Reading Hospital School of Health Sciences
Medical Imaging Program
MI238: Clinical Seminar III
2021-2022

Clavicle

Routine: AP & AP Axial (Merrill's recommends PA projections)

Position/Projection: **Erect or Supine (AP)**

Patient Prep: Remove everything from waist up
- *If the patient is wearing a plain shirt with no embroidery or decals you may image through the shirt*

Technique: **81 kVp ○●○ ; non AEC 5.0 mAs (Bucky)**

SID: 40"

Collimation: **RH –** 12 x 10, collimated to anatomy of interest
(*Merrill's recommends 12 x 8 collimation*)

Patient Position: Patient erect if possible. Adjust the body to center the clavicle to the midline of the table or vertical grid. Place arms along the sides and adjust the shoulder to lie in the same horizontal plane.

Central Ray: Perpendicular to the midshaft of the clavicle.
RH – enter about 1" medially from coracoid.

Marker Placement: Place the appropriate left or right marker on the lateral/ superior aspect of the patient.

Shielding: Gonadal shielding not required at RH

Breathing Instructions: Suspended **Expiration**
- To obtain a more uniform density image. (Merrill's)

Purpose/Structures: Demonstrates an AP image of the entire clavicle.

Evaluation Criteria:
- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Entire clavicle centered on image
- Lateral half of clavicle above the scapula, with the medial half superimposing the thorax
- Bony trabecular detail and surrounding soft tissues

Clavicle Anatomy:
- Female- shorter, less curved
- Male- thicker, more curved

**** RH Charging Info:**
- The clavicle charge does not specify a particular amount of views. So, if only one view is obtained there is no need for a reduced service.

Reading Hospital School of Health Sciences
Medical Imaging Program
MI238: Clinical Seminar III
2021-2022

Clavicle

Routine: AP & AP Axial (Merrill's recommends PA projections)

Position/Projection: **Erect or Supine (AP Axial)**

Patient Prep: Remove everything from waist up
- *If the patient is wearing a plain shirt with no embroidery or decals you may image through the shirt*

Technique: **81 kVp ○●○; non AEC 5.0 mAs (Bucky)**

SID: 40"

Collimation: **RH –** 12 x 10, collimated to anatomy of interest
(*Merrill's recommends 12 x 8 collimation*)

Patient Position: **RH -** Patient positioned the same as the AP. Patient erect if possible. Adjust the body to center the clavicle to the midline of the table or vertical grid. Place arms along the sides and adjust the shoulder to lie in the same horizontal plane.

Central Ray: Directed to enter the midshaft of the clavicle. Thinner patients require increased angulation to project the clavicle above the scapula and ribs.

RH: Directed 20° cephalad through the inferior border of the clavicle.

Merrill's:
For standing lordotic position – 0-15 degrees cephalic is recommended
For standing/supine position – 15-30 degrees cephalic is recommended

Marker Placement: Place the appropriate right or left marker on the lateral aspect of the patient.
A lead arrow or annotation is placed with the point up to indicate angle up.

Shielding: Gonadal shielding not required at RH

Breathing Instructions: Suspended **Inspiration**
- To elevate and angle the clavicle further. (Merrill's)

Purpose/Structures: An AP axial image of the clavicle projected above the ribs.

Evaluation Criteria:

- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Entire clavicle along with the AC and SC joints
- Lateral two-thirds of the clavicle projected above the ribs and scapula with the medial end superimposing the thorax
- Clavicle in horizontal orientation as compared with the AP projection
- Bony trabecular detail and surrounding soft tissues

Bontragers: AP Axial - Thin patients (asthenic) require 10 degree- 15 degree more angle than patients with thick shoulders and chest (hypersthenic)

***RH Charging Info:**

- The clavicle charge does not specify a particular amount of views. So if only one view is obtained there is no need for reduce service.

Reading Hospital School of Health Sciences
Medical Imaging Program
MI238: Clinical Seminar III
2021-2022

CLAVICLE – SPECIAL VIEW

*14th edition Merrill's Volume I, page 259

Position/Projection: **Erect or Supine (PA Axial)**

Patient Prep: Remove everything from waist up
- *If the patient is wearing a plain shirt with no embroidery or decals you may image through the shirt*

SID: 40" SID

Collimation: 12 X 10, collimated to anatomy of interest
(*Merrill's recommends 12 x 8 collimation*)

Patient Position: Similar to AP axial, except the patient is in a prone position or standing, facing the vertical grid.

Central Ray: Angled 15 to 30 degrees caudad directed to exit the midshaft of the clavicle.

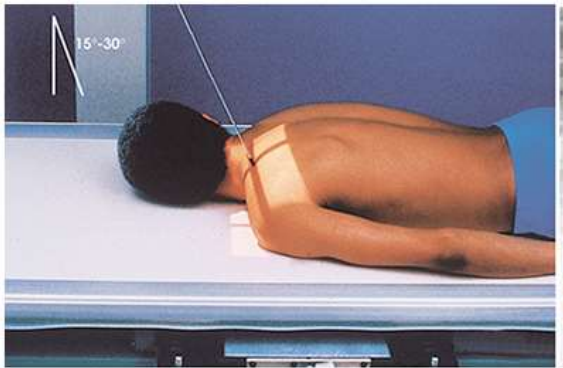
Marker Placement: Place the appropriate right or left marker on the lateral aspect of the patient.
A lead arrow or annotation is placed with the point down to indicate angle up.

Shielding: Gonadal shielding not required at RH

Breathing Instructions: Suspended **Inspiration**
- To elevate and angle the clavicle further. (Merrill's)

Purpose/Structures: An PA axial image of the clavicle projected above the ribs.
Reduces OID

Evaluation Criteria:
- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Entire clavicle along with the AC and SC joints
- Lateral two-thirds of the clavicle projected above the ribs and scapula with the medial end superimposing the thorax
- Clavicle in horizontal orientation as compared with the AP projection
- Bony trabecular detail and surrounding soft tissues



Scapula

Routine: AP & Lateral

Position/Projection: **Erect or Supine (AP)**

Patient Prep: Remove everything from waist up

Technique: **85 kVp ○●○ ; non AEC 5.5 mAs (Bucky)**

SID: 40”

Collimation: 10X12 Portrait

SID: 40”

Patient Position Patient erect if possible. Center the affected scapula to the midline of the image receptor. Abduct the arm to a right angle. **RH -**supinate the hand; **Merrill’s –** support the hand in a comfortable position. Do not rotate the body toward the affected side.

Central Ray: Direct the central perpendicular to the mid-scapular area 2 inches inferior to the coracoid process.

Marker Placement: Place the appropriate left or right marker on the lateral aspect of the patient

Shielding: Gonadal shielding not required at RH

Breathing Instructions: Slow breathing during exposure to obliterate lung detail

Purpose/Structures: An AP projection of the scapula.

Evaluation Criteria:

- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Lateral portion of the scapula free of superimposition from the ribs
- Scapula horizontal and not slanted
- Scapular detail through the superimposed lung and ribs (shallow breathing should help obliterate lung detail)
- Acromion and inferior angle included
- Bony trabecular detail and surrounding soft tissues

***RH Charging Info:** The scapula charge does not specify a particular amount of views. So if only one view is obtained there is no need for reduce service.

Scapula

Routine: AP & Lateral

Position: **Lateral - Option 1 RPO or LPO**

Projection: **AP**

Patient Prep: Remove everything from waist up

Technique: **85 kVp ; non AEC 8 mAs (Bucky)**

SID: 40”

Collimation: 10X12 Portrait

SID: 40”

Patient Position Patient erect if possible. Patient adjusted in oblique position with affected scapula centered to image receptor. The patient is done in the RPO or LPO.

Place the affected arm across the chest and place the hand on the opposite shoulder. After the placement of the arm, grasp the axillary and vertebral borders of the scapula between the thumb and index fingers of one hand and adjust the body rotation to place the wing of the scapula perpendicular to the plane of the image receptor.

Central Ray: Directed to the lateral border of the scapula

Marker Placement: Place the appropriate left or right marker on the lateral/ superior aspect of the patient.

Shielding: Gonadal shielding not required at RH

Breathing Instructions: Suspended Respiration

Purpose/Structures: A lateral image of the scapula.

Evaluation Criteria:

- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Lateral and medial scapular borders superimposed
- No superimposition of the scapular body on the ribs
- No superimposition of the humerus on the area of interest
- Acromion and inferior angle included
- Bony trabecular detail and surrounding soft tissues

***RH Charging Info:** The scapula charge does not specify a particular amount of views. So if only one view is obtained there is no need for reduce service.

Reading Hospital School of Health Sciences
Medical Imaging Program
MI238: Clinical Seminar III
2021-2022

Scapula

Routine: AP & Lateral

Position: **Lateral - Option 2 RAO or LAO**

Projection: **PA**

Patient Prep: Remove everything from waist up

Technique: **85 kVp ; non AEC 8 mAs (Bucky)**

SID: 40”

Collimation: 10X12 Portrait

Patient Position Patient erect if possible. Patient adjusted in oblique position with affected scapula centered to image receptor. The patient is done in the RAO or LAO.

Place the affected arm across the chest and place the hand on the opposite shoulder. After the placement of the arm, grasp the axillary and vertebral borders of the scapula between the thumb and index fingers of one hand and adjust the body rotation (about 45-60 degrees) to place the wing of the scapula perpendicular to the plane of the image receptor.

In Merrill’s, the arm is placed according to area of interest:

- For demonstration of the body of the scapula, the patient should extend the arm upward and rest the forearm on the head or across the upper chest and grasp the other shoulder
- For demonstration of the acromion and coracoid, the patient flexes the elbow and places the back of the hand on the posterior thorax or across the upper chest and grasp the other shoulder

Central Ray: Directed to the mid-medial border of the protruding scapula.

Marker Placement: Place the appropriate left or right marker on the lateral/ superior aspect of the patient.

Shielding: Gonadal shielding not required at RH

Breathing Instructions: Suspended Respiration

Purpose/Structures: A lateral image of the scapula. The placement of the arm determines the portion of the superior scapula that is superimposed over the humerus.

Evaluation Criteria:

- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Lateral and medial scapular borders superimposed
- No superimposition of the scapular body on the ribs
- No superimposition of the humerus on the area of interest
- Inclusion of the acromion and inferior angle
- Bony trabecular detail and surrounding soft tissues

***RH Charging Info:** The scapula charge does not specify a particular amount of views. So if only one view is obtained there is no need for reduce service.

Reading Hospital School of Health Sciences
Medical Imaging Program
MI238: Clinical Seminar III
2021-2022

Acromioclavicular Joints

RH Routine: 3 views, AP neutral of affected shoulder and bilateral weight-bearing

Position/Projection: Erect Neutral (AP) of the affected AC joint

Patient Prep: Remove everything from waist up

Technique: **81 kVp ○●○ ; non AEC 5.6 mAs (Bucky)**

SID: 40”

Collimation: 12 X 10 Crosswise
*Merrill’s recommends 8x6

Patient Position: Patient standing with arms down by their sides, with palm of hand against the thighs. Weight of body equally distributed on feet. Top of film approximately 2 inches above the top of the shoulder.

Central Ray: Perpendicular to the Acromioclavicular joint

Marker Placement: Place the appropriate left or right marker on the lateral aspect of the patient

Shielding: Gonadal shielding not required at RH

Breathing Instructions: Suspended Respiration.

Purpose/Structures: Images of the AC joints. This projection is used to show dislocation, separation, and function of the joints.

Evaluation Criteria:

- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Acromioclavicular joint visualized
- No rotation or leaning by the patient
- Right or left marker and weight bearing marker
- AC joint separation, if present, clearly seen on the images with weights
- Bony trabecular detail and surrounding soft tissues

Reading Hospital School of Health Sciences
Medical Imaging Program
MI238: Clinical Seminar III
2021-2022

Acromioclavicular Joints

RH Routine: 3 views, AP neutral of affected shoulder and bilateral weight-bearing

Position/Projection: Erect Weight Bearing (AP) of affected and unaffected AC joint

Patient Prep: Remove everything from waist up

Technique: **81 kVp ○●○ ; non AEC 5.6 mAs (Bucky)**

SID: 40”

Collimation: 12 X 10 Crosswise
*Merrill’s recommends 8x6

Patient Position: Weight-bearing views of each shoulder. Done separately. Weight of body equally distributed on feet. Patient standing with arms down by their sides holding sandbags of equal weight. It is important that the arms hang unsupported. The weights enable the demonstration of the joint space. If separated, the joint will be wider on the separated side. Top of film approximately 2 inches above the top of the shoulder.

Central Ray: Perpendicular to the Acromioclavicular joint

Marker Placement: Right and left markers should be utilized as well as an arrow pointing down to indicate weight bearing are placed above the shoulder being examined.

Shielding: Gonadal shielding not required at RH

Breathing Instructions: Suspended Respiration.

Purpose/Structures: Images of the AC joints. This projection is used to show dislocation, separation, and function of the joints.

Evaluation Criteria:

- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Acromioclavicular joint visualized
- No rotation or leaning by the patient
- Right or left marker and weight bearing marker
- AC joint separation, if present, clearly seen on the images with weights
- Bony trabecular detail and surrounding soft tissues

Reading Hospital School of Health Sciences
Medical Imaging Program
MI238: Clinical Seminar III
2021-2022

Acromioclavicular Joints

Merrill's Routine: Bilateral AP projection with and without weights

Position/Projection: Erect Bilateral (AP) without weights

Patient Prep: Remove everything from waist up

Technique: **81 kVp ○●○ ; non AEC 5.6 mAs (Bucky)**

SID: 72" (*to lessen the divergence of the beam)*

Collimation: 17 x 6 Crosswise

Patient Position: Place patient in upright position before vertical grid device and adjust the height of the IR so that the midpoint of the IR lies at the same level as the AC joints. Center midline of body to the midline of the grid. Make sure to equally distribute weight to avoid rotation. With the patient's arms hanging by the sides, adjust the shoulder to lie in the same horizontal plane. The arms hang unsupported.

Central Ray: Perpendicular to the midline of the body at the level of the AC joints.

Marker Placement: Place the appropriate left and right marker on the lateral aspect of the patient

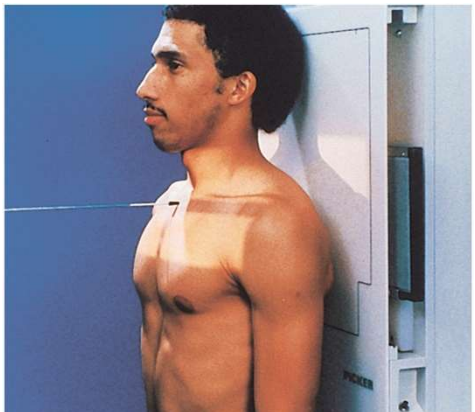
Shielding: Gonadal shielding not required at RH

Breathing Instructions: Suspended Respiration.

Purpose/Structures: Bilateral images of the AC joints. This projection is used to show dislocation, separation, and function of the joints.

Evaluation Criteria:

- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Both AC joints, with and without weights, included on one or two radiographs
- No rotation or leaning by the patient
- AC joint separation, if present, clearly seen on the images with weights
- Bony trabecular detail and surrounding soft tissues



Reading Hospital School of Health Sciences
Medical Imaging Program
MI238: Clinical Seminar III
2021-2022

Acromioclavicular Joints

Merrill's Routine: Bilateral AP projection with and without weights

Position/Projection: Erect Bilateral (AP) without weights

Patient Prep: Remove everything from waist up

Technique: **81 kVp ; non AEC 5.6 mAs (Bucky)**

SID: 72" (*to lessen the divergence of the beam)*

Collimation: 17 x 6 Crosswise

Patient Position: Place patient in upright position before vertical grid device and adjust the height of the IR so that the midpoint of the IR lies at the same level as the AC joints. Center midline of body to the midline of the grid. Make sure to equally distribute weight to avoid rotation. With the patient's arms hanging by the sides, adjust the shoulder to lie in the same horizontal plane. The arms hang unsupported. Affix equal weights (5-10 pounds) to each wrist by using a strap or band.

Central Ray: Perpendicular to the midline of the body at the level of the AC joints.

Marker Placement: Place the appropriate left and right marker on the lateral aspect of the patient

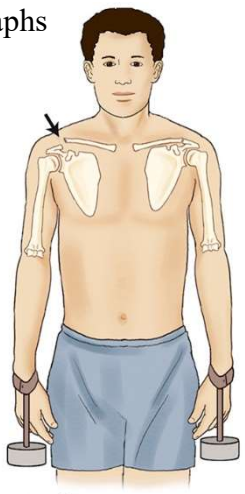
Shielding: Gonadal shielding not required at RH

Breathing Instructions: Suspended Respiration.

Purpose/Structures: Bilateral images of the AC joints. This projection is used to show dislocation, separation, and function of the joints.

Evaluation Criteria:

- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Both AC joints, with and without weights, included on one or two radiographs
- No rotation or leaning by the patient
- AC joint separation, if present, clearly seen on the images with weights
- Bony trabecular detail and surrounding soft tissues



Reading Hospital School of Health Sciences
Medical Imaging Program
MI238: Clinical Seminar III
2021-2022

Sternoclavicular Articulation /Joints

Routine: PA and RAO or LAO

Position/Projection: Erect or Prone (PA)

Patient Prep: Remove everything from waist up

Technique: **81 kVp ○●○; non AEC 3.6 mAs (Bucky)**

SID: 40”

Collimation: **RH -** 10 x 8 Crosswise
Merrill’s – 6 x 8

Patient Position: Place the patient in the erect position if possible. Center the MSP of the patient’s body to the midline of the image receptor. Center the image receptor at the level of the spinous process of the third thoracic vertebra, which lies posterior to the jugular notch. Place the patient’s arms along the sides of the body with the palms facing posteriorly.

Central Ray: Perpendicular to the center of the image receptor and entering T3 (about 3 inches below the vertebral prominens)

Shielding: Gonadal shielding not required at RH

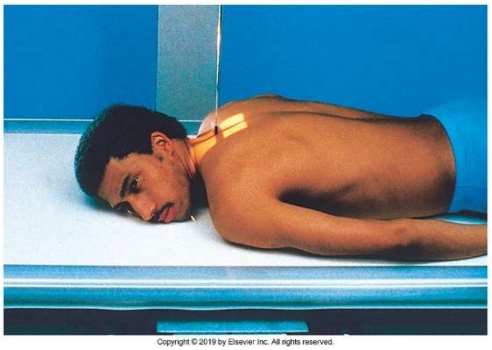
Breathing Instructions: **RH -** Suspended respiration.
*Merrill’s recommends suspended expiration

Marker Placement: Place the appropriate left or right marker on the lateral aspect of the Patient

Purpose/Structures: Sternoclavicular joints and the medial portions of the clavicles.

Evaluation Criteria

- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Both sternoclavicular joints and the medial ends of the clavicles
- No rotation present on a bilateral examination; slight rotation present on a unilateral examination
- Bony trabecular detail and surrounding soft tissues



Sternoclavicular Articulation /Joints

Routine: PA and RAO or LAO

Position/Projection: RAO or LAO (PA)

Patient Prep: Remove everything from waist up

Technique: **81 kVp ○●○; non AEC 5.0 mAs (Bucky)**

SID: 40”

Collimation: **RH –** 10 x 8
Merrill’s – 6 x 8

Structures Shown: A slightly oblique image of the Sternoclavicular joint is shown

Patient Position: Place the patient in the erect position if possible. Keeping the affected side adjacent to the image receptor, position the patient at enough of an oblique angle to project the vertebrae well behind the Sternoclavicular joint closest to the image receptor. The angle is usually about 10 to 15 degrees. Adjust the patient’s position to center the joint to the midline of the image receptor.

Central Ray: Central ray perpendicular to the sternoclavicular joint closest to the image receptor. Enters at the level of T2-T3 (about 3 inches distal to the vertebral prominens) and 1 to 2 inches lateral from the midsagittal plane (towards the elevated side). If the central ray enters the right side, the left SC joint is shown and vice versa.

Shielding: Gonadal shielding not required at RH

Breathing Instructions: **RH -** Suspended respiration.
*Merrill’s recommends suspended expiration

Marker Placement: Place the appropriate left or right marker on the lateral aspect of the patient. (mark side against board/side of interest)

Evaluation Criteria:

- Evidence of proper collimation and the presence of a side marker placed clear of the anatomy of interest
- Sternoclavicular joint of interest in the center of the radiograph, with the manubrium and the medial end of the clavicles included
  Helpful Hint:
  - LAO= Left side affected
  - RAO= Right side affected
- Open sternoclavicular joint space

- Sternoclavicular joint of interest immediately adjacent to the vertebral column with minimal obliquity
- Bony trabecular detail and surrounding soft tissues

***RH Charging Info** *(As of 2/14/19)* – The only charge available is XR SC Joint(s) 3 vws or more.

- If you are performing imaging on <u>one side</u>- you will need to place a **<u>52 modifier</u>** on the study as you are performing only 2 views; PA and one oblique
- If you are performing imaging <u>bilaterally</u> as per the order you will not need to place the modifier as you will have 3 views – PA and both obliques.