

MOUTH - GENERAL

From lips to palatoglossal fold (anterior pillar of fauces)

Vestibule is between teeth/gums and cheek. Emptied by buccinator

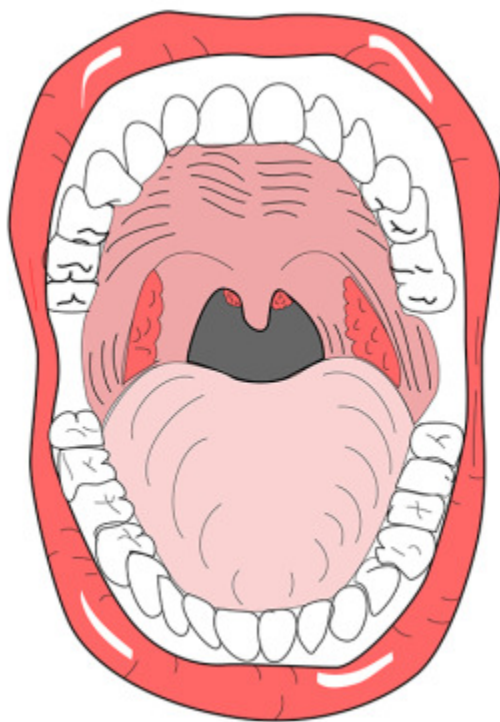
Roof is hard palate

Floor is tongue

Functions are eating, talking and extra airway

Sensations are taste, temperature, touch. Tongue/lips assess

Mucous membrane is stratified squamous. Nerve supply is Vb & Vc (buccal, mental, infra-orbital). Contains salivary glands, pierced by parotid duct (2nd upper molar tooth) and ducts of glands



Teeth: 32. All but molars erupted by 13yrs.

Incisors 8

Canines 4

Premolars 8

Molars 8 (erupt approx 18yrs)

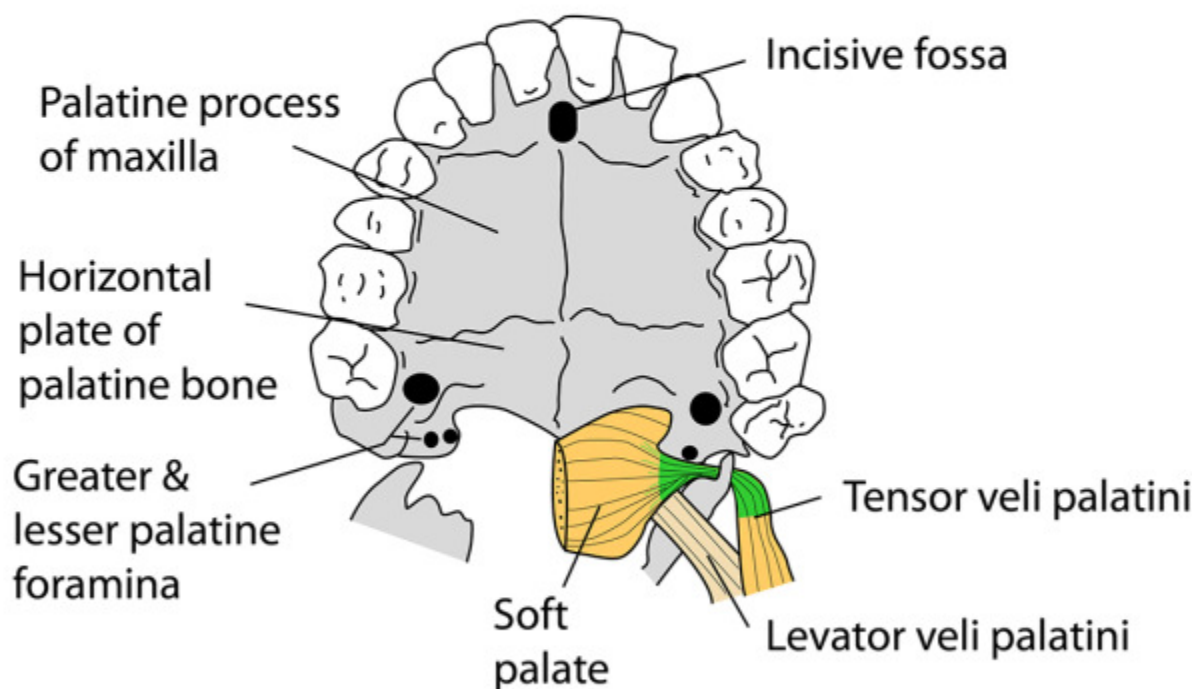
Deciduous: erupt 7-24 months

Teeth Ns: superior alveolar (Vb)

inferior alveolar (Vc)

HARD PALATE

- Mucoperiosteum (mucosa + periosteum)
- Sharpey's fibres into pits on bone
- **Blood supply:** Greater palatine artery
- **Venous drainage:** Pterygoid plexus
- **Lymph:** Retropharyngeal and deep cervical nodes
- **Nerve supply:** Greater palatine and nasopalatine



For more details of palate muscles, please see muscle section in the book - Instant Anatomy, by R H Whitaker & N R Borley. 4th edition. Wiley-Blackwell 2010

SOFT PALATE

Consists of:

- Aponeurosis
- Tensor veli palatini
- Levator veli palatini
- Palatoglossus
- Palatopharyngeus
- Muscles of uvula
- Mucosa
- Mucous & serous glands
- A few taste buds

Epithelium: Stratified squamous

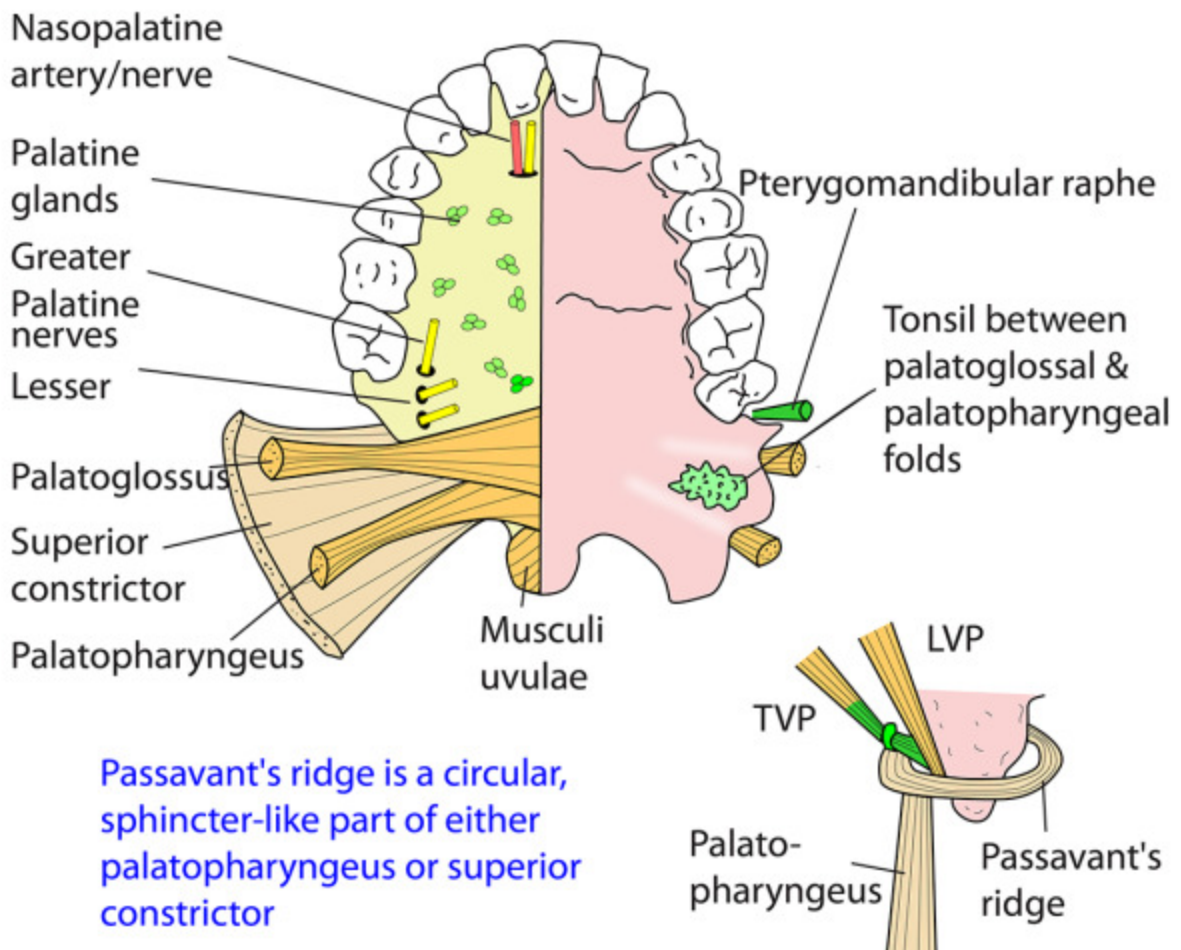
Blood: Lesser palatine (maxillary)
Ascending palatine (facial)
Palatine branch of ascending pharyngeal (external carotid)

Veins: Pharyngeal & pterygoid plexus

Lymph: Retropharyngeal & antero-superior deep cervical

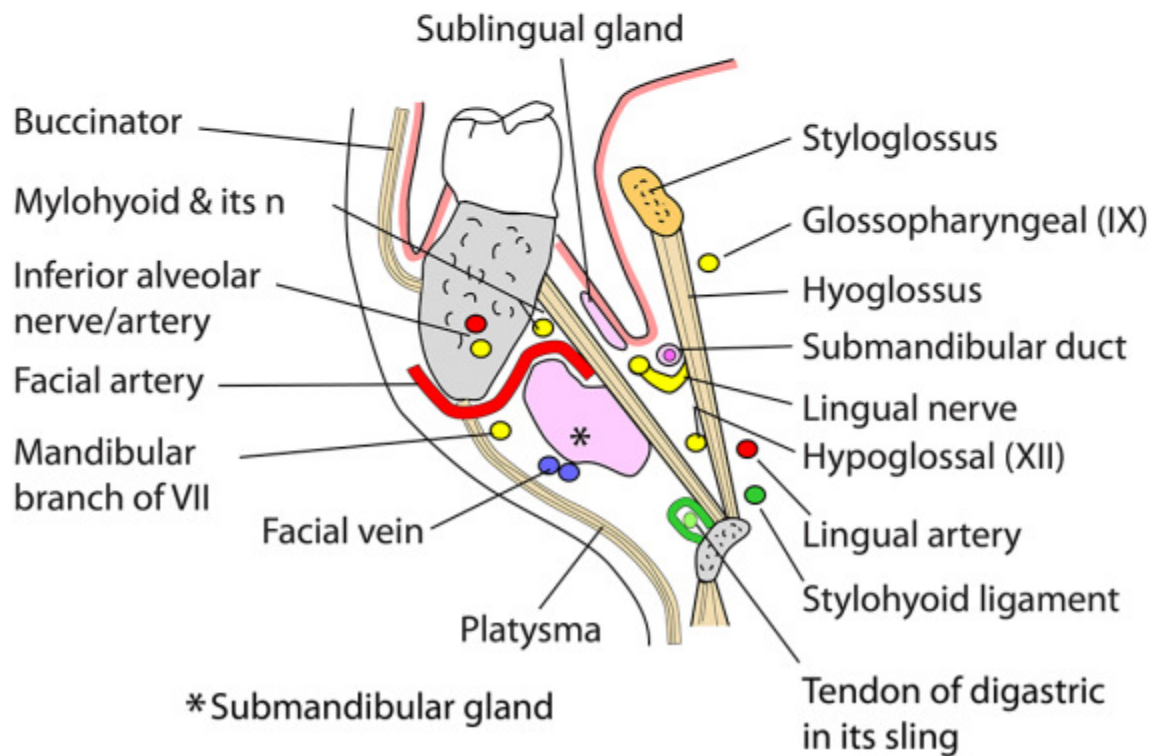
Nerve: Secretomotor - Vb via pterygopalatine ganglion
Sensation - Vb, lesser palatine + (IX)
Taste - Greater petrosal then lesser palatine

Function: closes nasopharynx

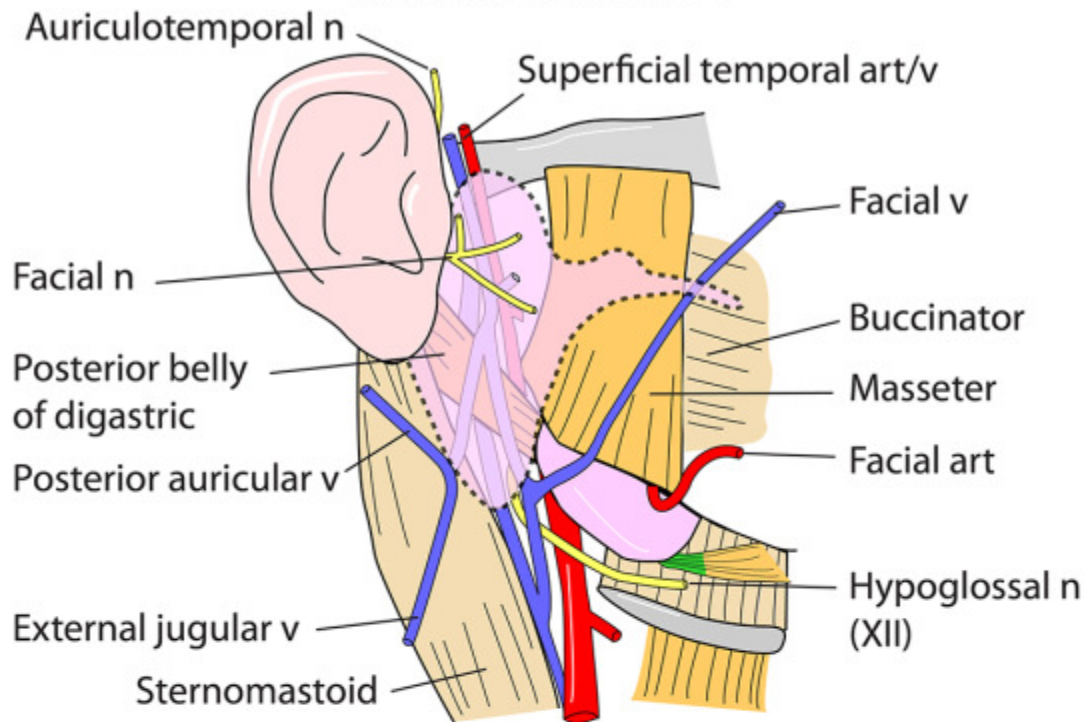


SUBLINGUAL GLAND

- Mucous gland
- Between mylohyoid and genioglossus
- 15 ducts - 1/2 into submandibular duct
1/2 into sublingual fold
- **Nerve supply:** secretomotor via submandibular ganglion
general sensation via lingual (Vc)
- **Blood supply:** lingual artery & branches of submental artery
- **Develops:** from a groove in floor of mouth that becomes a tunnel.
Blind end proliferates (ectodermal) to give secreting acini
- **(Note: all salivary glands develop from epithelial lining of mouth)**



PAROTID GLAND 1



**Lies between mastoid, styloid process, ramus of mandible.
Surrounded by parotid fascia (investing layer of deep fascia)**

- Serous secretions
- Produces amylase, water, Ig factors (lubricates & oral hygiene)
- Has an upper & lower pole, lateral, anterior & deep surface

RELATIONS:

Posterior

Sternocleidomastoid
Mastoid process

Above

External acoustic meatus
Temporomandibular joint

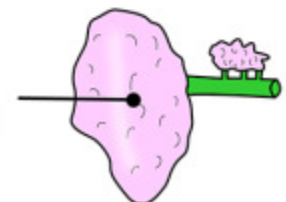
Anterior

Angle of mandible
Medial pterygoid plate
Masseter
Stylomandibular ligament

In gland: Facial nerve, retromandibular vein, external carotid artery, lymph nodes, fibres of auriculotemporal nerve

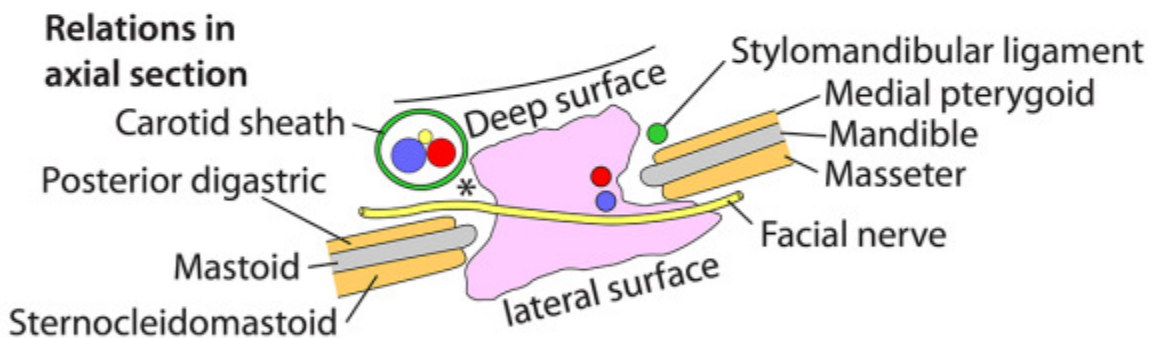
Deep to gland: Mastoid process, sternomastoid, posterior belly of digastric, styloid process, stylohyoid ligament & muscle, styloglossus, stylopharyngeus, temporomandibular joint

Lateral:
subcutaneous
surface



PAROTID GLAND 2

- **Blood supply:** Branches of external carotid
- **Venous drainage:** To retromandibular
- **Lymph drainage:** Pre-auricular to deep cervical
- **Nerve supply:** **Secretomotor** via inferior salivary nucleus to glossopharyngeal nerve to its tympanic branch to lesser petrosal nerve to otic ganglion to auriculotemporal nerve. **Sympathetics** via superior cervical ganglion and external carotid artery. **Sensation** for gland - auriculotemporal (Vc), for fascia - great auricular (C2)
- **Duct:** 5cm long, crosses masseter, pierces buccinator at 3rd molar and mucosa at 2nd molar. Stenson's duct
- **Surface markings of duct:**

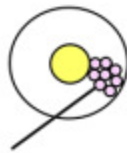


* Styloid process, stylohyoid, styloglossus, stylopharyngeus, stylohyoid and stylomandibular ligaments

Development Lining of mouth → Ectoderm → Tunnel → Far end proliferates

Histology

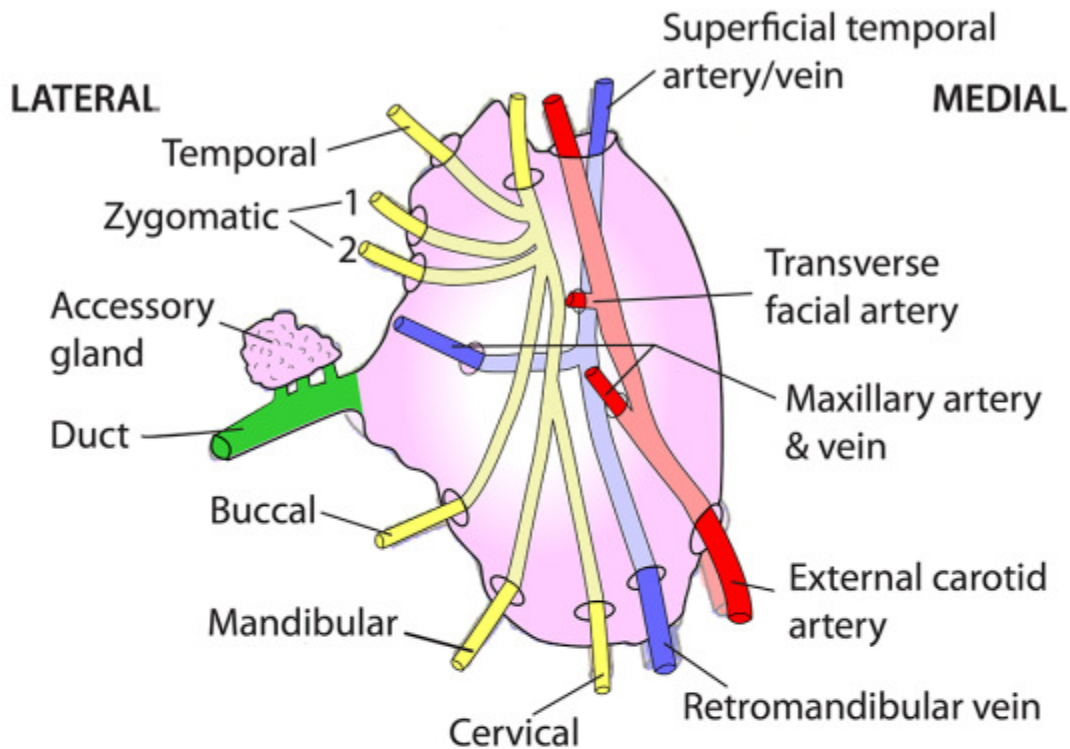
Stratified cuboidal ducts



Tubulo-acinar glands with the occasional myoepitheliocyte

PAROTID GLAND 3

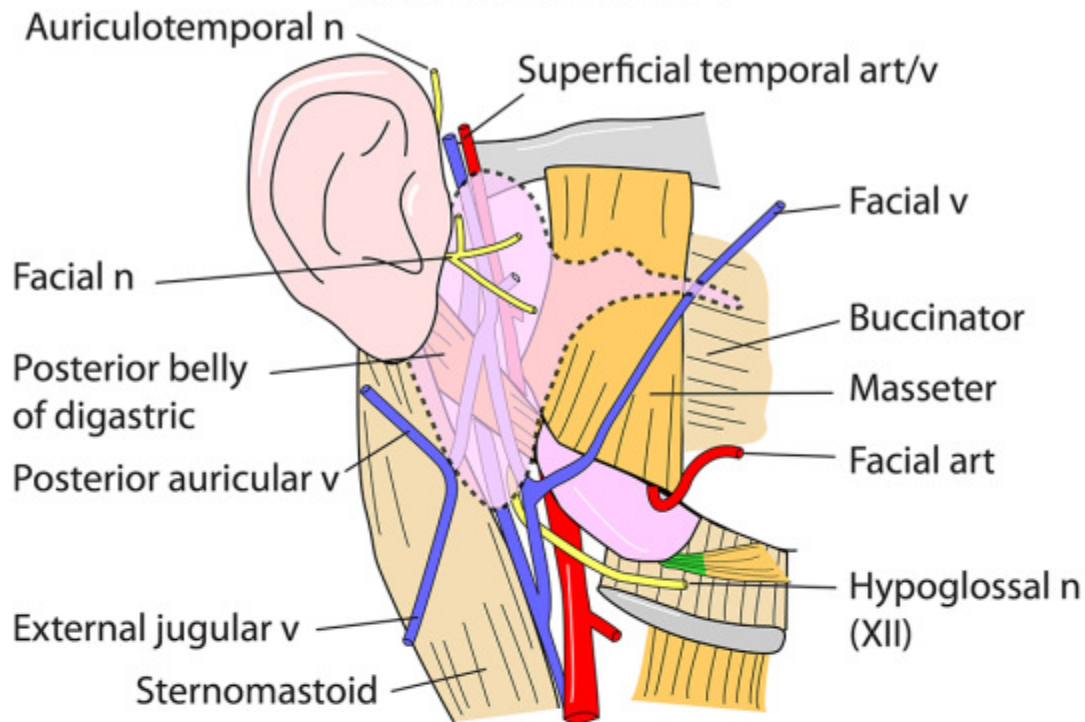
MEDIAL SURFACE OF RIGHT PAROTID GLAND



CLINICAL ASPECTS

- Mikiulitz & Sjorgren's syndromes
- Adenomas
 - Both sexes equal occurrence
 - Pleomorphic
 - Poorly circumscribed
 - Can become malignant
 - Usually superficial to VII
- Adenolymphoma - Warthin's tumour (more in males than females)
- Primary malignant - adenocystic, acinar cell
- Secondary malignant - from face
- Stones in duct
- Frey's syndrome - gustatory sweating. Regrowth of parasympathetic fibres into damaged sympathetic fibres in the auriculotemporal nerve

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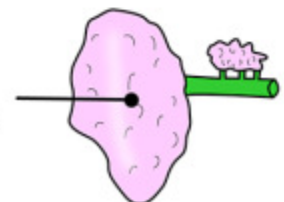
Anterior

Angle of mandible
Medial pterygoid plate
Masseter
Stylomandibular ligament

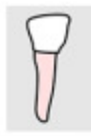



In gland: Facial nerve, retromandibular vein, external carotid artery, lymph nodes, fibres of auriculotemporal nerve

Deep to gland: Mastoid process, sternomastoid, posterior belly of digastric, styloid process, stylohyoid ligament & muscle, styloglossus, stylopharyngeus, temporomandibular joint

Lateral:
subcutaneous
surface



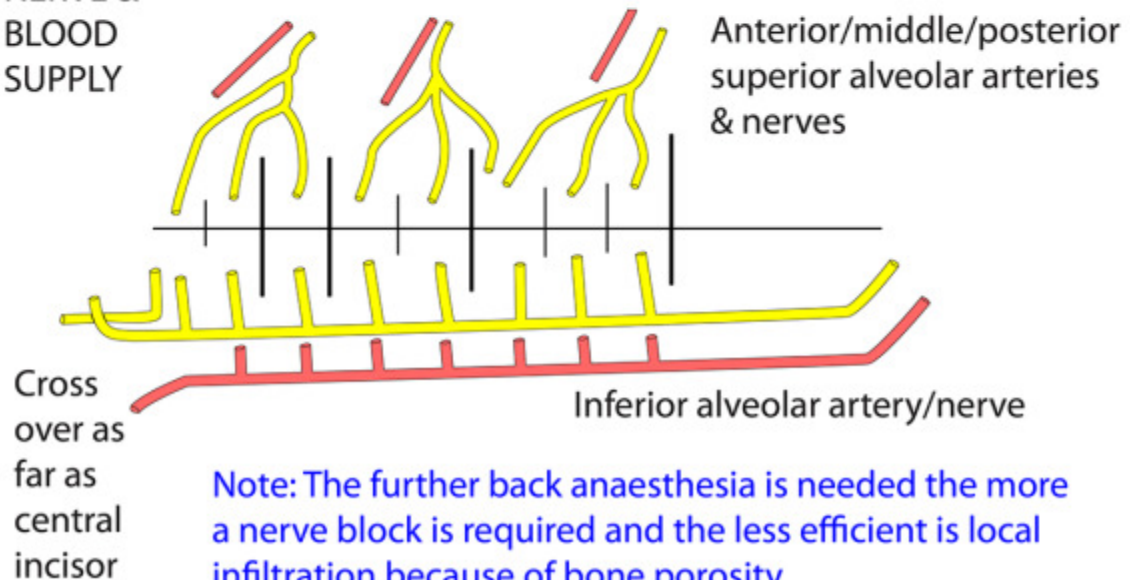
TEETH - 2

				
	INCISOR	CANINE	PREMOLAR	MOLAR
ADULT NUMBER	2	1	2	lower ³ upper
ROOTS	1	1	1	2 3
CUSPS	1	1	2	5 4
	TOTAL IN ADULTS 8 X 2 = 16 X 2 = 32			

ERUPTIONS

	Incisors	Canines	Premolars	Molars	
Deciduous (5x2=10x2=20)	7 8	18		12 24	months
	6 9	18		12 24	
Permanent	7 8	11	9 10	6 12 18+	years
	7 8	11	9 10	6 12 18+	

NERVE & BLOOD SUPPLY



TONGUE - SENSATION & TASTE

SUMMARY OF NERVE SUPPLY TO TONGUE

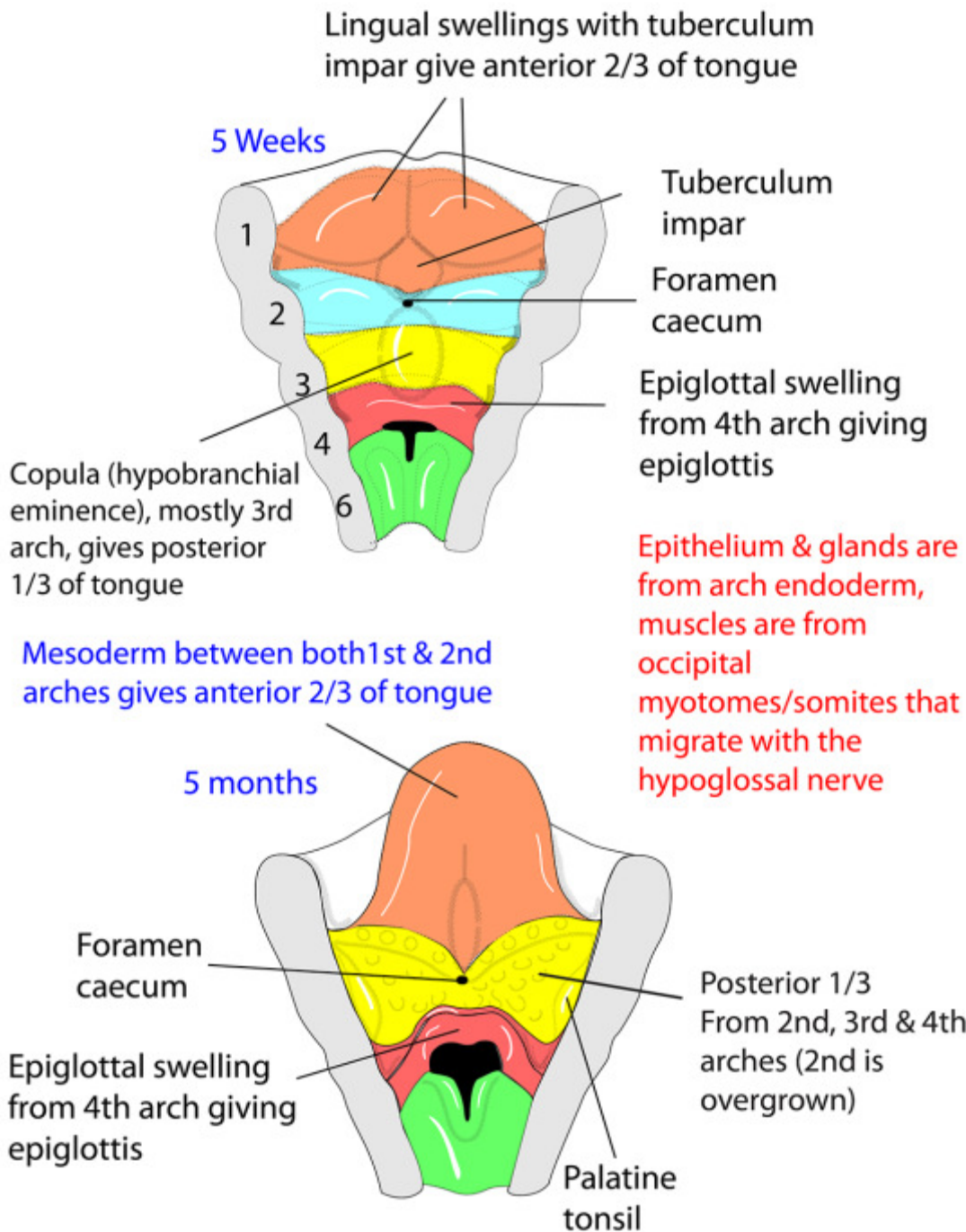
	SOMATIC SENSATION	TASTE	SECRETOMOTOR
ANTERIOR 2/3	Lingual (Vc)	Chorda tympani (VII)	Chorda tympani (VII) (anterior lingual glands)
POSTERIOR 1/3 + vallate papillae	Glosso-pharyngeal (IX)	Glosso-pharyngeal (IX)	Glosso-pharyngeal (IX)
VALLECULAE	Glosso-pharyngeal (IX)	Internal branch of superior laryngeal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

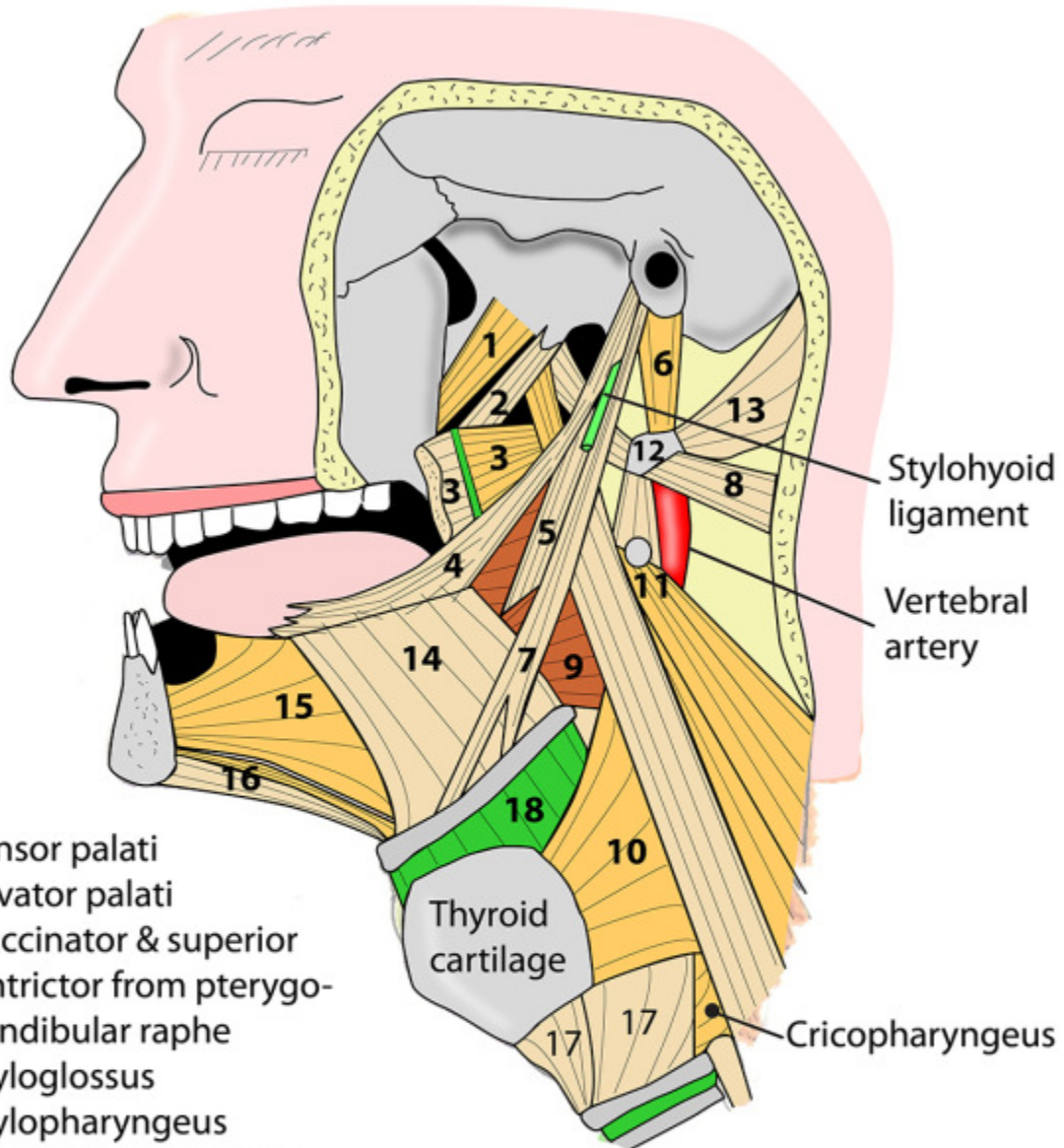
FORMATION OF THE TONGUE

FLOOR OF PHARYNX (PHARYNGEAL ARCHES)



Redrawn, with permission, from Sadler TW. Langman's Medical Embryology. 11th ed. Baltimore: Lippincott Williams & Wilkins; 2010

MUSCLES OF TONGUE, MOUTH & NECK



1. Tensor palati
2. Levator palati
3. Buccinator & superior constrictor from pterygo-mandibular raphe
4. Styloglossus
5. Stylopharyngeus
6. Rectus capitis lateralis
7. Stylohyoid
8. Inferior oblique
9. Middle constrictor
10. Thyropharyngeus
11. Transverse process of axis
12. Transverse process of atlas

- 13 Superior oblique
- 14 Hyoglossus
- 15 Genioglossus
- 16 Geniohyoid/mylohyoid
- 17 Cricothyroid
- 18 Thyrohyoid membrane

Stylohyoid ligament

Vertebral artery

Thyroid cartilage

Cricopharyngeus

TONGUE - MUSCLES

Hyoglossus

Hypoglossal nerve (XII)

Genioglossus

Hypoglossal nerve (XII)

Styloglossus

Hypoglossal nerve (XII)

Palatoglossus

Pharyngeal plexus (IX, X & sympathetic)

Intrinsic muscles

Superior/inferior longitudinal, transverse & vertical

Not attached to bone

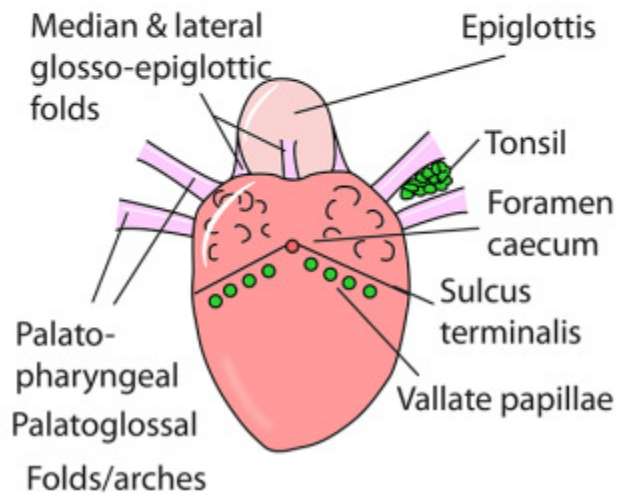
Hypoglossal nerve (XII)

Note: All muscles are supplied by hypoglossal nerve
except palatoglossus

For more details of tongue muscles, please see muscle section in the book -
Instant Anatomy, by R H Whitaker & N R Borley. 4th edition. Wiley-Blackwell 2010

TONGUE - GENERAL TOPOGRAPHY

The tongue is a mass of skeletal muscle covered by mucous membrane. It is divided functionally and embryologically into an anterior 2/3 and a posterior 1/3 by the sulcus terminalis

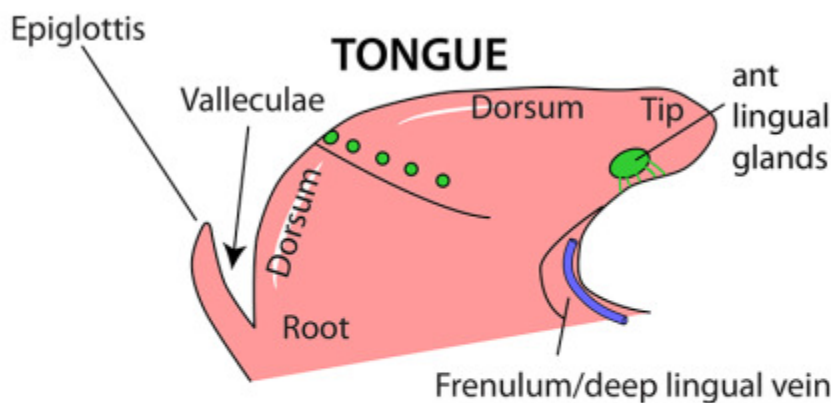


POSTERIOR 1/3:

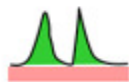
Oropharynx. smooth mucosa for swallowing
No papillae. Lingual tonsil.
Serous/mucous glands

ANTERIOR 2/3:

Oral. Papillae (filiform, fungiform & vallate) for grip/taste.
Glands on tip and sides only
Stratified, keratinising squamous epithelium



PAPILLAE



Filiform for grip, keratin tips - pink after chewing, white then brown when dry

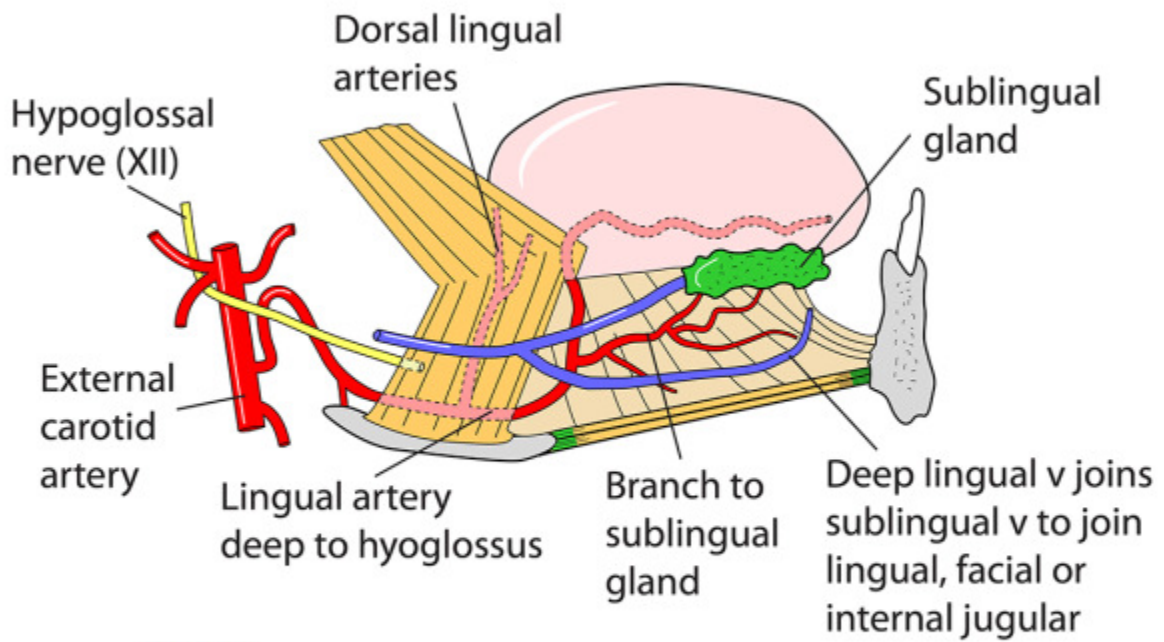


Fungiform
Taste buds



Vallate with crypts for taste and serous glands

TONGUE - LINGUAL ARTERY

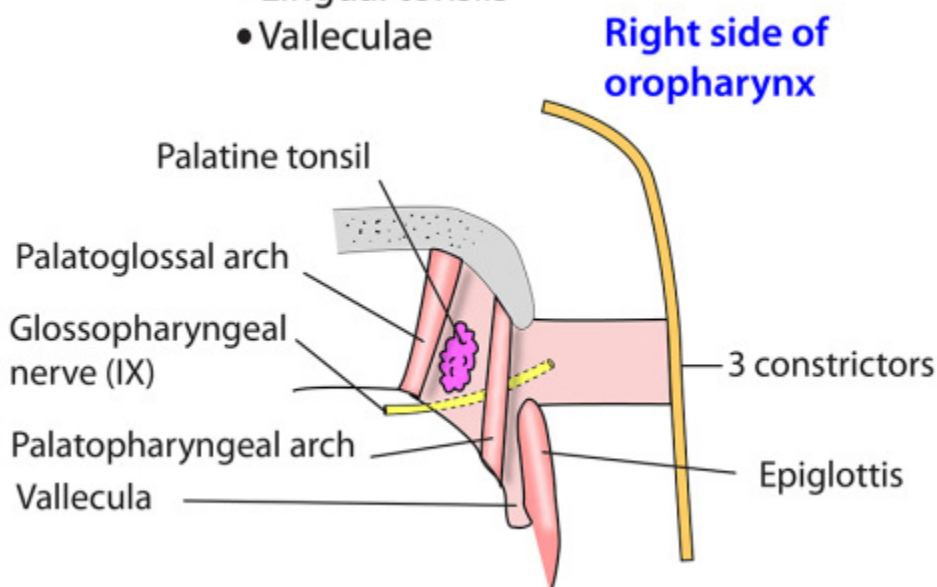


LYMPH

- Tip to submental glands bilaterally
- Dorsum to submandibular mostly unilaterally
- Posterior to jugulo-omohyoid & deep cervical

OROPHARYNX

- **From:** lower border of soft palate
- **To:** upper border of epiglottis
- **Anterior:** posterior aspect of tongue & palatoglossal arch
- **Posterior:** 3 constrictors & C2/C3 vertebrae
- **Inferior:** back of tongue, lingual tonsil & valleculae
- **Lateral:** palatoglossal/palatopharyngeal arches, constrictors & palatine (the) tonsil
- **Lining:** squamous epithelium
- **Nerves:** glossopharyngeal (IX) & internal laryngeal (X) in valleculae
- **Features:**
 - Palatine tonsils (see separate illustration)
 - Lingual tonsils
 - Valleculae

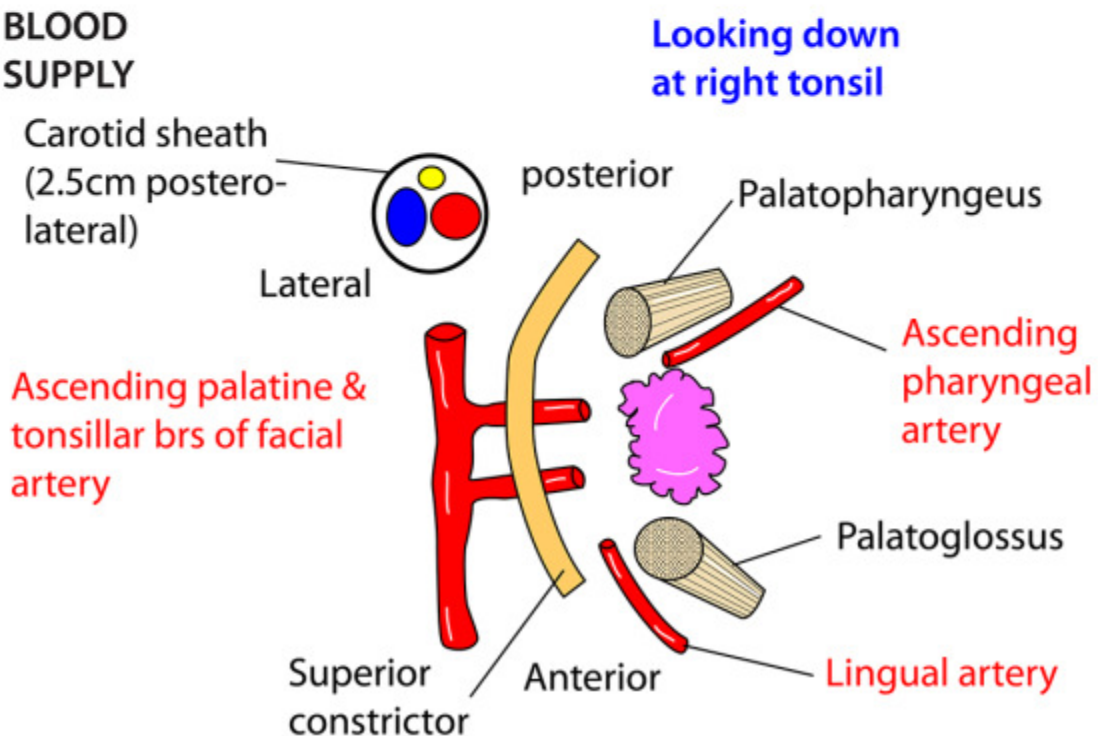


GAG REFLEX
Sensory: IX
Motor: X
(pharyngeal plexus to palate muscles)

PALATINE TONSIL

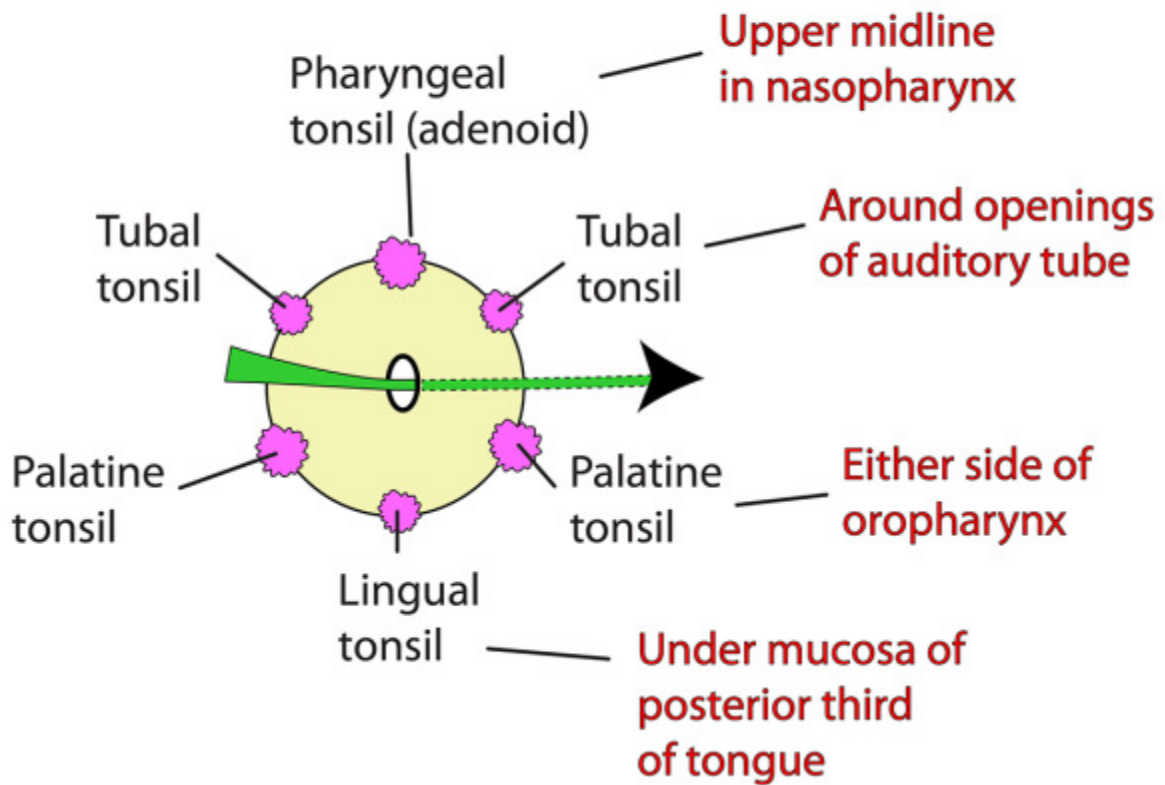
- Lymphoid tissue in tonsillar fossa
- **Anterior/posterior:** palatoglossal/palatopharyngeal arches
- **Superior:** soft palate
- **Inferior:** tongue
- **Medial:** mucosa & 20 tonsillar crypts, intratonsillar cleft
(this is a large crypt from 2nd pharyngeal pouch)
- **Bed:** submucosa (capsule), superior constrictor, facial artery & its branches
- **Lymph:** to deep cervical & jugulodigastric
- **Veins:** plexus in capsule to pharyngeal venous plexus. Also external palatine (paratonsillar) from soft palate
- **Nerves:** tonsillar branch of glossopharyngeal (IX) - hence referred pain to the middle ear. Also lesser palatine (maxillary via pterygopalatine ganglion)
- **Development:** 2nd pharyngeal pouch endoderm gives mucosa & crypts
Surrounding mesenchyme gives lymphoid tissue
- **Surface marking:** medial to lower masseter

BLOOD SUPPLY



WALDEYER'S RING

An interrupted circle of protective lymphoid tissue at the upper ends of the respiratory and alimentary tracts



RULES OF NERVE SUPPLY FOR MUSCLE GROUPS

ALL MUSCLES OF	SUPPLIED BY	EXCEPT	WHICH IS SUPPLIED BY
PHARYNX	Pharyngeal plexus (IX, X & sympathetic)	Stylopharyngeus	Glossopharyngeal (IX)
PALATE	Pharyngeal plexus (IX, X & sympathetic)	Tensor veli palatini	Nerve to medial pterygoid (Vc)
TONGUE	Hypoglossal (XII)	Palatoglossus	Pharyngeal plexus (IX, X & sympathetic)
FACIAL EXPRESSION & BUCCINATOR	Facial (VII)	Levator palpebrae superioris	Oculomotor (III)
MASTICATION	Mandibular division of Trigeminal (Vc)	Buccinator	Facial (VII)
LARYNX	Recurrent laryngeal	Cricothyroid	External branch of superior laryngeal nerve (X)