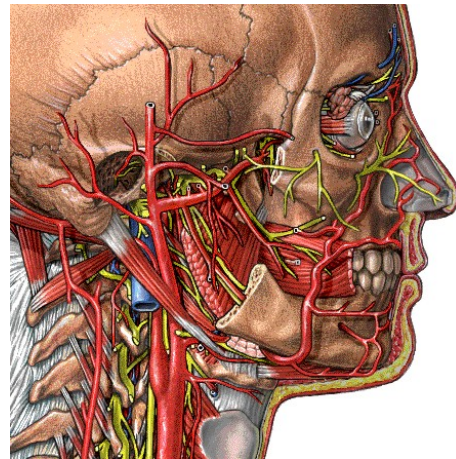
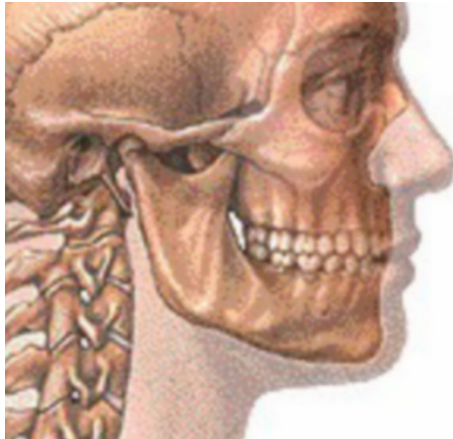
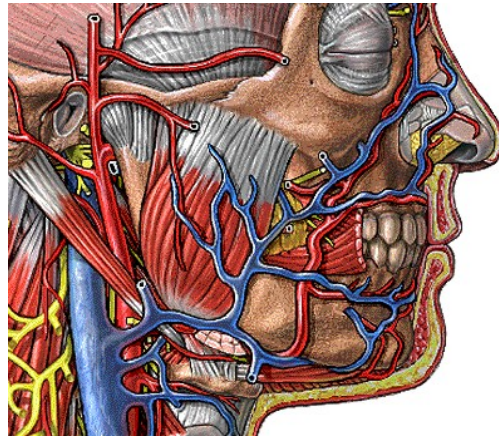
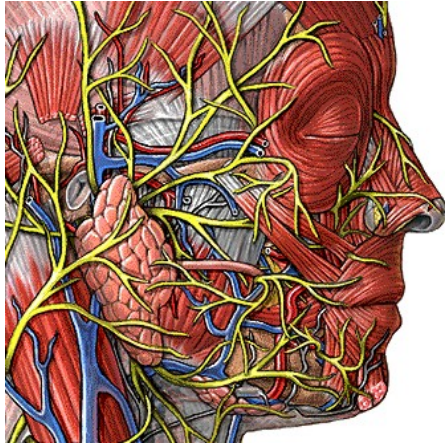


# PAROTID AND INFRATEMPORAL REGIONS



## OUTLINE

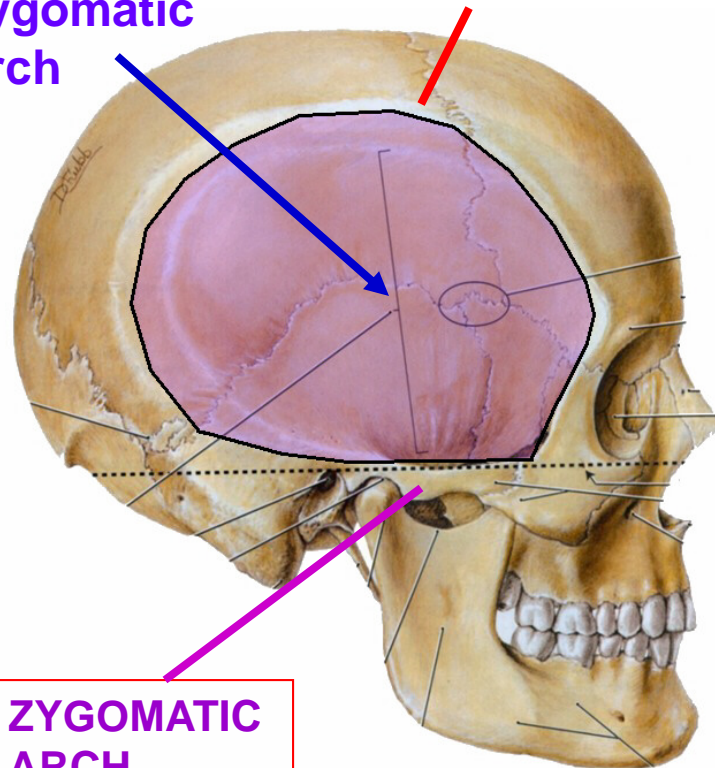
- I. TEMPORAL FOSSA
- II. INFRATEMPORAL FOSSA
- III. MAXILLARY ARTERY
- IV. PTERYGOID VENOUS PLEXUS
- V. TEMPORO-MANDIBULAR JOINT (TMJ)
- VI. MUSCLES OF MASTICATION
- VII. PAROTID REGION

**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

SUP. TEMPORAL LINE



ZYGOMATIC  
ARCH

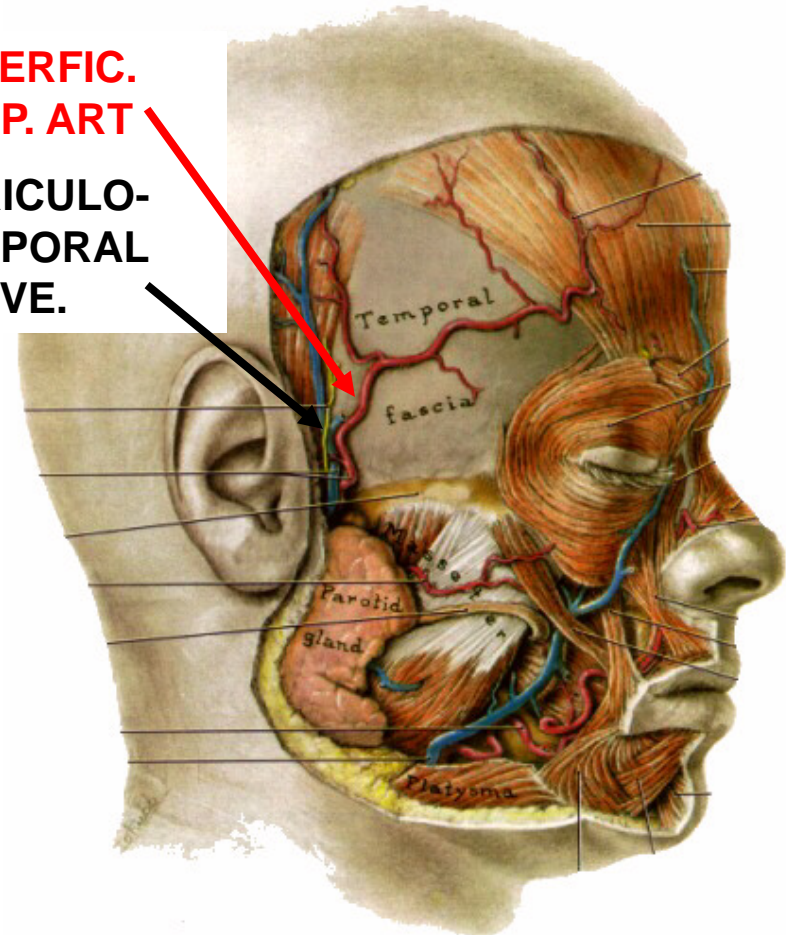
## BOUNDARIES:

SUP. - SUPERIOR TEMPORAL  
LINE

INF. - ZYGOMATIC ARCH

SUPERFIC.  
TEMP. ART

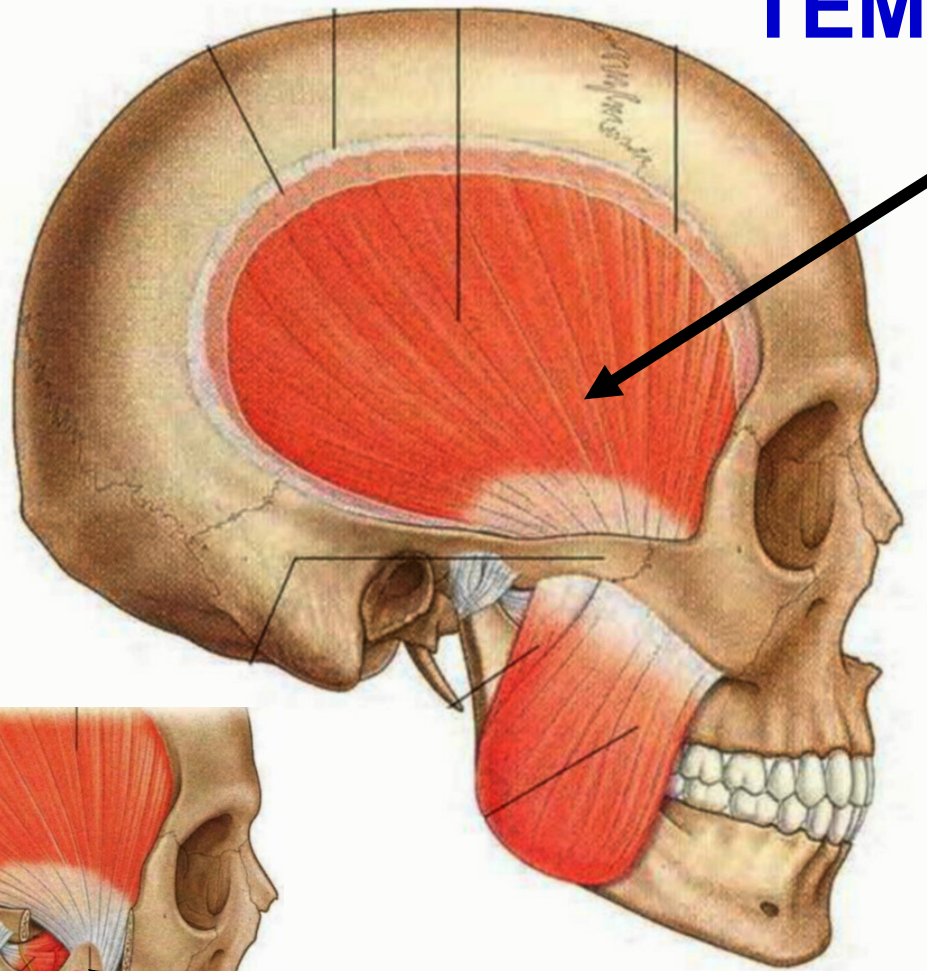
AURICULO-  
TEMPORAL  
NERVE.



## CONTAINS

- 1) SUPERFICIAL TEMPORAL ARTERY
- 2) AURICULO-TEMPORAL NERVE (V3)

# TEMPORAL FOSSA

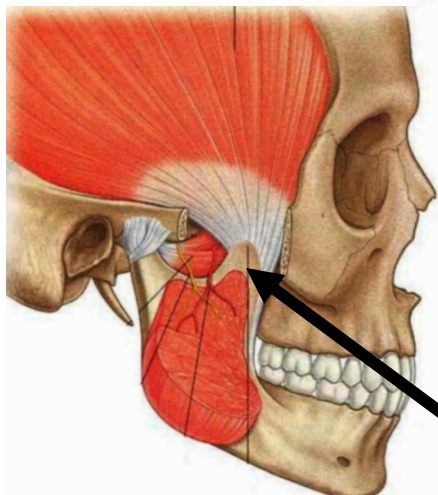


**TEMPORALIS  
MUSCLE**

**CONTAINS**

**1) TEMPORALIS  
MUSCLE**

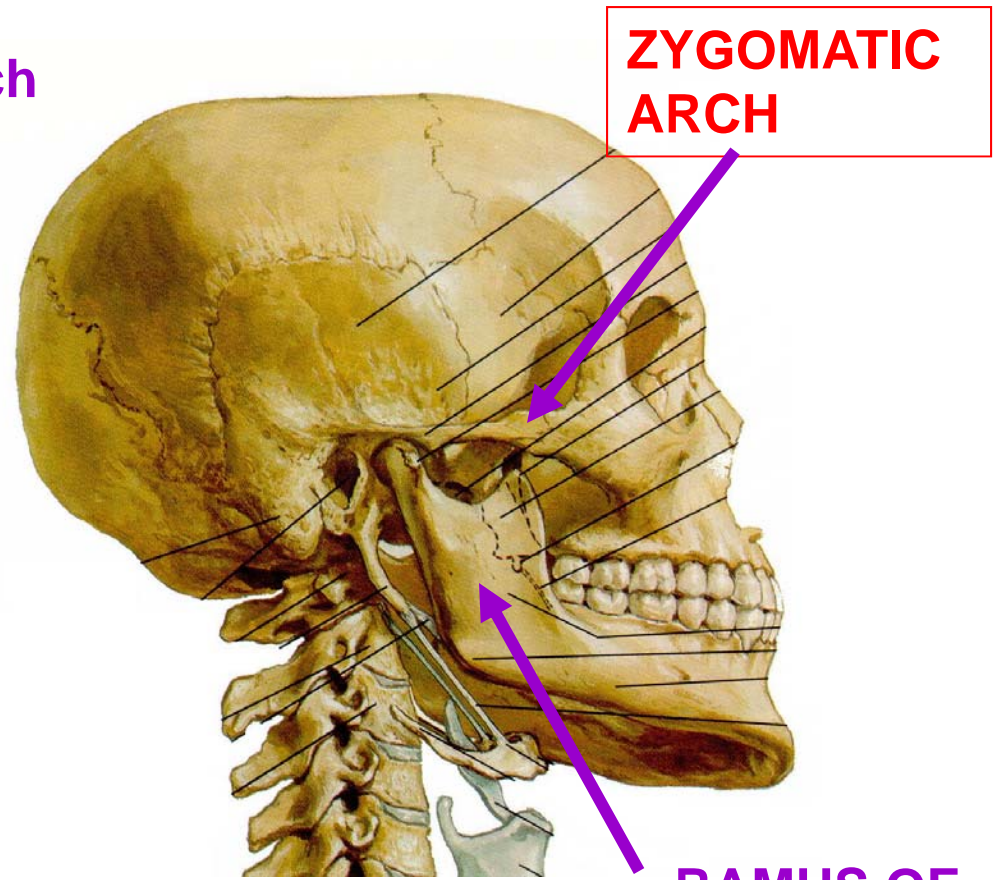
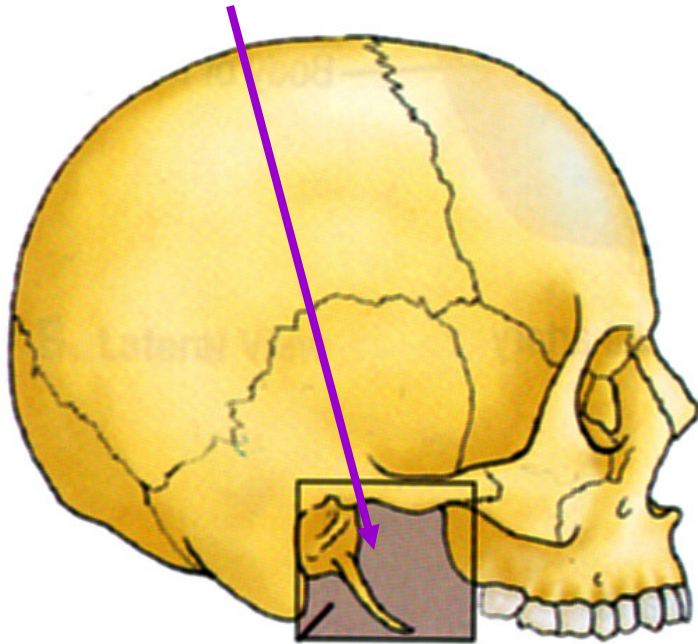
**2) DEEP  
TEMPORAL  
ARTERIES AND  
NERVES (DEEP  
TO TEMPORALIS  
MUSCLE)**



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

## II. INFRATEMPORAL FOSSA

INFRATEMPORAL FOSSA -  
area inferior to zygomatic arch



**BOUNDARIES**

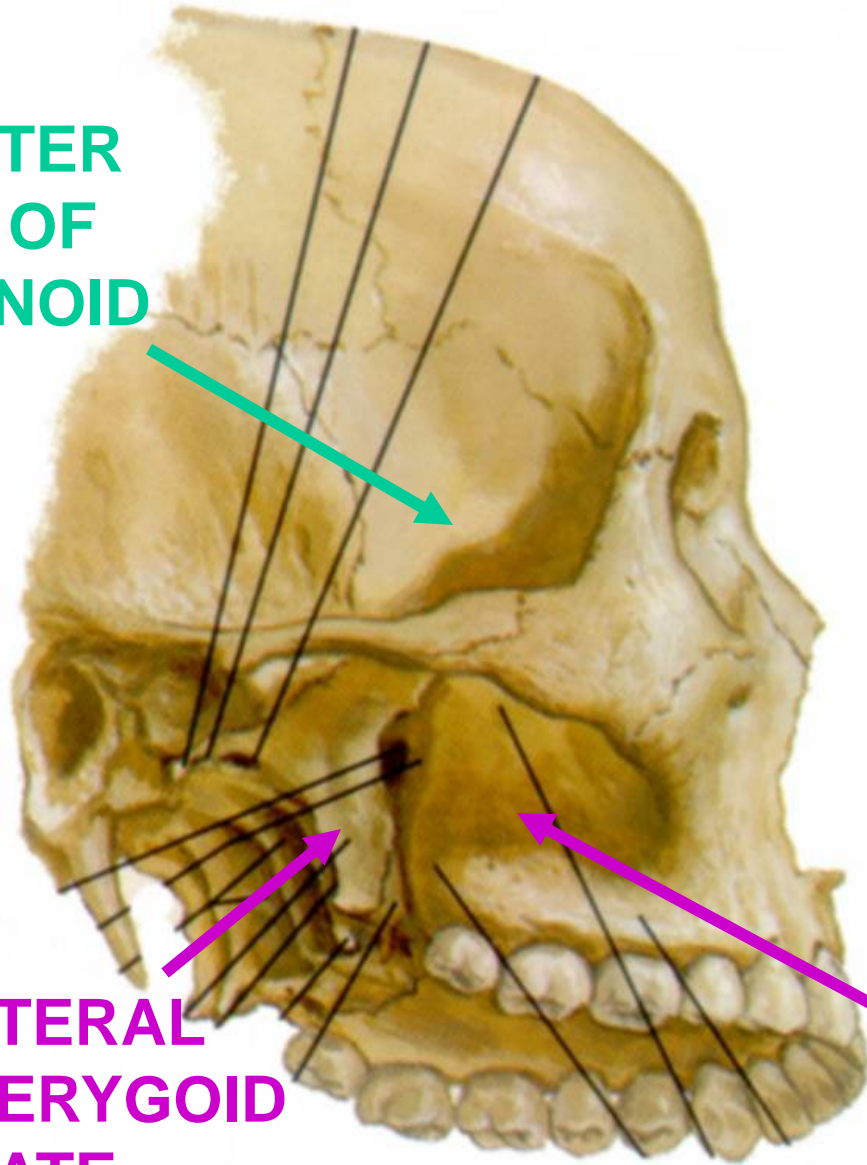
**SUPERIOR - ZYGOMATIC ARCH**

**LATERAL - MANDIBLE (RAMUS)**

**RAMUS OF  
MANDIBLE**

# INFRATEMPORAL FOSSA – remove mandible

**GREATER  
WING OF  
SPHENOID**



**SUPERIOR  
BOUNDARY ALSO -  
GREATER WING OF  
SPHENOID**

**MEDIAL- LATERAL  
PTERYGOID  
PLATE**

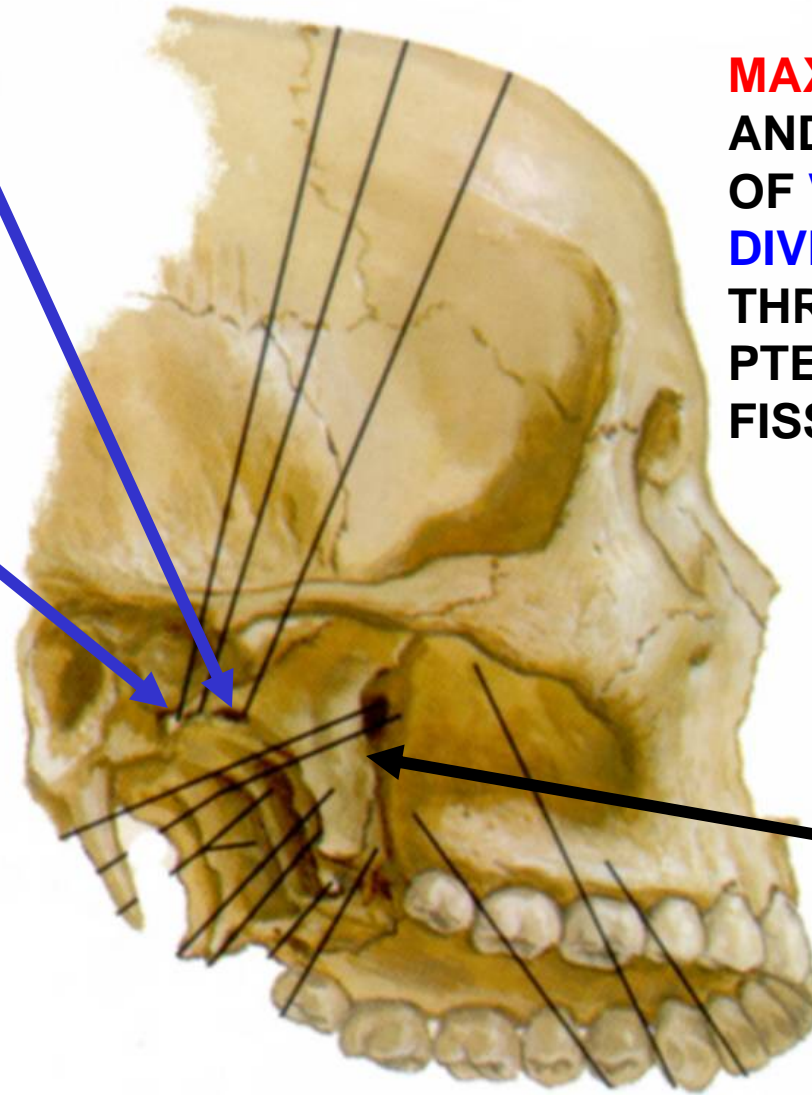
**LATERAL  
PTERYGOID  
PLATE**

**ANTERIOR -  
POST.SIDE  
MAXILLARY BONE**

# INFRATEMPORAL FOSSA: FORAMINA

## FORAMINA

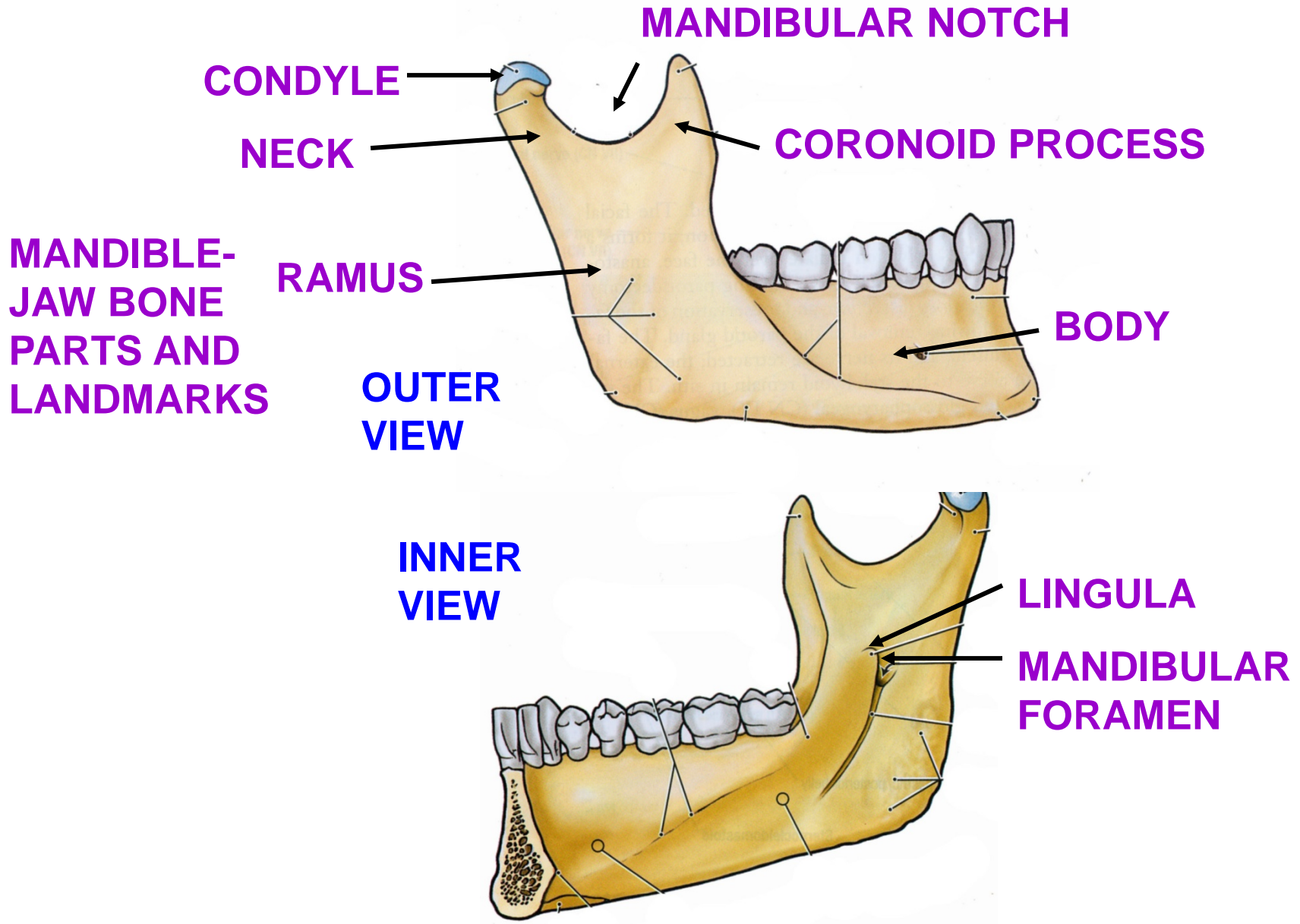
1. FORAMEN OVALE  
- V3; ACCESSORY  
MENINGEAL  
ARTERY;
2. FORAMEN  
SPINOSUM -  
MIDDLE  
MENINGEAL  
ARTERY AND  
NERVOUS  
SPINOSUS
3. MANDIBULAR  
FORAMEN -  
INFERIOR  
ALVEOLAR NERVE,  
ARTERY, VEIN



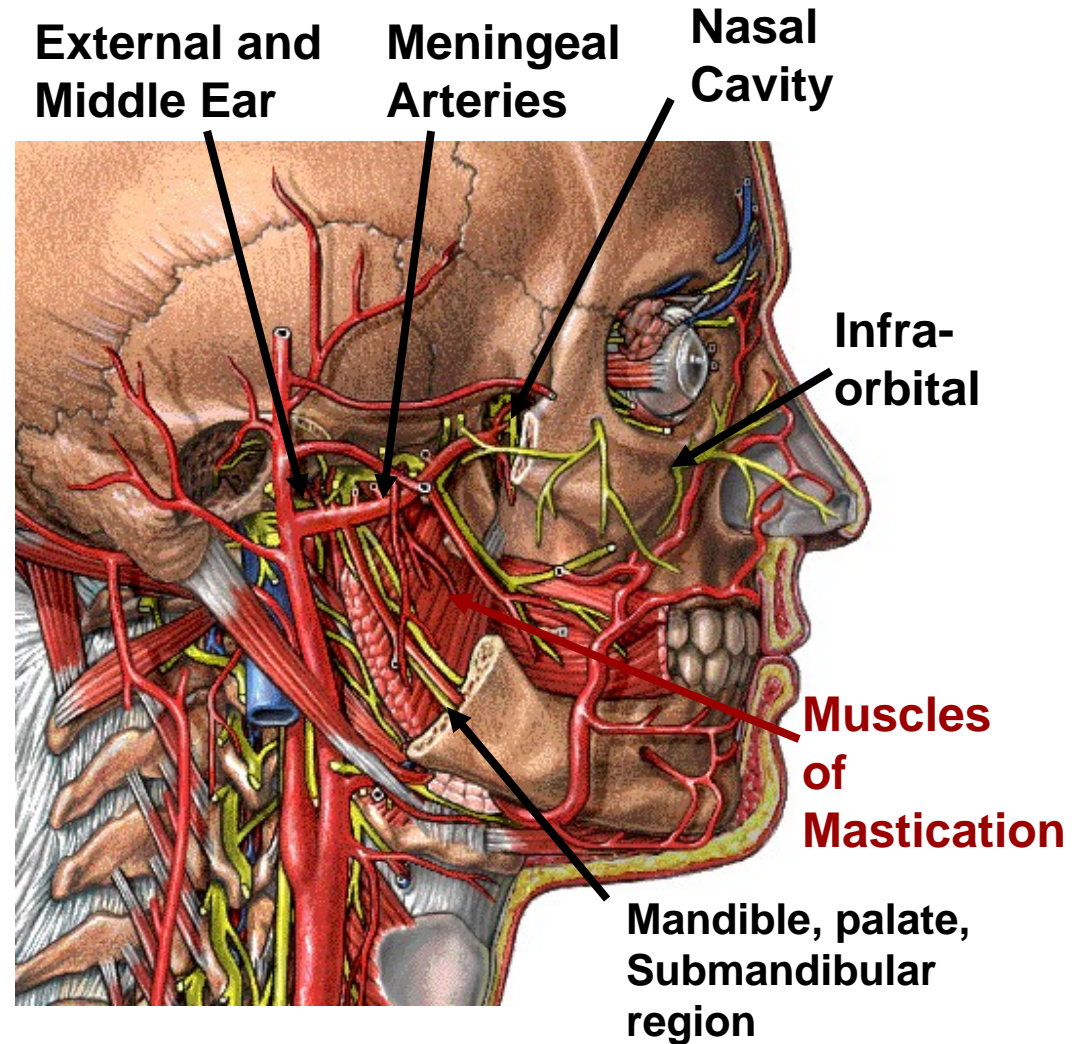
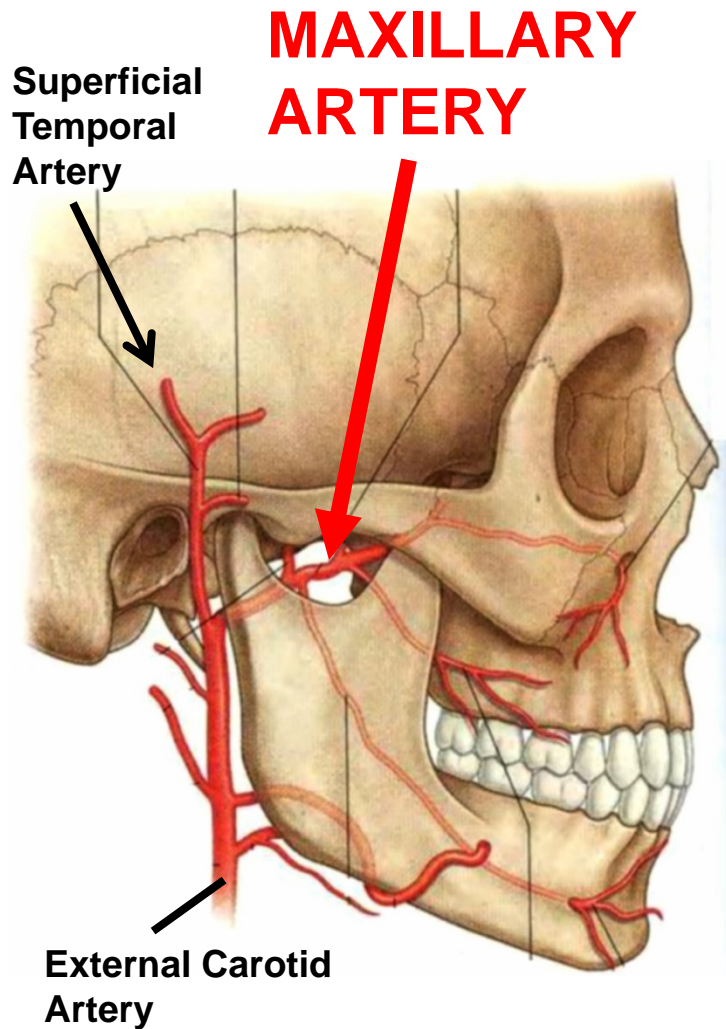
**MAXILLARY ARTERY  
AND BRANCHES  
OF V2 (MAXILLARY  
DIVISION OF V) PASS  
THROUGH  
PTERYGOMAXILLARY  
FISSURE**

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

# MANDIBLE (= JAW BONE) - PARTS & LANDMARKS



# INFRATEMPORAL FOSSA, MAXILLARY ARTERY

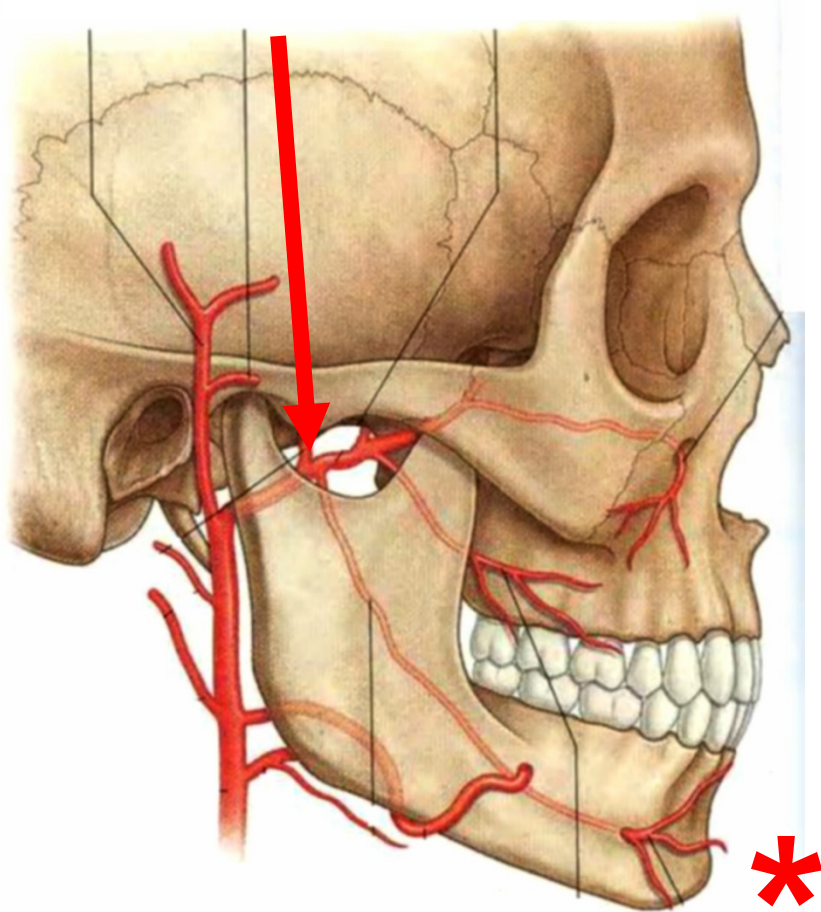


**COMPLEX, CLINICALLY IMPORTANT AREA - source of blood supply to nasal cavity, calvarium, oral cavity, middle ear; location of muscles of mastication**

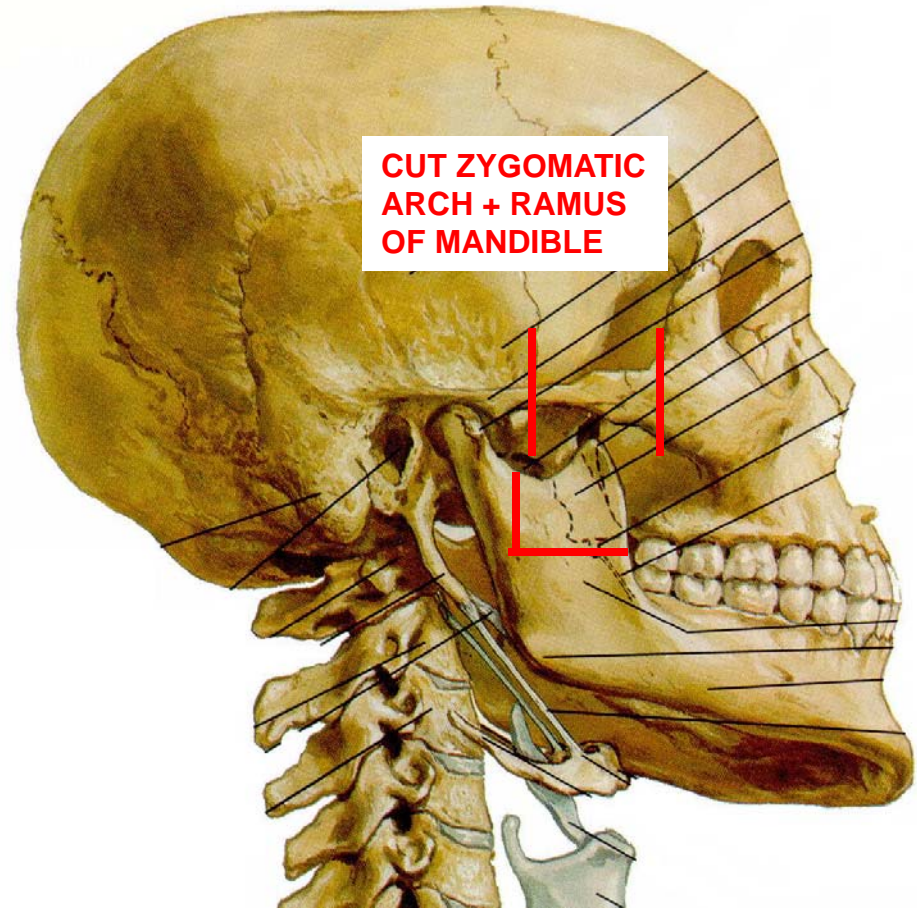


# INFRATEMPORAL FOSSA

## MAXILLARY ARTERY

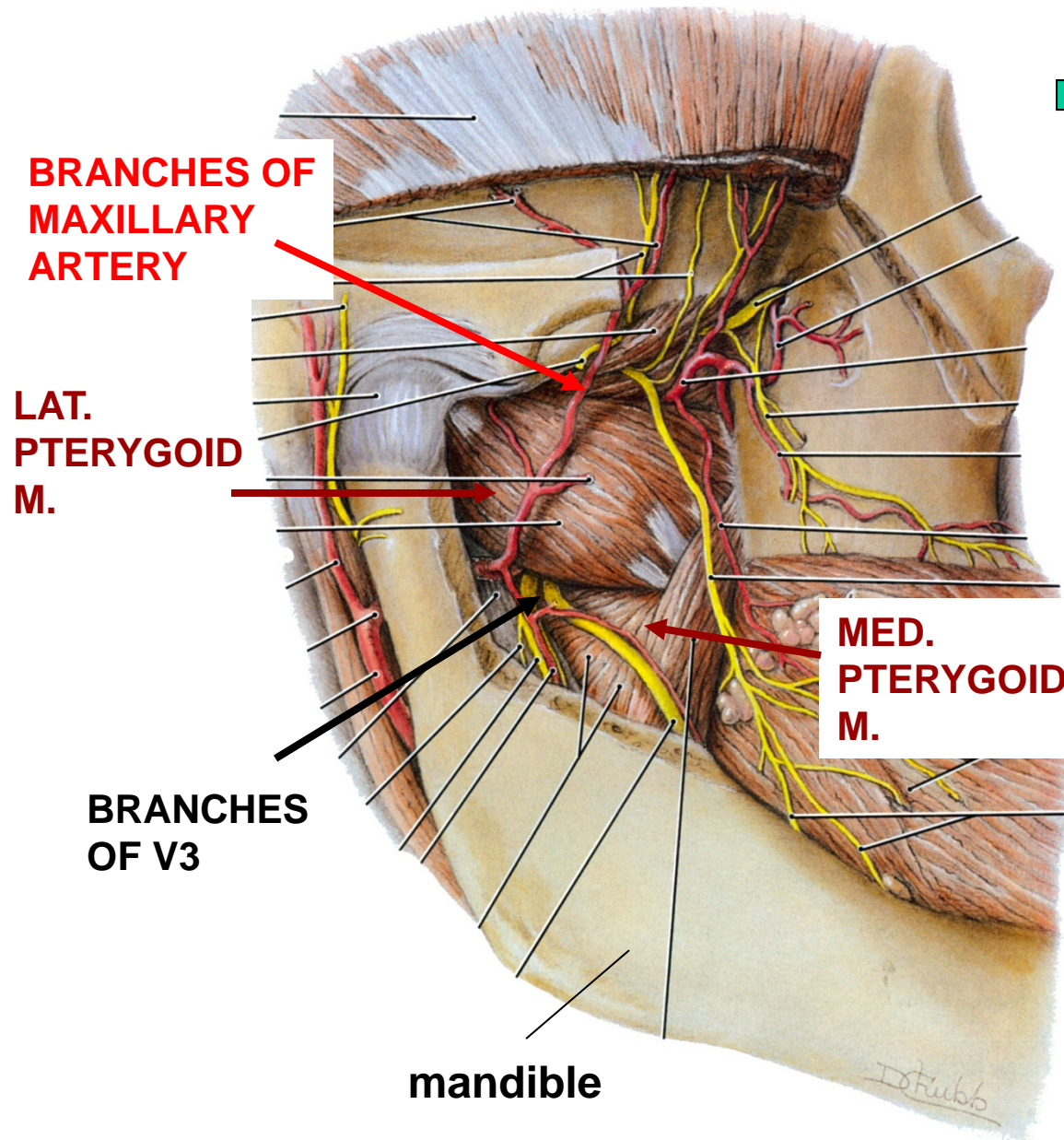


**CANNOT EFFECTIVELY LIGATE  
MAXILLARY ARTERY - bleeding (ex.  
nosebleed = epistaxis) treated by  
cauterization of branches**



**DISSECTION OF MAX. ARTERY- SAW  
THROUGH ZYGOMATIC ARCH,  
CORONOID PROCESS AND RAMUS OF  
MANDIBLE**

# INFRATEMPORAL FOSSA



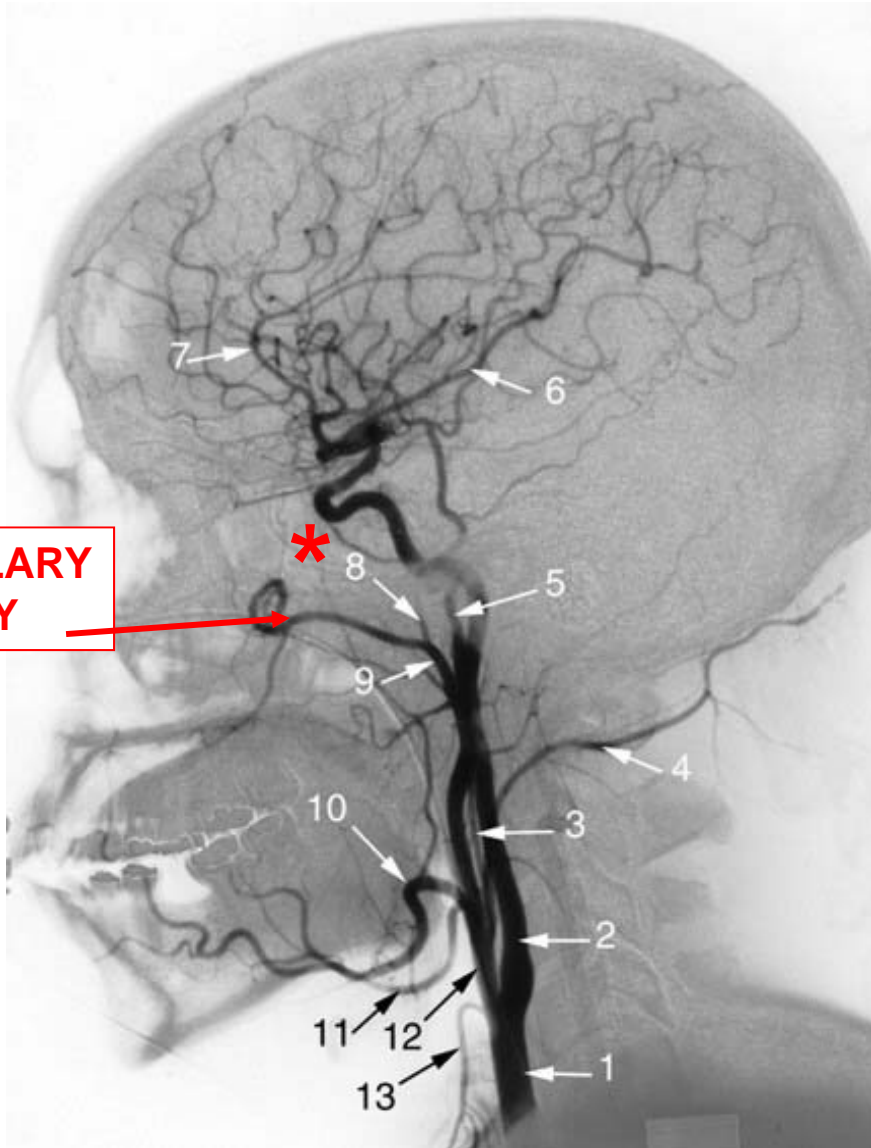
## CONTENTS

1) MEDIAL & LATERAL PTERYGOID MUSCLES

2) BRANCHES OF V3 from FORAMEN OVALE

3) MAXILLARY ARTERY & PTERYGOID VENOUS PLEXUS

# MAXILLARY ARTERY

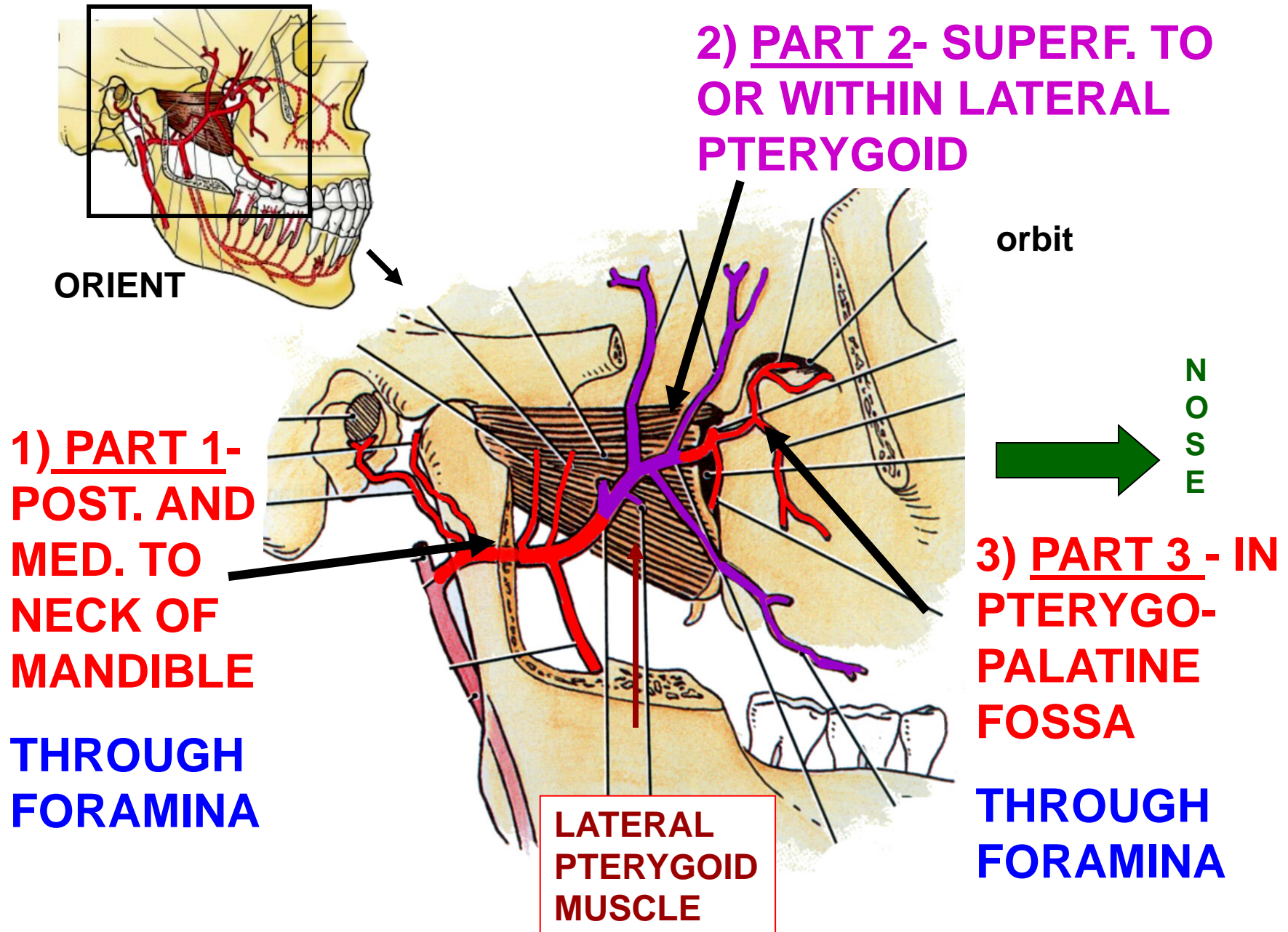


## TABLE OF BRANCHES

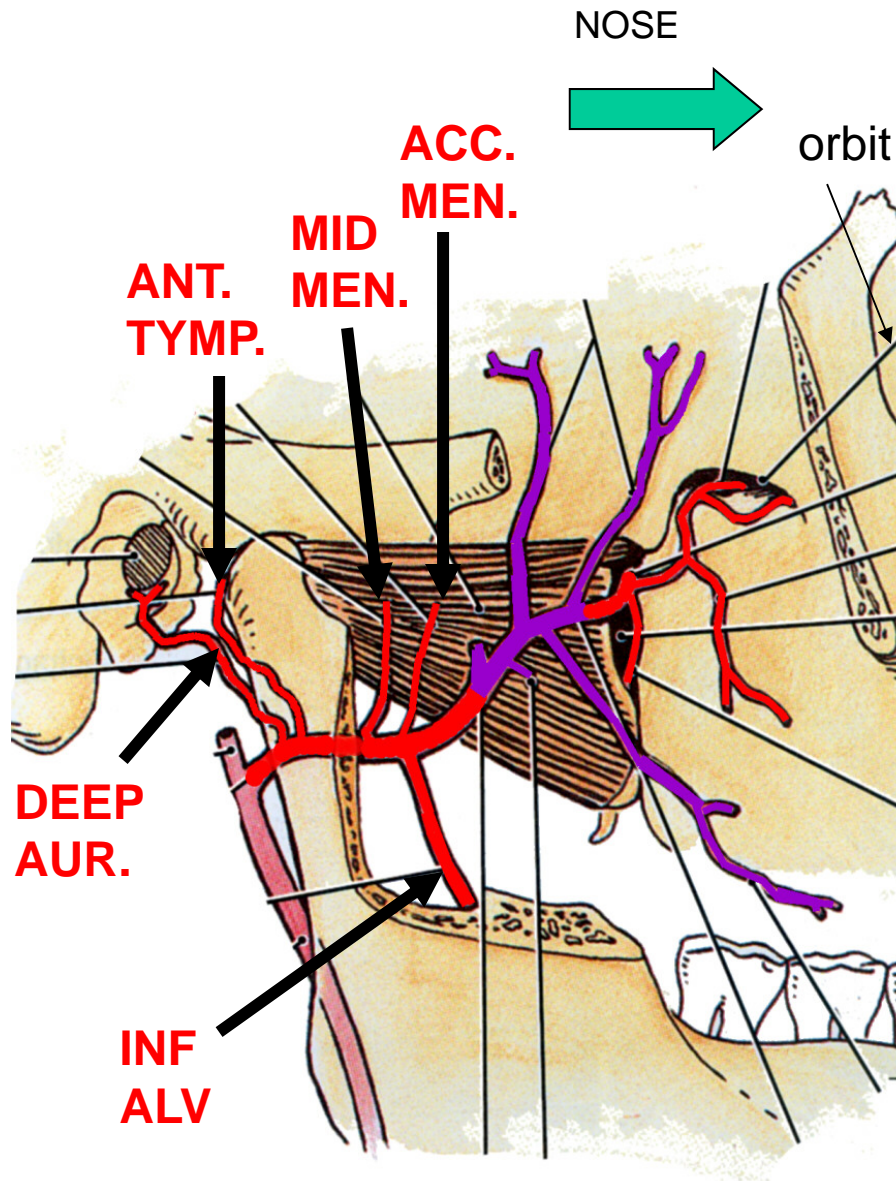
First part - posterior and medial to neck of mandible		
1. Deep Auricular Artery	External Auditory Meatus	Outer Ear, Tympanic Membrane
<u>2. Anterior Tympanic Artery*</u>	<u>Petrotympanic Fissure</u>	<u>Middle Ear</u>
<u>3. Middle Meningeal Artery*</u>	<u>Foramen Spinosum</u>	<u>Calvarium, Middle Cranial Fossa</u>
<u>(4. Accessory Meningeal A.)*</u>	<u>Foramen Ovale</u>	<u>Calvarium, Middle Cranial Fossa</u>
<u>5. Inferior Alveolar Artery*</u>	<u>Mandibular Foramen</u>	<u>Mandibular teeth; branch - Mental A. to chin</u>
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		
<u>1. Post. Superior Alveolar Artery*</u>	<u>Post. Sup. Alveolar Foramen</u>	<u>Posterior Maxillary Teeth</u>
<u>2. Descending Palatine Artery*</u>	<u>Greater and Lesser Palatine Foramina</u>	<u>Hard and Soft Palate</u>
3. Artery of Pterygoid Canal	Pterygoid Canal	Upper pharynx, Auditory tube
<u>4. Sphenopalatine Artery*</u>	<u>Sphenopalatine Foramen</u>	<u>Nasal Cavity, Palate</u>
<u>5. Infraorbital Artery*</u>	<u>Infraorbital Foramen</u>	<u>Skin below orbit; branches: Anterior Maxillary Teeth</u>

\* - 8- MIDDLE MENINGEAL ARTERY

# A. COURSE OF MAXILLARY ARTERY - three parts



# 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

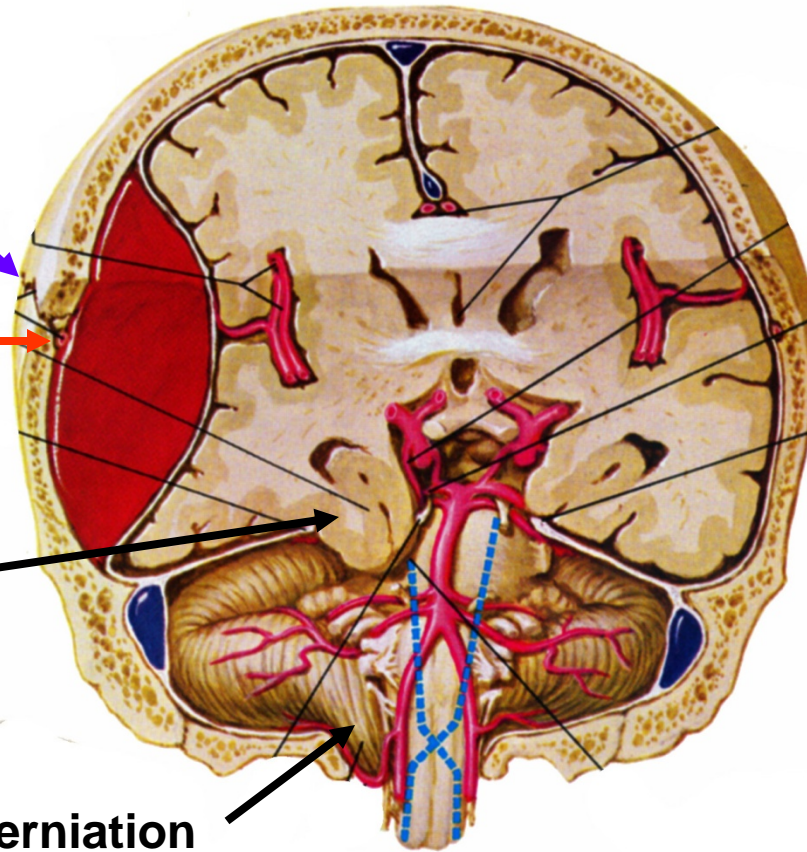
# DAMAGE MIDDLE MENINGEAL, [ACCESSORY MENINGEAL ARTERIES] - EPIDURAL HEMATOMA

Skull Fracture Near Pterion

Tear Middle Meningeal Artery

Uncal herniation

Tonsillar herniation



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

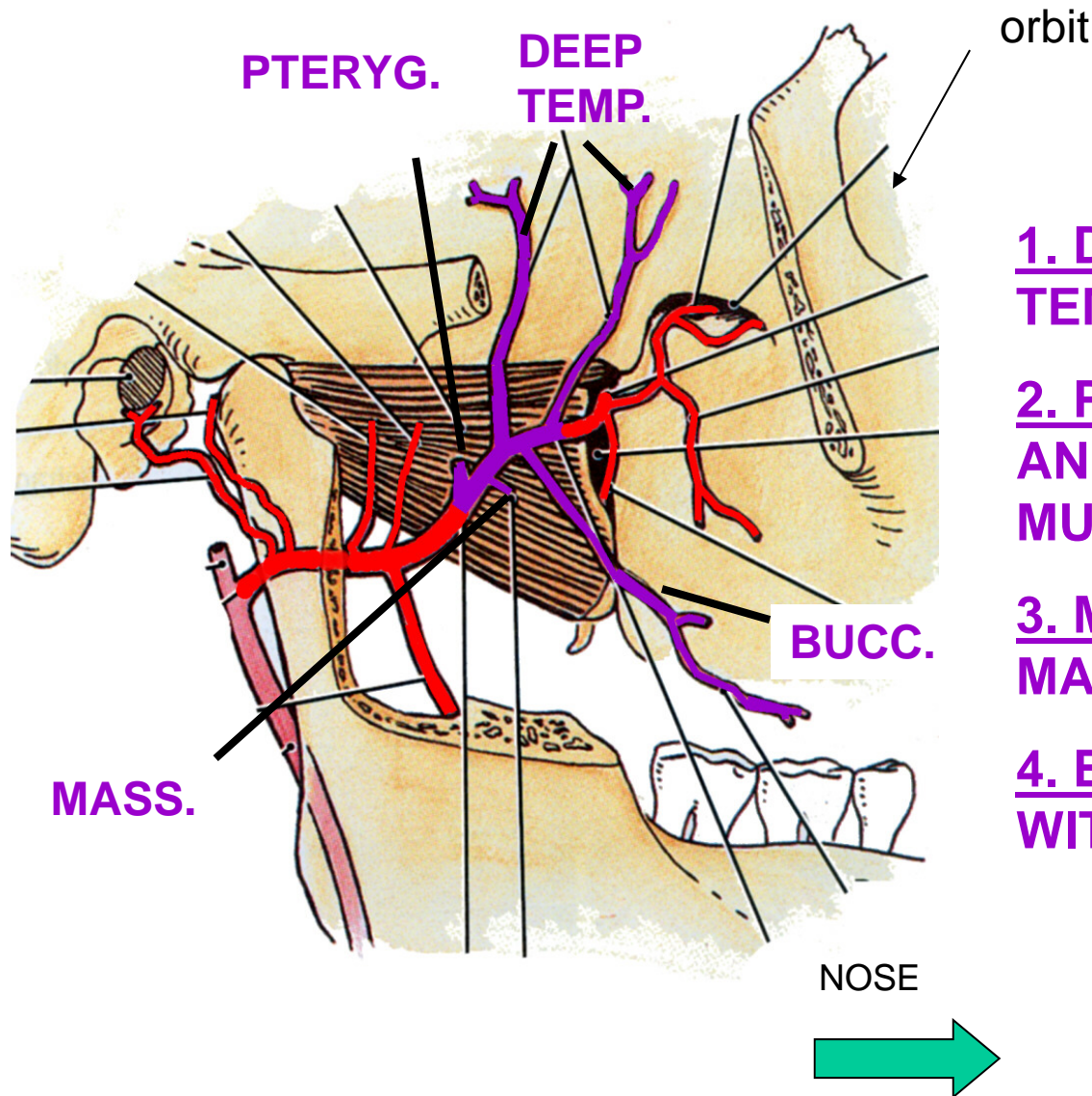
6) Herniation -

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



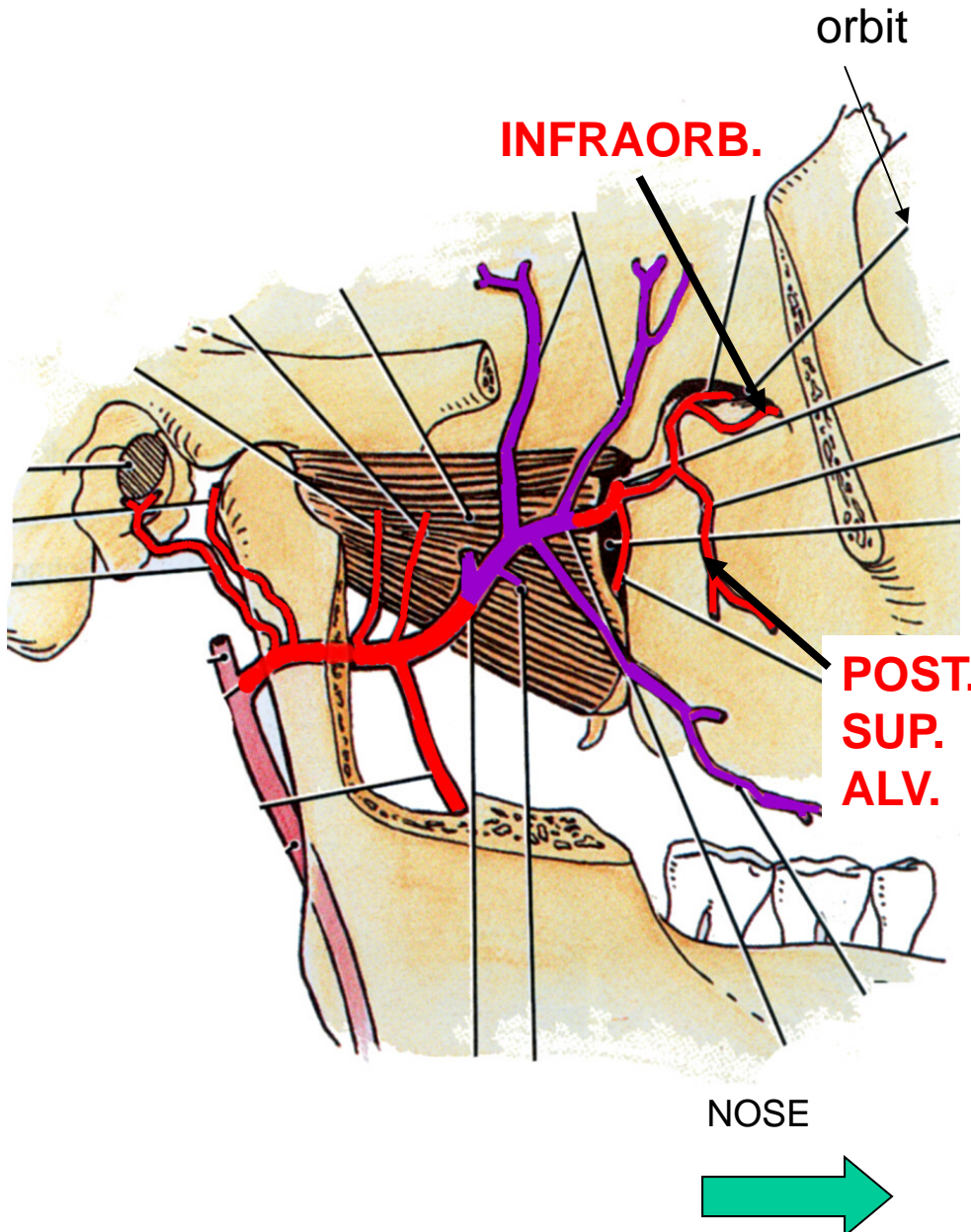
1. DEEP TEMPORAL A. - TEMPORALIS

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

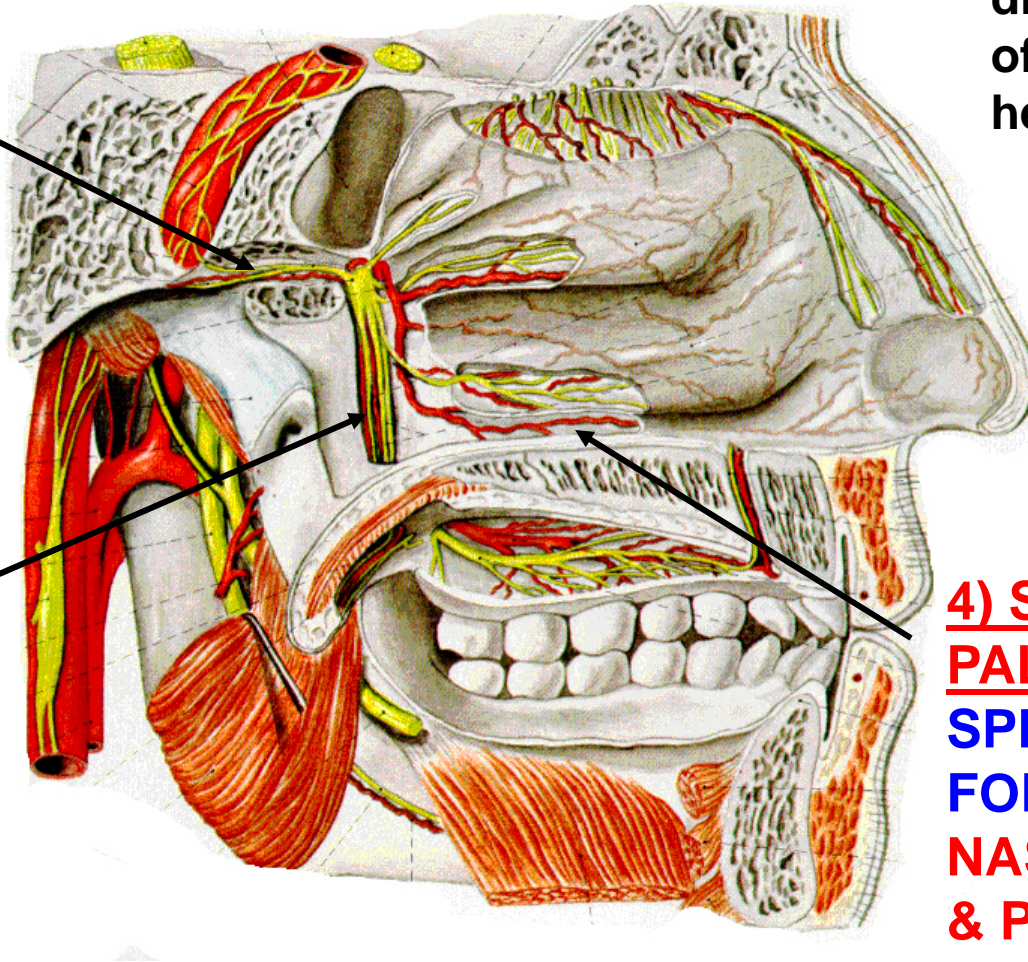
5. INFRAORBITAL A. -  
INFRAORB. FORAMEN- FACE -  
branch - ANT. SUP. ALVEOLAR  
A. - ANT. MAX. TEETH



# 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

NOSE →

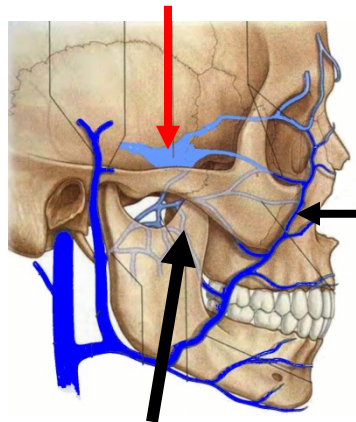
- 1) Branches of Maxillary artery have accompanying veins.
- 2) Drain to Pterygoid Venous Plexus (Superficial to
- 3) **ANASTOMOSE WITH CAVERNOUS SINUS AND FACIAL VEIN**



**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 anastomoses of Facial Vein).**

PTERYGOID  
VENOUS  
PLEXUS

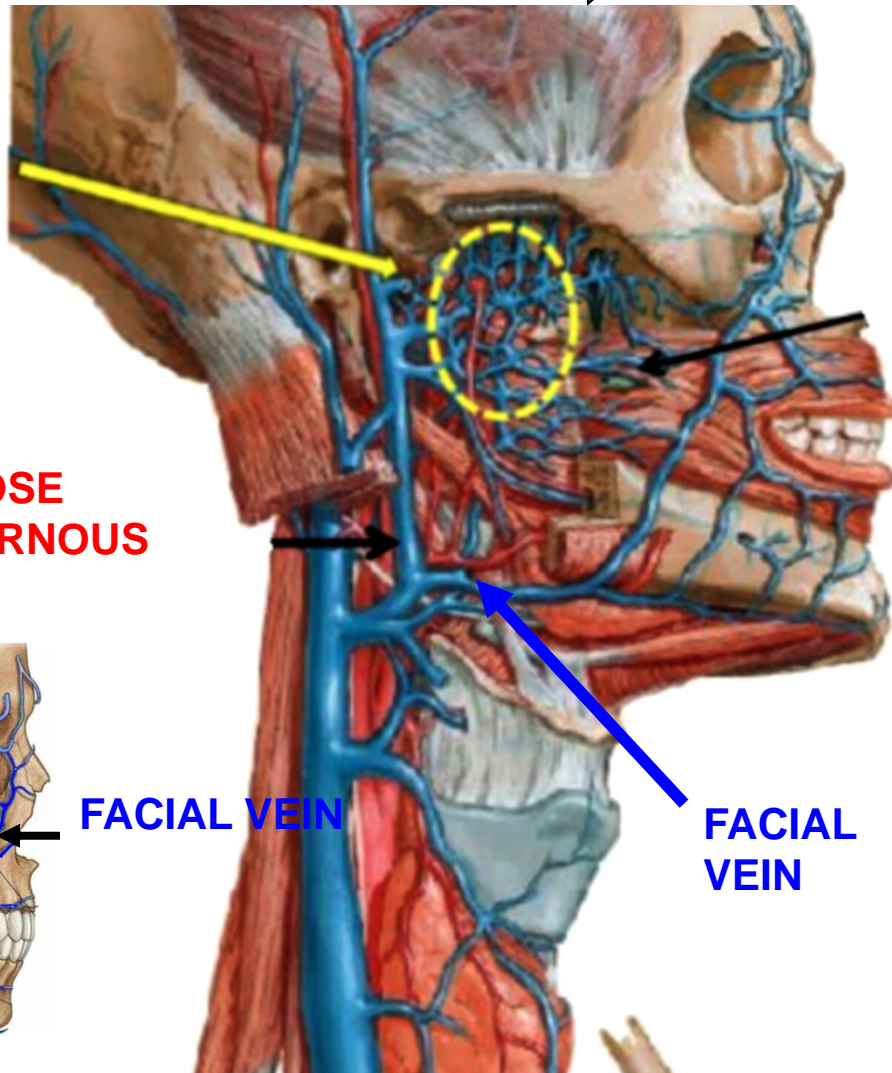
**ANASTOMOSE  
WITH CAVERNOUS  
SINUS**



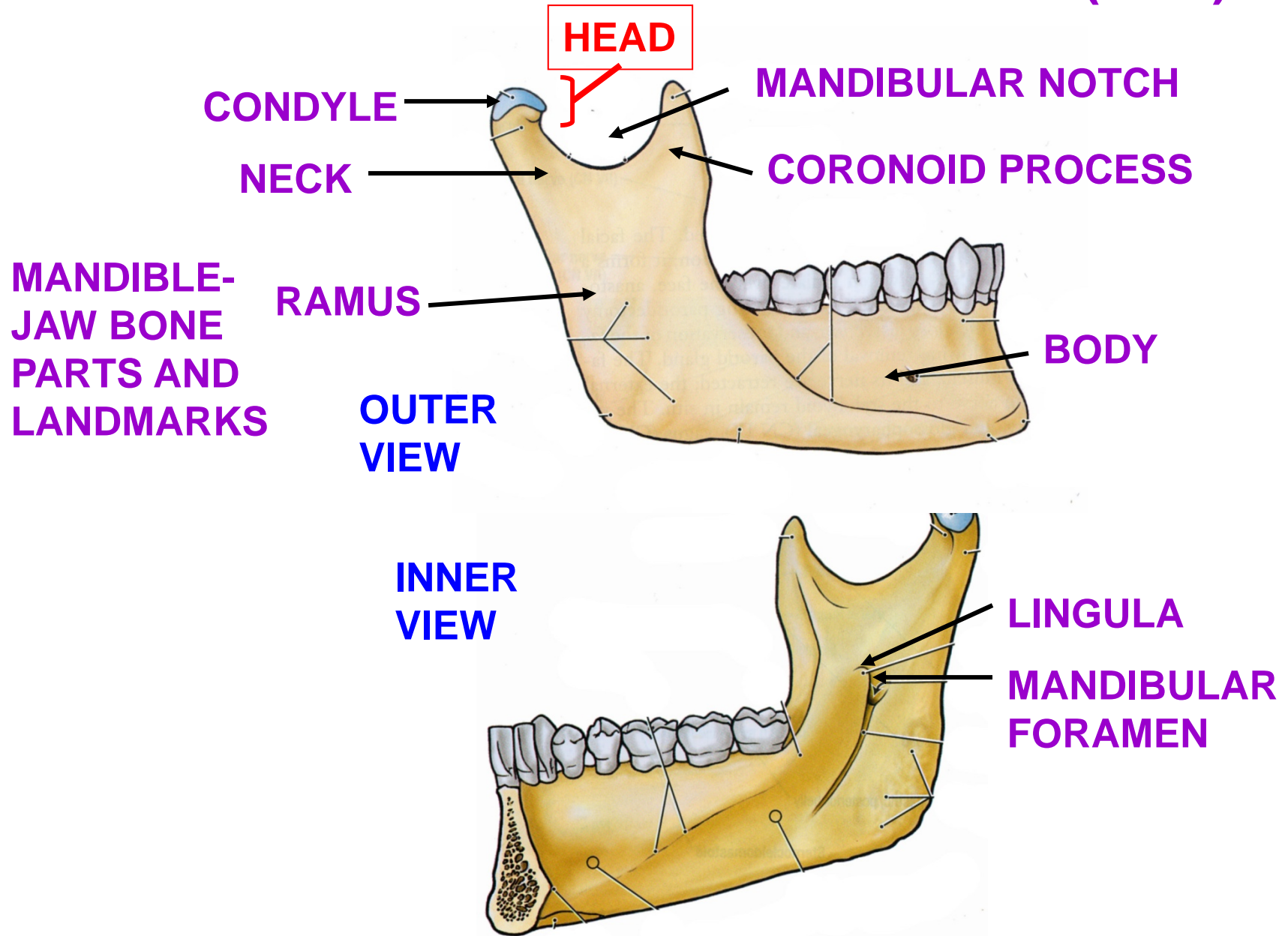
FACIAL VEIN

FACIAL  
VEIN

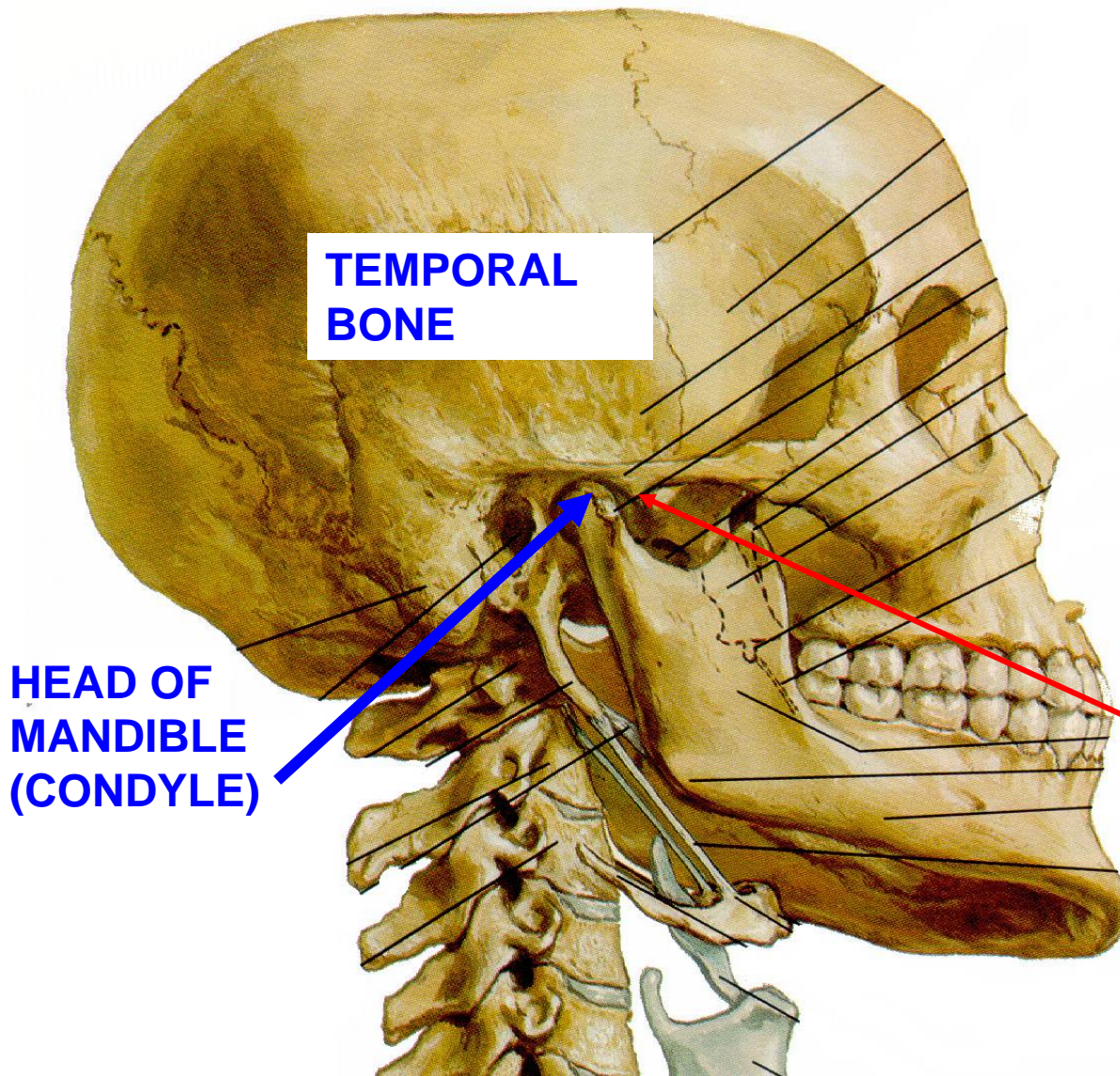
PTERYGOID  
VENOUS PLEXUS



# V. TEMPORO-MANDIBULAR JOINT (TMJ)



# 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)

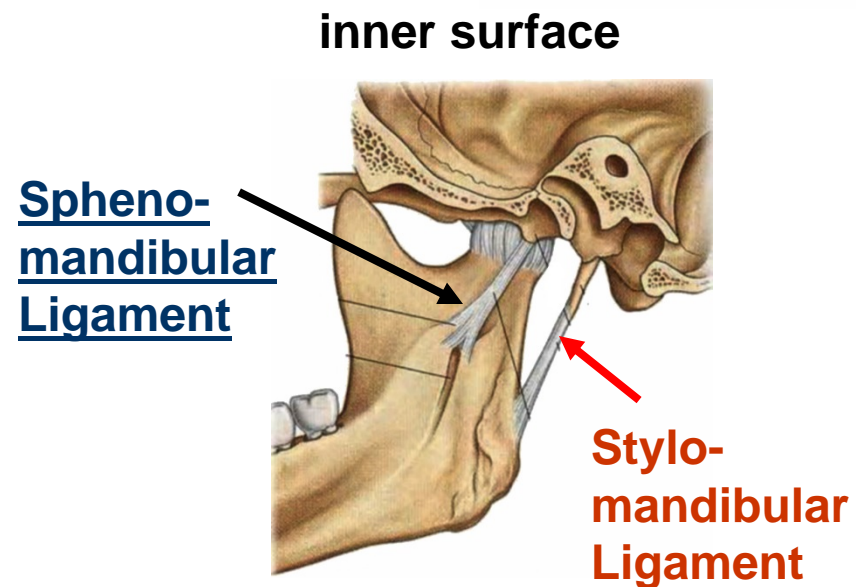
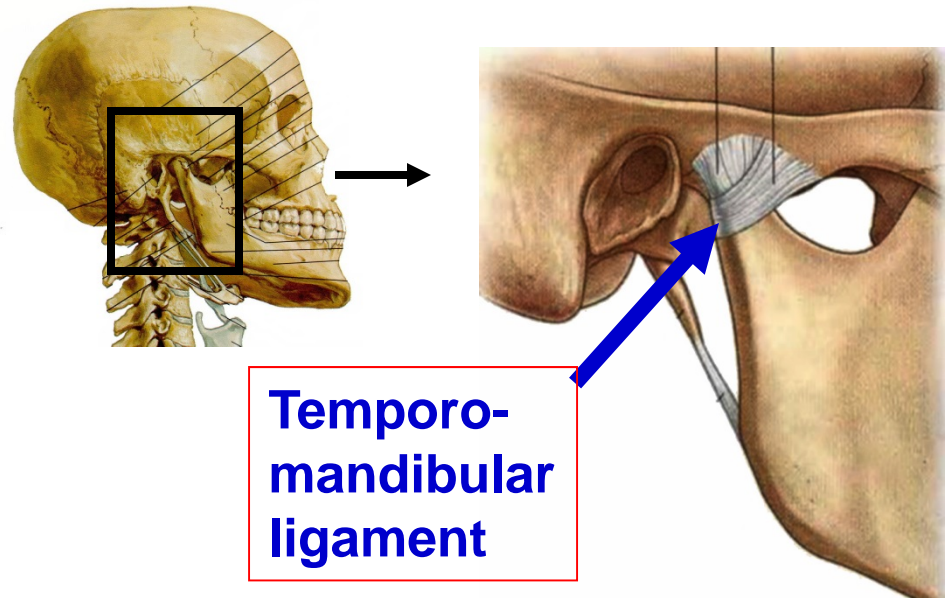
A. CAPSULE - SURROUNDS JOINT - TIGHTLY ATTACHED TO MANDIBLE, LOOSELY TO TEMPORAL BONE

## C. LIGAMENTS

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

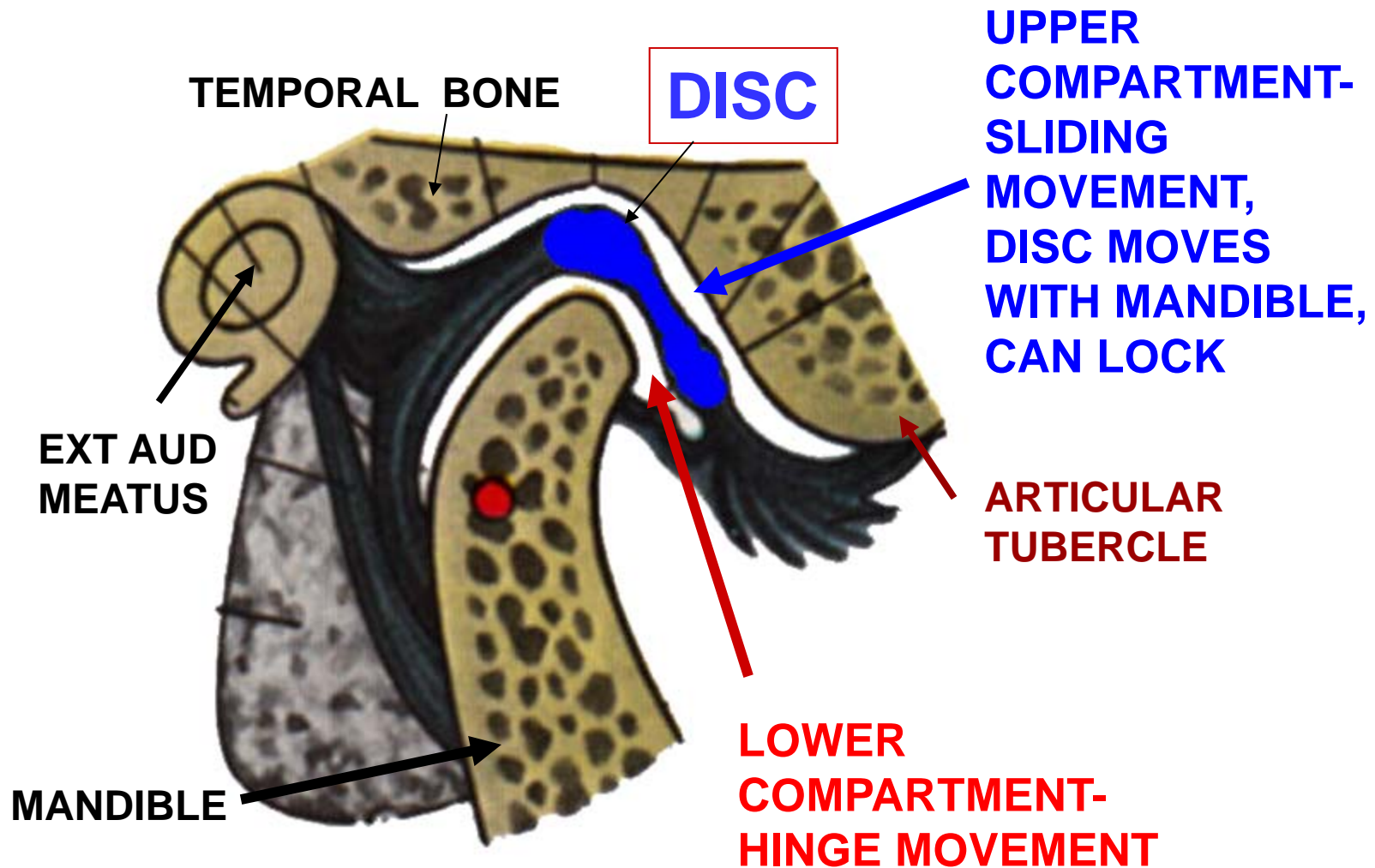
2) Sphenomandibular ligament - spine of sphenoid bone to lingula of mandible; function unclear.

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



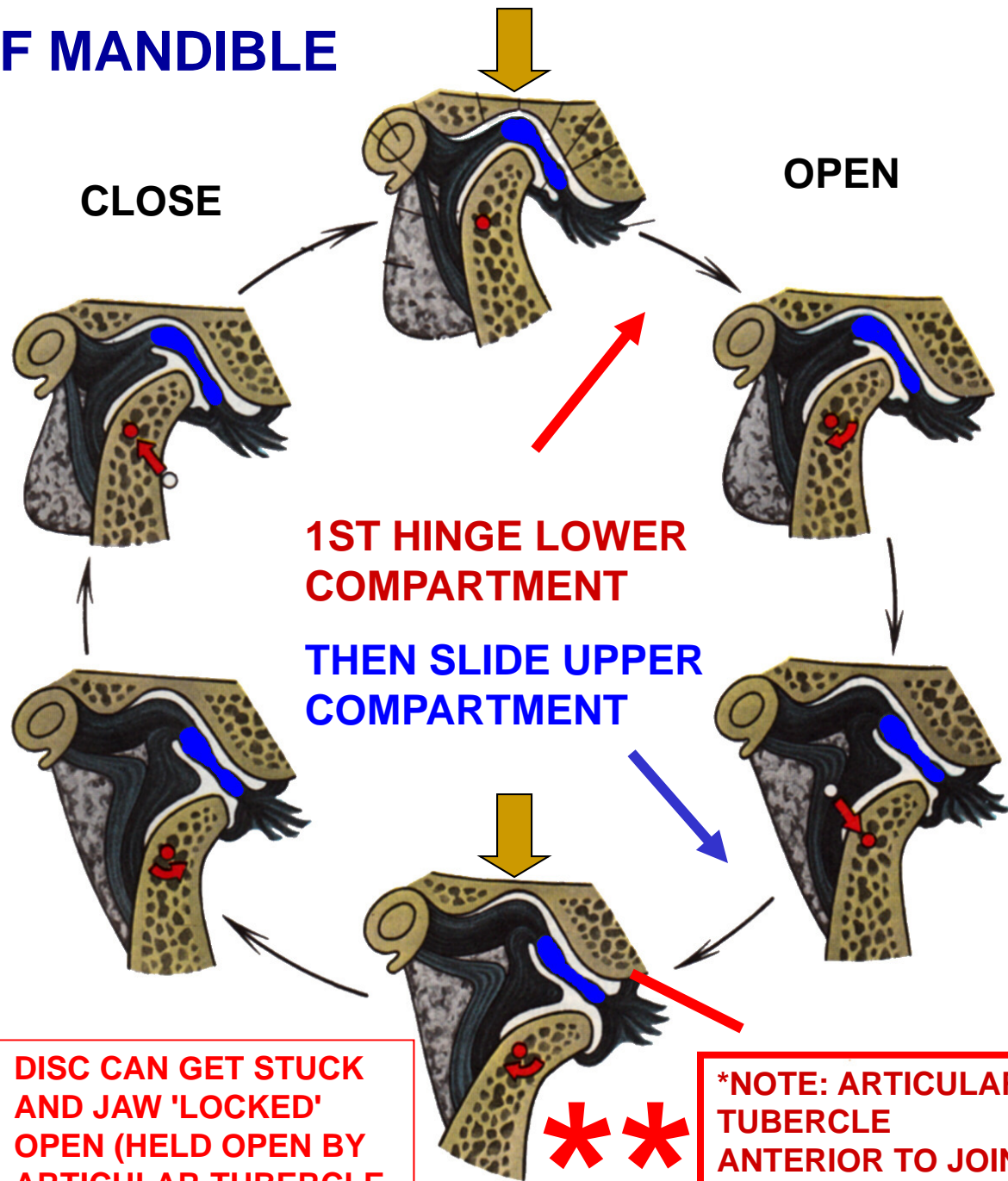
## D. MOVEMENTS OF MANDIBLE

### - '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



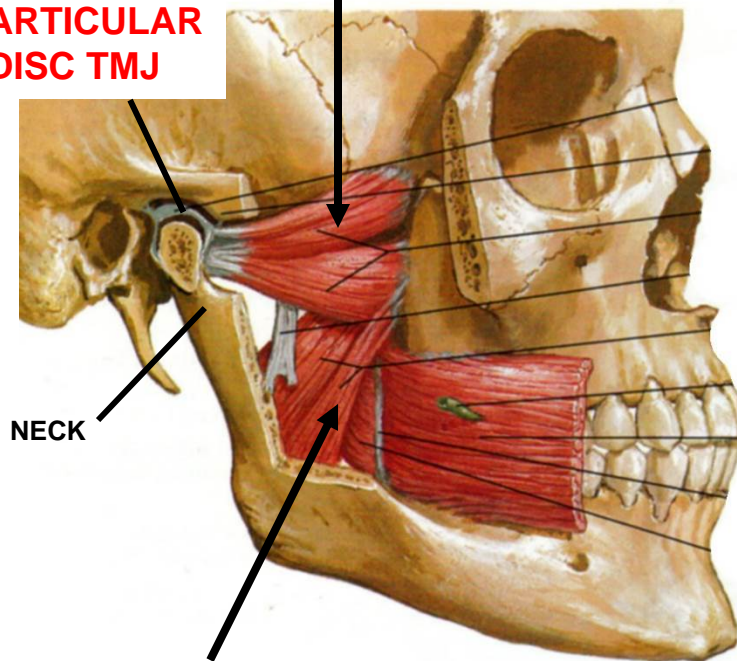
## VI. MUSCLES OF MASTICATION

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

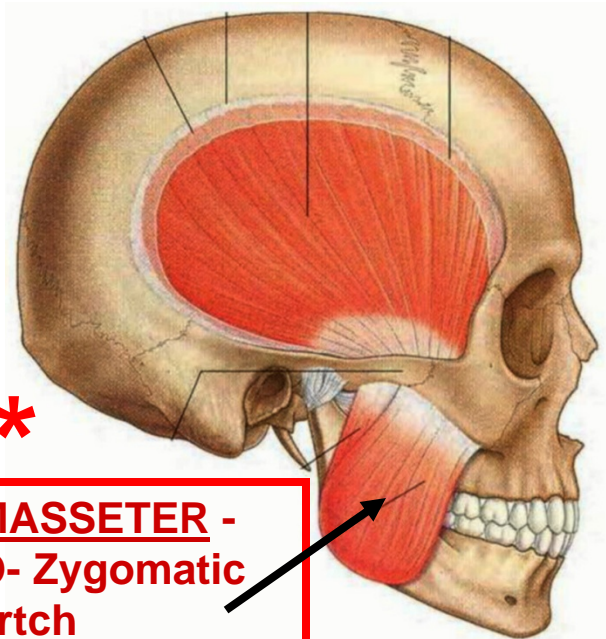
**PTERYGOID MUSCLES - O - Lateral Pterygoid Plate**

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

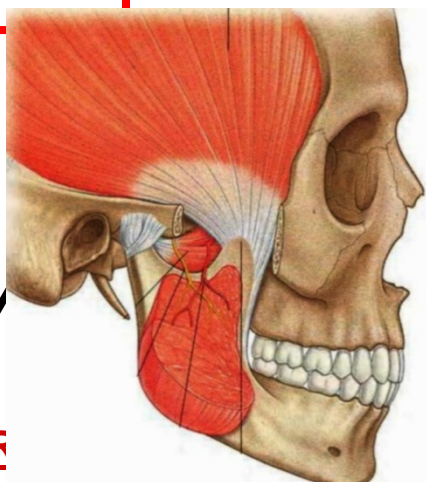
**ARTICULAR DISC TMJ**



**MED. PTERYGOID - I - Ramus, A - Elevate**



**MASSETER -  
O- Zygomatic arch  
I Ramus, A - Elevate**



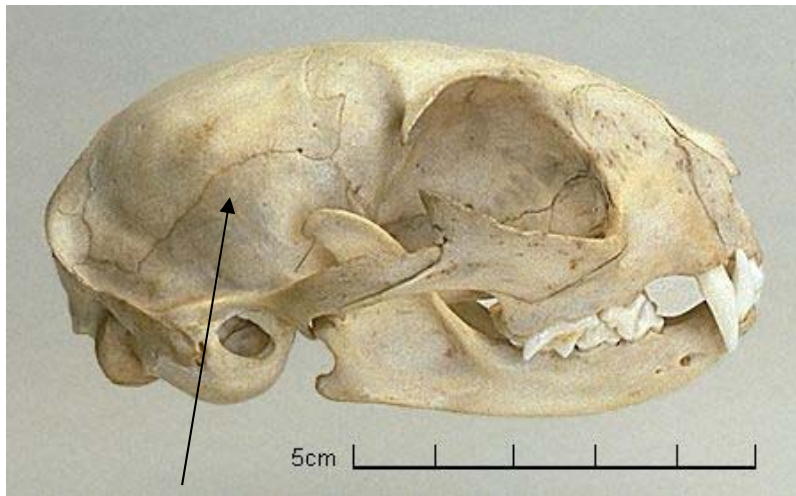
**TEMPOF  
I, Coronoid process  
A - Elevate, Retrude**

**- CORONOID PROCESS**



# TEMPORALIS IS EXCEPTIONALLY LARGE IN CARNIVORES

SKULL OF DOMESTIC CAT



TEMPORAL FOSSA

CAT



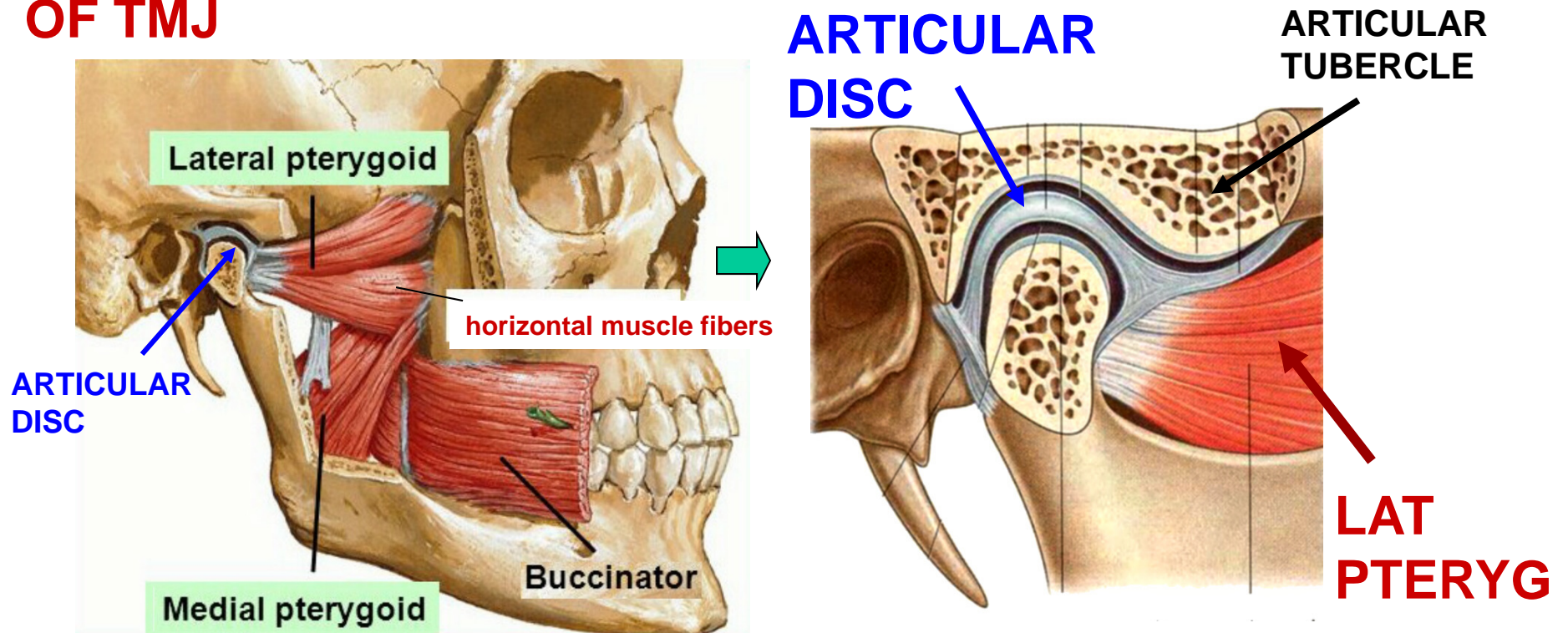
DOG



**CATS AND DOGS HAVE LARGE TEMPORALIS MUSCLES AND SMALL CRANIAL CAVITIES, SMALL BRAINS**

# MUSCLES OF MASTICATION

## LATERAL PTERYGOID - ATTACHES TO ARTICULAR DISC OF TMJ



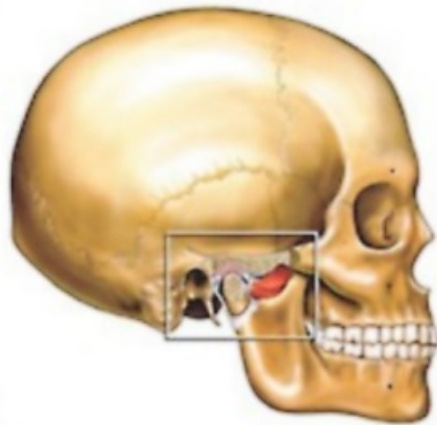
PULLS DISC ANTERIORLY WHEN OPEN MOUTH



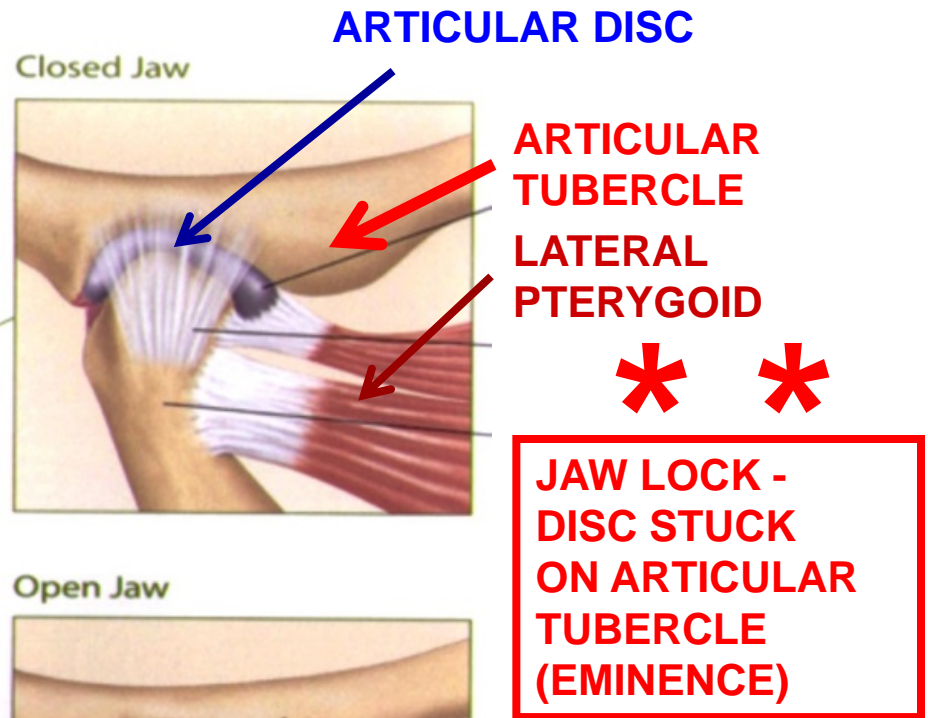
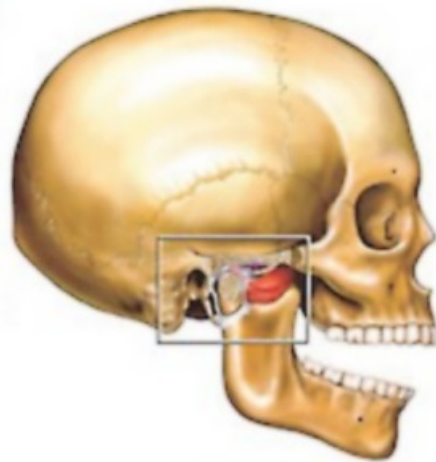
# TMJ JAW LOCK - mandible stuck in partial depression

**OPEN MOUTH =  
depress mandible**

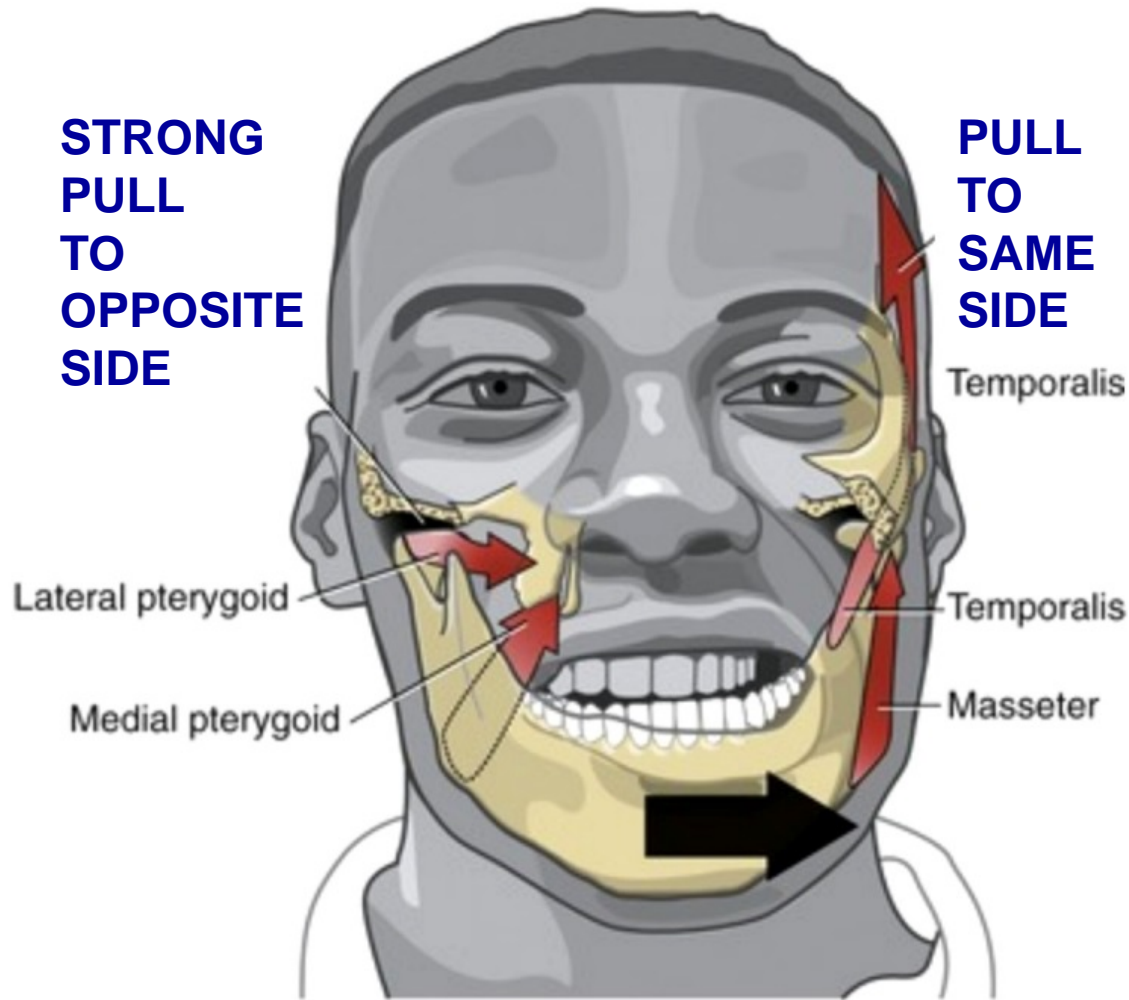
**FIRST  
HINGE  
LOWER  
COMPART  
MENT**



**THEN  
SLIDE  
UPPER  
COMPART  
MENT**



# LATERAL MOVEMENTS OF JAW - occur in chewing



## Lateral movements

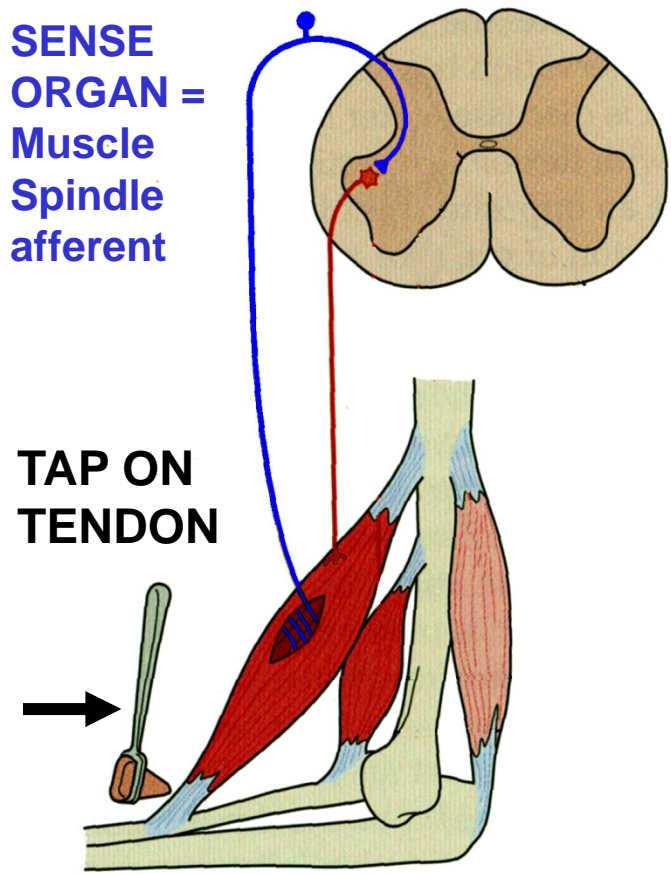
- 1) Lateral and Medial Pterygoid (inside mandible) pull toward opposite side
- 2) Temporals and Masseter (outside mandible) pull toward same side



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

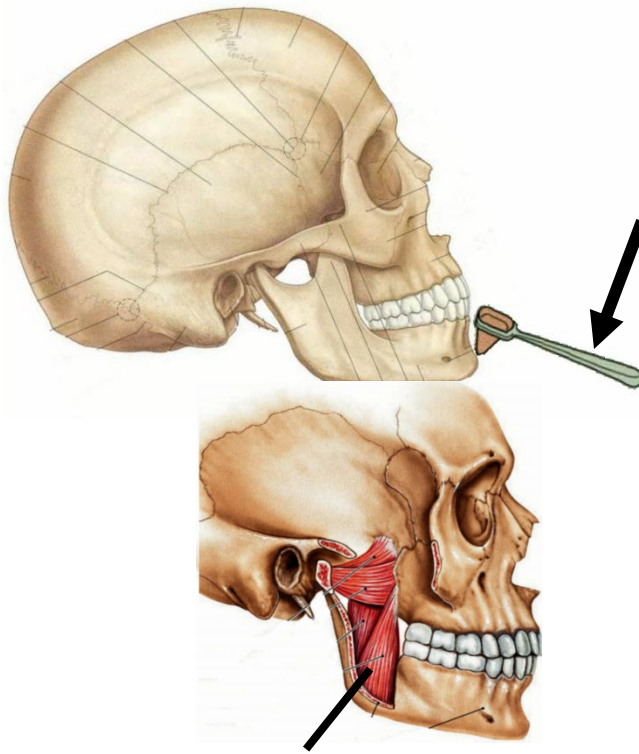
# JAW JERK REFLEX = STRETCH REFLEX OF MUSCLES OF MASTICATION - sensory and motor in V3

## STRETCH REFLEX IN BICEPS



## STRETCH REFLEX IN MUSCLES OF MASTICATION

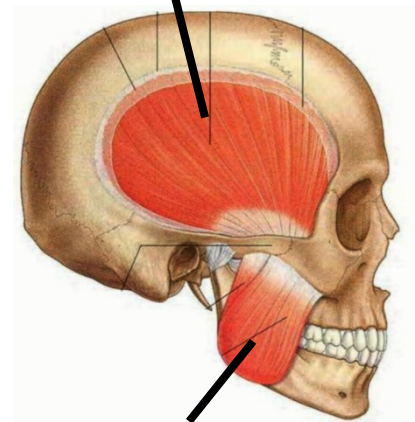
TAP DOWN ON CHIN



MEDIAL PTERYGOID

STRETCH MUSCLES THAT CLOSE MOUTH (ELEVATE MANDIBLE)

TEMPORALIS

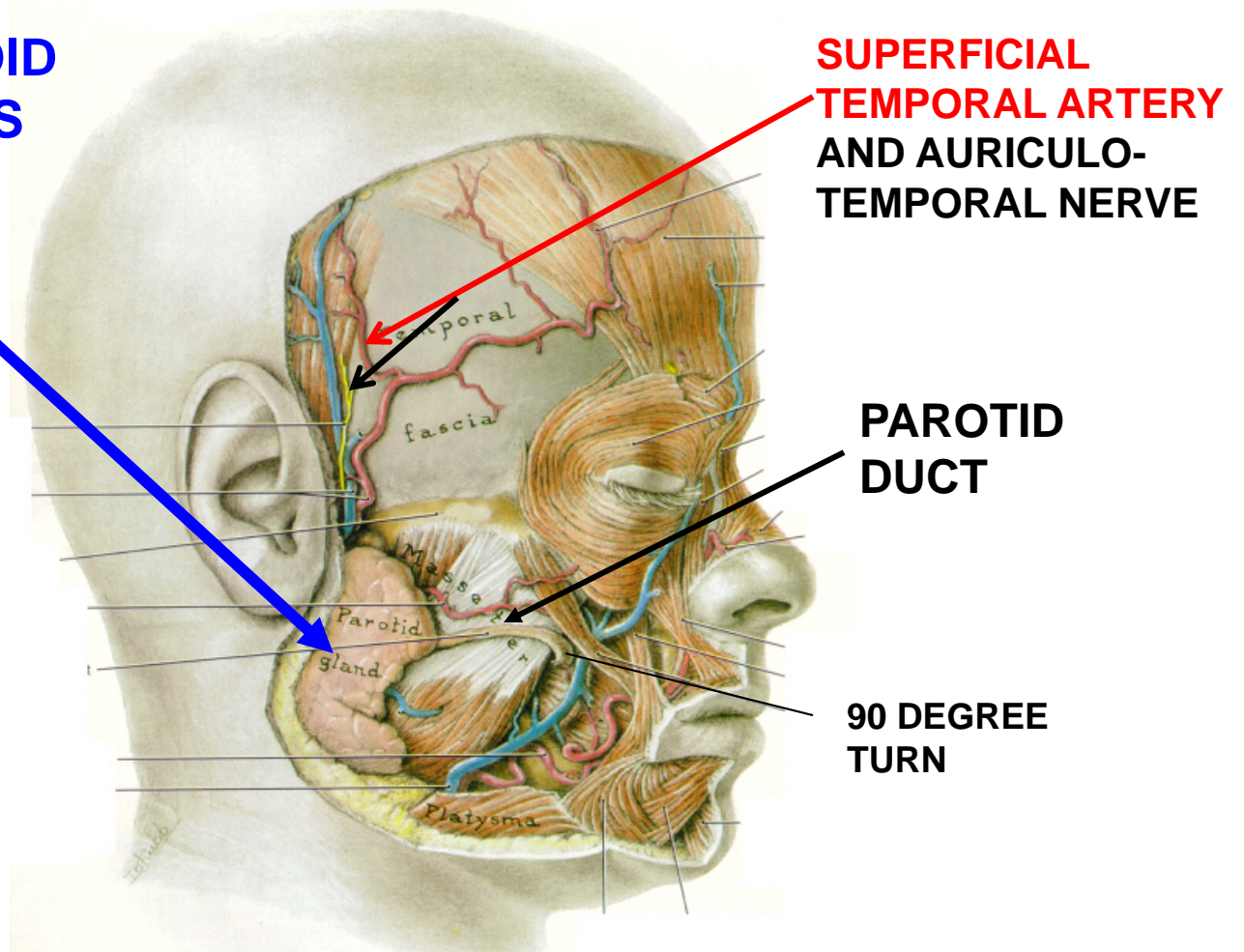


MASSETER

## VII. PAROTID REGION

- BETWEEN MASTOID  
PROCESS & RAMUS  
MANDIBLE

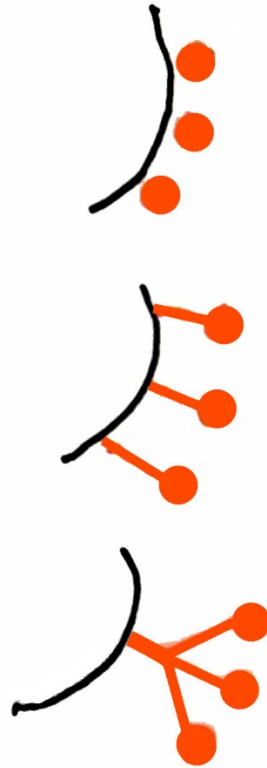
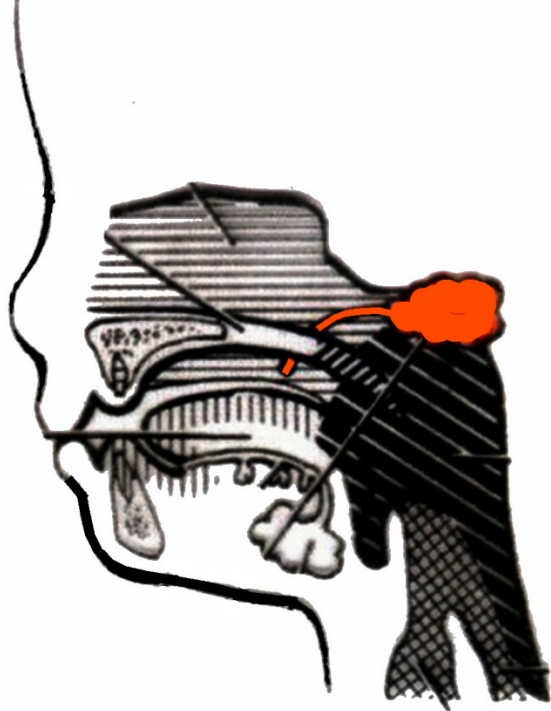
**PAROTID GLAND -  
CAPSULE** - FROM  
INVESTING LAYER  
- ATTACHED TO  
ZYGOMATIC ARCH  
AND TEMPORAL  
BONE (TYMPANIC  
PART); VERY  
TOUGH



**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



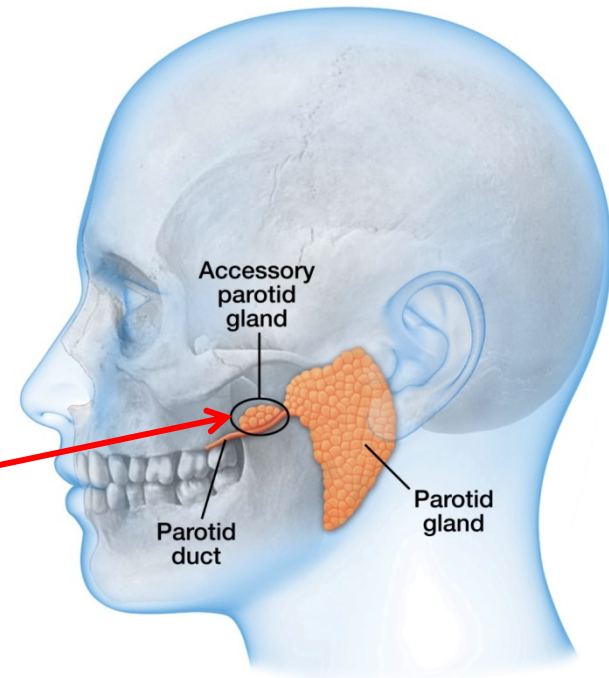
7 WEEKS

1) BUDS FROM ECTODERM OF PRIMITIVE MOUTH

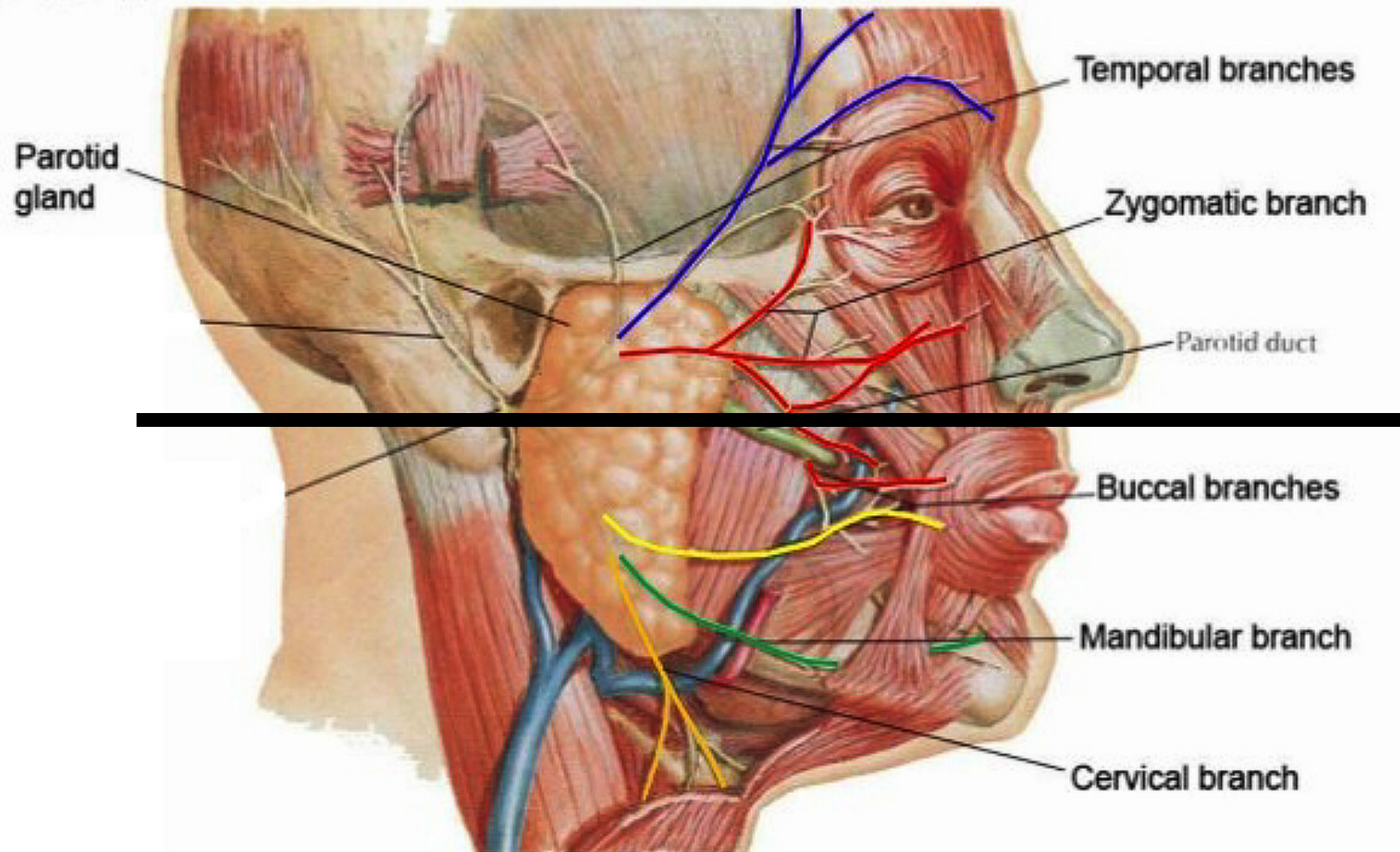
2) EXTEND TO FORM CORDS - DEVELOP LUMENS – FORM DUCTS

3) DUCTS JOIN

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



## ORIENT - HORIZONTAL SECTION THROUGH PAROTID GLAND





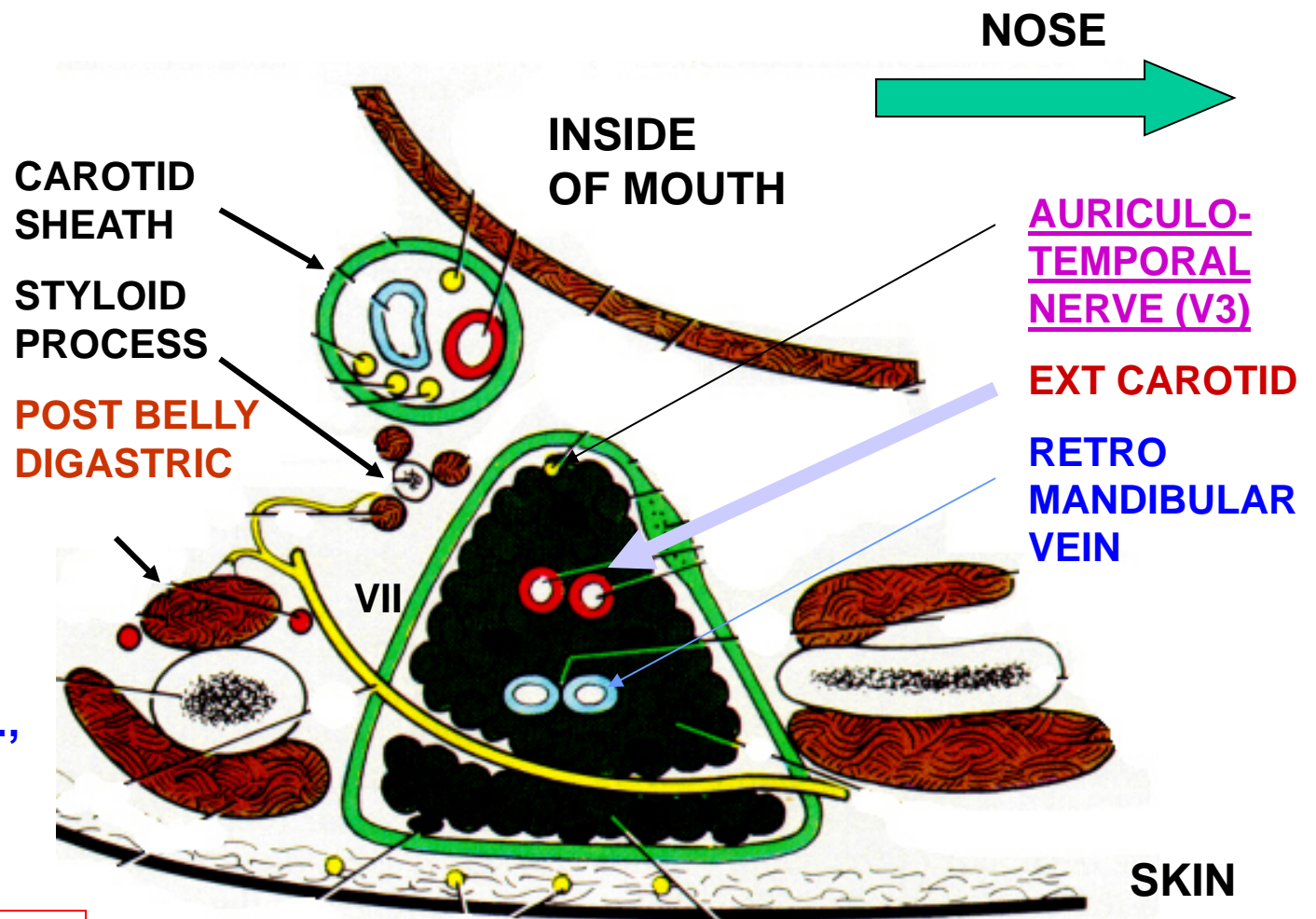
# PAROTID REGION - DEEP STRUCTURES

DEEP- POST  
BELLY  
DIGASTRIC,  
STYLOID  
PROCESS,  
CAROTID  
SHEATH

WITHIN PAROTID-

- 1) VII,
- 2) RETROMANDIBULAR VEIN,
- 3) EXT CAROTID A.,
- 4) AURICULO-TEMPORAL N.

INNERV. OF PAROTID -  
VISCERAL MOTOR  
(PARASYMP)  
OF IX  
(GLOSSOPHARYNG. 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) \*