SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai

DEPARTMENT OF RADIOGRAPHY AND IMAGING TECHNOLOGY

COURSE NAME :CLINICAL RADIOGRAPHY POSITIONING

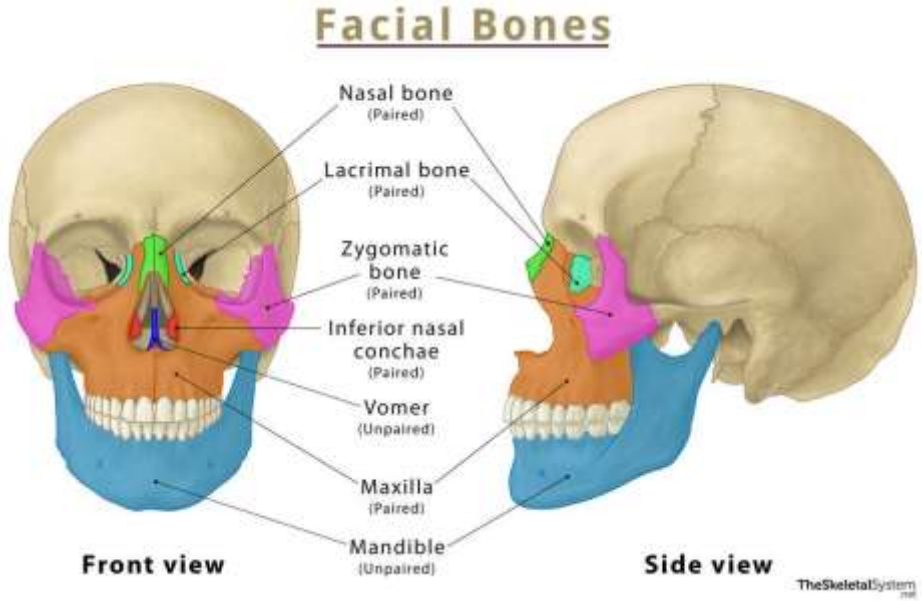
UNIT : SKULL RADIOGRAPHY

TOPIC :FACIAL BONES - RECAP

FACULTY NAME : MRS.G.HELANA JOY

INTRODUCTION (Define)

Radiography of the facial bones, petrous apex, zygomatic bone, nasal bone, mandible, and temporomandibular joint (TMJ) is crucial for evaluating trauma, congenital anomalies, infections, and neoplasms affecting the facial skeleton and associated joints.



COMMON INDICATIONS

- Trauma (e.g., fractures, dislocations)
- Infections (e.g., sinusitis, osteomyelitis)
- Tumors (e.g., osteoma, squamous cell carcinoma)
- TMJ dysfunction (e.g., arthritis, disc displacement)
- Congenital anomalies (e.g., cleft palate, craniofacial deformities)

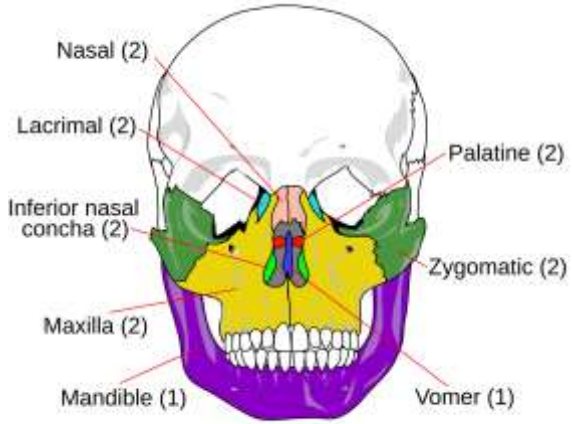
STANDARD VIEWS

- **Anteroposterior (AP) view**
- **Lateral view**
- **Waters' view** (for facial bones, sinuses)
- **Caldwell view** (for orbits, petrous apex)
- **Submentovertex (SMV) view** (for zygomatic arches, base of skull)
- **Oblique views** (for mandible, TMJ)

ANATOMY OF THE FACIAL BONES AND RELATED STRUCTURES

Facial Bones:

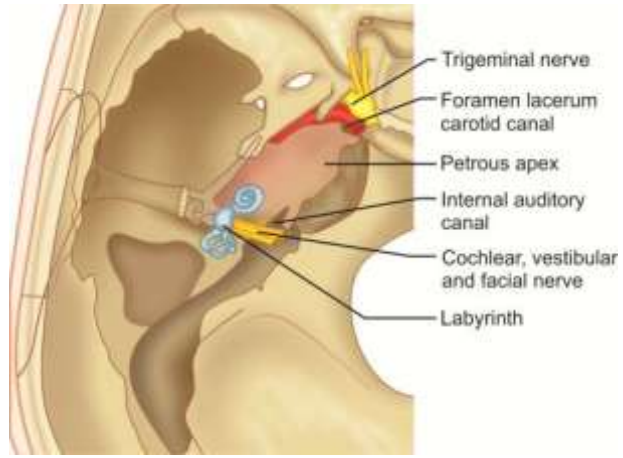
- **Bones**: Maxilla (2), zygomatic (2), nasal (2), lacrimal (2), palatine (2), inferior nasal conchae (2), vomer, mandible.
- **Landmarks**: Orbital margins, nasal septum, maxillary sinuses, mental foramen.



14 facial bones

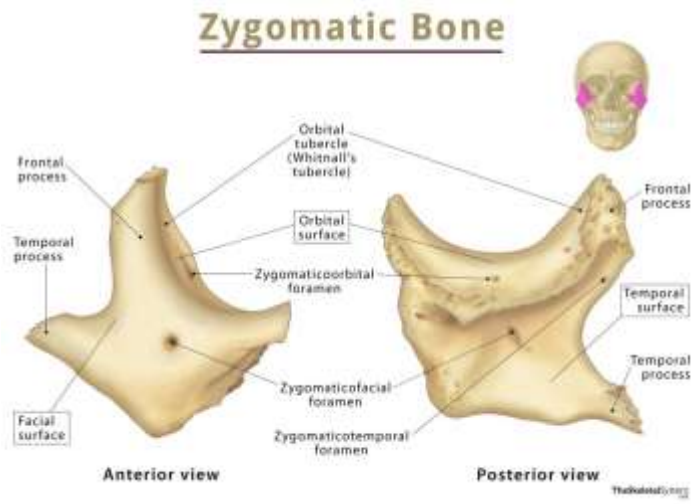
Petrous Apex:

- **Location**: Apex of petrous portion of temporal bone, near internal auditory canal.
- **Landmarks**: Petrous ridge, carotid canal, jugular foramen.



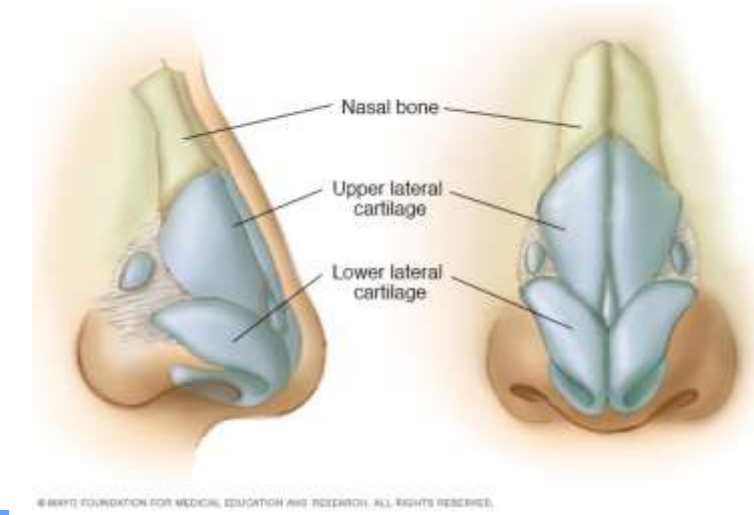
Zygomatic Bone:

- **Features**: Forms cheek prominence, lateral orbit, and zygomatic arch (with temporal bone).
- **Landmarks**: Zygomaticofrontal suture, zygomaticomaxillary suture.



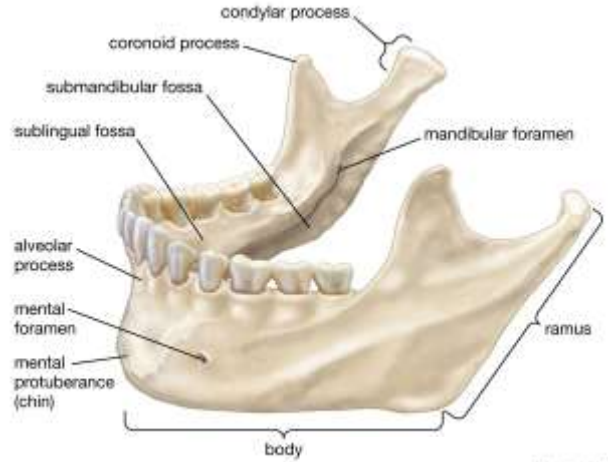
Nasal Bone:

- **Features**: Paired bones forming bridge of nose.
- **Landmarks**: Nasofrontal suture, nasal septum.



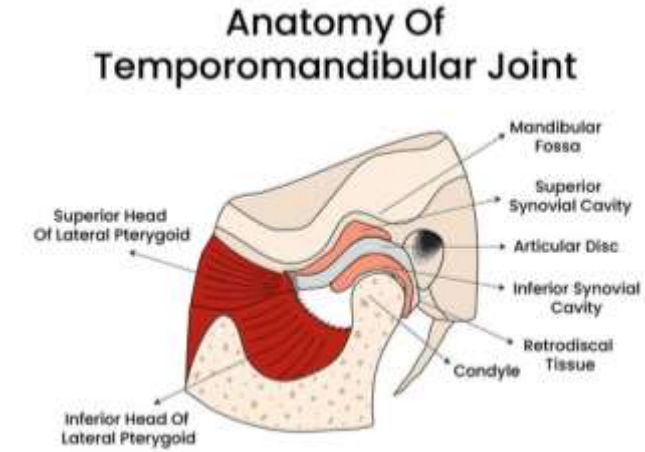
Mandible:

- **Parts**: Body, rami (2), condylar processes, coronoid processes.
- **Landmarks**: Mental protuberance, mandibular notch, angle of mandible.



Temporomandibular Joint (TMJ):

- **Components**: Mandibular condyle, articular disc, temporal bone (mandibular fossa, articular eminence).
- **Landmarks**: Glenoid fossa, postglenoid tubercle.



TECHNICAL FACTORS

- **kVp**: 65-80 kVp (lower for nasal bones, higher for mandible/TMJ)
- **mAs**: 5-20 mAs (adjusted for bone detail vs. soft tissue)
- **SID (Source-to-Image Distance)**: 100 cm (40 inches)
- **Grid**: Used for mandible and TMJ in adults; typically not required for nasal bones or thin facial structures.
- **Collimation**: Tight to area of interest to reduce scatter and improve image quality.

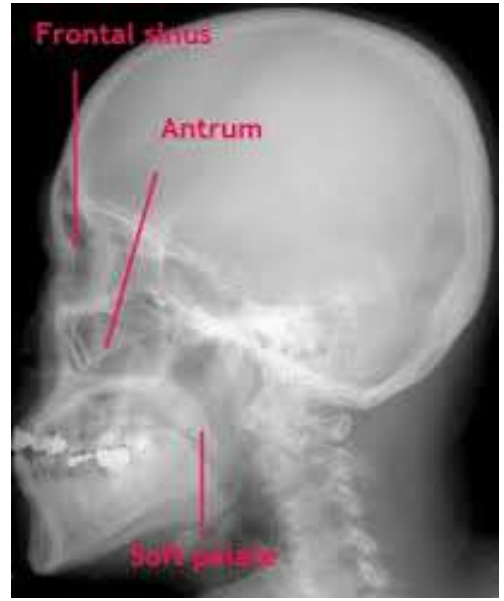
RADIOGRAPHIC POSITIONING FOR THE FACIAL BONES

Waters' View (Occipitomental):

- *Position:* Erect or prone, chin elevated, orbitomeatal line (OML) 37° to image receptor (IR), nose 1 cm from IR.
- *Central Ray (CR):* Perpendicular, centered to midface (at level of nasal bridge).
- *Collimation:* 20x25 cm, including orbits, maxillae, and sinuses.
- *Purpose:* Visualizes maxillary sinuses, orbits, zygomatic bones, nasal septum.

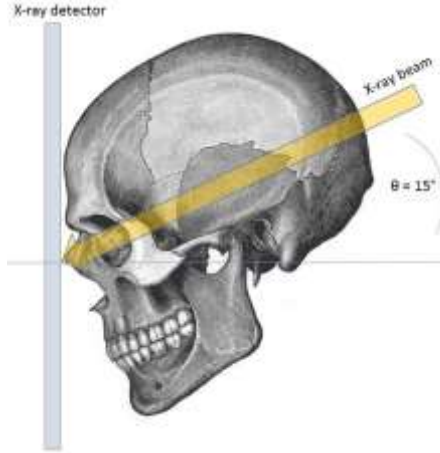
Lateral View:

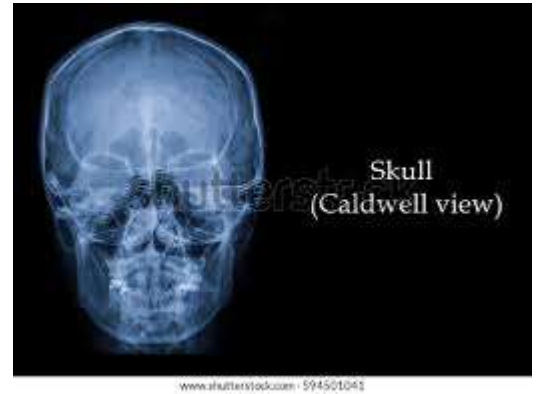
- *Position:* Erect or lateral recumbent, head in true lateral, OML parallel to IR.
- *CR:* Perpendicular, centered to zygomatic bone (midway between outer canthus and EAM).
- *Collimation:* 15x20 cm, including entire facial skeleton.
- *Purpose:* Assesses facial bones, sinuses, fractures.



Caldwell View (PA Axial):

- *Position:* Prone or erect, OML perpendicular to IR, forehead and nose on IR.
- *CR:* Angled 15° caudad, exiting at nasion.
- *Collimation:* 20x25 cm, including orbits and facial bones.
- *Purpose:* Visualizes orbits, ethmoid sinuses, frontal bone.





RADIOGRAPHIC POSITIONING FOR THE PETROUS APEX

Stenvers View:

- *Position:* Prone, head rotated 45° toward side of interest, OML perpendicular to IR.
- *CR:* Angled 12° cephalad, centered 3 cm anterior to external auditory meatus (EAM).
- *Collimation:* 8x10 cm, including petrous portion.
- *Purpose:* Visualizes petrous apex, internal auditory canal.

Towne's View:

- *Position:* Supine or erect, OML perpendicular, chin depressed (OML 30° to CR).
- *CR:* Angled 30° caudad, centered 2.5 cm above glabella.
- *Collimation:* 20x25 cm, including occipital bone and petrous ridges.
- *Purpose:* Evaluates petrous apex, foramen magnum.

RADIOGRAPHIC POSITIONING FOR THE ZYGOMATIC BONE

Submentovertex (SMV) View (Zygomatic Arches):

- *Position:* Supine or erect, neck hyperextended, infraorbitomeatal line (IOML) parallel to IR.
- *CR:* Perpendicular, midway between angles of mandible.
- *Collimation:* 15x15 cm, including zygomatic arches.
- *Purpose:* Visualizes zygomatic arches, detects fractures.

Waters' View:

- *Position:* Erect or prone, OML 37° to IR, chin elevated.
- *CR:* Perpendicular, centered to midface.
- *Collimation:* 20x25 cm, including zygomatic bones.
- *Purpose:* Assesses zygomaticomaxillary complex fractures.

Tangential View (for Isolated Arch):

- *Position:* Head tilted 15° away from side of interest, IOML parallel to IR.
- *CR:* Angled 15° cephalad, centered to zygomatic arch.
- *Collimation:* 8x10 cm, centered on arch.
- *Purpose:* Isolates zygomatic arch from superimposition.

RADIOGRAPHIC POSITIONING FOR THE NASAL BONE

Lateral View:

- *Position:* Erect or lateral recumbent, head in true lateral, IOML parallel to IR.
- *CR:* Perpendicular, centered to nasion.
- *Collimation:* 8x10 cm, including nasal bones and soft tissues.
- *Purpose*: Detects nasal fractures, deviations.

RADIOGRAPHIC POSITIONING FOR THE MANDIBLE

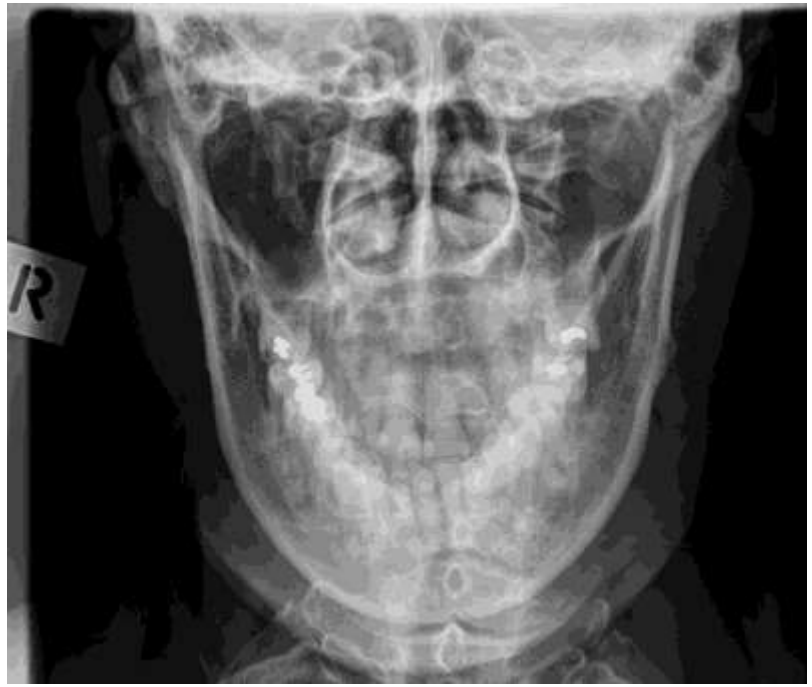
PA View:

- *Position:* Prone or erect, OML perpendicular to IR, forehead and nose on IR.
- *CR:* Perpendicular, exiting at junction of lips.
- *Collimation:* 15x20 cm, including entire mandible.
- *Purpose*: Visualizes mandibular body, rami, and angles.

Lateral Oblique View:

- *Position:* Head rotated 30° toward side of interest, OML parallel to IR.
- *CR:* Angled 25° cephalad, centered 2 cm below angle of mandible.
- *Collimation:* 10x12 cm, including mandible from condyle to symphysis.
- *Purpose:* Assesses body, ramus, and condyle for fractures.

AP VIEW

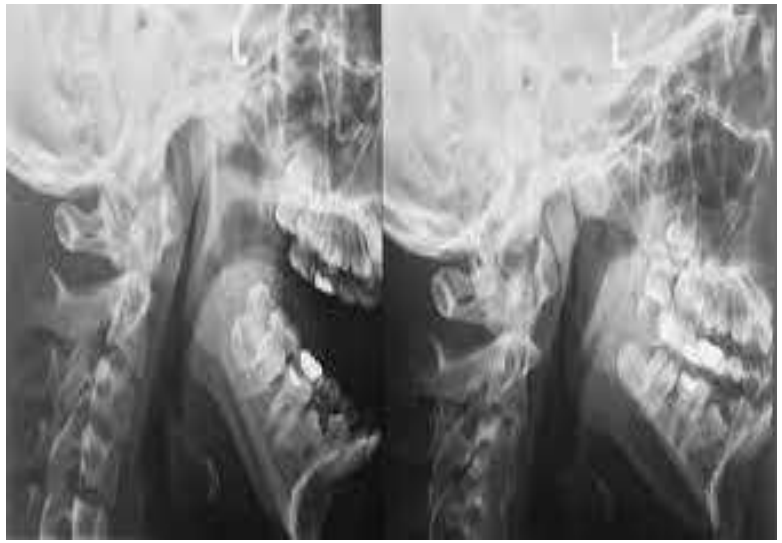


LATERAL VIEW

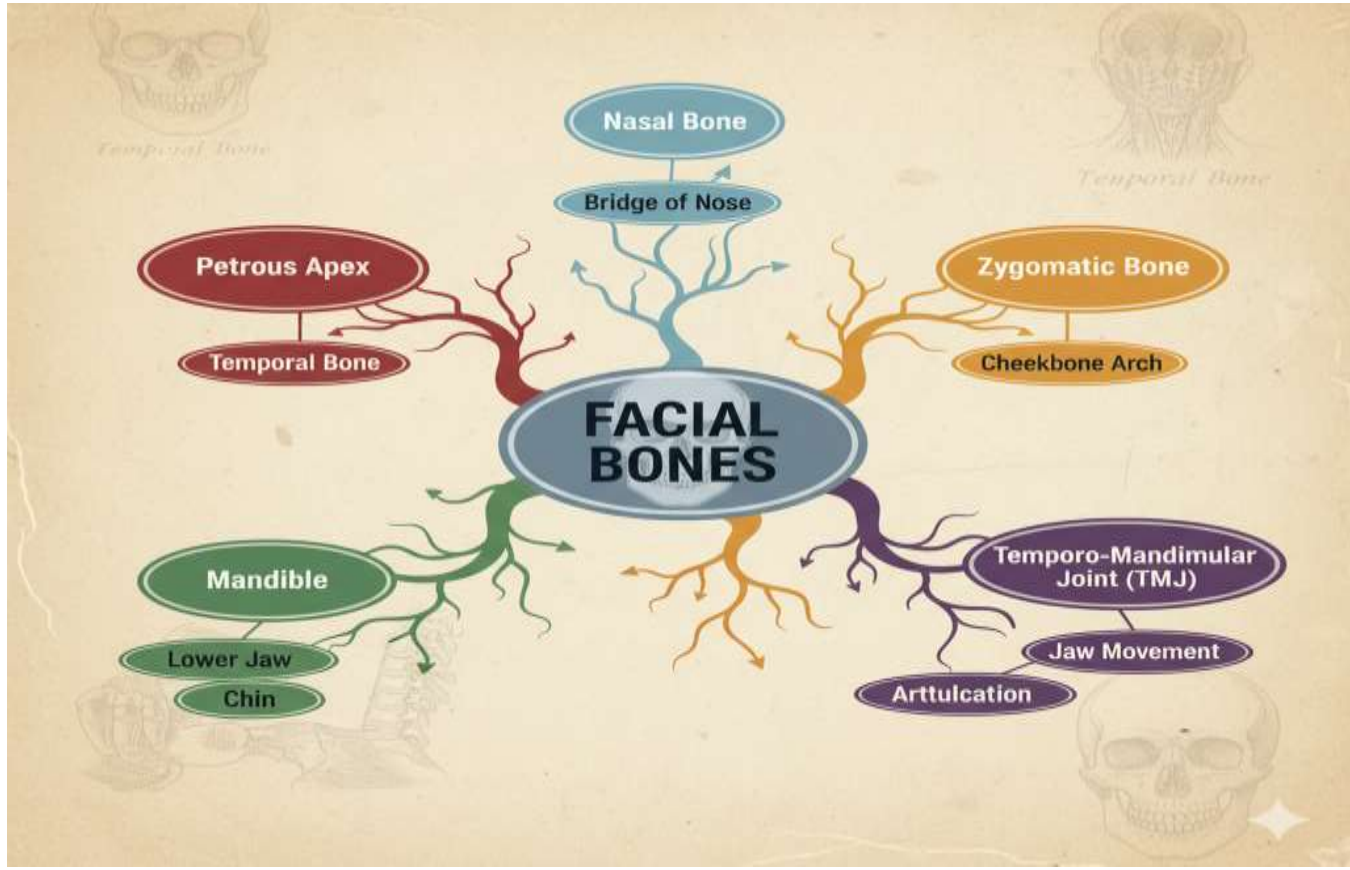
RADIOGRAPHIC POSITIONING FOR THE TEMPOROMANDIBULAR JOINT (TMJ)

Lateral View (Closed and Open Mouth):

- *Position:* Lateral, head in true lateral, OML parallel to IR; image taken with mouth closed, then open.
- *CR:* Perpendicular, centered 1.5 cm superior to EAM.
- *Collimation*: 8x10 cm, including TMJ and mandibular condyle.
- *Purpose:* Evaluates condylar movement, joint space, disc displacement.



SUMMARY


Nasal Bone
Bridge of Nose
Petrous Apex
Temporal Bone
Zygomatic Bone
Cheekbone Arch
FACIAL BONES
Mandible
Lower Jaw
Chin
Temporo-Mandimular Joint (TMJ)
Jaw Movement
Arttulcation

References

- **Bontrager, K. L., & Lampignano, J. P. (Latest Edition). T**
- **Textbook of Radiographic Positioning and Related Anatomy. *St. Louis, MO: Elsevier.***

  (Excellent source for positioning details and evaluation criteria).
- **Radiopaedia: Tempomandibular Joint View. Available at:**

https://radiopaedia.org/articles/temporomandibular-joint-axiolateral-oblique-view

- **Radiopaedia: Mandible Radiograph View. Available at:**

https://radiopaedia.org/articles/mandible-axiolateral-oblique-view

- **Radiopaedia: Nasal Radiograph. Available at:**

https://radiopaedia.org/articles/nasal-bones-lateral-view