

Points of focus

- ▶ Anatomy of the skull
- ▶ Anatomical features of the skull
- ▶ Landmarks & features of the mandible الفك السفلي
- ▶ Muscles of mastication
- ▶ Trigeminal nerve location & functions العصب الخامس
- ▶ Blood supply of the cranium
- ▶ Salivary glands
- ▶ Important structures in the oral cavity

Anatomy of the skull

► The skull has 2 main bone divisions:

1. The Cranium

④ العنقوي على الرأس

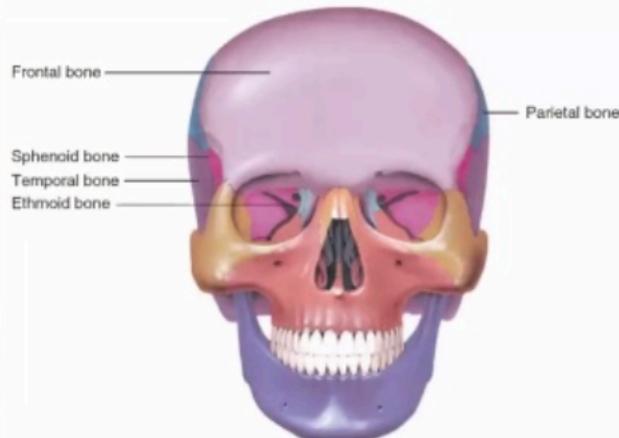
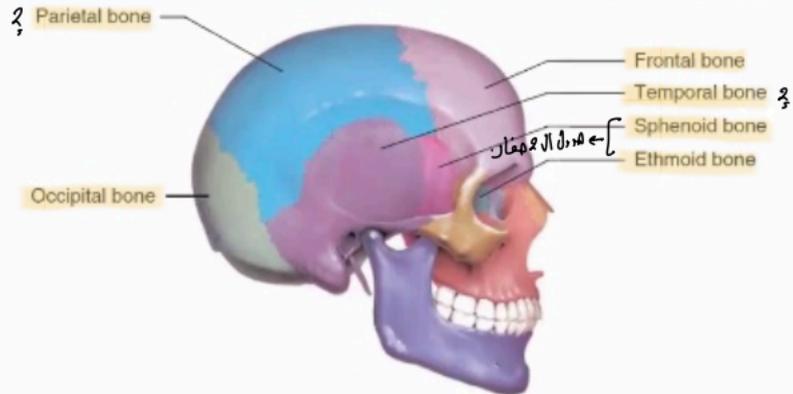
2. Facial bones

④ العظام للوجه والفكين

The cranium

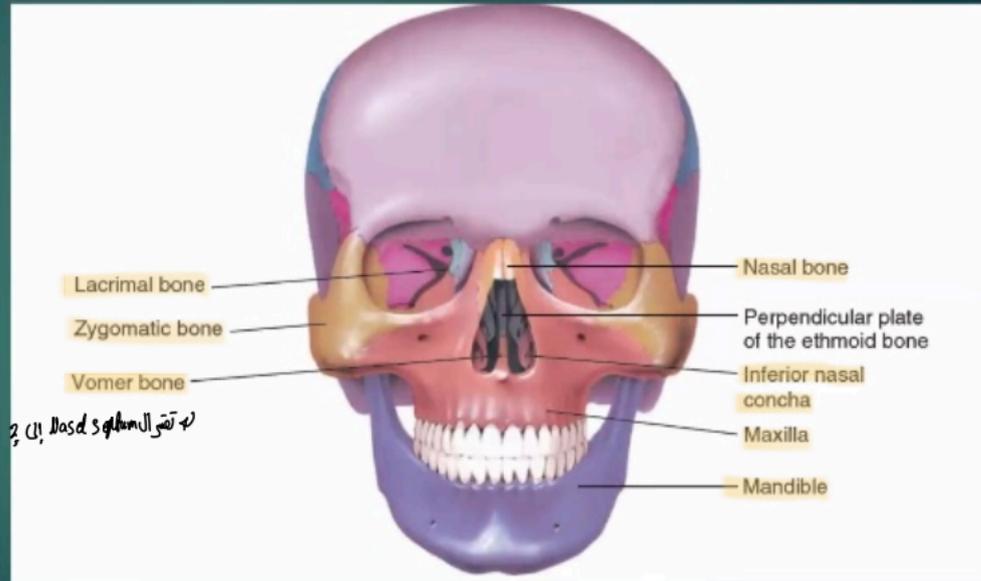
▶ The portion of the skull that encloses the brain

▶ Has 8 bones



Facial Bones

- ▶ 14 bones make up the facial division of the skull
- ▶ All are paired on one side except the vomer & the mandible



Facial Bones

عظام الوجه

- ▶ **Zygomatic:** 2 bones under each eye / form cheekbone & give character to the face...also called malar bone

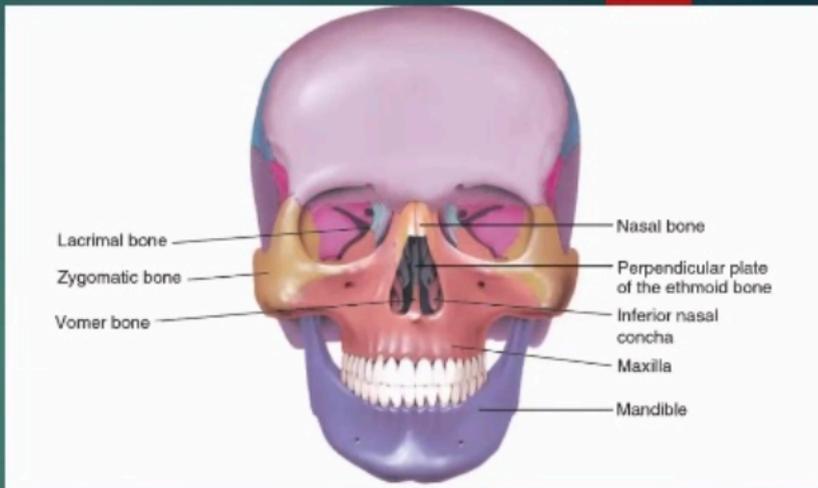
عظام الفك والوجه
التي تتصل بالوجه

- ▶ **Maxilla:** 2 large bones unite in the center in the median suture to form upper jaw...has maxillary sinus & infraorbital frenum (under eye)

الخط الوسطي

عظام الفك والوجه التي تتصل بالوجه

عظام الفك والوجه التي تتصل بالوجه



Facial Bones

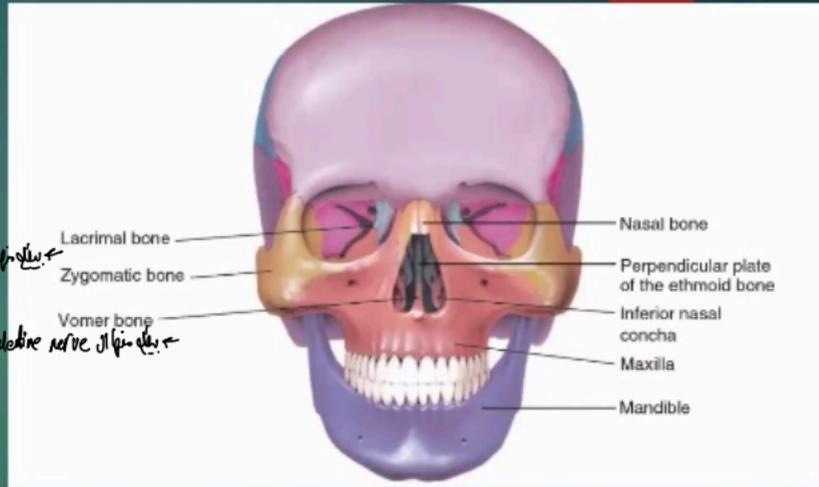
كامل جسم العظام
▶ **Palatine:** 2 bones unite at the median palatine suture to form the hard palate of the mouth & nasal floor. Has many foramina (incisive foramen, greater palatine)

nasopalatine nerve الجفون العظمى ←

greater palatine nerve الجفون العظمى ←

▶ **Nasal:** 2 bones that join side by side to form the arch or bridge of nose

عظم منقوشة للارتكاز

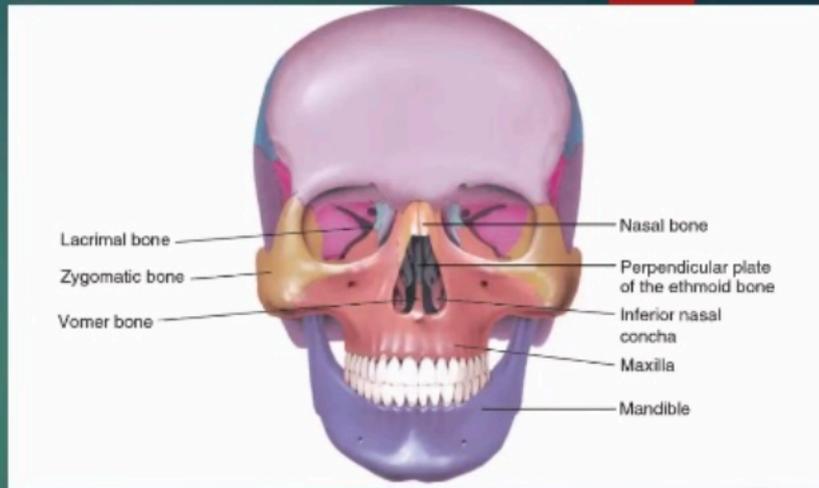


Facial Bones

➤ **Lacrimal:** 2 small bones /
each on inner side of orbital
cavity ..make corner of eye..
has lacrimal ducts. مسؤولة عن إزلاء الدموع من زاوية العين.

➤ **Inferior concha:** 2 thin bones
form lower part of the interior
of the nasal cavity

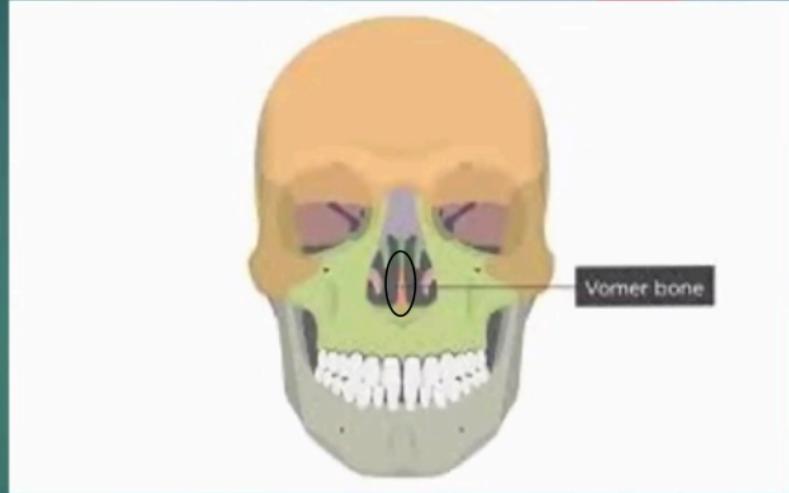
➤ **Mandible:** الأسنان في الفك السفلي one strong bone
that forms lower jaw
الفك السفلي.



Facial Bones

كلمة رامة فقط موجودة في كبريت الأنف لهم الأنف ان جميعت R ك R .

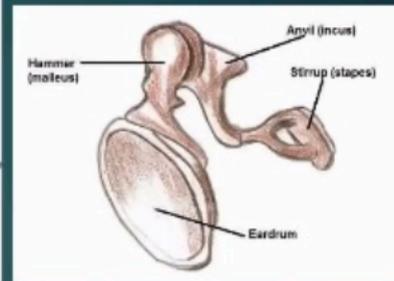
► **Vomer:** a single bone that forms the lower posterior part of the nasal septum / separates the nose into 2 chambers



Miscellaneous Bones of the Skull

► Auditory ossicles:
small bones in the
middle ear:

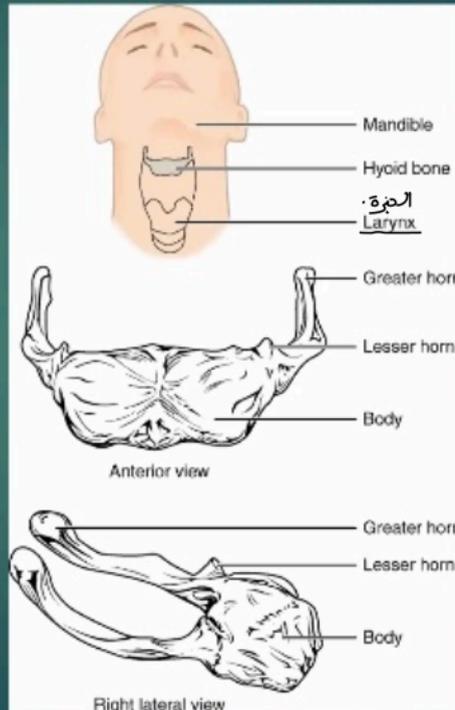
1. **Malleus**
2. **Incus**
3. **Stapes**



المطرقة - السندان - الركاب

Miscellaneous Bones of the Skull

- ▶ **Hyoid bone:** related to dental field but not located in the skull
- ▶ **Horseshoe-shaped bone** lying at base of tongue

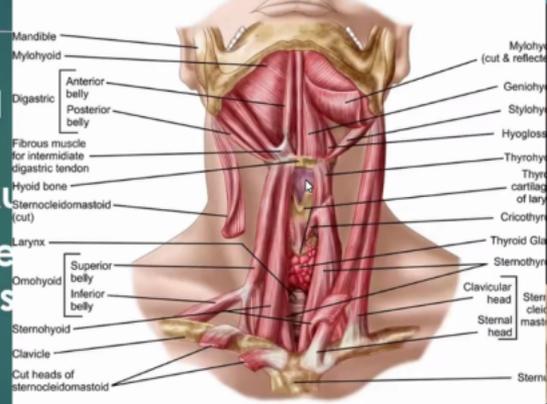


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Miscellaneous

- ▶ **Hyoid bone:** related to dental field but not located in the skull
- ▶ **Horseshoe-shaped bone** lying at base of tongue

صورة توضيحية للعضلات التي تربطها.



Anatomical Features of the Skull

- ▶ ^{الجيوب} Sinuses
- ▶ Bony sutures
- ▶ ^{تحويلات} Processes of skull bones
- ▶ ^{فتحات} Major foramina

Anatomical features of the Skull

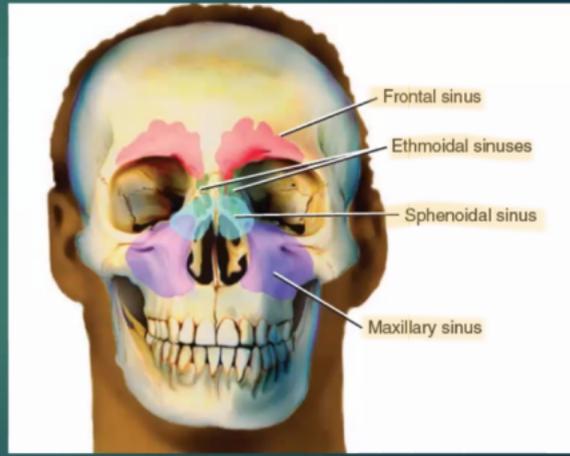
Sinuses

- ▶ Sinus: air pocket or cavity in a bone
- ▶ Receive name from bones in which it's situated

- 1) **Frontal**
- 2) **Ethmoid**
- 3) **Sphenoid**
- 4) **Maxillary..called atrium**

من العظام

من عظام الجيوب التي تسمى
فيها عظم من عظام ال nose & orbit



أفود صفة في

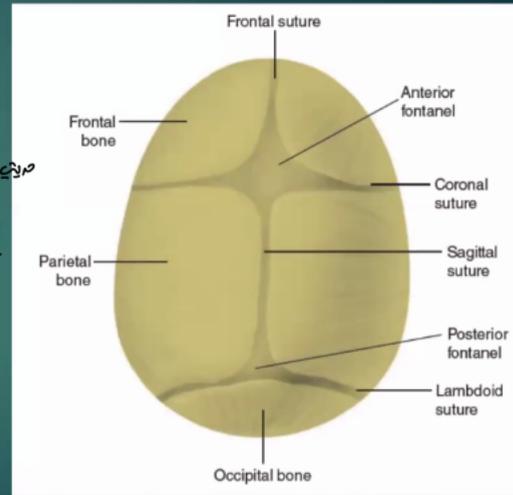
من العظام

Anatomical features of the Skull

Sutures of the skull

▶ A suture: a line where 2 or more bones unite in an immovable joint

1. **Coronal suture**: junction of frontal & parietal bones (soft at birth..fontanel) صينية الورد
2. **Sagittal suture**: union line btw 2 parietal bones
3. **Lambdoid suture**: btw parietal bone & upper border of occipital bone
4. **Temporoparietal suture**: btw parietal & temporal bones



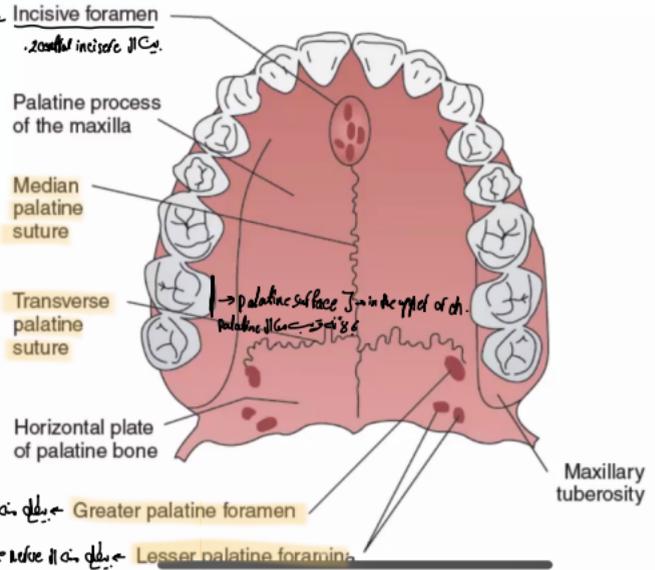
Bone structures of Hard Palate

بظاہر منہ کے nasopalatine کے ساتھ ساتھ
maxilla اور palatine bone کے ساتھ ساتھ
ہوتے ہیں۔

بظاہر منہ کے ساتھ ساتھ

greater palatine foramen کے ساتھ ساتھ

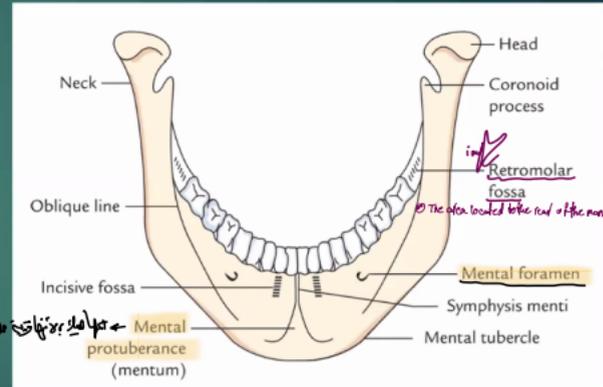
lesser palatine foramen کے ساتھ ساتھ



Anatomical features of the Skull

Processes of skull bone

- ▶ A **process**: a projection or outgrowth of bone
- ▶ Not to be confused with fusion lines where 2 bones develop into one like mandible → The **Symphysis in the center of mandible** & forms chin → chin or **mental protuberance**



Anatomical features of the Skull

Processes of skull bone

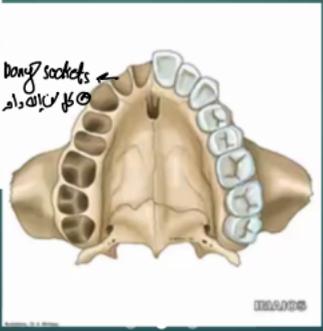
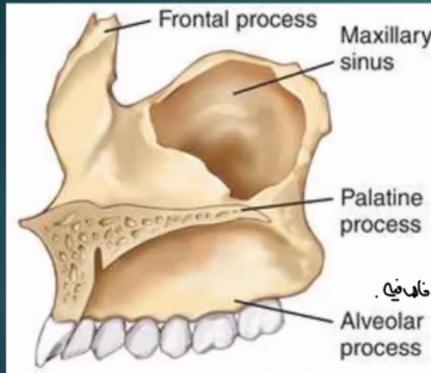
③ هياكل العظام.

▶ 8 main processes related to dentistry

1. Alveolar
2. Condylod
3. Coronoid
4. Frontal
5. Infraorbital
6. Mastoid
7. Pterygoid
8. Styloid

Anatomical features of the Skull

Processes of skull bone



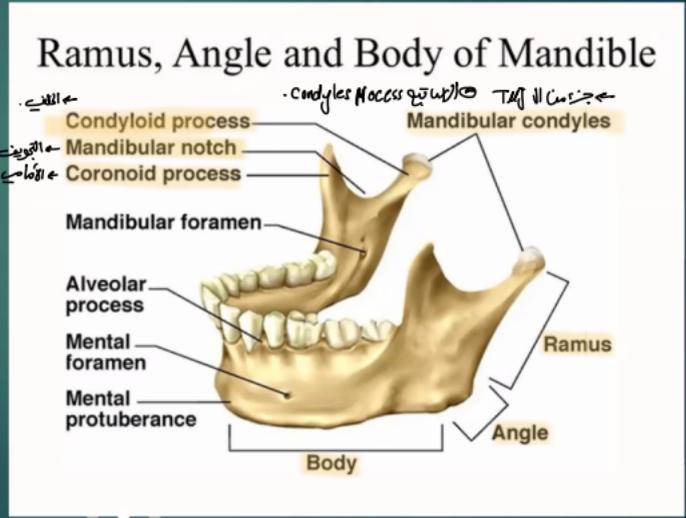
- ▶ Alveolar process: bone growth or border of the maxilla & mandible
- ▶ Forms teeth sockets

Anatomical features of the Skull

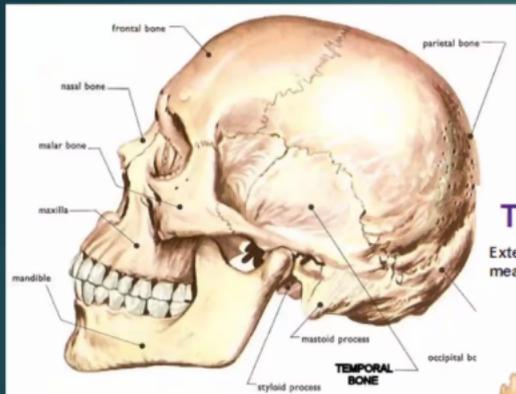
Processes of skull bone

- ▶ **Condyloid:** posterior growth on the **ramus** of the mandible/ articulates with the temporal bone in the **TMJ**
- ▶ **Coronoid:** anterior growth of ramus

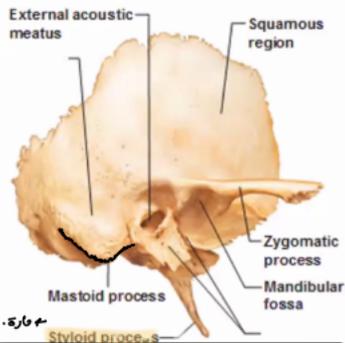
condyloid, coronoid
الجزء الخلفي من الفك السفلي
الجزء الأمامي من الفك السفلي



Processes of the skull



The Temporal Bone



- **Mastoid Process:** growth of temporal bone..used for muscles attachment
- **Styloid Process:** pointed growth of lower part of temporal bone ...attachment of tongue muscles

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Anatomical features of the Skull

هو شئ يتصل على طول الأضلاع العنقية والجمجمة
foramina

Foramina of the skull

- ▶ A foramen: an opening or hole in the bone for nerve and blood vessel passage
- ▶ Knowing the location of many foramina is important → anaesthesia injections

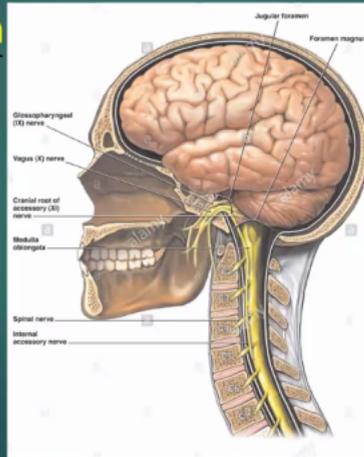
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Anatomical features of the Skull

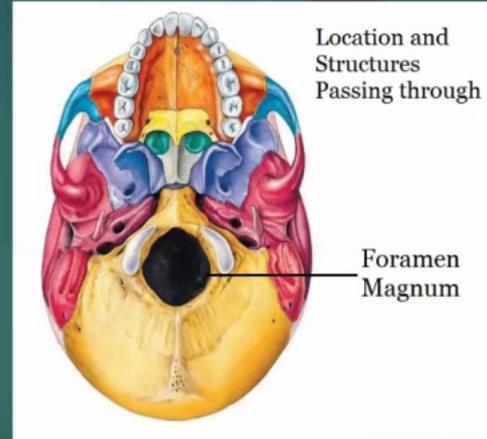
Foramina of the skull

قنوات في الجمجمة التي يمر بها الأعصاب

▶ Foramen Magnum



alamy stock photo

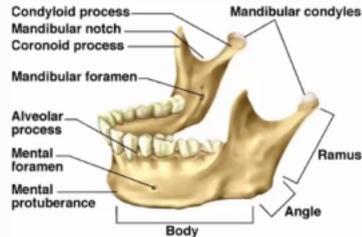


Anatomical features of the Skull

Foramina of the skull

- ▶ Mandibular foramen
- ▶ Mental foramen
- ▶ Lingual foramen

Ramus, Angle and Body of Mandible

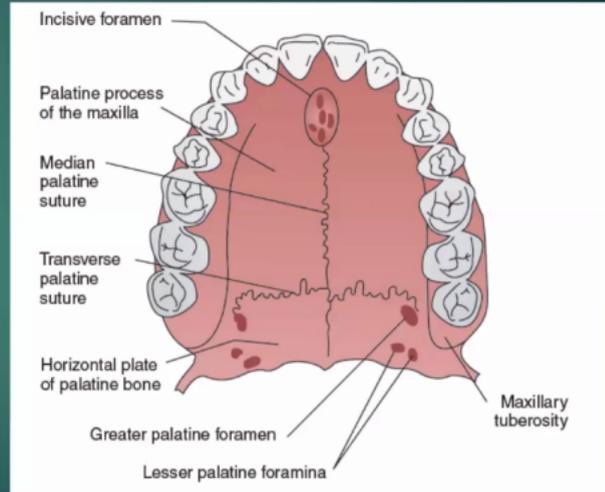


Anatomical features of the Skull

Foramina of the skull

- ▶ Incisive foramen
- ▶ Palatine foramen

 1. Lesser palatine foramen
 2. Greater palatine foramen

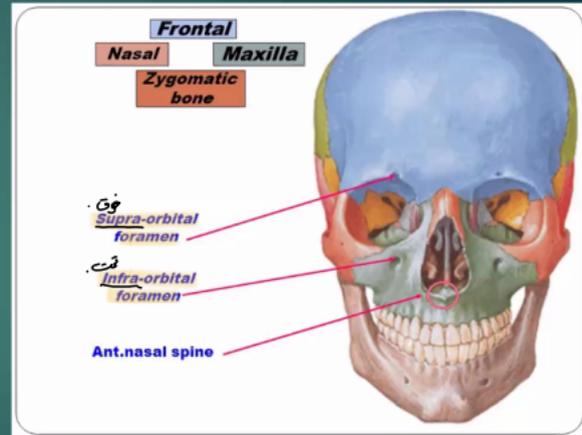


Anatomical features of the Skull

Foramina of the skull

- ▶ Supraorbital foramen
- ▶ Infraorbital foramen
- ▶ Zygomaticofacial foramen

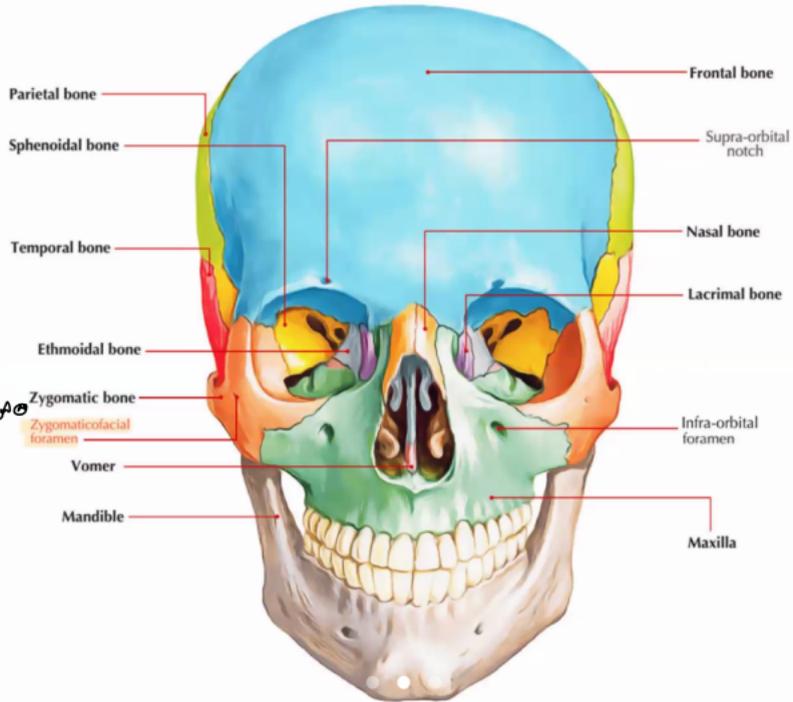
Infra-orbital foramen



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Anat Fora

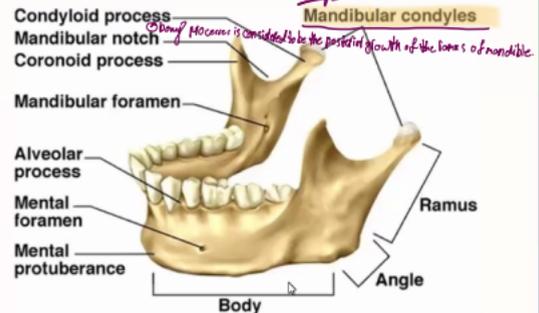
- ▶ Su
- ▶ Inf
- ▶ Zyg



Landmarks and features of the Mandible

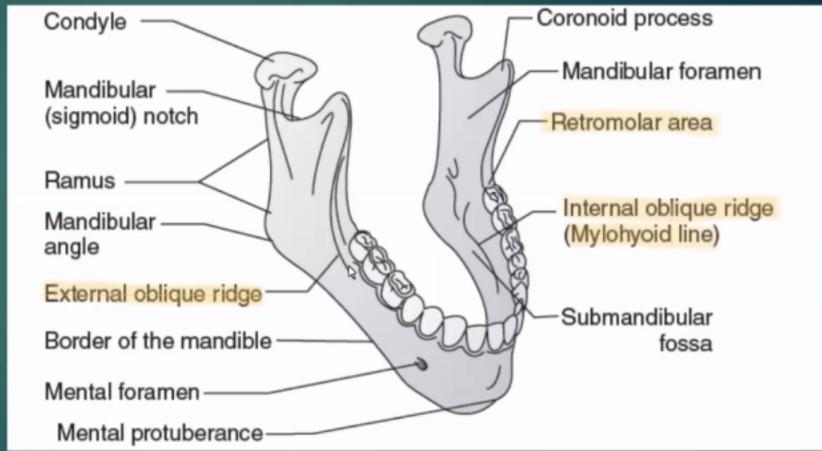
- ▶ **Ramus:** ascending part of mandible
- ▶ **Angle of mandible**
- ▶ **Mandibular notch:** *Sigmoid* Sigmoid notch
- ▶ **Symphysis:** Mental Protuberance

Ramus, Angle and Body of Mandible



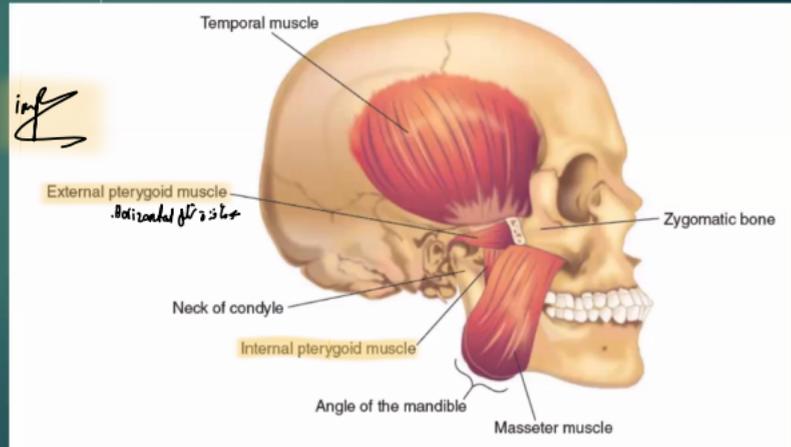
Landmarks and features of the Mandible

- oblique line = oblique ridge*
- ▶ **Mylohyoid ridge**
 - ▶ **Oblique line** → external.
 - ▶ **Retromolar area** → internal.
- cab*



Muscles of Mastication

- ▶ Mastication or chewing is controlled by a pair (right-left) of muscles
- ▶ 4 major muscles:
 - 1) **Temporal**
 - 2) **Masseter**
 - 3) **Internal pterygoid**
 - 4) **External pterygoid**

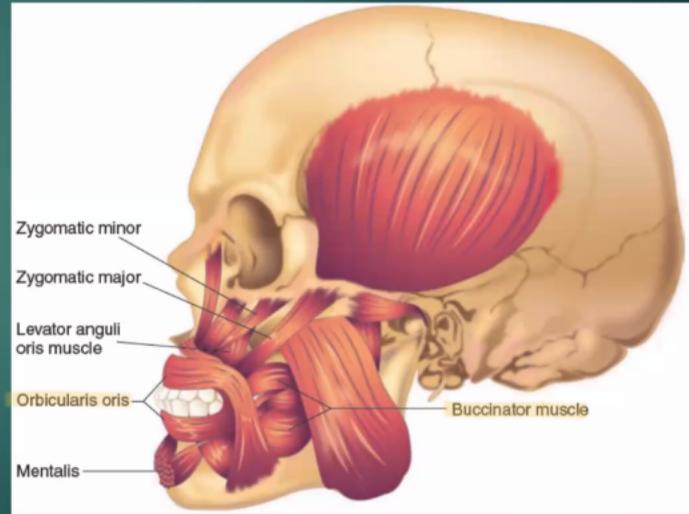


سے ماہم علاقہ نامہنغ ومان ہم نا نویسے .

Other muscles related to dentistry

سے الفللا راہ نولع الاز

- ▶ **Orbicularis oris:** circular muscle surrounding the mouth → compacts, compresses & protrudes lips
- ▶ **Buccinator:** principle cheek muscle
سے تامحق تطوبت الذر
- ▶ **Mentalis:** muscle of the chin → moves the chin & raises or lowers lower lip
سے تامحق فر حرة الازق



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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
Dr. Sajida insallata

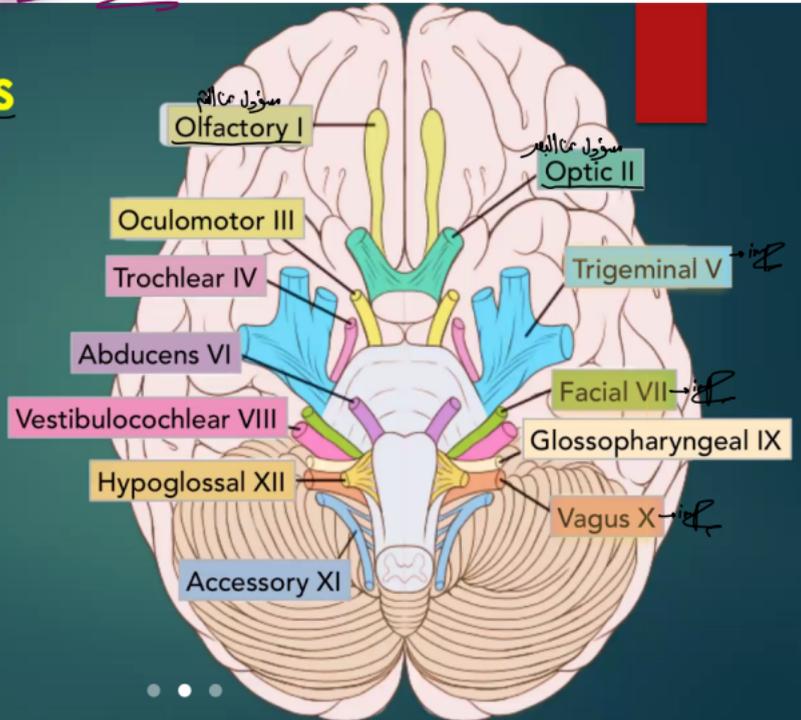
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Cranial nerves

له نماذج في الامتحان

- ▶ 12 pairs of nerves
- ▶ Each pair is numbered
- ▶ One of each pair on left and one on right
- ▶ Could be **sensory S** or **motor M** or **mixed (B for Both)**



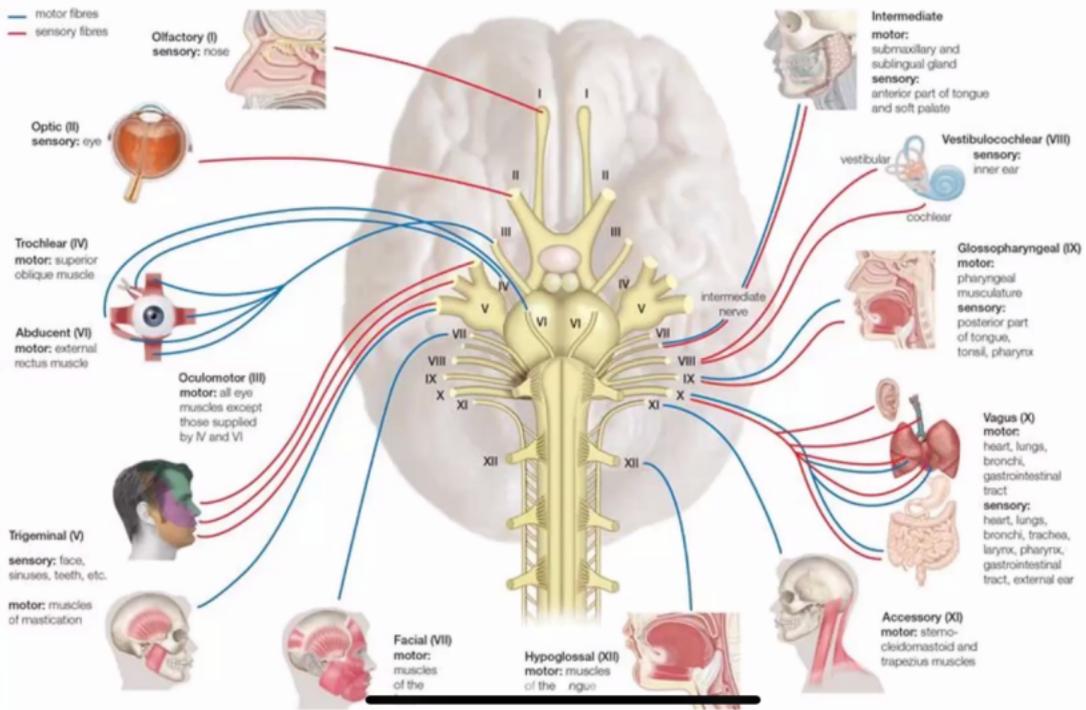


Table 2-1 The Cranial Nerves and Their Function

Nerve	Type	Meaning
I Olfactory (ol- FACK -toh-ree)	S	olfact – <i>smell</i>
II Optic	S	optic – <i>eye</i>
III Oculomotor (auk-you-loh- MOE -tor)	M	oculo – <i>eye</i> , motor – <i>movement</i>
Nerve	Type	Meaning
IV Trochlear (TRAH -klee-ur)	M	trochle – <i>small pulley</i>
V Trigeminal (try- JEM -in-al)	B S+M	tri – <i>three</i> , geminal – <i>branches</i>
VI Abducens (AB -due-sense)	M	ab – <i>away</i> , ducens – <i>to lead</i>
VII Facial (FAY -shal)	M	facial – <i>pertaining to the face</i>

VIII Vestibulocochlear (ves- tib -you-loh- COCK -lee-ar) also termed acoustic nerve	M	vestibulo – <i>small opening or cavity</i> , cochlear – <i>snail like</i>
IX Glossopharyngeal (gloss -oh-fair-en- JEE -al)	M	glosso – <i>tongue</i> , pharyngeal – <i>throat area</i>
X Vagus (VAY -gus)	M	vaga – <i>vagrant, wander</i>
XI Accessory (ack- SESS -ore-ee)	M	access – <i>assist, help out</i>
XII Hypoglossal (high -poe- GLOSS -al)	M	hypo – <i>under</i> , glosso – <i>tongue</i>

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Trigeminal Nerve V

- ▶ One of the 12 cranial nerves
- ▶ Motor & sensory
- ▶ Emerges from brain & branches at Gasserian ganglion
- ▶ Ganglion: mass of nerves

Has 3 divisions:

- 1) Ophthalmic
- 2) Maxillary
- 3) mandibular

هو إلى ههنا هنا

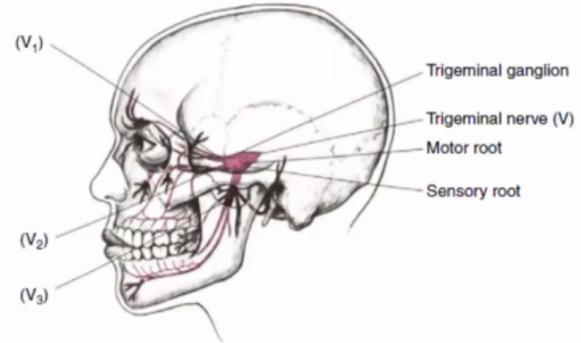


Figure 39-37. Trigeminal nerve distribution. (From Fehrenbach MJ, Herring SW: *Illustrated anatomy of the head and neck*, ed 3, St Louis, 2007, Saunders.)

Trigeminal Nerve branches

Ophthalmic V1

- ▶ Smallest division of V (sensory)
- ▶ Branches off Trigeminal ganglion
- ▶ Gives off 3 branches:
 - 1) Nasociliary nerve
 - 2) Frontal nerve
 - 3) Lacrimal nerve

Trigeminal Nerve branches

Maxillary V2

- ▶ Sensory division
- ▶ Arises from trigeminal ganglion
- ▶ Exits cranium from foramen rotundum
- ▶ Passes into pterygopalatine fossa
- ▶ Gives off the following branches:

1. Pterygopalatine nerves
2. Posterior superior alveolar nerve
3. Infraorbital nerve
4. Zygomatic nerve

حرف الی
حرف الی



Maxillary nerve V2 branches

الأول دلائل ظهورها في العنبر والمثلثية من العنبر

▶ Pterygopalatine nerves:

▶ Greater palatine

← يطلق على ال greater palatine nerve
 في تيمت وكان ديفيزي || palatine bone
 ← palatine recessa
 لـ هيشان التيمت

▶ Middle palatine

▶ Posterior / lesser palatine

▶ Nasopalatine

← يطلق على ال incisive foramen
 في تيمت وكان ديفيزي
 ← bone ← K₂ central il Lu

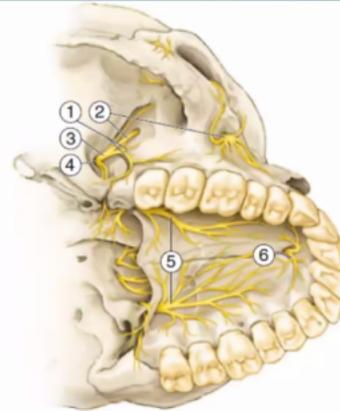


Figure 39-38. Distribution of the maxillary division (V₂). 1, Posterior superior alveolar branches; 2, infraorbital nerve; 3, maxillary nerve; 4, foramen rotundum; 5, greater palatine nerve; 6, nasopalatine nerve. (Data from Haglund J, Evers H: *Local anaesthesia in dentistry*, ed 2, Södertälje, Sweden, 1975, Astra Läkemedel.)

Maxillary V2 branches

Posterior superior alveolar nerve

- ▶ Descends from main trunk of V2 before it enters infraorbital canal
- ▶ Provides sensory innervation to the:

1. Pulp
2. Osseous tissues (bone)
3. Periodontal ligaments
4. Facial gingiva of maxillary molars

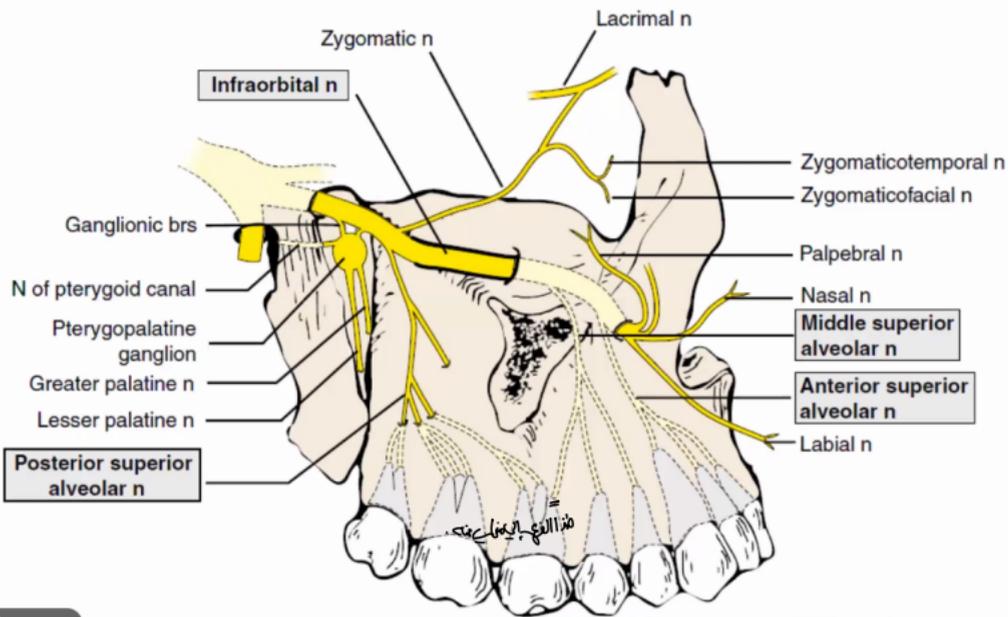
gum / gingiva .bone



Maxillary third, second and first molars EXCEPT mesiobuccal root of 1st molar

٥ سواله ٧ جزور داسنهم ملتزمه من.

٥ لانيجي بنا تلوس من مندر العصب ابي موجود في ال pulp + العصب ابي مربوط في ال root ١م ١٢.



Trigeminal Nerve branches Mandibular V3

٥ فروع إلى بلون both

▶ Sensory & motor (mixed)

▶ Has many branches:

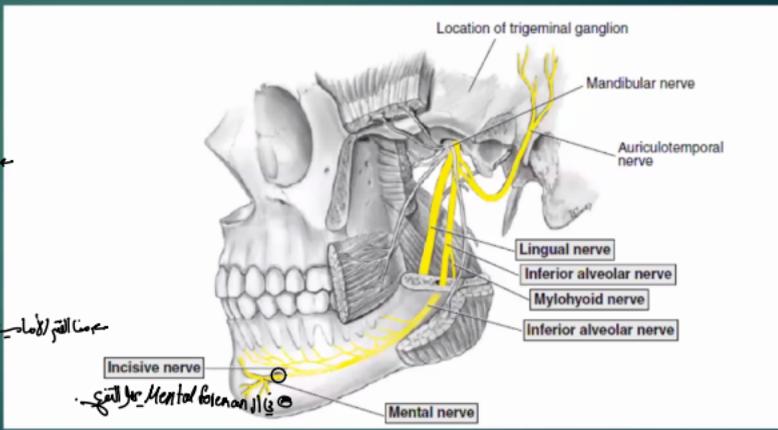
▶ Inferior alveolar ← يقوم بتزويد دهان الفم بالمغذيات

▶ Mental ← لا ينفذ رزق الدم

▶ Incisive ← ينفذ رزق الدم

▶ Buccal (long buccal) ← من الفم إلى الأذن

▶ Lingual



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Blood Supply of the Cranium

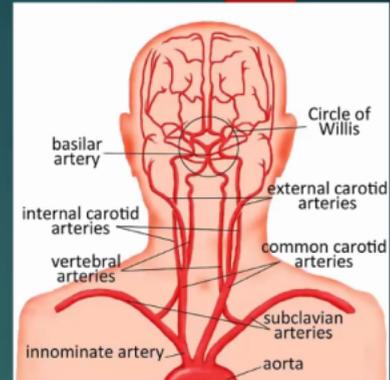
- ▶ **Arteries & veins & capillaries**
- ▶ **Arteries:** carry oxygenated blood away from the heart
- ▶ **Veins:** take deoxygenated blood to the heart
- ▶ **Focus in dentistry:**
- ▶ **Carotid artery** ^{عظام}
- ▶ **Jugular veins**



Carotid artery

Common carotid artery
أ. شريانية عامة

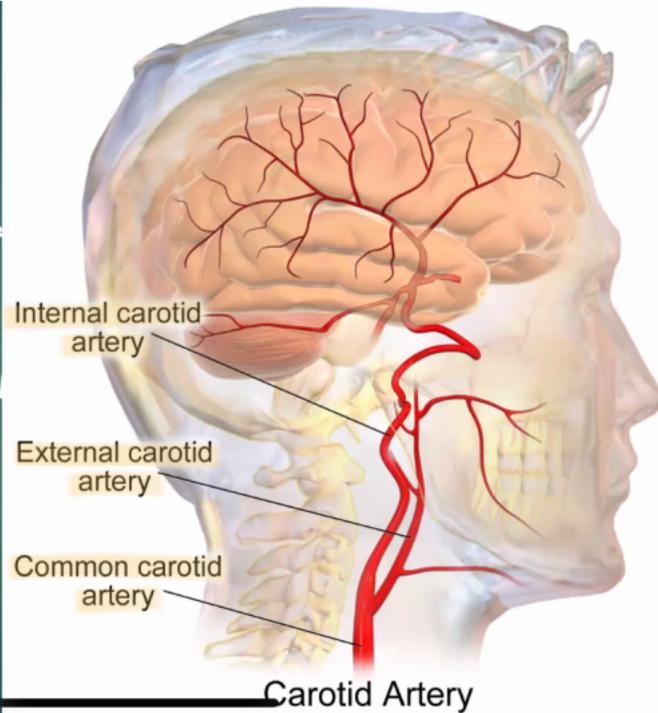
- ▶ Rises from the aorta (right & left)
- ▶ Divides into:
 - 1) Internal carotid artery:
provides blood supply to the brain & eyes
 - 2) External carotid artery



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Carotid artery

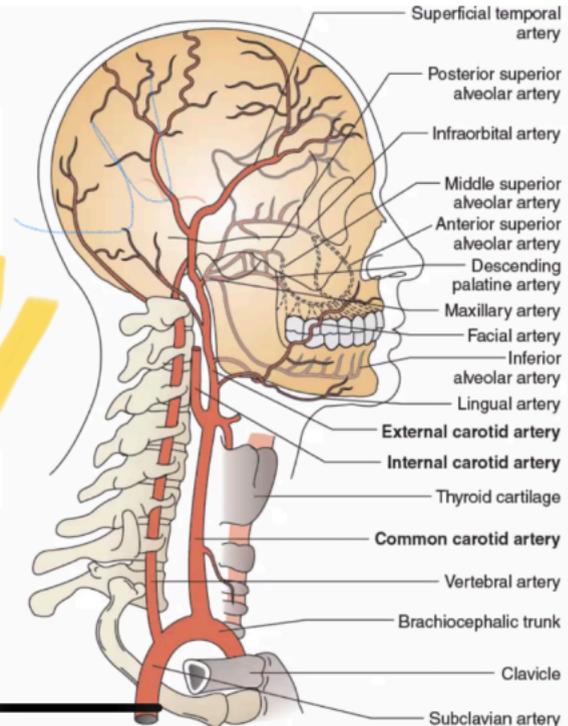
- ▶ Rises from the aorta (right & left)
- ▶ Divides into:
 - 1) **Internal carotid artery:** provides blood supply to the brain & eyes
 - 2) **External carotid artery**



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External Carotid Artery

- ▶ Provides blood supply to throat, face, mouth, tongue and ears
- ▶ Many branches namely:
 - 1) **Infraorbital** (under eye orbit)
 - 2) **Inferior alveolar** (lower alveolar process)
 - 3) **Facial** (pertaining to face)
 - 4) **Lingual** (tongue)
 - 5) **Maxillary**

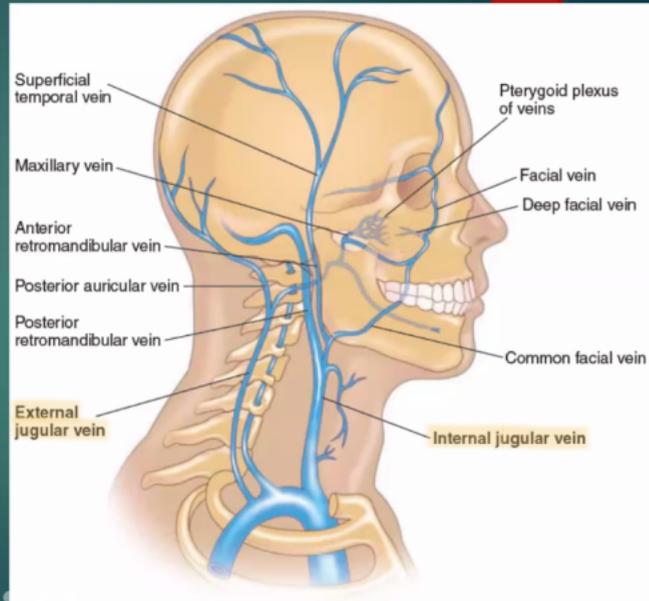


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Jugular vein

- ▶ Carries blood from head to heart
- ▶ Has 2 divisions:
- ▶ **Internal jugular vein:** collects & drains blood from brain, cranium, face & neck
- ▶ **External jugular vein**

القريب يوصل الدم إلى Superior vena cava



الغدد اللعابية Salivary Glands

← سلكة من تجاويفها

▶ **Secrete saliva**

← مادة موجودة في فمنا اللعاب

▶ **Minor salivary glands**

⊕ مطلوب منا في الامتحان ال duct

▶ **Major salivary glands which are:**

⊕ الفمقة عند الاطفال

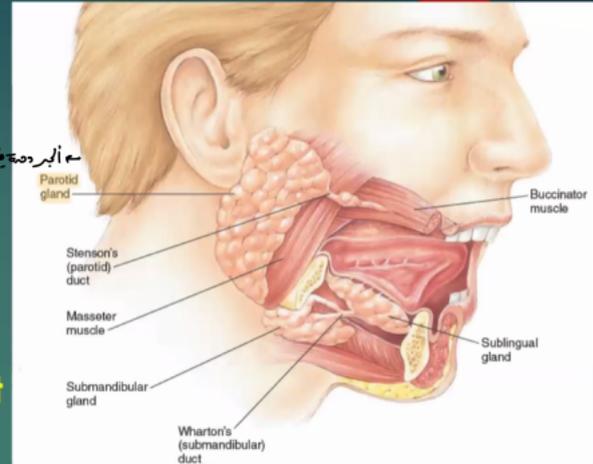
1. **Parotid ...largest / Stenson's duct**

2. **Submandibular ...smaller / Wharton duct**

⊕ في الفم اللسان في ال mouth على مستوى

2 central incisors d lingual surface

3. **Sublingual ... smallest / multiple ducts**



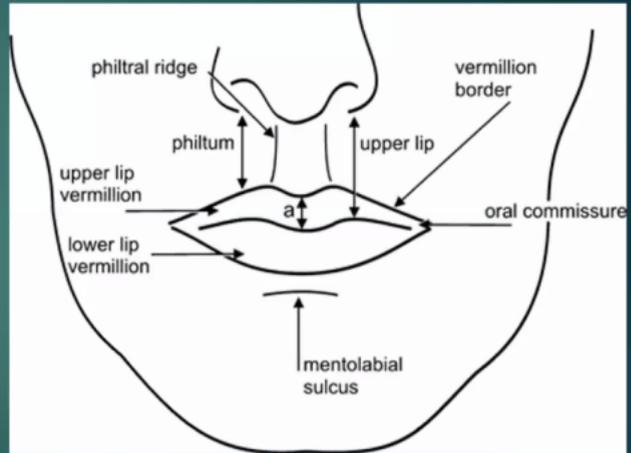
REC

Important Structures in the Oral Cavity

- ▶ Labia (lips)
- ▶ Frenum سما أُنْبِيَّةٌ مَوْجُودَةٌ رَافِعُ اللِّغَةِ
- ▶ Tongue لِسَانٌ structures
- ▶ Palate structures
- ▶ Miscellaneous oral cavity structures

Lips / labia

- ▶ **Superior oris** (upper lip) مصفاها lip، الثقب بالانسي
- ▶ **Inferior oris** (lower lip)
- ▶ **Labial commissure** (corners of mouth) رأبغ في التي
- ▶ **Vermillion border** (where pink-red lip tissue meets facial skin) الحد الذي يفصل بين التي واللحم
- ▶ **Philtrum** (median groove in the center external surface of upper lip) خوف التي والقبلي الأذن





REC

Frenum تissue take triangular shape.

▶ Triangular piece of tissue that attach tongue, each lip, cheek to the oral membrane

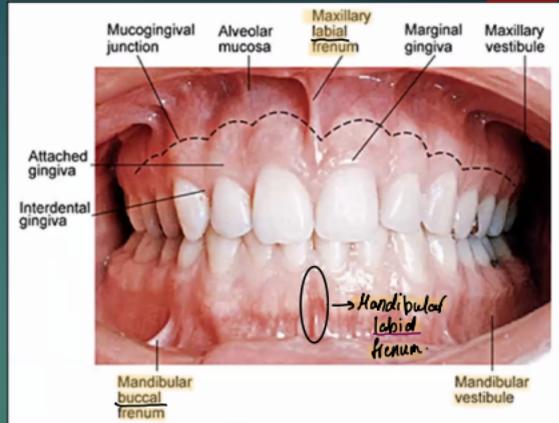
▶ **Frena** (plural frenum)

▶ 5 major frena:

▶ **Labial frenum** (2 tissues)

▶ **Lingual frenum** (1 tissue)

▶ **Buccal frenum** (2 tissues)

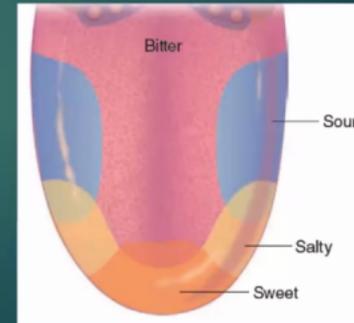
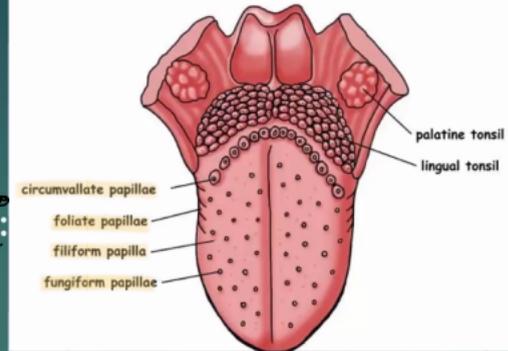


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Tongue

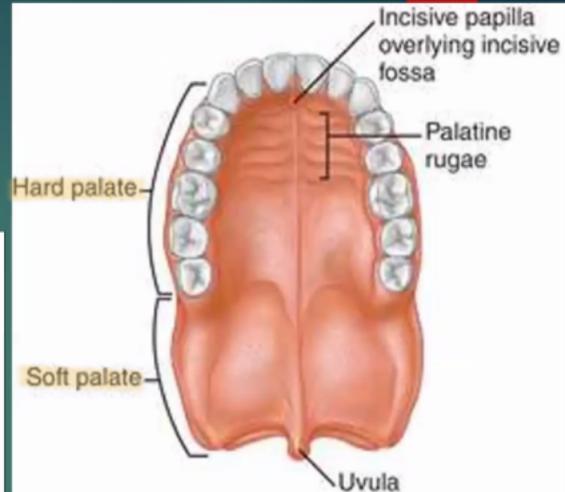
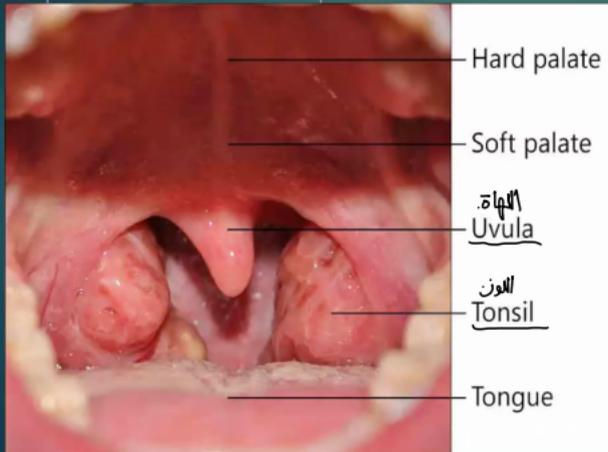
- ▶ **Glossa** = latin for tongue
- ▶ Has **papillae** (tissue growth) / **taste buds**:
نُدُوق الطعم المر / اللذيذ.
- ▶ **Circumvallate**: v-shaped on dorsum of tongue → **bitter taste** الطعم المر
- ▶ **Filiform**: smallest / covers entire dorsal aspect of tongue
- ▶ **Fungiform**: small dark red / middle & anterior & sides of tongue / sweet, salty taste
- ▶ **Foliate**: posterior lateral borders / sour taste

الطعم الحامض / الحامض



Palate Structures

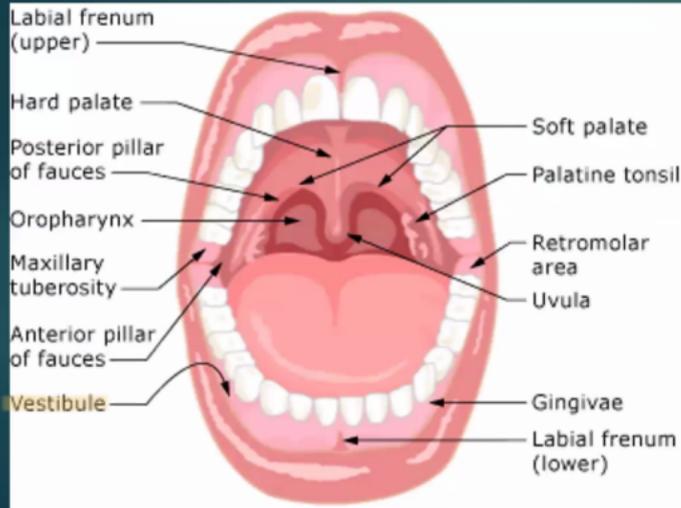
- ▶ Hard palate
- ▶ Soft palate



منطقة التي تطل على (cheek) في mucosa البتة استرجاع

REC

Vestibule



▶ **Labial vestibule:** area btw lips and teeth

▶ **Buccal vestibule:** area btw cheek and teeth

