Radiographic Procedures III (RAD 223)
Skull Morphology
Sinuses

Skull
- Cranium (8 bones)
  - Frontal, Occipital, Ethmoid, Sphenoid, Parietal, Temporal
- Facial bones (14 bones)

Floor of Cranium

Lateral view
Superior cutaway view
Cranial Sutures and Junction Points

- Cranial sutures
  - Coronal
  - Lambdoidal
  - Squamosal
  - Sagittal
- Junction points
  - Asterion
  - Bregma
  - Lambda
  - Pterion

Orbital (Horizontal) Portion of Frontal Bone (Inferior View)

Occipital Bone Inferior View
Skull Morphology

- Mesocephalic skull
  - Skull of average shape
  - Width 75%-80% of length
Skull Positioning Aids

5 Common Positioning Errors
1. Rotation
2. Tilt
3. Excessive flexion
4. Excessive extension
5. Incorrect CR angle

Paranasal Sinuses Anatomy
- Four groups
- Communicate with nasal cavity
- Sinuses develop in fetus
- Maxillary cavity present at birth
- Frontal, sphenoid @6 yrs
- Ethmoid develop later
- All sinuses fully developed late teens
Frontal Sinuses
- Inner and outer tables of frontal bone
- Rarely symmetric
- Number varies

Ethmoid Sinuses
- Within lateral masses of ethmoid bone
- Three collections
- Communicate with sphenoid sinus and nasal cavity

Maxillary Sinuses
- Within maxilla
- Above upper teeth
- Air-fluid levels visible
Sphenoid Sinus

- Below sella turcica
- Asymmetric
- May indicate basal skull fracture (sphenoid effusion)

Technical Considerations for Sinuses

- kVp Range:
  - Analog: 65-75
  - Digital systems: 75-85
- Erect
- Horizontal beam
- AEC not recommended
- 40” SID
- Small FSS
- Shield

Paranasal Sinus Routine

- Routine
  - Lateral
  - PA Caldwell
  - Parietoacanthial (Waters)
  - Submentovertex (SMV)
- Special
  - Parietoacanthial transoral (open mouth Waters)
Lateral Sinus
- CR midway between outer canthus and EAM

Evaluation Criteria: Lateral Sinuses
- All four sinuses demonstrated
- Cranium not rotated or tilted
- Optimal exposure factors

PA Caldwell Sinuses
- OML perpendicular to IR, 15° tilt
- OML 15° from horizontal
- Horizontal CR; CR exits nasion
Evaluation Criteria: PA (Caldwell) Sinuses

- Frontal and ethmoid sinuses demonstrated
- Petrous ridges in lower ⅔ of orbits
- No rotation or tilt
- Optimal exposure factors

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Parietoacanthial (Waters)

- MML perpendicular to IR
- CR horizontal, to exit at acanthion

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Evaluation Criteria: (Waters) Sinuses

- Maxillary sinuses demonstrated
- No rotation of cranium
- Petrous ridges below maxillary sinuses
- Optimal exposure factors
PA Transoral (Waters)

- MML perpendicular to IR
- Open mouth
- Horizontal CR, exit at acanthion

Evaluation Criteria: PA Transoral (Waters)

- Sphenoid sinus visualized
- Frontal and maxillary sinuses also included
- No rotation or tilt
- Petrous ridges below maxillary sinuses
- Optimal exposure factors

SMV Sinuses

- IOML parallel to IR
- Horizontal CR, between angles of mandible
Evaluation Criteria: SMV Sinuses

- Mandibular condyles anterior to petrous ridges
- No rotation or tilt
- Correct collimation
- Optimal exposure factors