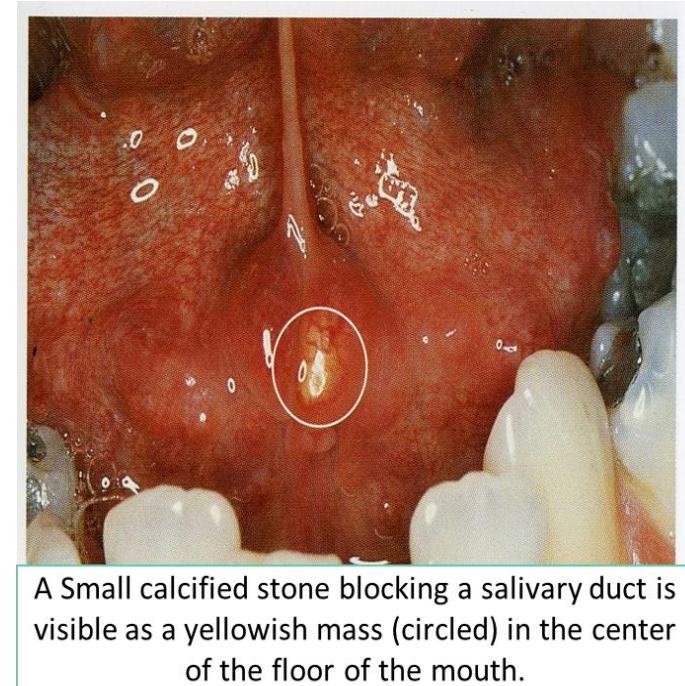
Extra



Submandibular Duct Clinical Note

1. Calculus Formation

- The submandibular duct is a common site of **calculus formation**.
- The presence of a **tense swelling below the body of the mandible**, which is greatest before or during a meal and is reduced in size or absent between meals, is **diagnostic** of the condition.
- Clinically: examination of the floor of the mouth will reveal absence of ejection of saliva from the orifice of the duct of the affected gland + Frequently, the stone can be palpated in the duct, which lies below the mucous membrane of the floor of the mouth.



2. Enlargement of Submandibular Lymph Nodes *Only on the boys' slides*

- are commonly due to :
 - 1- Pathologic condition of scalp, face, maxillary sinus, or mouth cavity.
 - 2- Acute infection of teeth (most common cause of painful enlargement these nodes)

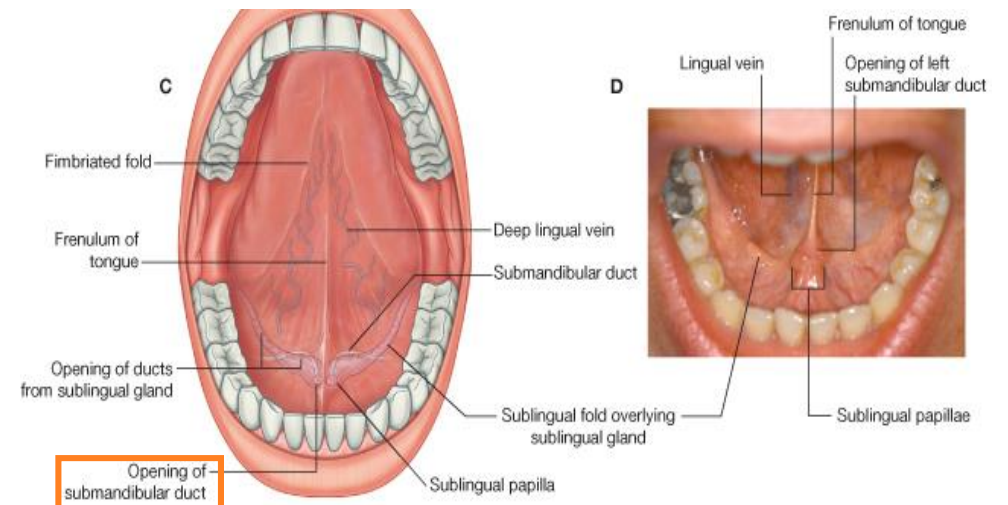
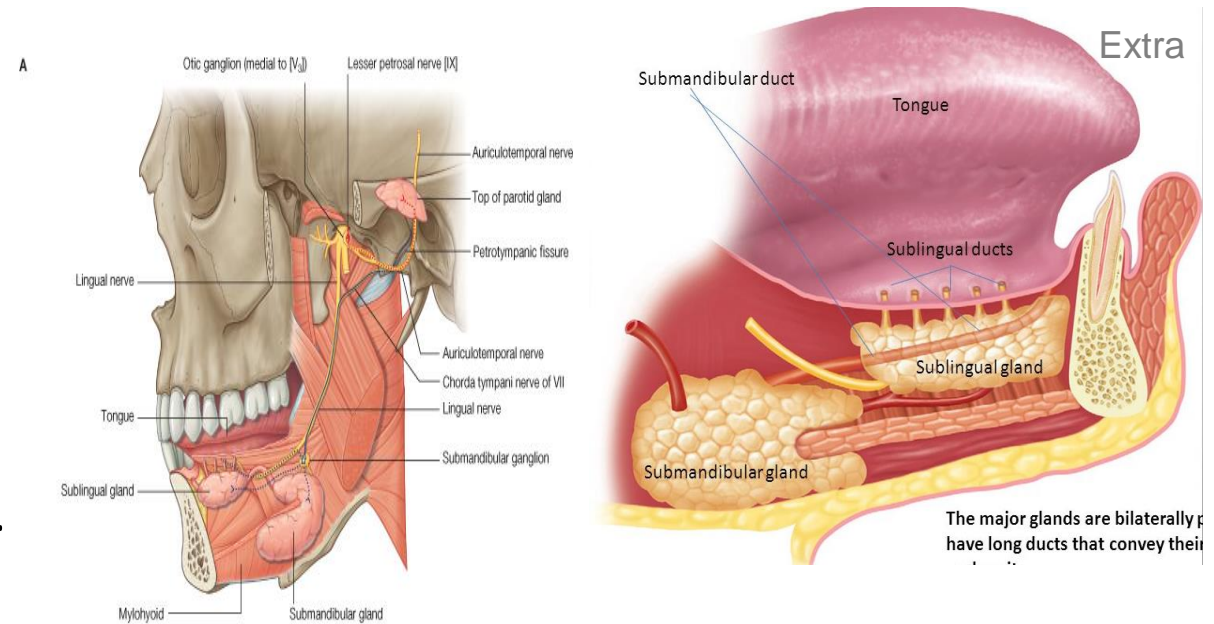
Sublingual Gland

Location

- The smallest of the three main salivary glands.
- It contains **both** serous & mucous acini.
- It lies below the mucous membrane of the floor of mouth, within sublingual fold, close to the midline.

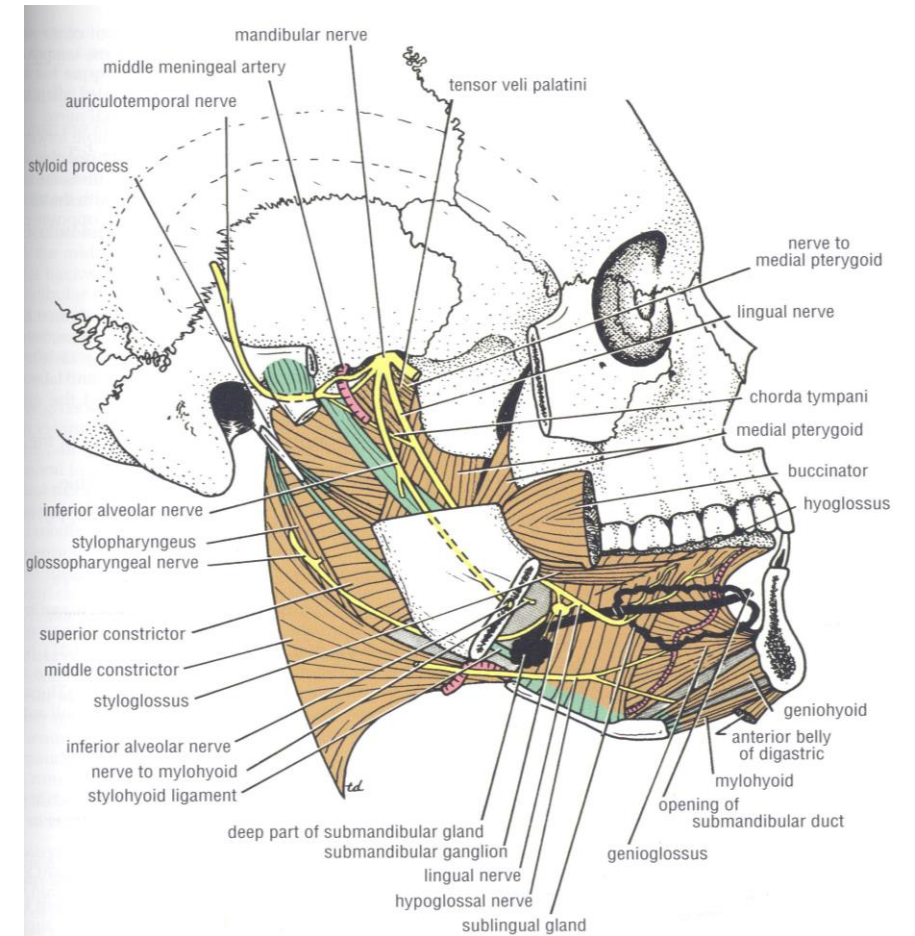
Sublingual Ducts

- The sublingual ducts are 8 to 20 in number.
- Most open into floor of mouth on the summit of the sublingual fold, but a few may open into the submandibular duct.



Sublingual Gland Relations

Posteriorly	deep part of submandibular gland
Medially (deep)	genioglossus + lingual nerve + submandibular duct.
Laterally (superficial)	sublingual fossa of medial surface of mandible.
Superiorly	Mucous membrane of floor of mouth, forming sublingual fold.
Inferiorly	it is supported by mylohyoid muscle.



GLANDS	GENERAL NOTES	DUCT	NERVE\BLOOD SUPPLY	Structures within the gland \Clinical application
PAROTID	<ul style="list-style-type: none"> Largest Formed entirely of serous acini Triangular in shape accessory part: A small part that is separated from the main gland. Capsule: Tight, derived from deep cervical fascia of the neck. 	It opens into the vestibule of the mouth on a small papilla , opposite the upper second molar (maxillary) tooth.	<p><u>Parasympathetic</u> from inferior salivary nucleus via auriculotemporal nerve</p> <p><u>Sympathetic:</u> from plexus around external carotid artery.</p> <p><u>Arterial:</u> ECA & its branches.</p> <p><u>Venous drainage:</u> retromandibular vein.</p> <p><u>Lymphatic:</u> parotid & deep cervical lymph nodes.</p>	<p><u>Structures within the gland:</u></p> <p>1- Facial nerve: -TWO Branches before it enters the gland -FIVE Branches within the parotid</p> <p>2- Retromandibular vein.</p> <p>3- External carotid artery.</p>
SUBMANDIBULAR	<ul style="list-style-type: none"> deep to the body of the mandible Formed of 2 parts: Large superficial part Small deep part 	The duct emerges from the deep part of the gland. It is crossed laterally by the lingual nerve It opens on the summit of a small sublingual papilla, which lies at the side of the frenulum of the tongue.	<p><u>Arterial supply:</u> Facial + lingual artery.</p> <p><u>Lymph drainage:</u> Submandibular + deep cervical lymph nodes</p> <p><u>Parasympathetic</u> secretomotor supply is from superior salivary nucleus via lingual nerve</p>	<p><u>Clinical application:</u></p> <p>-the submandibular duct can be palpated through the floor of the mouth alongside the tongue. Saliva can usually be seen emerging from the orifice of the duct.</p> <p>-common site of calculus formation.</p> <p>The presence of a tense swelling below the body of the mandible.</p>
SUBLINGUAL	<ul style="list-style-type: none"> The smallest 	<ul style="list-style-type: none"> sublingual ducts are 8 to 20 in number. Most open into the summit of the sublingual fold, but a few may open into the submandibular duct. 	<p><u>Arterial supply:</u> Facial artery.</p> <p><u>Venous drainage:</u> Facial vein.</p> <p><u>Lymph drainage:</u> Submandibular lymph nodes</p> <p><u>Parasympathetic</u> secretomotor supply is from superior salivary nucleus via lingual nerve</p>	-

MCQs

1. The submandibular duct emerge from which part of the gland ?

- A- The superficial part
- B- The deep part
- C- The anterior part
- D- The posterior part

2. The submandibular duct crossed laterally by which structure ?

- A- The lingual nerve
- B- The facial nerve
- C- The parotid duct
- D- retromandibular vein

3. Which of the following duct is a common site for calculus formation ?

- A- The thoracic duct
- B- The parotid duct
- C- The sublingual duct
- D- The submandibular duct

4. What's the blood supply for the sublingual gland?

- A- Sublingual artery
- B- Facial Artery
- C- External carotid artery
- D- Submental Artery

5. Which of the salivary is the largest?

- A.Sublingual
- B.submandibular
- C.Parotid
- D.Buccal

6. Parotid produces a

- A. mixed serous & mucous secretion.
- B. serous secretion
- C. mucous secretion
- D. nothing

7. Structures within the Parotid gland?

- A. Facial nerve
- B. Retromandibular vein
- C. External carotid artery
- D. All of the above

8.How many branches the facial nerve gives before it enters the parotid?

- A.5
- B.2
- C.3
- D.4

9.Which of the salivary glands is capsulated by the deep cervical faciae?

- A.Sublingual
- B.submandibular
- C.Parotid
- D.Buccal

Answers: 1. B, 2. A, 3. D, 4. B, 5. C, 6. B, 7. D, 8. B, 9. C

SAQ

A\ What are the structures within the parotid gland ?

- 1-Facial nerve – most superficial structure
- 2- retromandibular vein - intermediate in position
- 3- External carotid artery – most deep structure

B\ What's the nerve supply for the parotid gland ?

- Sympathetic from plexus around External carotid artery
- Parasympathetic from (inferior salivary nucleus- tympanic nerve) through the glossopharyngeal nerve to tympanic plexus –lesser petrosal to otic ganglion which is postganglionic fiber running in auriculotemporal nerve



Leaders:

Nawaf ALKhudairy
Jawaher Abanumy

Members:

Alanoud Abuhaimed
Anwar Alajmi
Do'aa abdufattah Reema Alshayie
Ghada Alothaim Reema Alotaibi
Lama Alfawzan Safa Al-Osaimi
Lama ALTamimi Wejdan alzaid
Rawan AlWadee Shatha Alghaihb



Feedback



anatomyteam436@gmail.com



[@anatomy436](https://twitter.com/anatomy436)

References:

- 1- Girls' & Boys' Slides
- 2- Greys Anatomy for Students
- 3- TeachMeAnatomy.com