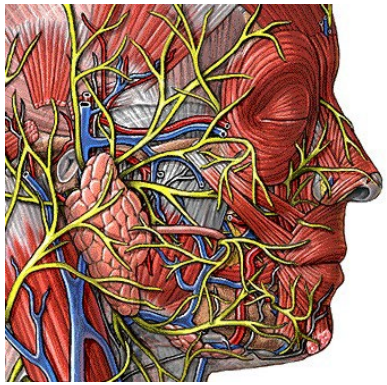
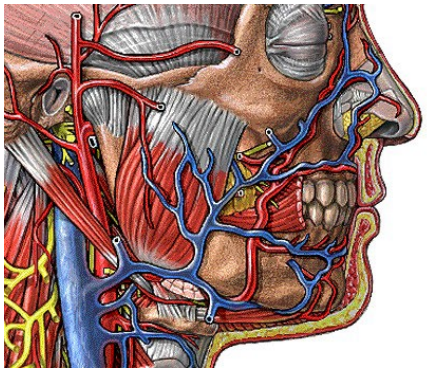
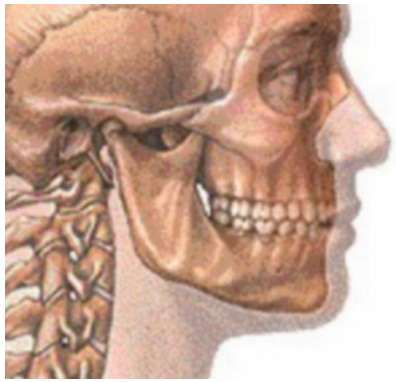
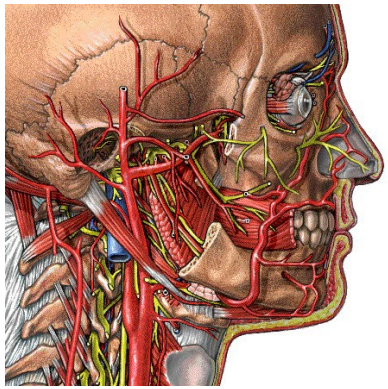
PAROTID AND INFRATEMPORAL REGIONS

DISSECTION OF INFRATEMPORAL FOSSA - Superficial to Deep









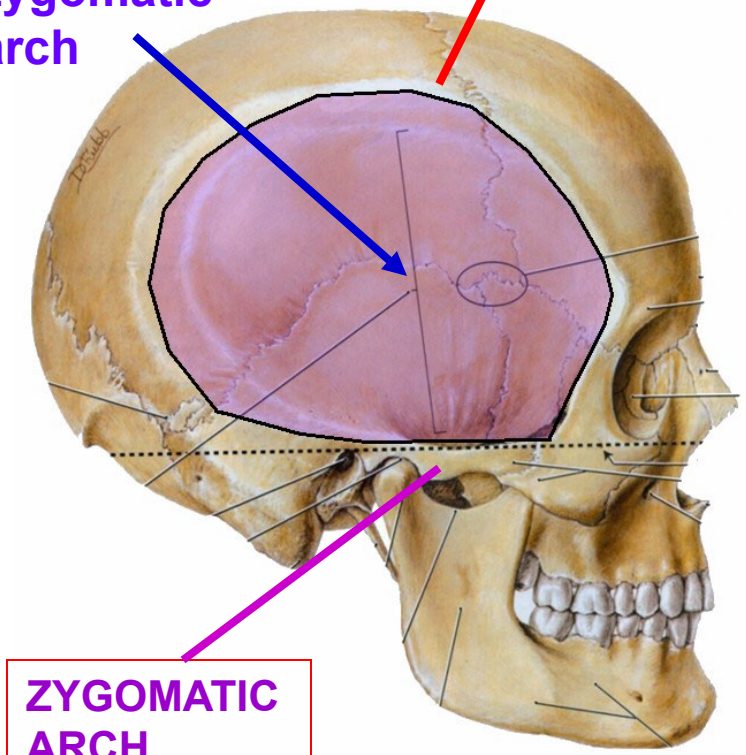
OUTLINE

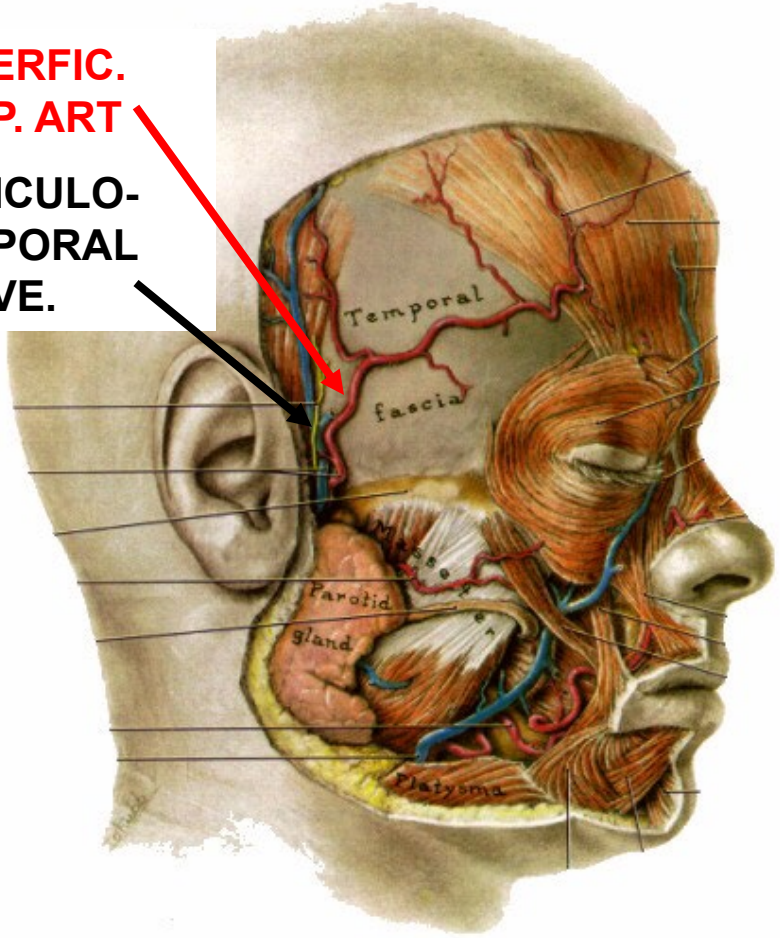
I. TEMPORAL FOSSA
II. INFRATEMPORAL FOSSA
III. MAXILLARY ARTERY
IV. PTERYGOID VENOUS PLEXUS
V. TEMPORO-MANDIBULAR JOINT (TMJ)
VI. MUSCLES OF MASTICATION
VII. PAROTID REGION

COMPLEX, CLINICALLY IMPORTANT AREA - source of blood supply to nasal cavity, calvarium, oral cavity, middle ear; location of muscles of mastication

I. TEMPORAL FOSSA

TEMPORAL FOSSA - area above zygomatic arch





BOUNDARIES:

SUP. - SUPERIOR TEMPORAL LINE

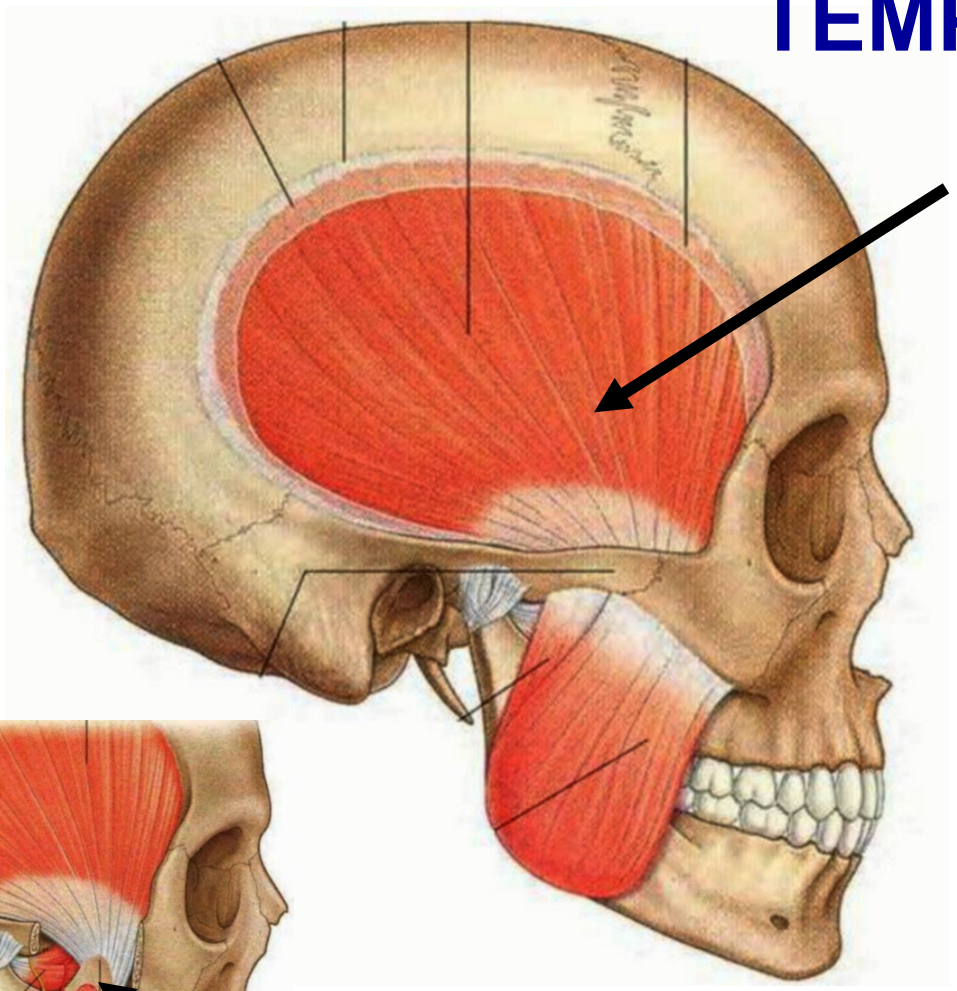
INF. - ZYGOMATIC ARCH

CONTAINS

1) **SUPERFICIAL TEMPORAL ARTERY**

2) **AURICULO-TEMPORAL NERVE (V3)**

TEMPORAL FOSSA

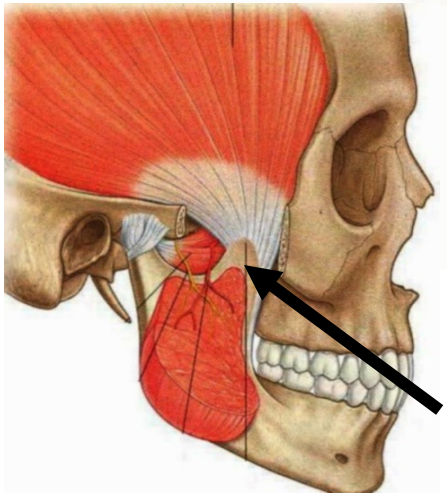


TEMPORALIS MUSCLE

CONTAINS

1) TEMPORALIS MUSCLE

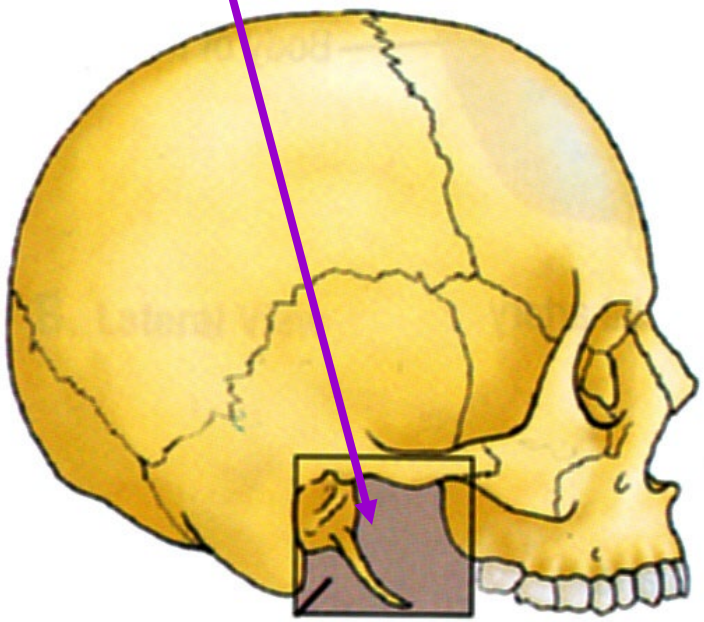
2) DEEP TEMPORAL ARTERIES AND NERVES (DEEP TO TEMPORALIS MUSCLE)

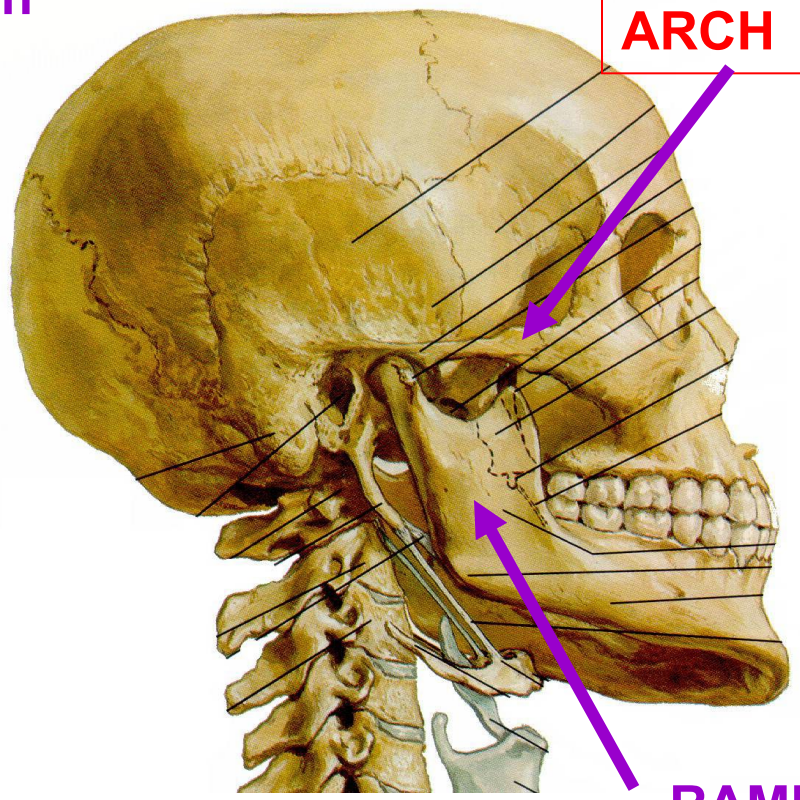


TEMPORALIS MUSCLE INSERTS TO MANDIBLE (CORONOID PROCESS) MEDIAL TO ZYGOMATIC ARCH

II. INFRATEMPORAL FOSSA

INFRATEMPORAL FOSSA -
area inferior to zygomatic arch



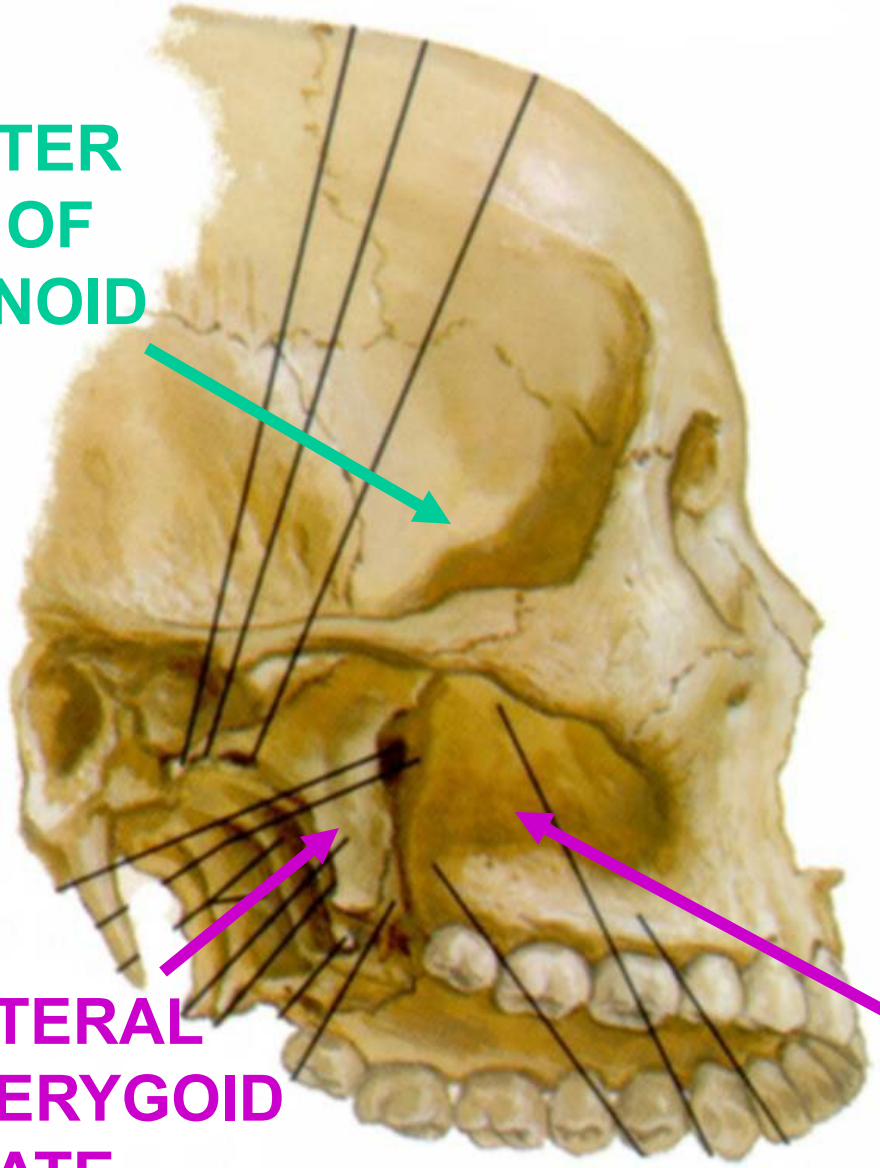


ZYGOMATIC ARCH

RAMUS OF MANDIBLE

BOUNDARIES
SUPERIOR - ZYGOMATIC ARCH
LATERAL - MANDIBLE (RAMUS)

INFRATEMPORAL FOSSA – remove mandible



GREATER WING OF SPHENOID

SUPERIOR BOUNDARY ALSO - GREATER WING OF SPHENOID

MEDIAL- LATERAL PTERYGOID PLATE

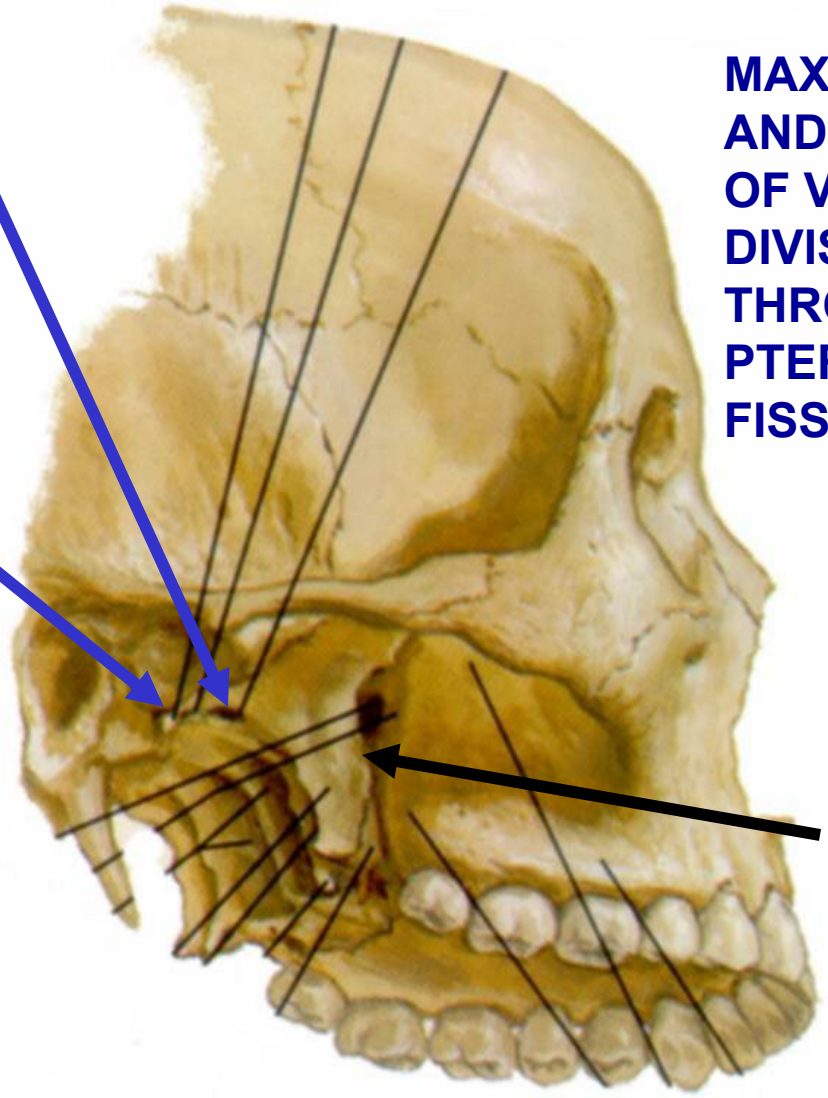
ANTERIOR - POST.SIDE MAXILLARY BONE

LATERAL PTERYGOID PLATE

INFRATEMPORAL FOSSA: FORAMINA

FORAMINA

1. **FORAMEN OVALE - V3; ACCESSORY MENINGEAL ARTERY;**
2. **FORAMEN SPINOSUM - MIDDLE MENINGEAL ARTERY AND NERVOUS SPINOSUS**
3. **MANDIBULAR FORAMEN - INFERIOR ALVEOLAR NERVE, ARTERY, VEIN**



MAXILLARY ARTERY AND BRANCHES OF V2 (MAXILLARY DIVISION OF V) PASS THROUGH PTERYGOMAXILLARY FISSURE

4. **PTERYGO-MAXILLARY FISSURE –** LEADS TO **PTERYGO-PALATINE FOSSA**

MANDIBLE (= JAW BONE) - PARTS AND LANDMARKS

MANDIBULAR NOTCH

CONDYLE

NECK

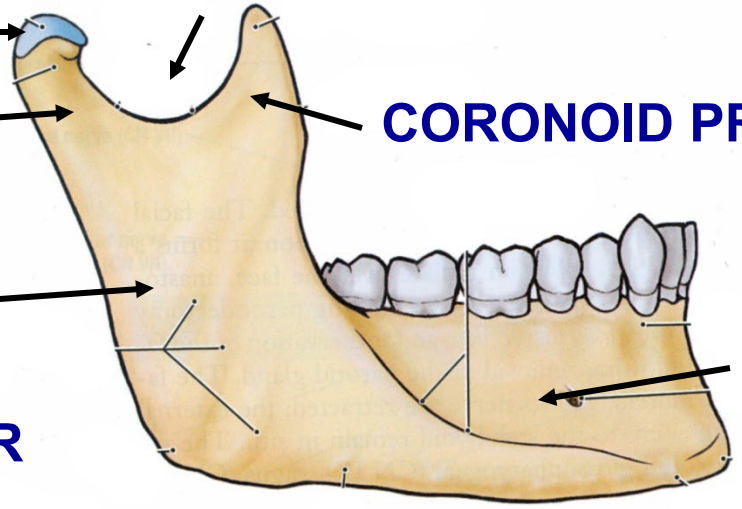
CORONOID PROCESS

MANDIBLE-
JAW BONE
PARTS AND
LANDMARKS

RAMUS

BODY

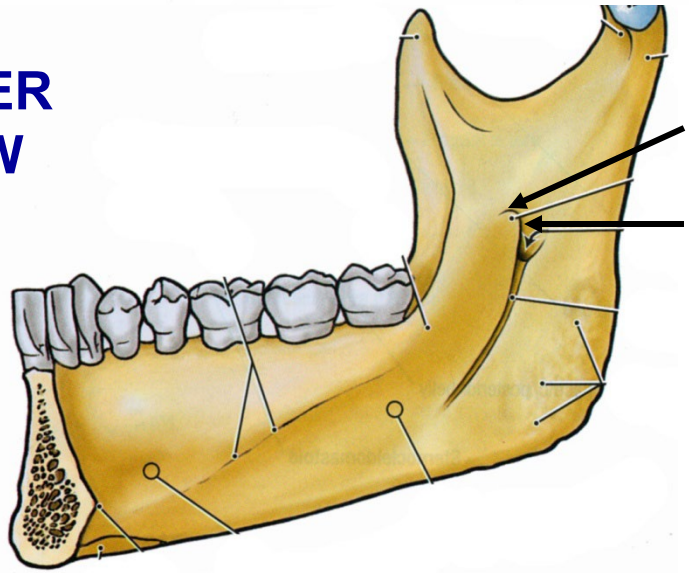
OUTER
VIEW



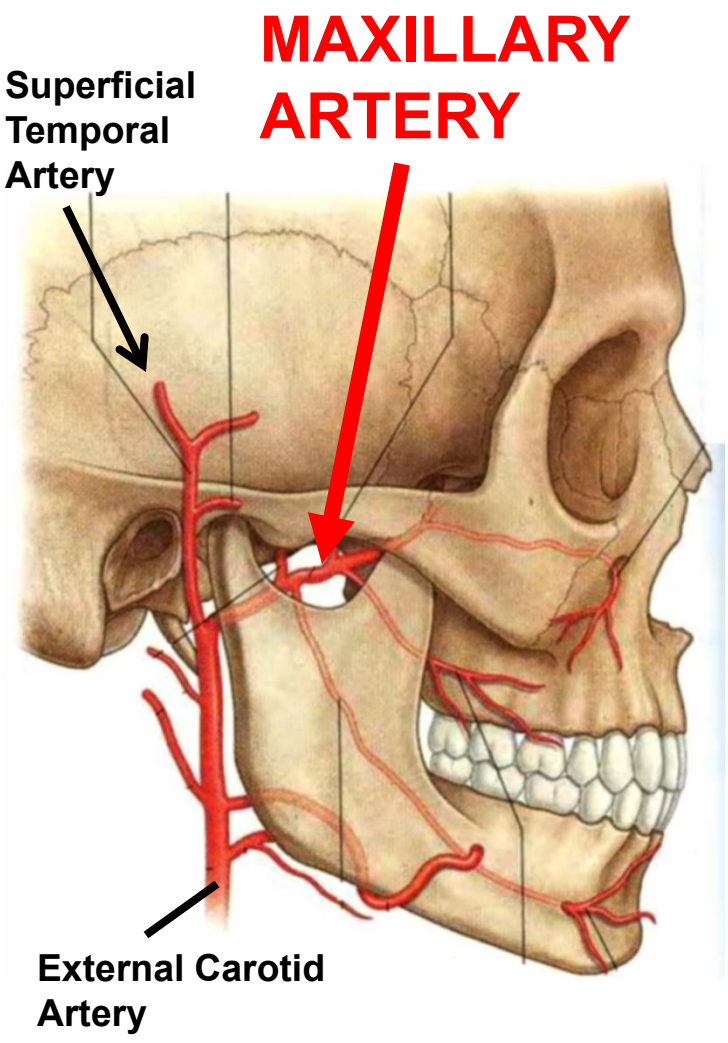
INNER
VIEW

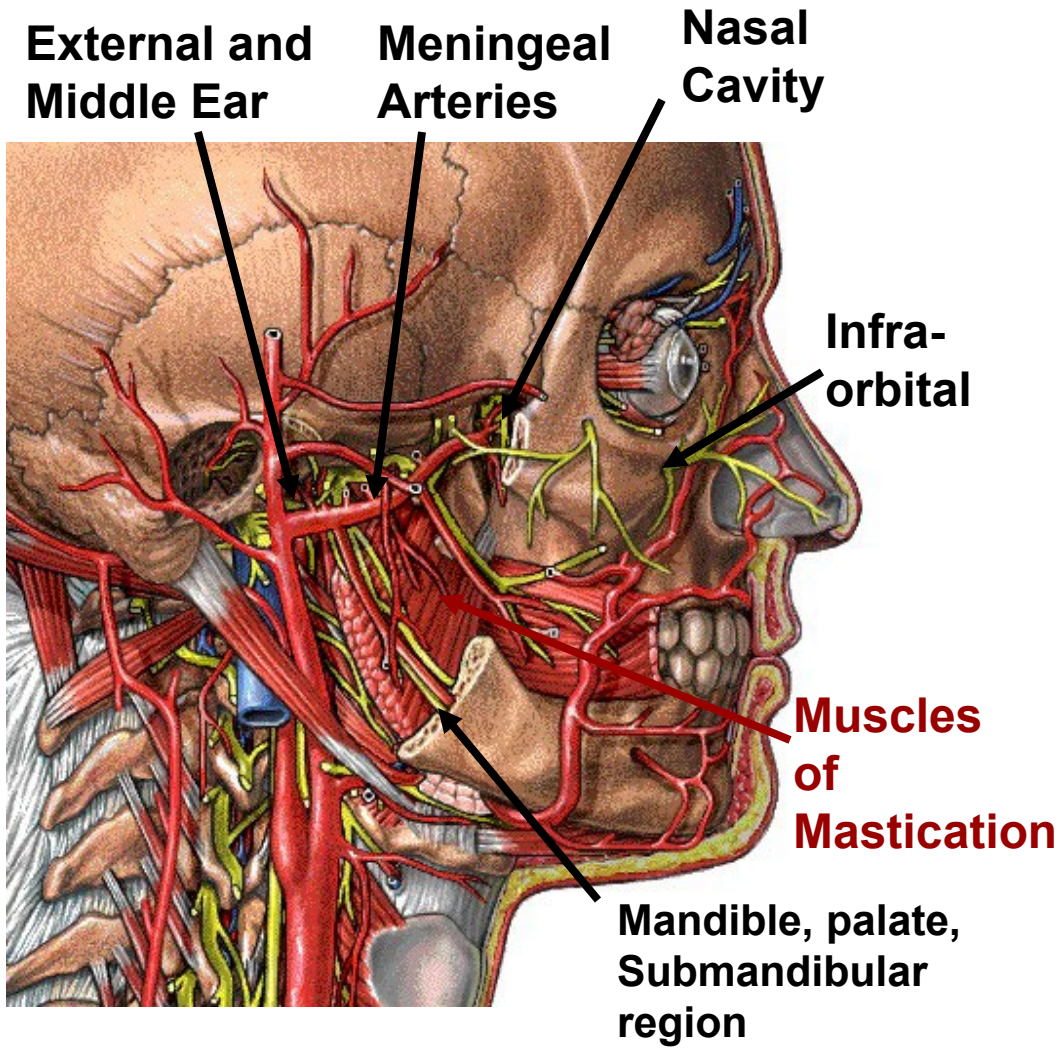
LINGULA

MANDIBULAR
FORAMEN



INFRATEMPORAL FOSSA, MAXILLARY ARTERY

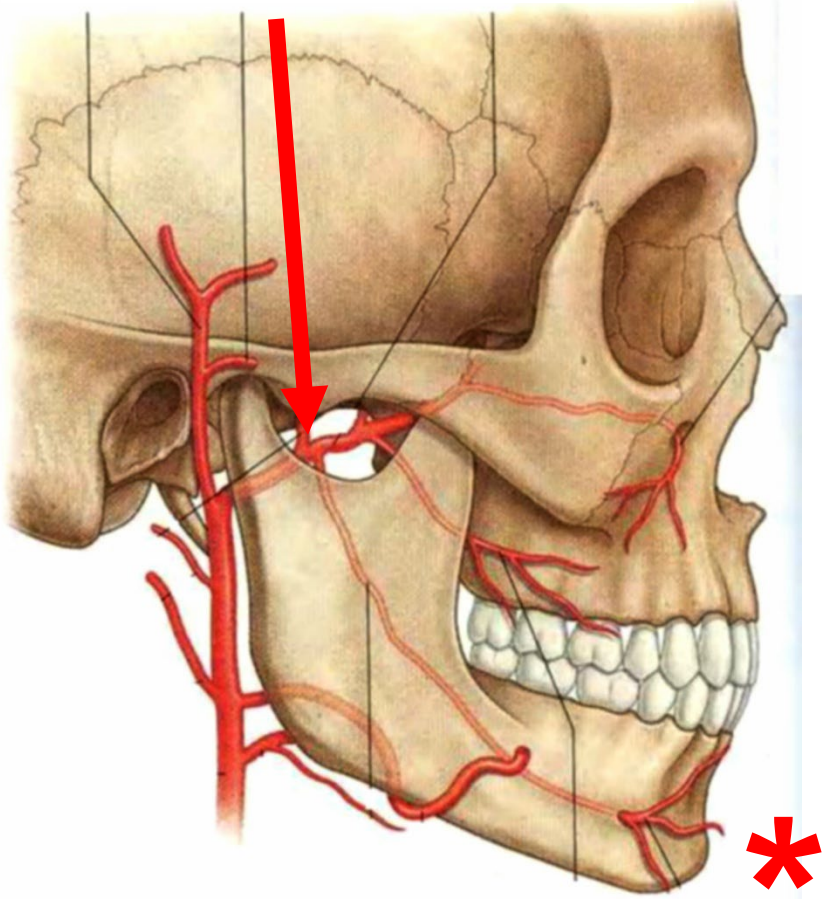




COMPLEX, CLINICALLY IMPORTANT AREA - source of blood supply to nasal cavity, calvarium, oral cavity, middle ear; location of muscles of mastication

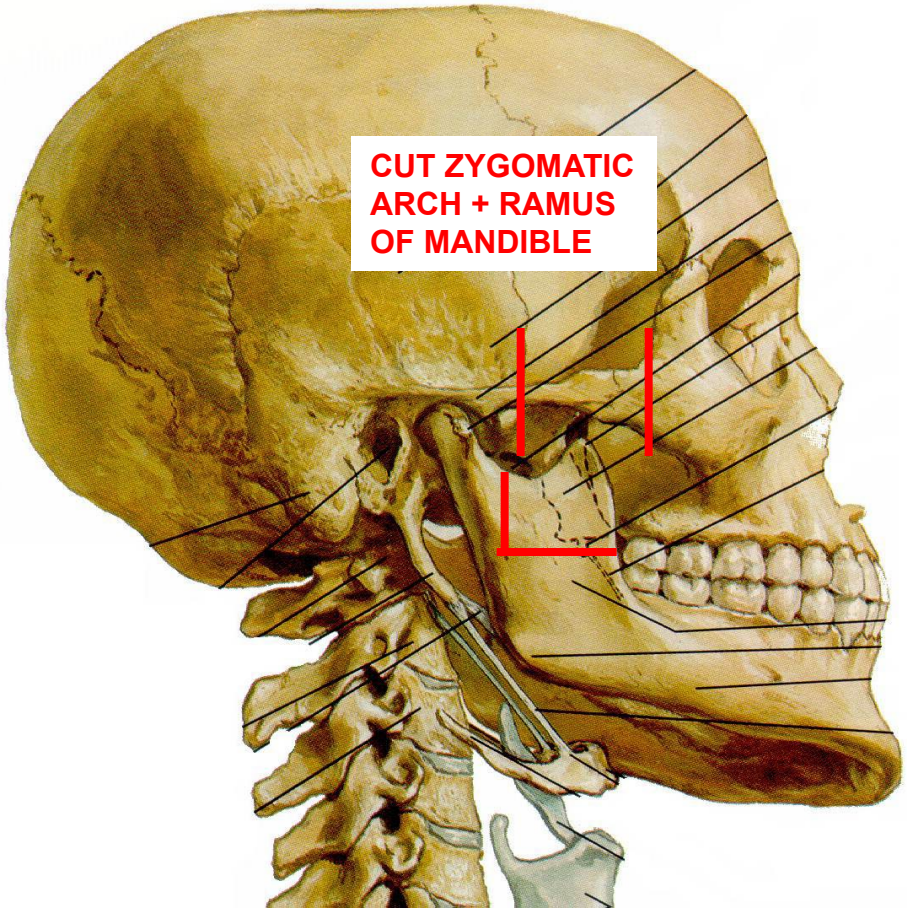
INFRATEMPORAL FOSSA

MAXILLARY ARTERY



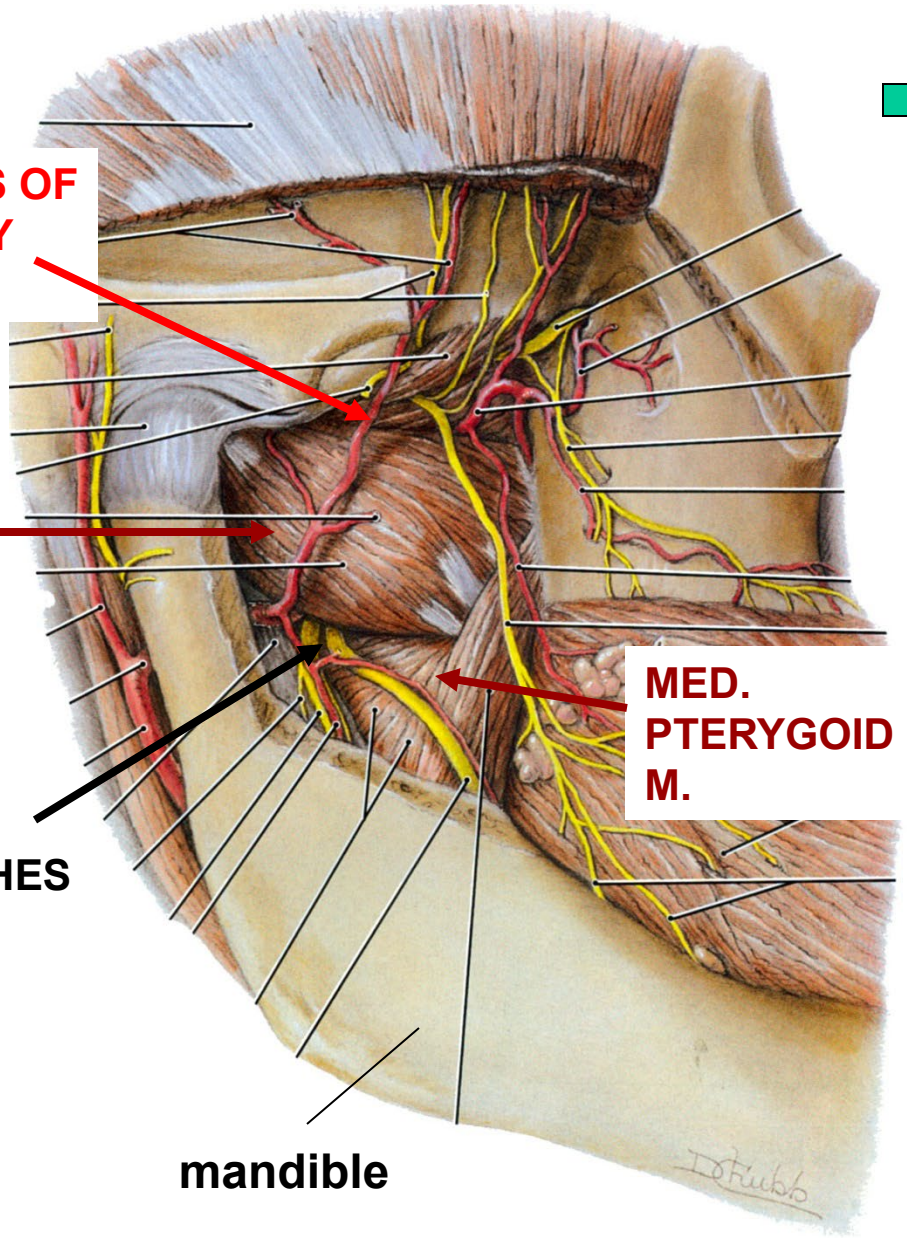
*

CANNOT EFFECTIVELY LIGATE MAXILLARY ARTERY - bleeding (ex. nosebleed = epistaxis) treated by cauterization of branches



DISSECTION OF MAX. ARTERY (ORIENT ON PROSECTIONS) - SAW THROUGH ZYGOMATIC ARCH, CORONOID PROCESS AND RAMUS OF MANIDBLE

INFRATEMPORAL FOSSA



NOSE

CONTENTS

1) MEDIAL & LATERAL PTERYGOID MUSCLES

2) BRANCHES OF V3 from FORAMEN OVALE

3) MAXILLARY ARTERY & PTERYGOID VENOUS PLEXUS

MAXILLARY ARTERY

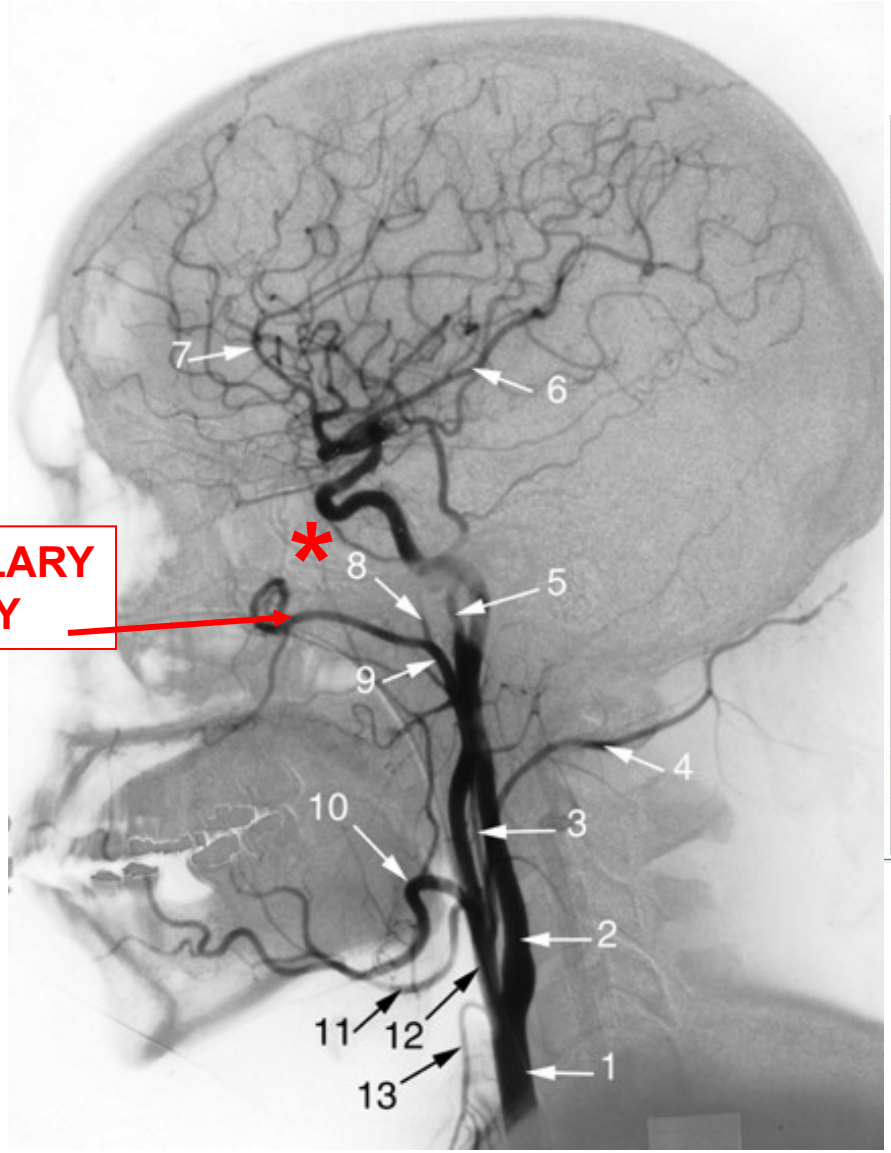
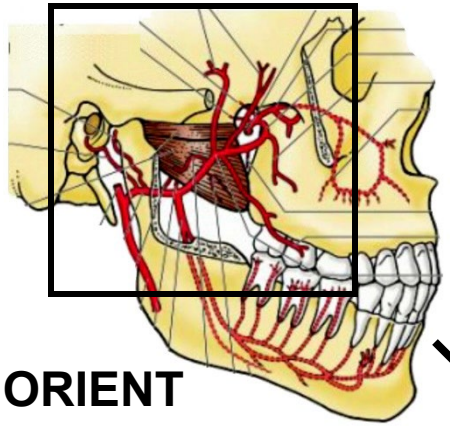


TABLE OF BRANCHES

First part - posterior and medial to neck of mandible		
1. Deep Auricular Artery	External Auditory Meatus	Outer Ear, Tympanic Membrane
2. Anterior Tympanic Artery*	Petrotympanic Fissure	Middle Ear
3. Middle Meningeal Artery*	Foramen Spinosum	Calvarium, Middle Cranial Fossa
(4. Accessory Meningeal A.)*	Forman Ovale	Calvarium, Middle Cranial Fossa
5. Inferior Alveolar Artery*	Mandibular Foramen	Mandibular teeth; branch - Mental A. to chin
Second part - superficial to or within Lateral Pterygoid muscle		
1. Deep Temporal Artery	----------	Temporalis muscle
2. Pterygoid Arteries	----------	Med. and Lat. Pterygoid m.
3. Masseteric Artery	----------	Masseter
4. Buccal Artery	----------	over Buccinator to Cheek
Third part - within Pterygopalatine fossa		
1. Post. Superior Alveolar Artery*	Post. Sup. Alveolar Foramen	Posterior Maxillary Teeth
2. Descending Palatine Artery*	Greater and Lesser Palatine Foramina	Hard and Soft Palate
3. Artery of Pterygoid Canal	Pterygoid Canal	Upper pharynx, Auditory tube
4. Sphenopalatine Artery*	Sphenopalatine Foramen	Nasal Cavity, Palate
5. Infraorbital Artery*	Infraorbital Foramen	Skin below orbit; branches: Anterior Maxillary Teeth

*** - 8- MIDDLE MENINGEAL ARTERY**

A. COURSE OF MAXILLARY ARTERY - three parts



ORIENT

2) PART 2- SUPERF. TO OR WITHIN LATERAL PTERYGOID

orbit

N O S E

1) PART 1- POST. AND MED. TO NECK OF MANDIBLE

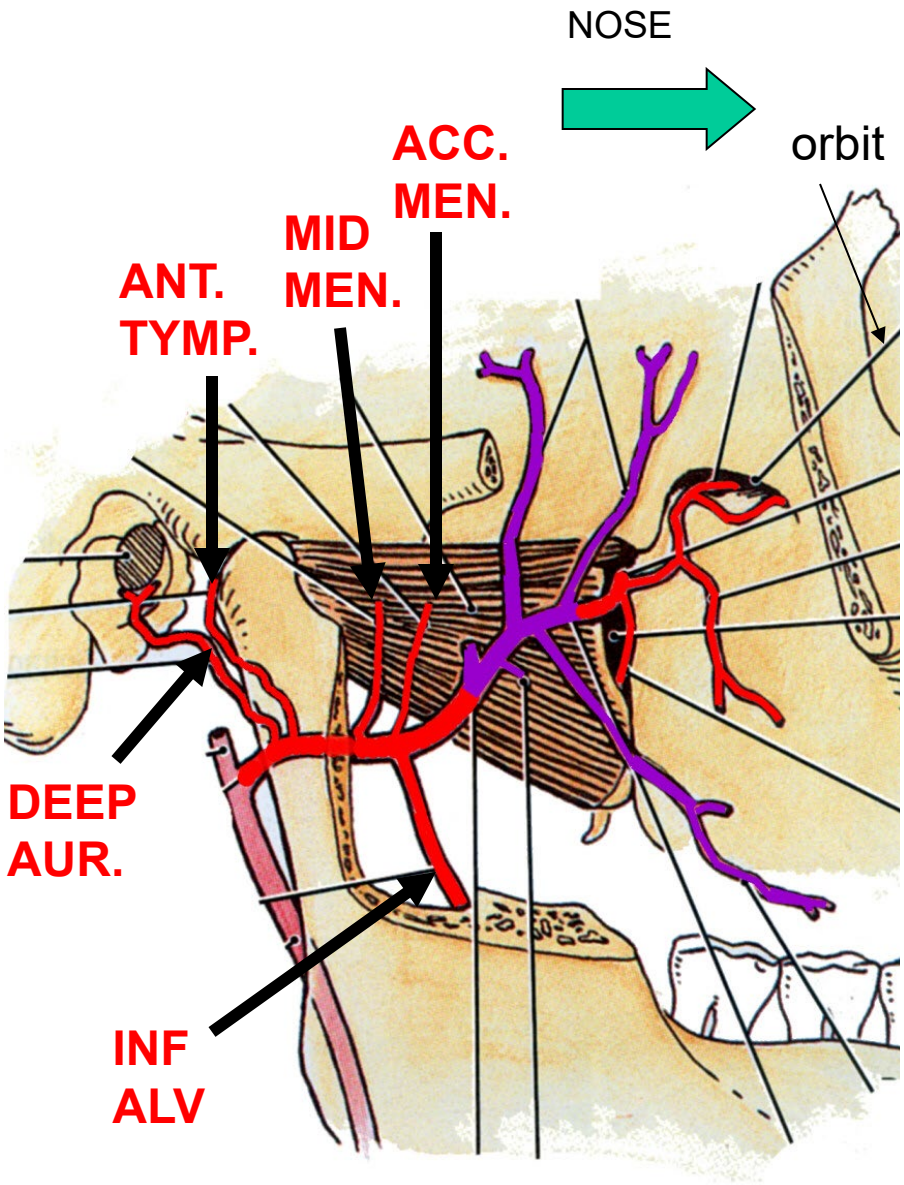
THROUGH FORAMINA

3) PART 3 - IN PTERYGO-PALATINE FOSSA

THROUGH FORAMINA

LATERAL PTERYGOID MUSCLE

MAXILLARY ARTERY- FIRST PART THROUGH FORAMINA



1. DEEP AURICULAR - EXT. AUD. MEATUS - OUTER EAR, TYMPANIC MEMBRANE

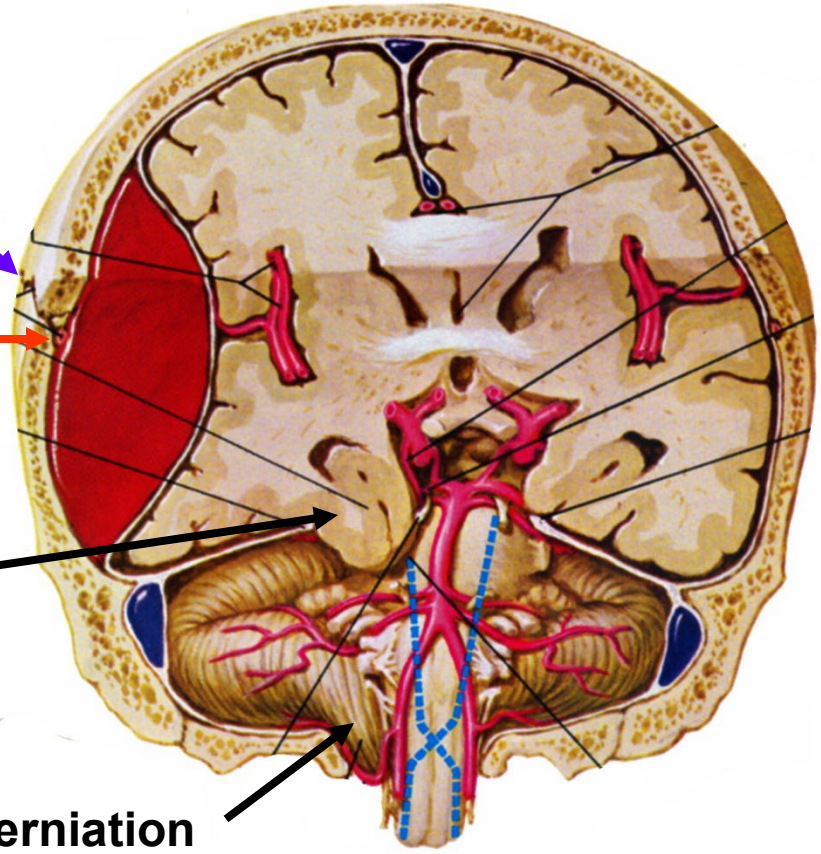
2. ANTERIOR TYMPANIC - PETROTYMPANIC FISSURE TO MIDDLE EAR

3. MIDDLE MENINGEAL - FOR. SPINOSUM TO MID. CRAN FOSSA, CALVARIUM

4. ACCESSORY MENINGEAL - FOR. OVALE TO MID. CRAN FOSSA, CALVARIUM

5. INF. ALVEOLAR - MANDIB. FOR. - LOWER TEETH - branch - MENTAL ART TO CHIN

DAMAGE MIDDLE MENINGEAL, [ACCESSORY MENINGEAL ARTERIES] - EPIDURAL HEMATOMA



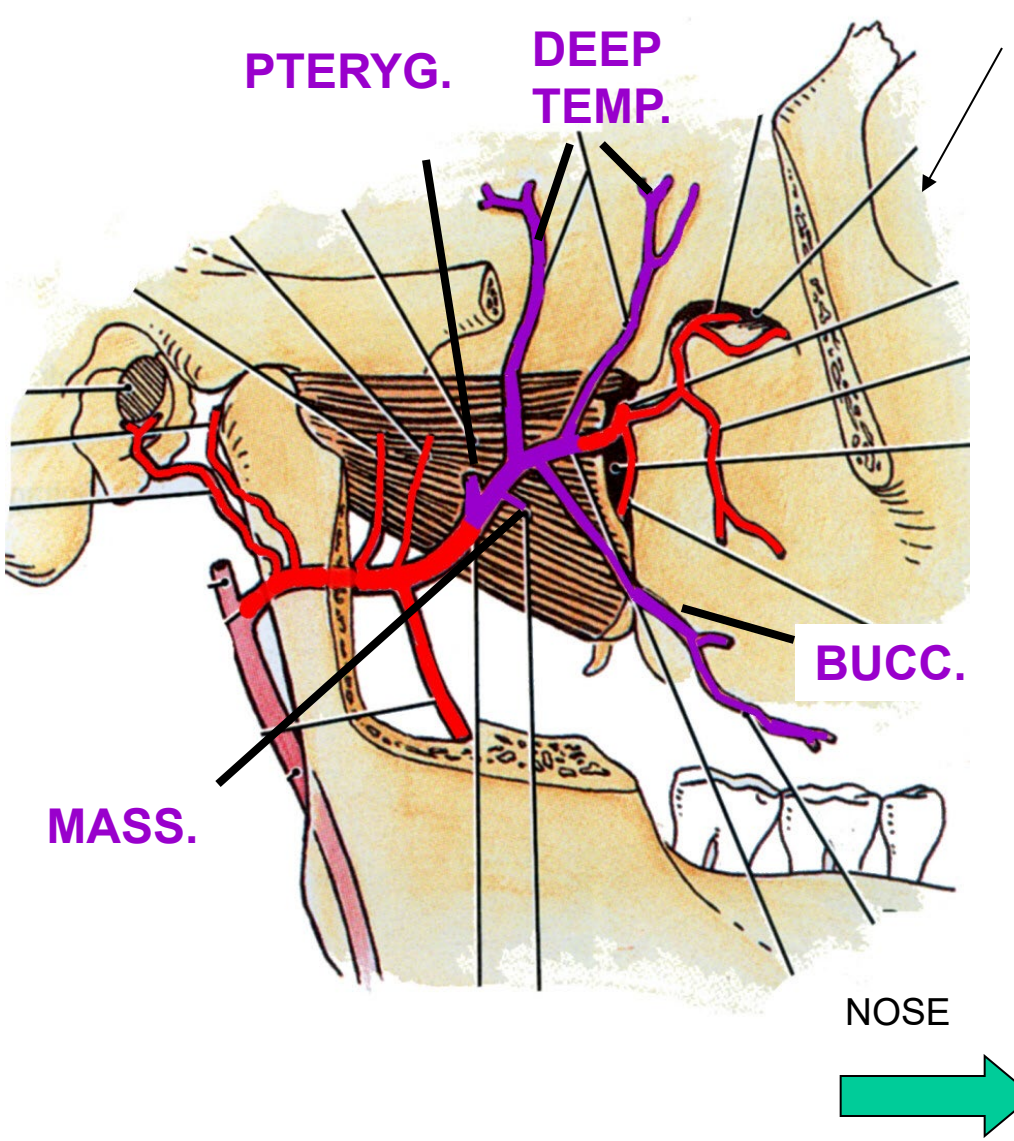
1) Skull fracture near Pterion
2) Tear Middle Meningeal Artery
3) Blood 'peels' dura from bone
4) Lens shaped (biconvex) mass on CT

5) mass can displace brain

6) Herniation -
i. Uncal herniation- push Temporal lobe (uncus) through tentorial notch
ii. Tonsillar herniation - push Cerebellum (tonsil) through foramen magnum

Clinical - bleeding is arterial – can be profuse and rapid; - ex, car accident – patient lucid at first - can be fatal within hours if herniation occurs

MAXILLARY ARTERY- SECOND PART - MOSTLY MUSCLES



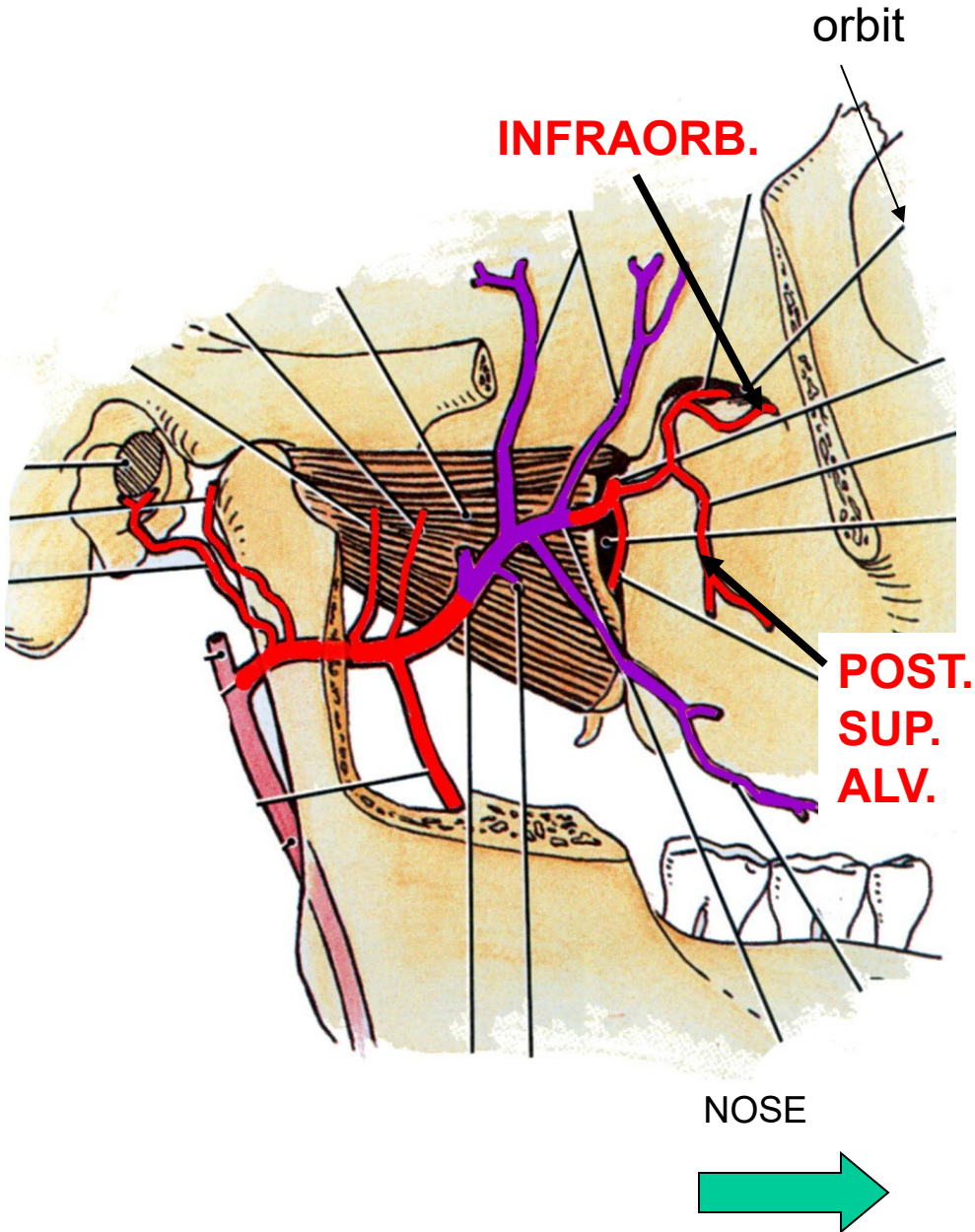
1. DEEP TEMPORAL A. - TEMPORALIS

2. PTERYGOID A. - MED. AND LAT. PTERYGOID MUSCLES

3. MASSETERIC A. - MASSETER

4. BUCCAL A. - TO CHEEK WITH BUCCAL BR. V3

MAXILLARY ARTERY- THIRD PART THROUGH FORAMINA



1. POST. SUP. ALVEOLAR - POST SUP ALV. FOR TO POST MAX TEETH

2. DESCENDING PALATINE - GREATER AND LESSER PAL. FOR. - TO PALATE

3. ARTERY OF PTERYGOID CANAL - PTERYGOID CANAL- PHARYNX AND AUD. TUBE

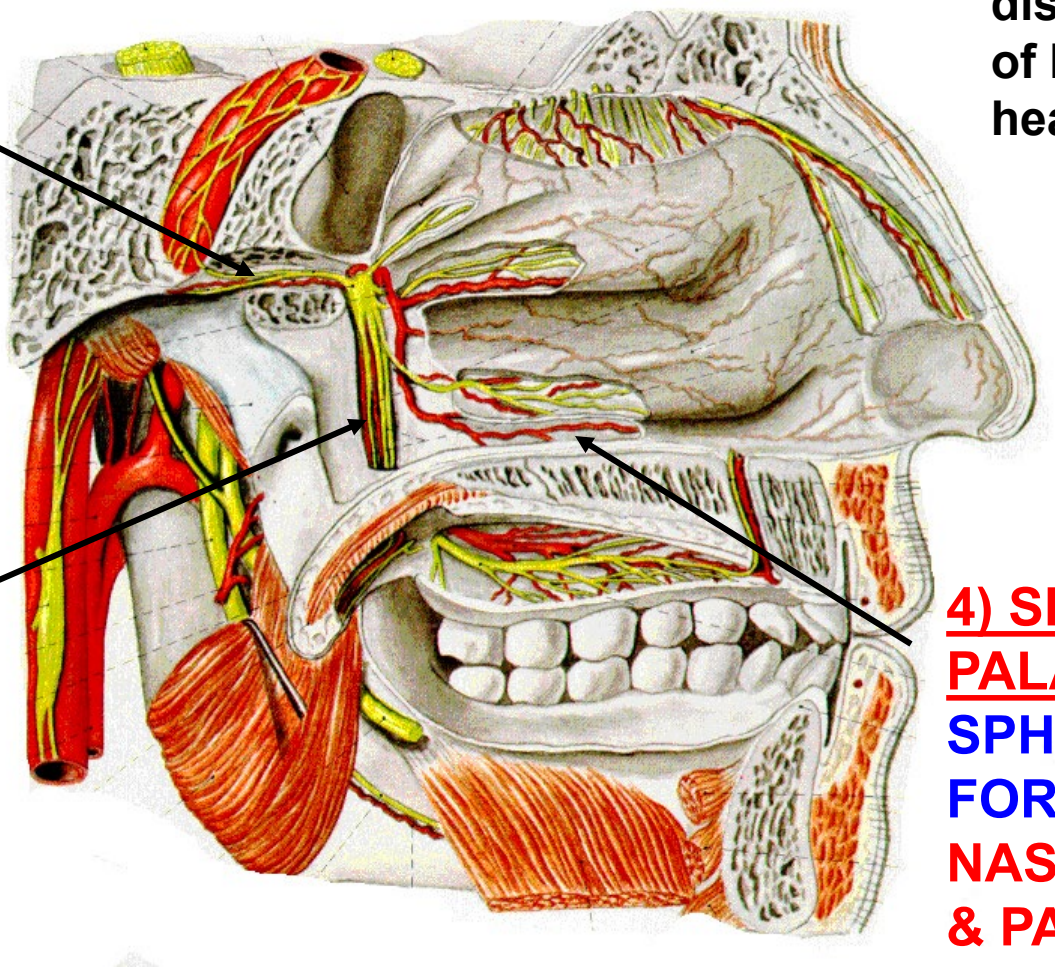
4. SPHENOPALATINE A. - SPHENOPALATINE FORAMEN - NASAL CAVITY

5. INFRAORBITAL A. - INFRAORB. FORAMEN- FACE - branch - ANT. SUP. ALVEOLAR A. - ANT. MAX. TEETH

MAXILLARY ARTERY THIRD PART - BISECT HEAD TO SEE DEEP STRUCTURES

3) ARTERY OF PTERYGOID CANAL - PTERYGOID CANAL - UPPER PHARYNX AND AUDITORY TUBE

2) DESCENDING PALATINE - GR. & LESS PAL. FOR. - HARD AND SOFT PALATE

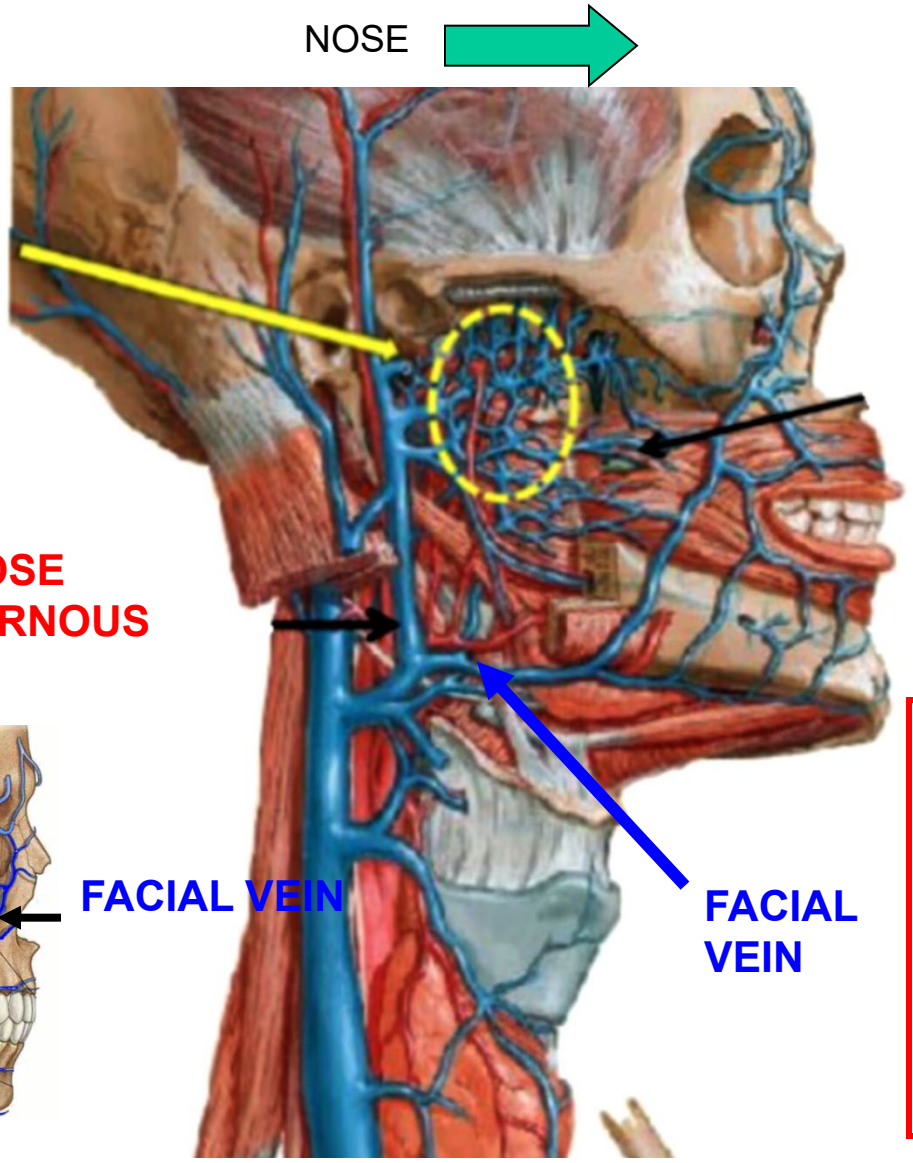


dissection of bisected head

NOSE

4) SPHENO-PALATINE A. - SPHENOPAL. FORAMEN NASAL CAVITY & PALATE

IV. PTERYGOID VENOUS PLEXUS



1) Branches of Maxillary artery have accompanying veins.

2) Drain to Pterygoid Venous Plexus (Superficial to

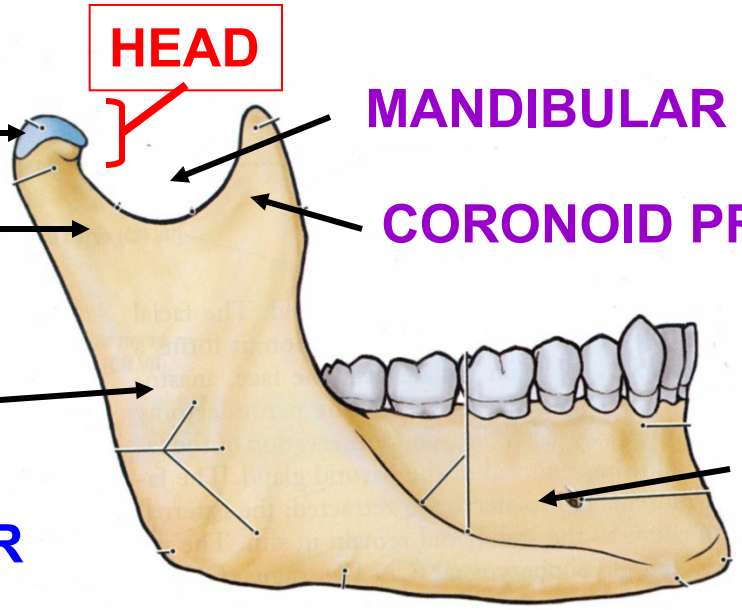
3) ANASTOMOSE WITH CAVERNOUS SINUS AND FACIAL VEIN

*

Clinical Note: Pterygoid venous plexus has anastomoses with veins that drain to Cavernous Sinus; Infections can spread from teeth, nasal cavity, palate, etc. to brain (similar to anastomses of Facial Vein).

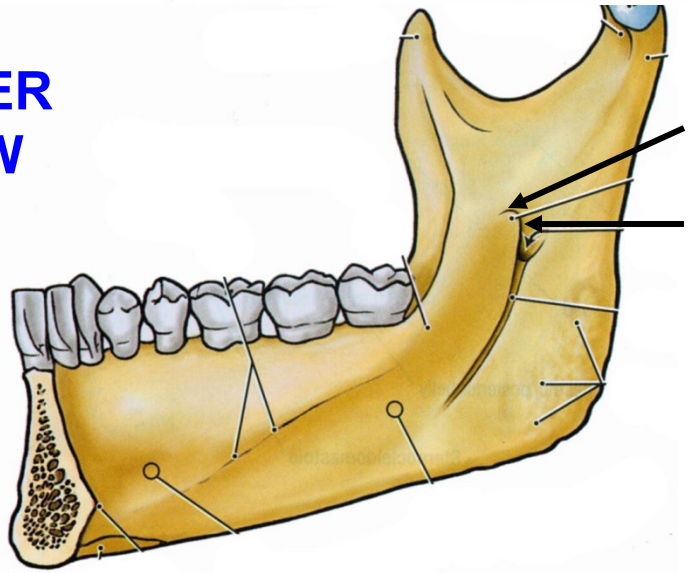
V. TEMPORO-MANDIBULAR JOINT (TMJ)

MANDIBLE-JAW BONE PARTS AND LANDMARKS

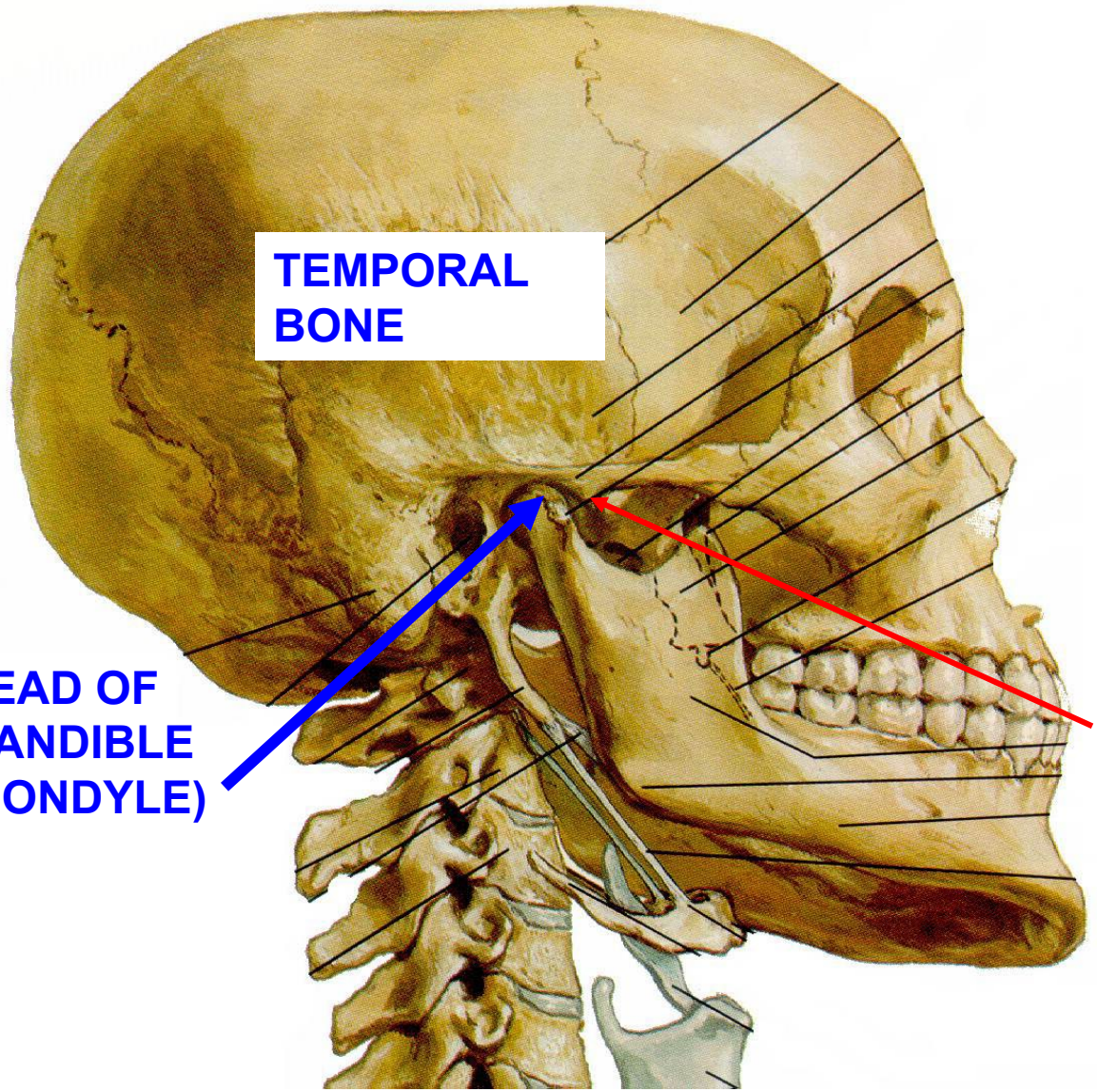


OUTER VIEW

INNER VIEW



V. TEMPORO-MANDIBULAR JOINT (TMJ)



SYNOVIAL JOINT BETWEEN HEAD OF MANDIBLE (CONDYLE) AND MANDIBULAR FOSSA OF TEMPORAL BONE

***NOTE: ARTICULAR TUBERCLE** ** **(EMINENCE) ANTERIOR TO JOINT**

TEMPORO-MANDIBULAR JOINT (TMJ)

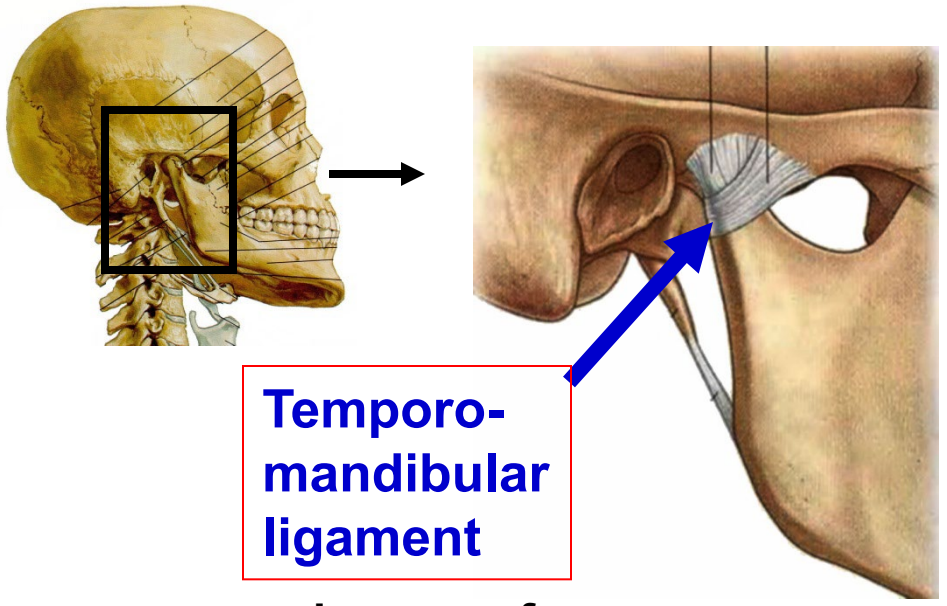
A. CAPSULE - SURROUNDS JOINT - TIGHTLY ATTACHED TO MANDIBLE, LOOSELY TO TEMPORAL BONE

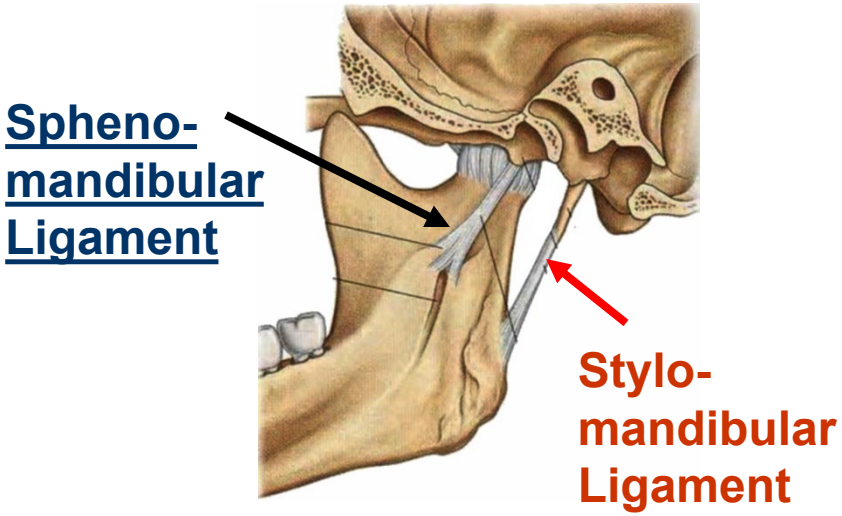
C. LIGAMENTS

1) Temporo-mandibular (Lateral) Ligament - lateral thickening of capsule - Prevents movement posteriorly and inferiorly

2) Sphenomandibular ligament - spine of sphenoid bone to lingula of mandible; function unclear.

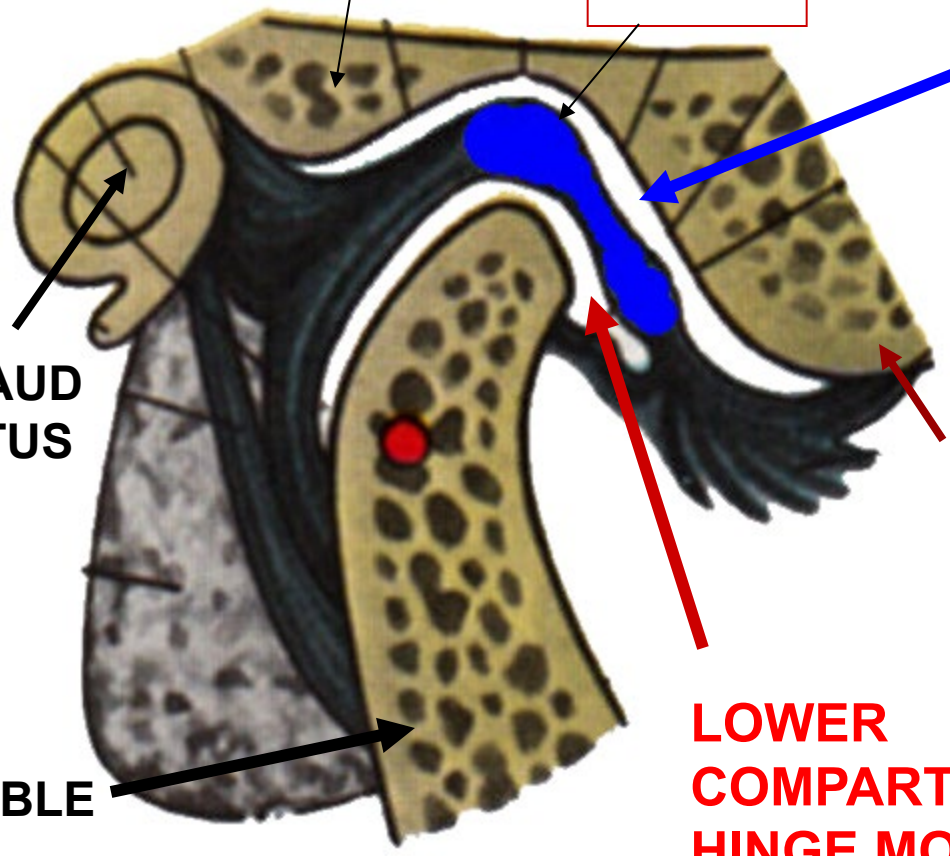
3) Stylomandibular ligament - Styloid process of temporal bone to posterior border of mandible; function unclear.





B. ARTICULAR DISC OF TMJ

TMJ DISC TIGHTLY ATTACHED TO MANDIBLE; ARTICULAR DISC-CARTILAGINOUS; DIVIDES JOINT INTO TWO COMPARTMENTS

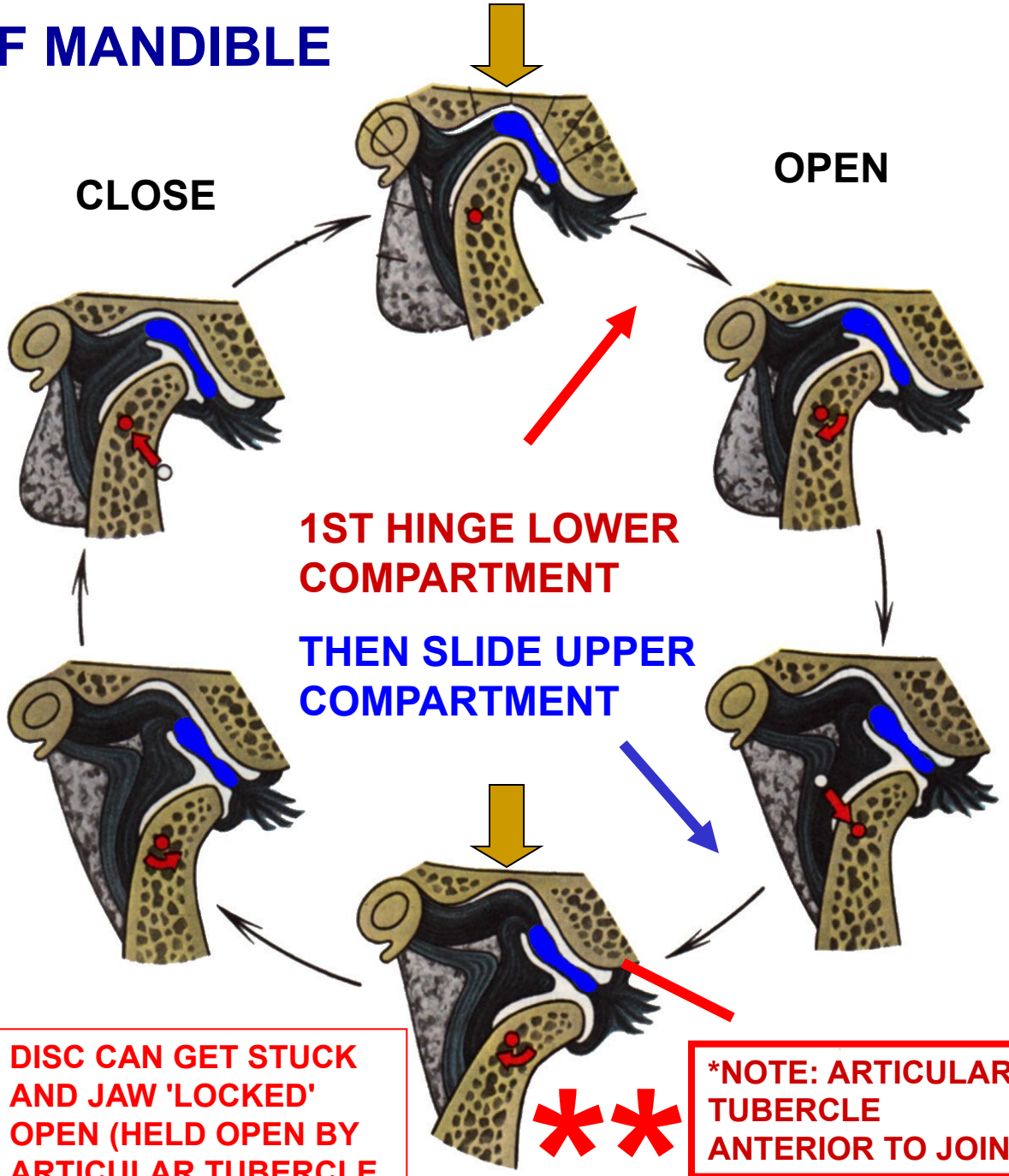


D. MOVEMENTS OF MANDIBLE - 'LOCKED' JAW

1. DEPRESSION/ ELEVATION - OPEN/CLOSE MOUTH - FIRST HINGE IN LOWER COMPARTMENT THEN SLIDE IN UPPER COMPARTMENT

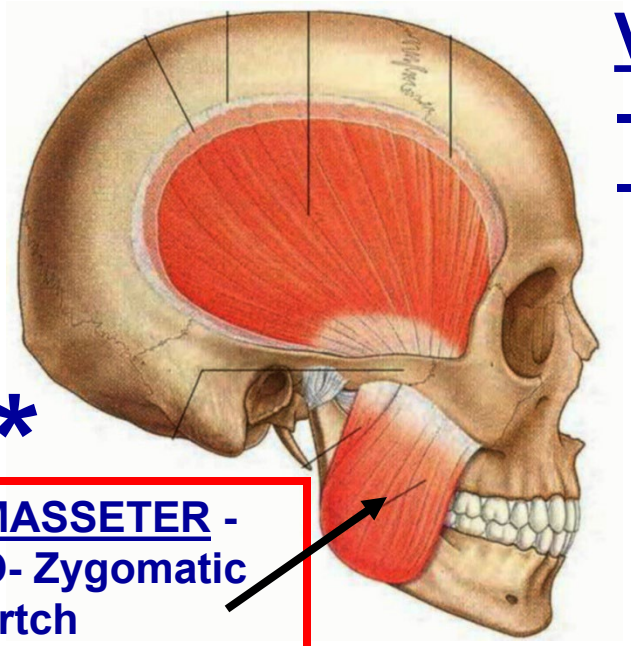
2. PROTRUDE/ RETRUDE

3. LATERAL MOVEMENT - BOTH SLIDE UPPER COMPARTMENT



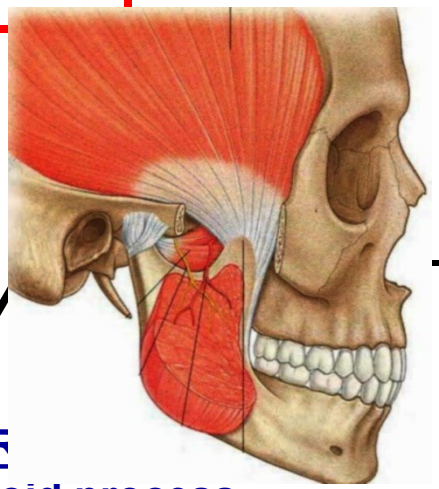
VI. MUSCLES OF MASTICATION

- ALL INN BRANCHIOMOTOR V3
- ELEVATE = CLOSE; DEPRESS = OPEN MOUTH



*

MASSETER -
O- Zygomatic artch
I Ramus, A - Elevate



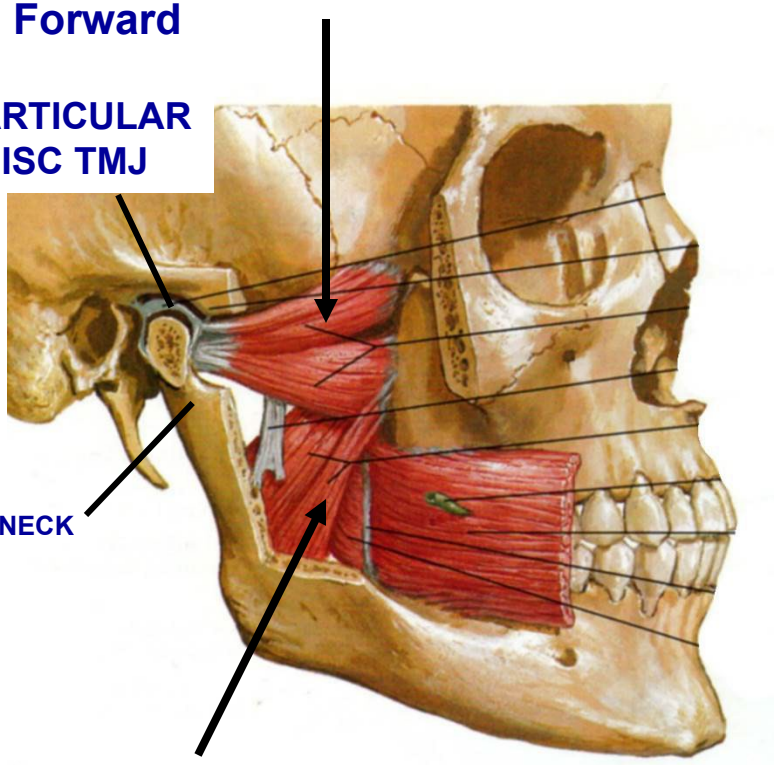
– CORONOID PROCESS

TEMPOR
I, Coronoid process
A - Elevate, Retrude

PTERYGOID MUSCLES - O - Lateral Pterygoid Plate

LAT. PTERYGOID - I - Neck, Articular Disc A - Depress, Protrude Pull Disc Forward

ARTICULAR DISC TMJ

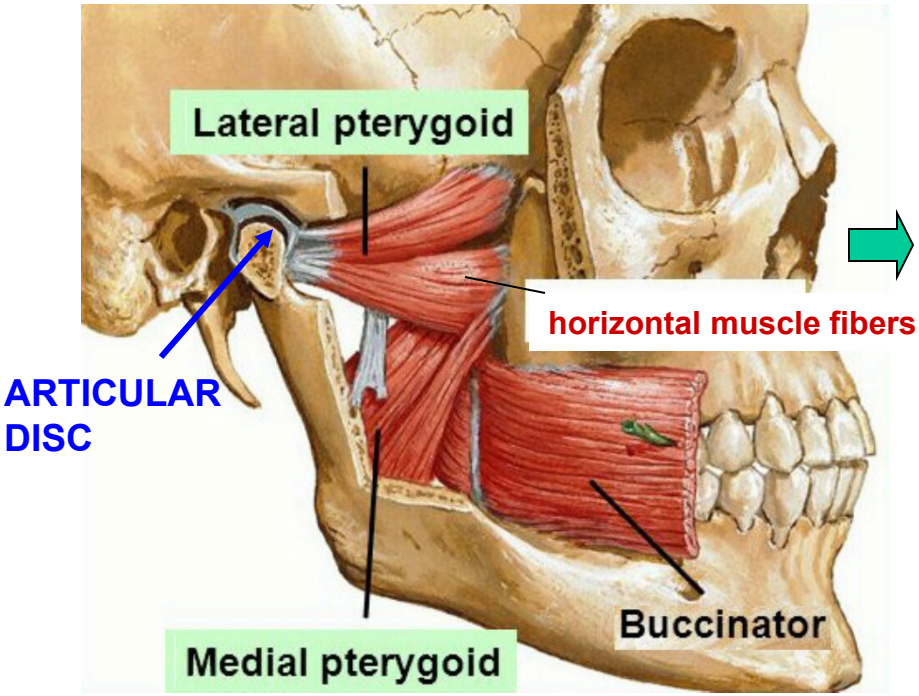


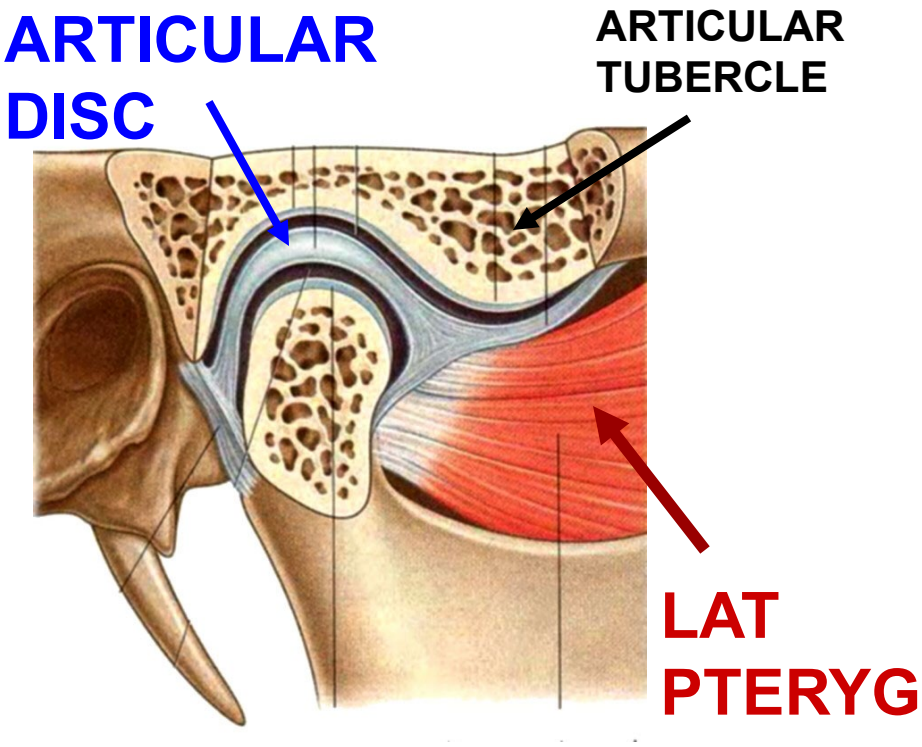
NECK

MED. PTERYGOID - I - Ramus, A - Elevate

MUSCLES OF MASTICATION

LATERAL PTERYGOID - ATTACHES TO ARTICULAR DISC OF TMJ



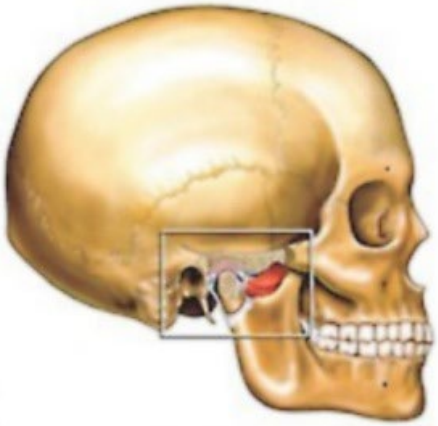


PULLS DISC ANTERIORLY WHEN OPEN MOUTH *

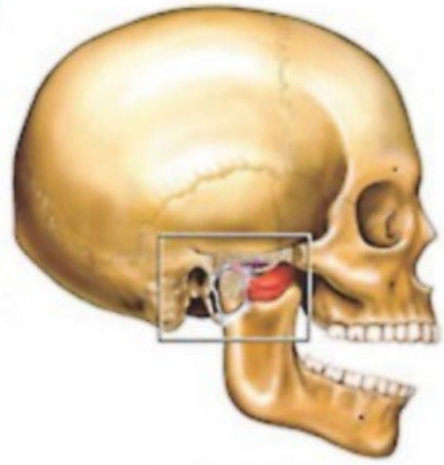
TMJ JAW LOCK - mandible stuck in partial depression

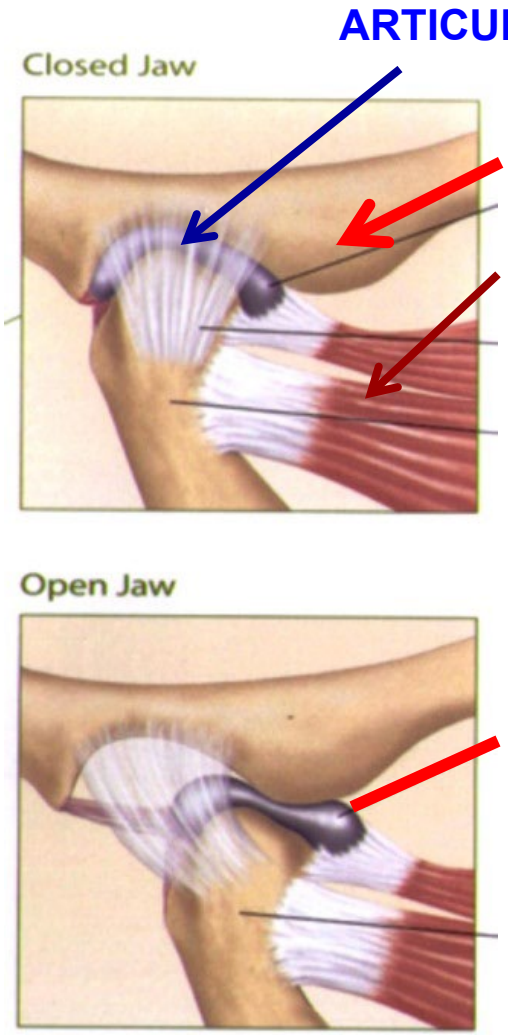
OPEN MOUTH =
depress mandible

FIRST
HINGE
LOWER
COMPART
MENT



THEN
SLIDE
UPPER
COMPART
MENT

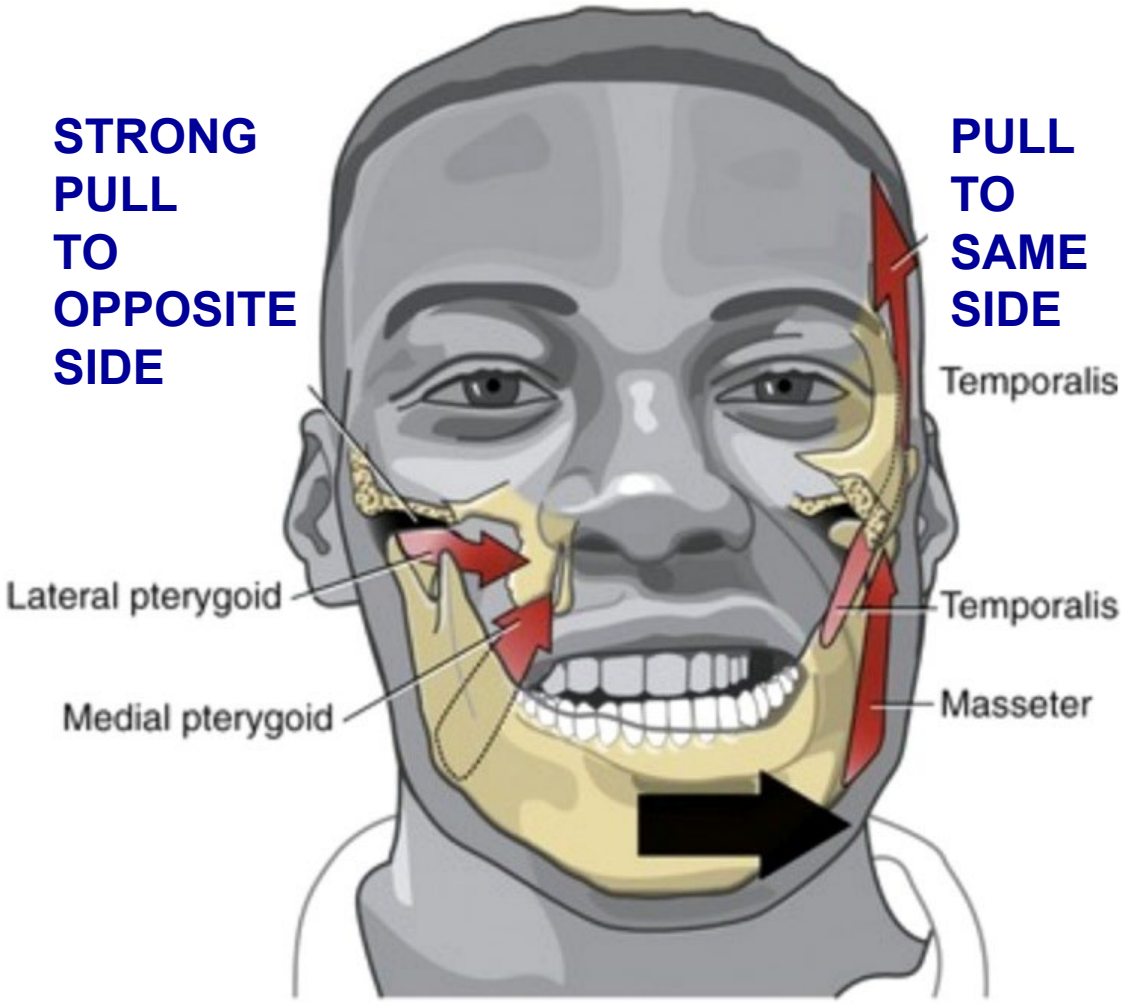




* *

JAW LOCK - DISC STUCK ON ARTICULAR TUBERCLE (EMINENCE)

LATERAL MOVEMENTS OF JAW - occur in chewing



Lateral movements

1) Lateral and Medial Pterygoid (inside mandible) pull toward opposite side

2) Temporals and Masseter (outside mandible) pull toward same side

**

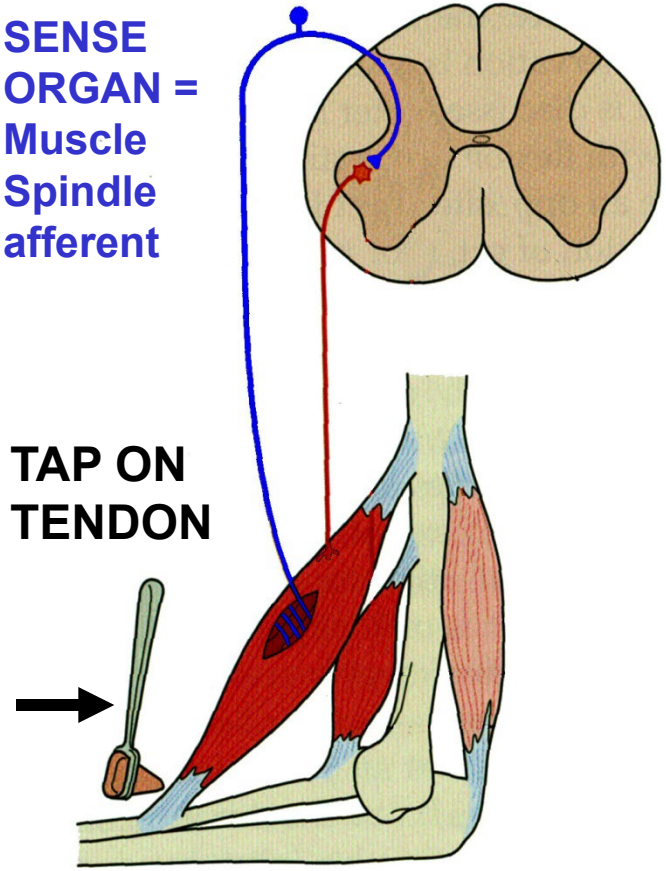
TRIGEMINAL NERVE DAMAGE (LMN) - Jaw deviates TOWARD paralyzed side (patient opens mouth); unopposed action of Lateral Pterygoid muscle of intact side)

JAW JERK REFLEX = STRETCH REFLEX OF MUSCLES OF MASTICATION - sensory and motor in V3

STRETCH REFLEX IN BICEPS

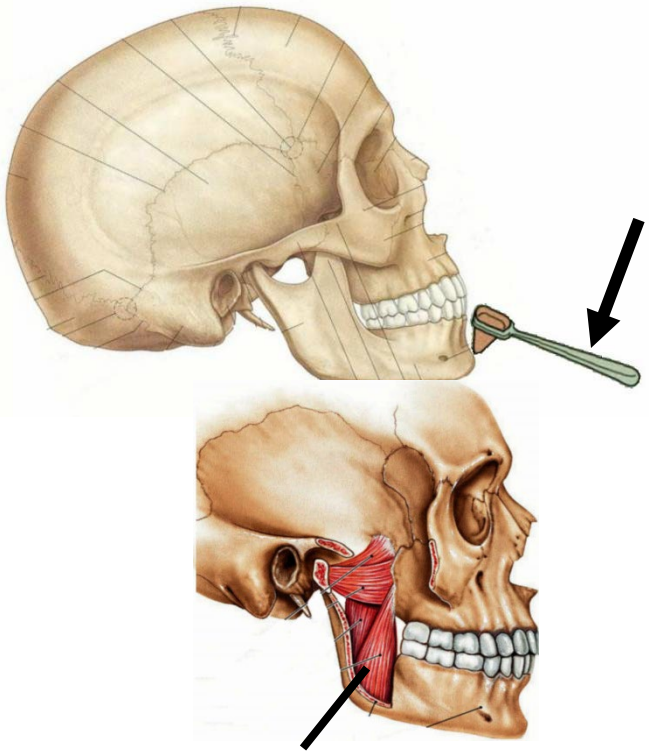
SENSE ORGAN = Muscle Spindle afferent

TAP ON TENDON



STRETCH REFLEX IN MUSCLES OF MASTICATION

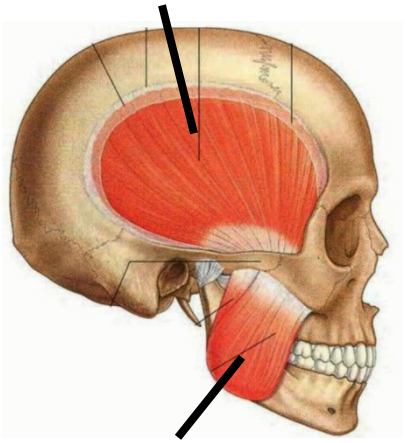
TAP DOWN ON CHIN



MEDIAL PTERYGOID

STRETCH MUSCLES THAT CLOSE MOUTH (ELEVATE MANDIBLE)

TEMPORALIS

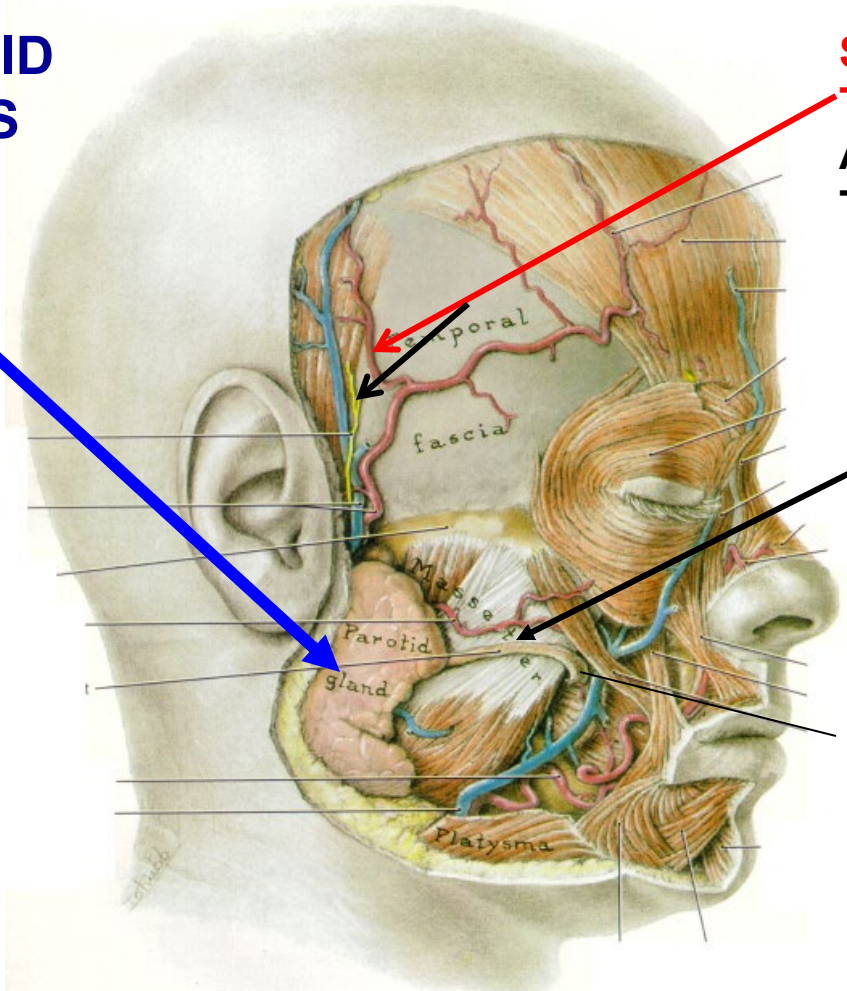


MASSETER

VII. PAROTID REGION

- BETWEEN MASTOID PROCESS & RAMUS MANDIBLE

PAROTID GLAND - CAPSULE - FROM INVESTING LAYER - ATTACHED TO ZYGOMATIC ARCH AND TEMPORAL BONE (TYMPANIC PART); VERY TOUGH



SUPERFICIAL TEMPORAL ARTERY AND AURICULO-TEMPORAL NERVE

PAROTID DUCT

90 DEGREE TURN

PAROTID DUCT- ENTERS MOUTH, PIERCES BUCCINATOR OPPOSITE 2ND MANDIBULAR MOLAR TOOTH; MAKES 90 DEGREE TURN - ACTS AS PASSIVE VALVE, LETS YOU BLOW UP BALLOONS

DEVELOPMENT OF PAROTID

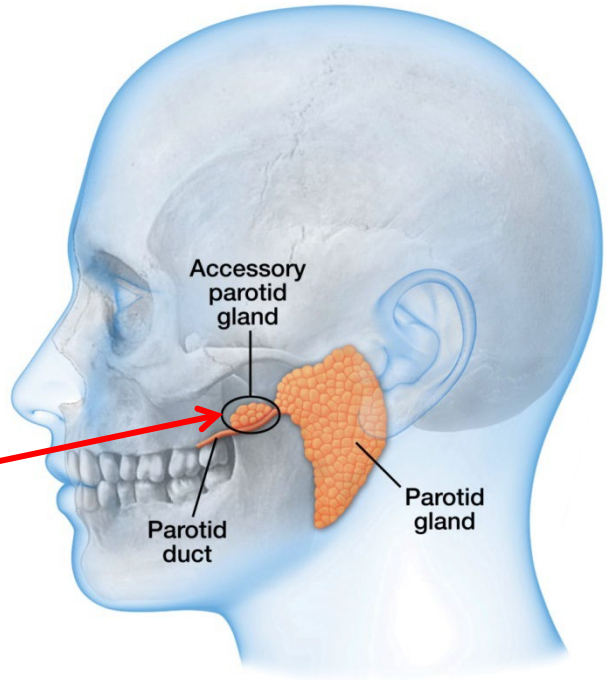
OUTPOCKETINGS OF MOUTH

7 WEEKS

1) BUDS FROM ECTODERM OF PRIMITIVE MOUTH

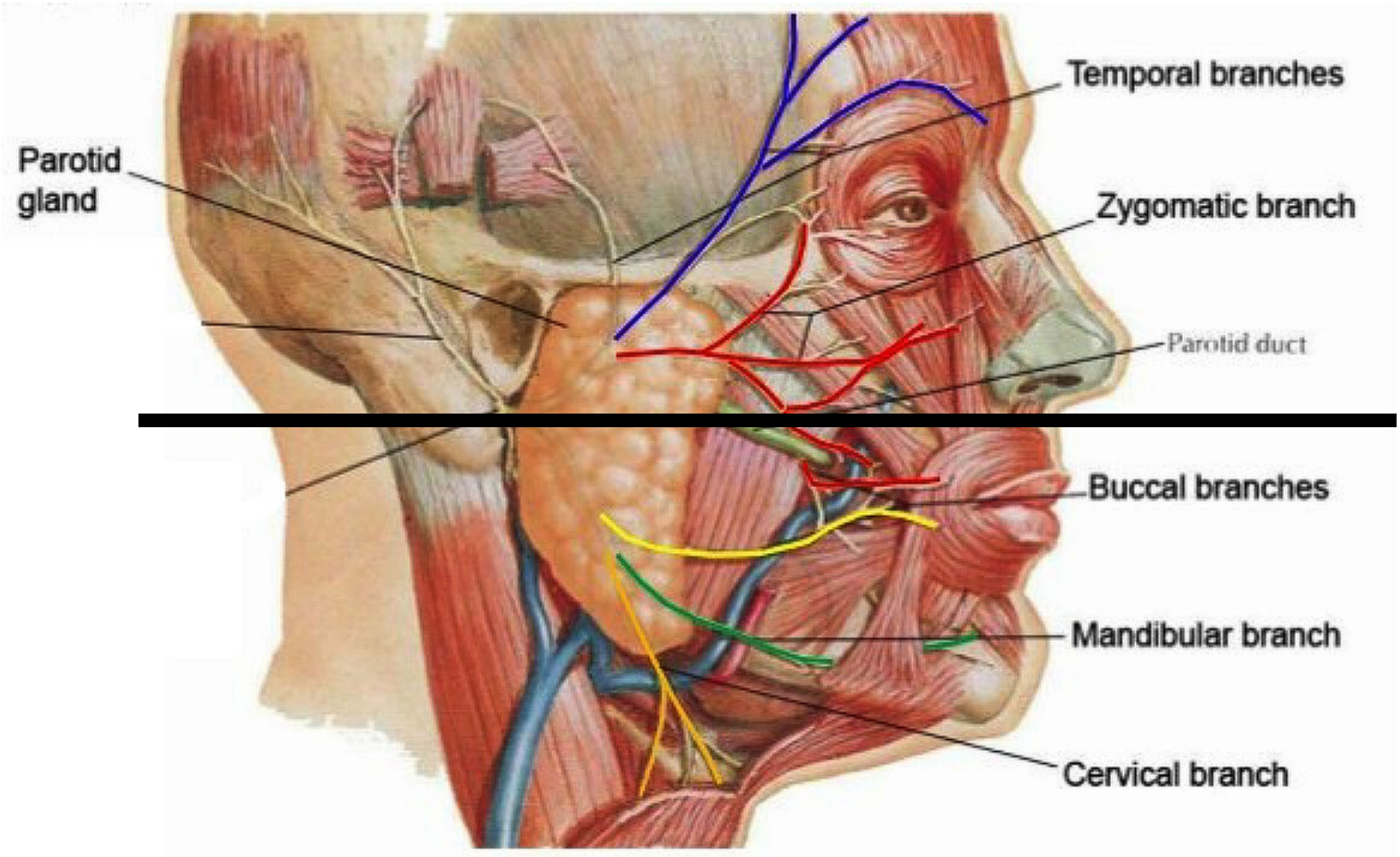
2) EXTEND TO FORM CORDS - DEVELOP LUMENS – FORM DUCTS

3) <u>DUCTS JOIN</u>



Note: can have Accessory Parotid Glands if ducts join incompletely; no clinical consequence

ORIENT - HORIZONTAL SECTION THROUGH PAROTID GLAND



PAROTID REGION - DEEP STRUCTURES

DEEP- POST BELLY DIGASTRIC, STYLOID PROCESS, CAROTID SHEATH

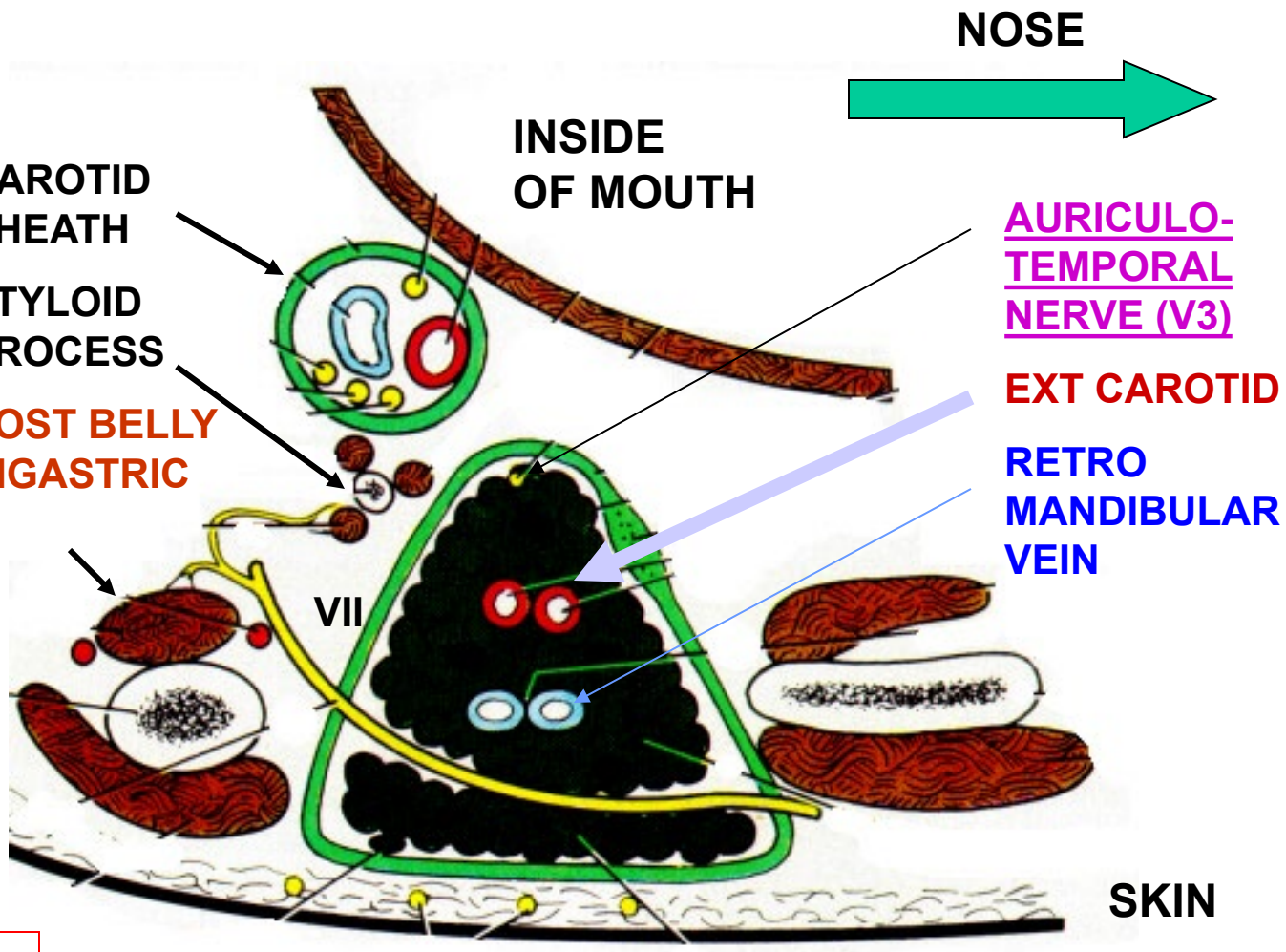
WITHIN PAROTID-

1) VII,

2) RETROMANDIB-ULAR VEIN,

3) EXT CAROTID A.,

4) AURICULO-TEMPORAL N.



INNERV. OF PAROTID - VISCERAL MOTOR (PARASYMP) OF IX (GLOSSPHARYNG. N)

NOTE: MUMPS: VIRAL INFECTION OF PAROTID; SWELLING PAINFUL DUE TO TIGHTNESS CAPSULE; REFERRED PAIN TO EAR - COMPRESSION OF AURICULO-TEMPORAL NERVE (ALSO PAROTID TUMOR) *