Reading Hospital School of Health Sciences
Medical Imaging Program
MI 263 Clinical Seminar V
2022-2023

Skull

Routine:	AP Axial Towne, PA Axial Caldwell, and Bilateral Laterals
Position/Projection:	**Erect or Recumbent (AP Axial Towne)**
Patient Prep:	Remove anything removable from their mouth or head.
Technique:	**85 kVp ○●○: non AEC 10 mAs (Bucky)**
SID:	40" SID
Collimation:	10 X 12 Portrait (Lengthwise)
Patient Position:	Patient should be placed in an AP projection. Mid-sagittal plane is perpendicular to the midline of the IR. Flex neck so that the orbitomeatal line is perpendicular to the plane of the IR. Position the IR so that its upper margin is at the level of the highest point of the vertex. If patient has difficulties flexing neck far enough to get OML perpendicular, place the IOML perpendicular.
Central Ray:	Central ray should be angled 30° caudad to the OML OR 37° to the IOML. The central ray enters about 2.5 inches above the glabella and passes through the EAM.
Marker Placement:	Right or left marker on appropriate anatomical side.
Shielding:	RH does not require gonadal shielding. If patient requests a shield, educate them on why we do not shield. If shield is still requested, place shield on anterior surface.
Breathing Instructions:	Suspended respiration.
Purpose/ Structures:	Symmetric image of the petrous pyramids, the posterior portion of the foramen magnum, the dorsum sellae and the posterior clinoid processes projected within the foramen magnum, the occipital bone, and the posterior portion of the parietal bones.

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Evaluation Criteria:

- Evidence of proper collimation & presence of side marker placed clear of anatomy of interest
- Entire cranium without rotation or tilt demonstrated by:
  - Equal distance from the lateral border of skull to lateral margin of foramen magnum on both sides
  - Symmetric petrous pyramids.
  - MSP of cranium aligned with long axis of collimated field
- Dorsum sellae and posterior clinoid processes visible within foramen magnum.
- Bony detail of occipital bone and surrounding soft tissues

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Skull

Routine: AP Axial Towne, PA Axial Caldwell, and Bilateral Laterals

Position/Projection: **Erect or Recumbent (PA Axial Caldwell)**

Patient Prep: Remove anything removable from their mouth or head.

Technique: **85 kVp ○●○: non AEC 7.1 mAs (Bucky)**

SID: 40" SID

Collimation: 10 X 12 Portrait (Lengthwise)

Patient Position: Patient should be placed in a PA projection. Flex the patient's neck so that the OML is perpendicular to the plane of the IR (generally, the patient's forehead and nose will be resting against the IR). Mid-sagittal plane perpendicular to the IR Check for rotation by feeling the mastoid tips.

Central Ray: Direct the central ray to exit the nasion at an angle of 15º caudad.

Marker Placement: Right or left marker on appropriate anatomical side.

Shielding: RH does not require gonadal shielding. If patient requests a shield, educate them on why we do not shield. If shield is still requested, place shield on posterior surface.

Breathing Instructions: Suspended respiration.

Purpose/ Structures: Petrous pyramids within the lower third of the orbits, the anterior and posterior ethmoidal air cells, crista galli, frontal bone, and the frontal sinuses.

Evaluation Criteria:

- Evidence of proper collimation & presence of side marker placed clear of anatomy of interest
- Entire cranium without rotation or tilt, demonstrated by:
  - Equal distances from the lateral border of the skull to the lateral border of the orbits on both sides.
  - Petrous ridges should be symmetric.
  - MSP if cranium aligned with long axis of the collimated field
- Petrous pyramids should lie in the lower 1/3 of the orbits.
- Entire cranial perimeter showing three distinct tables of squamous bone
- Bony detail of frontal bone and surrounding soft tissues

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Skull

Routine: AP Axial Towne, PA Axial Caldwell, and Bilateral Laterals

Position/Projection: **Erect or Recumbent (Right & Left Lateral)**

Patient Prep: Remove anything removable from their mouth or head.

Technique: **85 kVp ○●○: non AEC 3.2 mAs (Bucky)**

SID: 40" SID

Collimation: 12 X 10 Landscape (Crosswise)

Patient Position: Place the patient in an anterior oblique position. Mid-sagittal plane must be parallel to the IR. Flex the patient's neck so that the IOML is perpendicular to the front edge of the IR and parallel to the long axis of the IR. The interpupillary line should be perpendicular to the IR.

Central Ray: Central ray is perpendicular entering 2 inches superior to the EAM.

Marker Placement: Mark side closest to image receptor. Marker should be placed anterior to the patient.

Shielding: RH does not require gonadal shielding. If patient requests a shield, educate them on why we do not shield. If shield is still requested, place shield on posterior surface, on hip closest to tube.

Breathing Instructions: Suspended respiration.

Purpose/ Structures: A lateral image of the superimposed halves of the cranium shows the detail of the side adjacent to the IR. The sella turcica, anterior clinoid processes, dorsum sellae, and posterior clinoid processes are well demonstrated.

Evaluation Criteria:

- Evidence of proper collimation & presence of the side marker clear of anatomy of interest
- Entire cranium without rotation or tilt demonstrated by:
  - Superimposed orbital roofs and greater wings of sphenoid.
  - Superimposed mastoid regions and EAM's.
  - Superimposed TMJ's.
  - Sella turcica seen in profile.
- No overall of cervical spine on mandible
- Bony detail of cranium & surrounding soft tissue

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Skull – SPECIAL VIEW

*14th edition Merrill's Volume 2, page 38

Position/Projection: **Erect or Recumbent (PA)**

Patient Prep: Remove anything removable from their mouth or head.

SID: 40" SID

Collimation: 10 X 12 Portrait (Lengthwise)

Patient Position: Patient either erect or prone with mid-sagittal plane centered to the IR. Flex the patient's neck so that the OML is perpendicular to the plane of the IR. Mid-sagittal plane perpendicular to the IR Check for rotation by feeling the mastoid tips.

Central Ray: Perpendicular to the IR and exits the nasion.

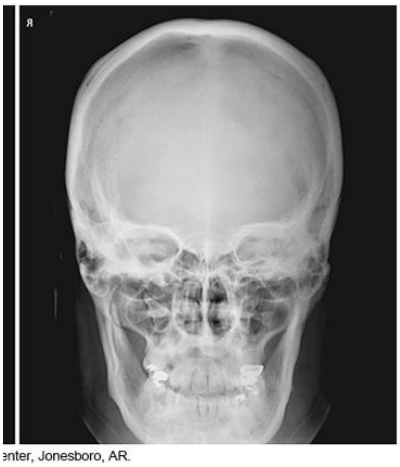
Marker Placement: Right or left marker on appropriate anatomical side.

Breathing Instructions: Suspended respiration

Purpose/Structures: Frontal bone is area of interest.

Evaluation Criteria:

- Evidence of proper collimation
- Distance from the lateral border of the skull to the lateral border of the orbit should be equal on both sides.
- Petrous ridges should be symmetric.
- MSP if cranium aligned with long axis of the collimated field
- Orbits filled by the petrous ridges
- Entire cranial perimeter showing three distinct tables of squamous bone
- Penetration of frontal bone with appropriate brightness at lateral borders of skull



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Skull – SPECIAL VIEW

*14th edition Merrill's Volume 2, page 52

Position/Projection: **Erect or Recumbent (SMV full basal)**

Patient Prep: Remove anything removable from their mouth or head.

SID: 40" SID

Collimation: 10 X 12 Portrait (Lengthwise)

Patient Position: Hyperextend the neck so that the IOML is nearly parallel with the IR. Rest the head on its vertex, and adjust the head so that the midsagittal plane is perpendicular to the IR.

Central Ray: Directed through the sella turcica perpendicular to the IOML between the angles of the mandible (3/4 inch anterior to the EAM).

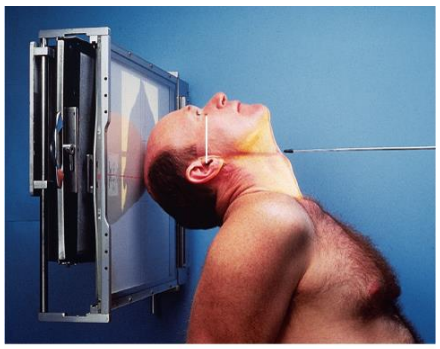
Marker Placement: Right or left marker on appropriate anatomical side.

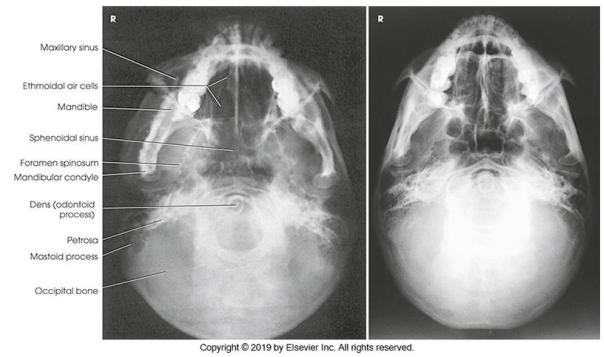
Breathing Instructions: Suspended respiration

Purpose/Structures: To demonstrate petrosae, mastoid processes, formina ovale, spinosum, carotid canals, sphenoid and ethmoid sinuses, mandible, bony nasal septum, dens and occipital bone.

Evaluation Criteria:

- Evidence of proper collimation
- Equal distances from the lateral borders of the skull to the mandibular condyles on both sides
- Symmetric petrosae
- IOML parallel to IR demonstrated by:
  - Mental protuberance superimposed over anterior frontal bone
  - Mandibular condyles anterior to petrosae
- Brightness and contrast sufficient to demonstrate cranial base anatomy





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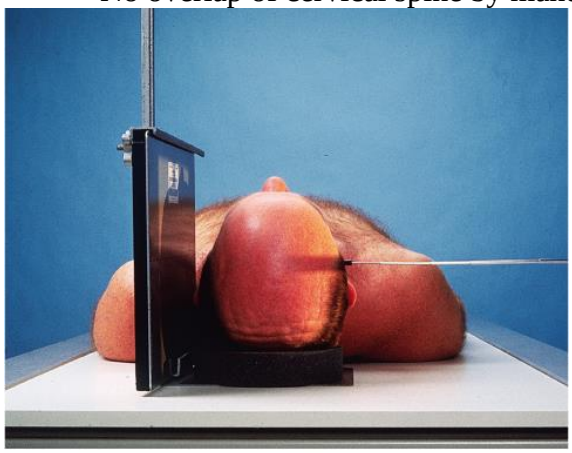
Skull – SPECIAL VIEW

*14th edition Merrill's Volume 2, page 124

Position/Projection:	**Recumbent (Trauma Cross Table Lateral)**
Patient Prep:	Remove anything removable from their mouth or head.
SID:	40" SID
Collimation:	12 X 10 Landscape (Crosswise)
Patient Position:	Patient is supine. Elevate head on sponge. MSP is parallel to IR and IP is perpendicular to IR.
Central Ray:	Perpendicular central ray enters 2 inches superior to EAM.
Marker Placement:	Mark side against IR.
Breathing Instructions:	Suspended respiration
Purpose/Structures:	Lateral image of the cranium shows detail of the side adjacent to the IR.

Evaluation Criteria:

- Evidence of proper collimation.
- Entire cranium without rotation or tilt
- Penetration of parietal region
- No overlap of cervical spine by mandible



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Skull – SPECIAL VIEW

*14th edition Merrill's Volume 2, page 43

Position/Projection:	**Recumbent (AP Axial, Reverse Caldwell)**
Patient Prep:	Remove anything removable from their mouth or head.
SID:	40" SID
Collimation:	10 X 12 Portrait (Lengthwise)
Patient Position:	Patient is supine. MSP and OML are perpendicular to the IR.
Central Ray:	CR 15° cephalad angle entering the nasion.
Marker Placement:	Right or left marker on appropriate anatomical side.
Breathing Instructions:	Suspended respiration
Purpose/Structures:	Same as PA Caldwell except orbits are magnified.

Evaluation Criteria:

- Evidence of proper collimation.
- Entire cranium without rotation or tilt
- Petrous pyramids lying in lower 1/3 of orbits
- Penetration of frontal bone

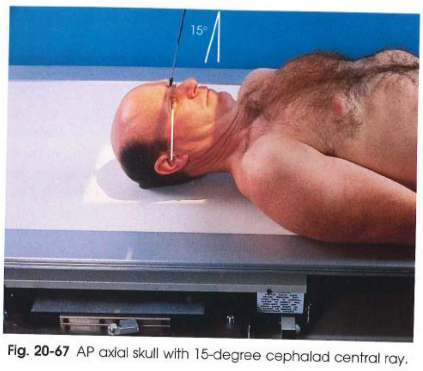

Fig. 20-67 AP axial skull with 15-degree cephalad central ray.

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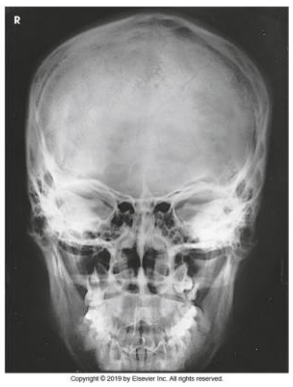
Skull – SPECIAL VIEW

*14th edition Merrill's Volume 2, page 43

Position/Projection:	**Recumbent (Trauma AP)**
Patient Prep:	Remove anything removable from their mouth or head.
SID:	40" SID
Collimation:	10 X 12 Portrait (Lengthwise)
Patient Position:	Patient is supine. MSP and OML are perpendicular to the IR.
Central Ray:	Perpendicular CR entering the nasion.
Marker Placement:	Right or left marker on appropriate anatomical side.
Breathing Instructions:	Suspended respiration
Purpose/Structures:	Same as PA except orbits are magnified.

Evaluation Criteria:

- Evidence of proper collimation.
- Entire cranium without rotation or tilt
- Petrous pyramids are filling orbits
- Penetration of frontal bone



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Skull – SPECIAL VIEW

*14th edition Merrill's Volume 2, page 48

Position/Projection:	**Recumbent (Trauma AP Axial Towne)**
Patient Prep:	Remove anything removable from their mouth or head.
SID:	40" SID
Collimation:	10 X 12 Portrait (Lengthwise)
Patient Position:	Patient is supine. MSP perpendicular to IR.
Central Ray:	Angle CR to go through the OML, then add another 30 degrees. Enters 2 ½ inches above the glabella.
Marker Placement:	Right or left marker on appropriate anatomical side.
Breathing Instructions:	Suspended respiration
Purpose/Structures:	Symmetric image of the petrous pyramids, the posterior portion of the foramen magnum, the dorsum sellae and the posterior clinoid processes projected within the foramen magnum, the occipital bone, and the posterior portion of the parietal bones.

Evaluation Criteria:

- Evidence of proper collimation
- Equal distance from the lateral border of skull to lateral margin of foramen magnum on both sides, indicating no rotation.
- Symmetric petrous pyramids.
- MSP of cranium aligned with long axis of collimated field
- Dorsum sellae and posterior clinoid processes visible within foramen magnum.
- Penetration of occipital bone without excessive density at lateral borders of skull.