UCDMC
DIAGNOSTIC IMAGING
RADIOLOGY ROUTINE VIEWS
ALSO
ORTHO AND SPECIAL PROTOCOLS
Each pediatric patient's films shall be checked with the radiologist prior to the patient leaving the Radiology Department. Gonadal shielding must be used for all examinations unless necessary information is obstructed by the shield. See gonadal shield protocol (last page).

**SKULL ADULT**

CT Preferred; check with Radiologist
- Caldwell 15°
- Townes 30°
- Both Laters
- SMV

**SKULL FOR VP VALVE SETTING**

Single view of skull to visualize the valve pressure verification wheel. See next page for explanation and picture.

**SKULL CRANIOSYNOSTOSIS PEDS**

AP
- Townes
- Lateral
- Waters (Sleep): only for patients < 3 months old

**SKULL PEDS**

Caldwell 15°
- Townes 30°
- Cross Table Lateral

**SINUSES ADULTS**

CT preferred; check with Radiologist
- Waters Open Mouth
- Caldwell23°
- SMY
- Lateral

**SINUSES ADULT POST-OP**

AP
- LAT

**SINUSES PEDS**

CT may be preferred; check with Radiologist – may perform 3-4 cut axial CT. If Radiologist is unavailable, perform views below.
- Initial Study
  - Waters
  - Lateral—upright or crosstable (include nasopharynx to thoracic outlet)
- If follow up study:
  - Waters only

**SINUSES SPECIAL VIEW**

6' Upright Caldwell on wall bucky
- PLACE A PENNY NEXT TO MAXILLARY SINUS (taped to bucky)
- Check image with Neuroradiologist

**ORBITS FOR MRI**

To R/O FB
- Waters – eyes up
- Waters – eyes down
SKULL VIEW FOR VP VALVE SETTING

The ventriculoperitoneal valve (also known as the Codman Hakim Valve) must be visualized to determine the valve setting at the dial. In order to visualize the valve pressure verification wheel, the non-implanted side of the head opposite the dial should rest on the table or vertical bucky. The implanted side is closest to the x-ray tube. The valve mechanism is parallel to the x-ray plate or imaging detector and the central ray is perpendicular to the valve mechanism. Collimate to the skull. See picture below for how the image should appear.

The dial should appear with a bb in the center of the inner circle with the inner and outer edges of the circular dial appearing concentric.
FACIAL BONES ADULT
Caldwell
Waters
SMV
Lateral
LABEL FILMS AS PERFORMED: UPRIGHT, SUPINE, OR CROSS-TABLE LATERAL

Do upright if possible

FACIAL BONES PEDS
Caldwell
Waters
Lateral: upright or cross-table when possible.
LABEL FILMS AS DONE: UPRIGHT, SUPINE, OR CROSS-TABLE LATERAL

NASAL BONES
Waters
Bilateral Views

TMJ
Townes
Open & Closed Mouth Laterals with 25° caudal angle

MANDIBLE
AP
Both Obliques
Townes for rami

C-SPINE
AP
LAT
Swimmers (if C7 - T1 not visualized)
(Hanging Order: AP/LAT/Swimmer's)

C-SPINE F/U
AP
LAT

C-SPINE TRAUMA
AP
LAT
Swimmer's (if C7-T1 not visualized)
Odontoid
Hanging Order: AP/LAT/Swimmer's/Odontoid

C-SPINE FLEXION/EXTENSION
LATERALS: Three views--
NEUTRAL
FLEXION
EXTENSION

C-SPINE F/U ODONTOID
AP
LAT
Odontoid
(Hanging Order: AP/LAT/Odontoid)

C-SPINE Complete
AP
Odontoid (if trauma)
Obliques (if ordered)
Lateral
Swimmers (if C7 - T1 not visualized)

Routine views for Department of Radiology UCDavis Health Systems
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University of California Davis Health Systems
Diagnostic Imaging Radiology Routine Views

C-SPINE PEDIATRIC
(Under 6 years with previous Head & C-Spine CT obtain AP/LAT only)
AP
Odontoid
Lateral (C1-T1)
Swimmers (if C7-T1 not visualized)

T-SPINE
AP
Lateral (use breathing technique) Include T1-L1.
Swimmer’s (include C7-T1)

T-SPINE F/U
AP
LAT
(If metal present, center on level of interest and include all metal on one image)

THOROCOLUMBAR SPINE
(AP/LAT)
(T-L Spine)
AP
LAT
(If metal present, adjust to include all metal on one image)

L-Spine orders from Neurology or Neurosurgery must be performed according to the ordering physician’s request. A lateral L-Spine in neutral, flex, or extension should be collimated to the size of a 10 x 12 and include L1-S1. If the order states a specific area, collimate the lateral to that area, e.g. Spondylolisthesis L4-5 should be collimated to L4-5.

If an L-spine exam is ordered on an ambulatory pediatric outpatient diagnosed with back pain, the L-spine exam must be performed standing.

L-Spine
AP
LAT
L5-S1 Spot (Important to do this image)

L-Spine for pediatric patient
AP
LAT
L5-S1 Spot
If Obliques are requested by ordering physician, check with Pediatric Radiologist before performing.

L-Spine F/U
AP
LAT

L-Spine Flexion-Extension
AP
Lateral NEUTRAL
Lateral FLEXION (with maximum effort)
Lateral EXTENSION (with maximum effort)
Use 14 X 17, place cassette crosswise for flexion view, and lengthwise for extension view. Penetrate to visualize L5-S1.
*If new patient, include L5-S1 Spot

SACRUM/COCCYX ADULT
AP 15° Cephalic
AP 10° Caudal
Lateral

SACRUM/COCCYX PEDS
Angled AP (angle tube 15° cephalad)
Lateral

Routine views for Department of Radiology UCDavis Health Systems
01/20/2015
S 1 JOINTS

AP
Ferguson view (angle tube 30° - 35° cephalad)

PELVIS

AP (rotate feet internally to project hips in AP position)

PELVIS 5 VIEWS

AP
INLET
OUTLET
JUDET VIEWS (BILATERAL)
Hanging Order: AP/INLET/OUTLET/JUDETS

PELVIS JUDET Views

AP
BILATERAL JUDET VIEWS 45°

PELVIS INLET/OUTLET

INLET VIEW
OUTLET VIEW

HIPS < 6 MOs

Von Rosen Pelvis
(Internally rotate & abduct each leg 45°, legs from 90° angle)
DO NOT FORCE. IF PROBLEM, CONSULT RADIOLOGIST.

INITIAL EXAM: Shield MALE ONLY
FOLLOW UP EXAM: Shield MALE AND FEMALE

HIPS > 6 MOs

AP Pelvis
Frog-leg lateral

INITIAL EXAM: Shield MALE ON BOTH VIEWS
Shield FEMALE ON FROG-LEG LATERAL VIEW

HIP ADULT
Modified Dunn
Bend knee 45° flex

HIP TRAUMA
Abduct slightly

ABDOMEN PORTABLE
FOR FEEDING TUBE

ABDOMEN FOR KIDNEY STONE

Pelvis
Frog-leg lateral (cross table if patient has prosthetic)

Supine
Both Obliques with patient rolled up 45° on each side
Lateral (left or right)

ABDOMEN FOR BACLOFEN PUMP
(To demonstrate pump is connected to tube)

ABDOMEN ACUTE ADULT

KUB with cassette placed crosswise and centered to xiphoid; bottom of plate will be at top of iliac crest; include all of upper abdomen from side to side and part of chest above diaphragm.

Chest x-ray: PA or AP (Upright if possible)
Upright Abdomen (include diaphragm)
Supine KUB
Left Lateral Decubitus: for free air
   If patient cannot stand, take a second Left Lateral Decub with a grid for fluid levels.
Place lead markers and annotate with 3 arrows on the up side of all decubitus images. Also, annotate as “RT SIDE UP” or, if appropriate, “LT SIDE UP”.

Routine views for Department of Radiology UC Davis Health Systems

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University of California Davis Health Systems
Diagnostic Imaging Radiology Routine Views

ABDOMEN COMPLETE ADULT

- Upright Abdomen (include diaphragm)
- Supine KUB
- Left Lateral Decubitus for free air
  - If patient cannot stand, take a second Left Lateral Decub with a grid for fluid levels.
- Place lead markers and annotate with 3 arrows on the up side of all decubitus images. Also, annotate as “RT SIDE UP” or “LT SIDE UP”.

ABDOMEN FOR FOREIGN BODY

- KUB

PEDS EXAM for FOREIGN BODY of AIRWAY

- LAT NECK, AP or PA CXR
  - (Nasopharynx to diaphragm should be demonstrated by taking the above two images.)

PEDS EXAM for FOREIGN BODY of DIGESTIVE SYSTEM

- LAT NECK, AP or PA CXR, and KUB
  - (Nasopharynx to rectum should be demonstrated by taking the above three images.)

CHEST ADULT

- PA Lateral

CHEST FOR TB SCREENING STUDY OF ASYMPTOMATIC PATIENT WITH A +PPD TEST

- PA OR AP (Single view)

CHEST DECUBITUS

- Effected side down, direct central ray at mid-level of lung down, collimate to side down. Exam performed to visualize fluid level on side down. (Central ray directed at side down provides optimal fluid level detail.)
- Only perform side up if specifically requested by the doctor.
- Place lead markers and annotate with 3 arrows on the up side of all decubitus images. Also, annotate as “RT SIDE UP” or “LT SIDE UP”.

CHEST PORTABLE

- AP WITH A GRID, 50° MINIMUM SID

CHEST INFANT >3 MONTHS

- PA & LAT in Pigg-0-Stat

CHEST CHILD

- PA & LAT - Upright

RIBS

- PA/LAT CXR: 2-view chest x-ray
- RIBS: AP OR PA: injured side closest to cassette or detector.
  - Include T-1 to T-12 of injured side, or if bilateral, perform with cassette crosswise and include T-1 to T-12 (will probably require 2 cassettes when bilateral).
  - ANTERIOR OBLIQUE of injured side. (Both anterior obliques if bilateral injury.)
  - POSTERIOR OBLIQUE of injured side. (Both posterior obliques if bilateral injury.)
  - From T-1 down, perform image on inspiration.
  - From T-12 up, perform image on expiration.
  - Place bb at site of injured area.
  - Annotate each image as PA, AP, RAO, RPO, LAO, or LPO
  - Use 60 - 80 kV for ribs.
STERNUM

RAO 10°
LATERAL

X-ray each extremity individually due to central ray
divergence except for the Complete Knee.

AP & LAT (demonstrate both joints and use stitching if possible)

AP, LAT, & Merchant view

AP & LAT

AP Bilateral Obliques
Cross-table Lateral

AP Supine
Internal Oblique (patient lying down)
Cross-table Lateral

AP Standing
LAT Standing or on table

AP Upright bilateral
Rosenberg Bilateral
Merchant Bilateral
Lateral, both sides
(If cannot get both knees straight, do separately)

AP
LAT in full extension

AP template 14 X 17
LAT template 14 X 17

NO TEMPLATE:

Merchant view
Full length standing AP (Hip to ankles) 14 X 51 Scanogram
with ruler lengthwise in the middle.

Pre-Op chest

Merchant view & LAT

AP & LAT

Always weight-bearing unless trauma or post-op, then perform as
requested by the ordering doctor.

AP
MORTISE OBLIQUE (does not have to be weight bearing)
LAT

Routine views for Department of Radiology UC Davis Health Systems

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FOOT

Always weight-bearing unless trauma or post-op, then perform as requested by the ordering doctor.

AP
OBLIQUE - Internal (Oblique does not need to be weight bearing)
LAT

AP & LAT

FOOT FOR ARTHRITIS

FOOT AND ANKLE

DR. Giza Protocol
WB AP bilat feet
WB oblique affected foot
CALCANEAL SERIES
(OS CALCIS)
WB LAT foot/ankle (affected)
TOE
WB AP ankle (affected)
WB MORTISE ankle (affected)

ADDITIONAL VIEWS:

Broden views
Canali view

ALL VIEWS WEIGHT-BEARING IF POSSIBLE

AP
OBLIQUE - Internal
LAT

Always weight-bearing unless trauma or post-op, then perform as requested by the ordering doctor.

AP, OBLIQUE, LAT - FOOT
AP, MORTISE OBLIQUE, LAT - ANKLE
OBLIQUES MAY BE DONE ON TABLE

Does not have to be weight-bearing.

AXIAL VIEW (Harris Beath)
LAT

PA
OBLIQUE - Internal
LATERAL
 Attempt to separate the toe of concern on the lateral view.
Clearly label as to which toe.

Merrills page 198

Ankle view (True AP of Talus): 15° Internal Rotation with
30°-40° Cephalad Angle on Tube

UPPER EXTREMITIES

AC JOINTS

AP with weights (Both joints on one image)
AP without weights (Both joints on one image)

PA to include both SC joints
RAO (Right Anterior Oblique)
LAO (Left Anterior Oblique)

STERNOCLAVICULAR JOINTS

CLAVICLE

AP
AP 25° cephalic angle

Routine views for Department of Radiology UC Davis Health Systems

01/20/2015
# University of California Davis Health Systems
## Diagnostic Imaging Radiology Routine Views

<table>
<thead>
<tr>
<th>SCAPULA</th>
<th>AP</th>
<th>Y-VIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHOULDER ADULT</td>
<td>AP Upright</td>
<td>GRASHEY</td>
</tr>
<tr>
<td>Y-VIEW (Y view if axillary not possible)</td>
<td>AXILLARY</td>
<td></td>
</tr>
<tr>
<td>SHOULDER TRAUMA</td>
<td>AP</td>
<td>GRASHEY</td>
</tr>
<tr>
<td>Y-VIEW (Y view if axillary not possible)</td>
<td>AXILLARY</td>
<td></td>
</tr>
<tr>
<td>SHOULDER IMPINGEMENT</td>
<td>AP Upright</td>
<td>AXILLARY</td>
</tr>
<tr>
<td>SUFRASPINATOUS OUTLET VIEW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHOULDER (&quot;THROWER&quot;)</td>
<td>AP with Internal rotation</td>
<td>GRASHEY</td>
</tr>
<tr>
<td>AP with External rotation</td>
<td>AXILLARY</td>
<td></td>
</tr>
<tr>
<td>West Point view (Prone axillary view)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHOULDER INSTABILITY</td>
<td>GRASHEY</td>
<td>AXILLARY</td>
</tr>
<tr>
<td>APICAL OBLIQUE/WEST POINT VIEW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER SHOULDER VIEWS:</td>
<td>Stryker view</td>
<td></td>
</tr>
<tr>
<td>HUMERUS</td>
<td>AP</td>
<td>LAT</td>
</tr>
<tr>
<td>ELBOW ADULT</td>
<td>AP</td>
<td>LAT</td>
</tr>
<tr>
<td>EXTERNAL OBLIQUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELBOW TRAUMA</td>
<td>AP</td>
<td>LAT</td>
</tr>
<tr>
<td>EXTERNAL OBLIQUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RADIAL HEAD VIEW (True lateral w/ tube angled 45° medially)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELBOW PEDS</td>
<td>AP</td>
<td>External Oblique</td>
</tr>
<tr>
<td>LAT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOREARM</td>
<td>AP</td>
<td>LAT</td>
</tr>
<tr>
<td>WRIST</td>
<td>PA (Elbow 90° flexed. Shoulder, elbow and wrist joints in the same plane to permit right angle rotation of the ulna and radius. The central beam is directed vertically at center of wrist.)</td>
<td></td>
</tr>
<tr>
<td>PA (&quot;Variance&quot; PA view and should be labeled as such.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OBLIQUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LATERAL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Routine views for Department of Radiology UCDavis Health Systems

01/20/2015
HAND
PA
OBLIQUE
LATERAL

HAND F/U
PA
LAT

HANDS FOR ARTHRITIS
BILLERIAL PA
BALL CATCHER’S (NORGAARD VIEW): Both hands catching volleyball (45° angle) not baseball or basketball.

FINGER
PA Hand
OBLIQUE Finger
LATERAL Finger
Clearly label which finger.

FINGER F/U
PA Finger
OBLIQUE Finger
LAT Finger
Clearly label which finger.

BONE SURVEY ADULT
SKULL – LATERAL
C-SPINE – LAT
PELVIS – AP
T-SPINE – AP/LAT
L-SPINE – AP/LAT (Include ABDOMEN on AP L-SPINE)
BILATERAL HUMERI – AP
BILATERAL FEMURS – AP
(DO NOT NEED RADIUS-ULNA OR TIB-FIB)
(DO NOT NEED FEET AND HANDS)

SCANOGRAM
Patient over ruler
Perform three views on a single 14x17

SCANOGRAI
Slit over HIP JOINTS
Slit over KNEE JOINTS
Slit over ANKLE JOINTS

NECK AND UPPER AIRWAY
Soft tissue AP
Soft tissue lateral (include skull base and nasopharynx)
Do lateral neck in mild extension & good inspiration

SHUNT FILMS:

V-P SHUNT
(Ventriculoperitoneal)
Skull AP & LAT to include neck
Chest AP & LAT
Abdomen AP & LAT
May combine chest & abdomen on same film if patient is of appropriate size.

V-A SHUNT
(Ventriculoatrial)
Skull AP & LAT to include neck
Chest AP & LAT

L-P SHUNT
Abdomen AP & LAT (lateral abdomen to include spine)
If a scoliosis exam is ordered on an ambulatory pediatric outpatient diagnosed with back pain, the scoliosis exam must be performed standing.

**SCOLIOSIS: ORTHOPEDIC**

PA & LAT (as requested to include rib cage and iliac crest)

**SCOLIOSIS: NON-ORTHOPEDIC**

PA Upright to include iliac crest

**SPINE FOR OCULOAURICULAR VERTEBRAL SPECTRUM (OAVS) PEDIATRIC EXAM**

C-Spine AP & LAT
T-L-S Spine AP & LAT

Do not do as total spine (CTLS) or as scoli that includes c-spine. Must be checked by attending ped radiologist.
University of California Davis Health Systems
Diagnostic Imaging Radiology Routine Views

NOTE: If a peds non-trauma skeletal survey is requested, and the child has had a good quality babygram within the previous 12 hours, inform the Radiologist to determine if an additional Chest and Abd are necessary.

PEDIATRIC BONE SURVEY

A. Bone Survey I - Evaluation and Follow-up of Metastatic Disease
   1. Skull AP and LAT
   2. Chest PA to include both shoulders
   3. T & L Spine - LAT
   4. Abdomen AP (to include pelvis and lumbar spine)
   5. Upper and lower extremities - AP (Include hands and feet)
   6. If clinician has any specific areas of interest, then these should be specified separately.

B. Bone Survey II - Evaluation and Follow-up of Neuroblastoma and Histiocytosis X
   1. Skull AP, LAT, TOWNES
   2. Chest AP (to include T - spine)
   3. Abdomen-supine (to include pelvis)
   4. T & L Spine - LAT
   5. Both Humeri and Femurs - AP
   6. Both radii/ulnas and tibias/fibulas - AP

In small children, entire long bones of upper extremity or entire long bones of lower extremity can be included on one film.

C. Bone Survey III - Suspected Child Abuse (SAT series)
   1. Skull AP & LAT (include cervical spine on lateral)
   2. Chest AP & LAT
      On AP include shoulders and be sure all ribs are well seen. On LAT include sternum LAT and provide good non-rotated lateral view of thoracic spine. If infant, perform AP babygram to include pelvis and LAT babygram to include sternum and non-rotated thoracic-lumbar-sacral spine.
   3. Ribs: Bilateral Oblique views
   4. Abdomen: AP to include pelvis. Do not perform if babygram was done.
   5. Spine: LAT to include all of abdomen and thoracic-lumbar-sacral spine. Do not perform if babygram was done.
   6. Upper extremities - AP (include separate images of the humerus, forearm, and hand)
   7. Lower extremities - AP (include separate images of the femur, tib-fib, ankle, and foot)
      The ankle MUST be a true AP, and not oblique.

BONE DETAIL MUST BE GOOD ON ALL EXTREMITY IMAGES. PAY SPECIAL ATTENTION TO THE METAPHYES.

D. Bone Survey IV - Genetic Skeletal Survey
   1. Skull PA and LAT
   2. Spine AP and LAT
   3. Chest PA
   4. Pelvis AP
   5. Unilateral (one side only) upper extremity AP (be sure to include humerus and forearm on one cassette)
   6. Unilateral (one side only) lower extremity AP (be sure to include femur and tib-fib on one cassette)
   7. Hand AP (one hand only)
   8. Foot AP (one foot only)

IF THERE ARE ANY PROBLEMS CONCERNING ABOVE PROTOCOLS OR ANY QUESTIONS, PLEASE CHECK WITH RADIOLOGIST.

Routine views for Department of Radiology UCDavis Health Systems
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GENERAL INFORMATION:
A. If views are not specified on requisition, obtain films according to this list.
B. For traumatic injuries, the part to examine should not be excessively manipulated.
C. Shield gonads in all cases, except when shield covers specific part to be examined radiographically. See gonad shield guidelines.
D. If any questionable cases, check with radiologist.

GONADAL SHIELDING GUIDELINES
Gonadal shielding must be used for examinations near or including gonads unless necessary information is obscured by shield or shadow shields.

<table>
<thead>
<tr>
<th>EXAMS</th>
<th>MALES INITIAL</th>
<th>FOLLOW-UP</th>
<th>FEMALES INITIAL</th>
<th>FOLLOW-UP</th>
<th>ADDITIONAL COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelvis</td>
<td>One view X</td>
<td>X</td>
<td></td>
<td></td>
<td>One view only if x-rays taken. Not for trauma and metastases.</td>
</tr>
<tr>
<td>Hips AP / Frog</td>
<td>X</td>
<td>X</td>
<td>One view X</td>
<td>X</td>
<td>Os female shield one view only if two images taken.</td>
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<tr>
<td>Abdomen</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>Avoid covering bladder and rectum</td>
</tr>
<tr>
<td>IVP</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chest AP / PA / LAT</td>
<td>USE MINI/APRON</td>
<td>SHIELDS</td>
<td></td>
<td></td>
<td>To reduce scatter from edge of film</td>
</tr>
<tr>
<td>Dorsal Spine AP LAT</td>
<td>USE MINI/APRON</td>
<td>SHIELDS</td>
<td></td>
<td></td>
<td>To reduce scatter from edge of film</td>
</tr>
<tr>
<td>Lumbar Spine AP/Lat</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Shielding is limited to males if sacrum is included.</td>
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<tr>
<td>SACRUM AP/LAT</td>
<td>X</td>
<td>X</td>
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<td></td>
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<tr>
<td>COCCYX AP</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COCCYX LAT</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Females collimate well</td>
</tr>
<tr>
<td>3rd Standing Spine</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>Use Mobil Standing Shield</td>
</tr>
<tr>
<td>PA &amp; Lat.</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Femora AP</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Fluoroscopy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Use mini-aprons whenever possible</td>
</tr>
</tbody>
</table>

X - Use shield

NOTE: Position of Shield

Routine views for Department of Radiology UCDavis Health Systems

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<table>
<thead>
<tr>
<th>Position/Projection</th>
<th>MA/Time</th>
<th>mAs</th>
<th>KVP</th>
<th>DISTANCE</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCOLI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AP, PA</td>
<td>63</td>
<td>85</td>
<td>72</td>
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<tr>
<td>LAT</td>
<td>125</td>
<td>85</td>
<td>72</td>
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<tr>
<td>C-Spine</td>
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</tr>
<tr>
<td>AP</td>
<td>25</td>
<td>75</td>
<td>40</td>
<td>15° cephalic</td>
<td></td>
</tr>
<tr>
<td>AP MOBI-C</td>
<td>50</td>
<td>75</td>
<td>72</td>
<td>no angle</td>
<td></td>
</tr>
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When using a manual technique, utilize the most appropriate MA station possible for the procedure.
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When using a manual technique, utilize the most appropriate MA station possible for the procedure.
Gravity stress mortise radiograph of the ankle

Serendipity View

- **Discussion:**
  - the name given to the 40 deg cephalic tilt view of the SC joints;
  - used to visualize the sternoclavicular joints and medial 1/3 of the clavicles for fractures or dislocation;
  - SC joints are visualized on the same film and compared side to side;

- **Technique:**
  - patient is supine;
  - non rigid 11 x 14 inch cassette is placed under the upper chest, shoulders, and neck;
  - beam is angled 40 deg. off vertical centered on the sternum;
  - tube to cassette distance is 60 deg for adults and 40 deg for child;
  - CT scan best evaluates the s-c joint;
**Sternoclavicular Articulations**

**PA PROJECTION**

NOTE: This position may be difficult to perform on trauma patients. Use the upright position if the patient is able.

**Image receptor:** 8 x 10 inch (18 x 24 cm) crosswise

**Position of patient**
- Place the patient in the prone position.
- Center the midsagittal plane of the patient's body to the midline of the grid.
- Adapt the same procedure for use with the patient who is standing or seated upright.

**Position of part**
- Center the IR 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 upward.
- Adjust the shoulders to lie in the same transverse plane.
- For a bilateral examination, rest the patient's head on the chin and adjust so that the midsagittal plane is vertical.

For a unilateral procedure, ask the patient to turn the head to the affected side and rest it directly on the table (Fig. 9-23). Turn the IR so that the spine slightly turns to the side being examined and turn the table to obtain a better visualization of the bony projection of the manubrium.

- **Shield gonads.**
- **Respiration:** Suspend at the end of expiration to obtain a more uniform density.

**Central ray**
- Perpendicular to the center of the grid and entering T3

**Structures shown**
A PA projection demonstrates the joints and the medial portions of the clavicles (Figs. 9-24 and 9-25)

**EVALUATION CRITERIA**
The following should be clearly demonstrated:
- Both SC joints and the neck of the clavicles
- SC joints through the superior vertebral and rib shadows
- No rotation present on a unilateral examination; slight rotation present on a bilateral examination

---

**Fig. 9-23** Unilateral examination to demonstrate left SC articulation.

**Fig. 9-24** Bilateral SC joints (arrows).

**Fig. 9-25** Unilateral SC joint (arrow).
**A. OBLIQUE PROJECTION**

**BODY ROTATION METHOD**

**RAO or LAO position**

This position may be difficult to perform on patients. Use the upright position if the patient permits.

- **Image receptor:** 8 x 10 inch (18 x 22 cm) crosswise
- **Position of part:**
  - Keeping the affected side adjacent to the IR, position the patient at enough of an oblique angle to project the vertebrae well behind the SC joint closest to the IR. The angle is usually about 10 to 15 degrees.
  - Adjust the patient's position to center the joint to the midline of the grid.
  - Adjust the shoulders to lie in the same transverse plane (Fig. 9-26, A, B).
  - Shield gonads.
  - Respiration: Suspend at the end of expiration to obtain a more uniform density.

**Central ray**

- Perpendicular to the SC joint closest to the IR. The central ray enters at the level of T2-T3 (about 3 inches [7.6 cm] distal to the vertebral prominens) and 1 to 2 inches (2.5 to 5 cm) lateral from the midsagittal plane. If the central ray enters the right side, the left SC joint is shown, and vice versa (see Fig. 9-26, B).
- Center the IR to the central ray.

**Structures shown**

A slightly oblique image of the SC joint is demonstrated (Fig. 9-26, C).

**EVALUATION CRITERIA**

The following should be clearly demonstrated:

- SC joint of interest in the center of the radiograph, with the manubrium and the medial end of the clavicle included
- Open SC joint space
- SC joint of interest immediately adjacent to the vertebral column with minimal obliquity
- Reasonably good visibility of the SC joint through the superimposing rib and lung fields

---

**Fig. 9-26**

A, PA oblique SC joint, LAO position: body rotation method. B, Axial view (from foot upward) of central ray position in relation to spine and SC joint. C, PA oblique SC joint, LAO position. The joint closest to the IR is shown (arrow).
PA OBLIQUE PROJECTION
CENTRAL RAY ANGULATION
METHOD
Non-Bucky

Image receptor: 8 × 10 inch (18 × 24 cm) crosswise

NOTE: For this projection, the joint is closer to the IR and less distortion is obtained than when the previously described body rotation method is used. A grid IR placed on the tabletop also enables the joint to be projected with minimal distortion. Note also, this position may be difficult to perform on trauma patients. Use the upright position if the patient is able.

Position of patient
- Place the patient in the prone position on a grid IR positioned directly under the upper chest.
- Center the grid to the level of the SC joints.
- To avoid grid cutoff, place the grid on the radiographic table with its long axis running perpendicular to the long axis of the table.

Position of part
- Extend the patient’s arms along the sides of the body with the palms of the hands facing upward.
- Adjust the shoulders to lie in the same transverse plane.
- Ask the patient to rest the head on the chin or to rotate the chin toward the side of the joint being radiographed (Fig. 9-27).

Central ray
- From the side opposite that is being examined, direct to the midpoint of the IR at an angle of 15 degrees toward the midsagittal plane. A small angle is satisfactory in examinations of SC articulations because only a slight anteroposterior overlapping of the vertebrae and these joints occurs.
- The central ray should enter at the level of T2-T3 (about 3 inches [7.6 cm] distal to the vertebral prominens) and 1 to 2 inches (2.5 to 5 cm) lateral to the midsagittal plane. If the central ray enters the left side, the right side is shown and vice versa.

Structures shown
A slightly oblique image of the SC joint is demonstrated (Figs. 9-28 and 9-29).

EVALUATION CRITERIA
The following should be clearly demonstrated:
- SC joint of interest in the central radiograph, with the maximum in the midsagittal plane.
- Open SC joint space
- SC joint of interest imaged in direct superimposition to the vertebral column with normal obliquity
- Reasonably good visualization of the joint through the suprascapular and lung fields

Fig. 9-27 A, PA oblique SC joint: central ray angulation method. Central ray (CR) enters left side to show right joint. B, Axial view (from the feet upward) of central ray position in relation to spine and SC joint.
Lungs and heart

Posteroanterior oblique projections

Left and right anterior oblique views

Film: 14" × 17" lengthwise.

Grid technique, stationary or high-speed移动 should be used with patients who are exceptionally

Position of patient

The patient is maintained in the same position, sit or seated erect, that was used for the posteroanterior projection. Ask the patient to let his arms hang free an-

changing the film, have him turn approximately grees toward the right side for a left oblique pro-

and approximately 45 degrees toward the left sid right oblique projection. Ask the patient to stand straight; when he is standing, the weight of the bod be, equally distributed on the feet to prevent un-

rotation. Check the film centering used for the view to be certain that the film projects far enough the upper border of the shoulders to clear the iden-

Position of part

Left anterior oblique view. Rotate the pati as to place the left shoulder and breast in contac the cassette, and then center the chest to the film the patient to place his left hand on the hip with the down. Adjust the rotation of the body to the desir
gree of obliquity, usually 45 degrees for routine exa
tions of the chest and, for the purpose of separato shadows of the aorta and the spine, 55 to 60 degree studies of the heart and great vessels. Ask the pati raise his right arm to shoulder level and to grasp th of the cassette stand for support. In order to prevent tion of the spine, adjust the shoulders to lie in the transverse plane and have the patient face straight a

Right anterior oblique view. Reverse the position, and unless otherwise instructed, the pati here adjusted to place the thorax at an angle of 45 de
CHEST
Lungs and heart
Posteroanterior oblique projections
Left and right anterior oblique views—cont’d

Central ray
Direct the central ray horizontally, and center (1) at the level of the fourth thoracic vertebra for the lungs, and (2) at the level of the sixth or seventh thoracic vertebra for the heart.

Breathing instructions
The exposure is made at the end of full inhalation.

Barium studies
The barium sulfate mixture used in heart studies should be about the consistency of cooked cereal so that it will descend slowly and will adhere to the esophageal mucosa. With the patient in position and briefed on the procedure, have him swallow two or three mouthfuls of the mixture and then hold a bolus of one tablespoonful in his mouth until he is signaled to take a deep breath and then to swallow the bolus in one movement immediately before the exposure.

The usual exposure technique need not be increased for barium studies in the oblique position.

Structures shown
Left anterior oblique view. The maximum area of the left lung field, with its posterior part lying behind the shadow of the spine and its anterior part lying under the superimposed shadows of the spine and the mediastinal structures. The trachea and its bifurcation, the entire right branch of the bronchial tree, and a foreshortened view of the right lung. The heart, the descending aorta, lying just in front of the spinal shadow, the arch of the aorta, and the pulmonary artery and its main right branch.

Right anterior oblique view. The maximum area of the right lung field, with its posterior portion lying behind the shadow of the spine and its anterior part under the superimposed shadows of the spine and the mediastinal contents. The trachea and entire left branch of the bronchial tree, and a foreshortened view of the left lung. This projection gives the best view of the left atrium, the left main branch of the pulmonary artery, the anterior portion of the apex of the left ventricle, and the right retrocardiac space. When filled with a barium sulfate mixture, the esophagus is well shown in the right anterior oblique view.

NOTE: An increase of 12 to 14 kilovolts from the frontal view exposure will maintain the established contrast-density standard, and will correctly penetrate the chest of average shape.
Special Instructions:
- Bilateral clenched fist
- Supinated, ulnar deviation

Thank you!

Fig. 10-48. LPO (left AP oblique).

Fig. 10-49. RPO (right AP oblique).

As the shoulder is rotated adjust the shoulders to lie in a position of expiration. Exposure at the end of full inhalation and 10-49).
Tribute to the late Vicky Marlow
Derek Mckinnon

www.mcinncentra.co.uk

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Knee:

Bil Standing AP, Bil Rosenberg, Bil Sunrise, Lateral affected side

\[ \angle \leq 60^\circ \]

Shoulder:

AP, Grashey, Outlet view, Axillary

Post-op ACL:

AP, Lat (doesn't have to be standing)

Pre-op PCL:

AP, Lat, stress sunrise view

Post PCL:

AP, Lat (no stress view)

Stress Sunrise view:

Include half of tib/fib on images. Can burn out the patellas.

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(revised 03/29/2011)
X-Ray Protocol for UC Davis Medical Center Orthopedics  
Foot and Ankle Clinic  
Dr. Giza and Dr. Kreulen

For all new patients without acute injuries, please obtain ALL of the following x-ray images:

- WB AP BILAT FOOT
- WB OBLIQUE AFFECTED FOOT
- WB LATERAL FOOT/ANKLE
- WB AP ANKLE
- WB MORTISE ANKLE

All of the above views are necessary even if the student-athlete is only being evaluated for one of these issues. For example, a student-athlete with a foot injury would need the necessary views of the feet, PLUS views of the ankle as well. All should be weight-bearing.

For acute injuries, non-weight bearing images are acceptable, and images of just the affected area are typically acceptable as well. Any splints should be removed prior to imaging, if possible.
Dr. Szabo (Hand)

ALL TEMPLATED STUDIES: USE 100MM DEVICE (3 BALLS) with 42 inch tube to marker distance

Thumbs:
affected side AP, OBL, LAT
include base of thumb. Dr. Prefers Roberts view
Memills pg. 64-65 (Include all of the wrist bones)
CMC-PA and ballcatchers with stress thumb view

Hand:
New patient PA - OBL - LAT (include wrist)
F/U PA - LAT

Wrist:
PA (ulnar variance projection --Wrist, Humerus & Shoulder all in the same horizontal plane unclenched fist unless indicated) – LAT (possible OBL) ordered as “wrist films”
F/U Depends on the injury

** FOR DISTAL RADIUS FX – elevate hand about 30deg. If order for 2 views with history distal radius—PA, regular lateral and tangential lateral. Change charge to 3 views.

“Szabo wrist series”
1) Clenched fist PA,
2) radial & ulnar deviation,
3) Lateral clenched fist,
4) Lateral Flex & Ext.

ATTENTION: Do not X-Ray both extremities on same film

Elbow:
Series affected side
AP, LAT, EXT OBL, RADIAL HEAD VIEW, when ordered

Shoulder Series: Preop Templated shoulder, 14x17 to show most of humerus. Top sphere of template (100mm marker) at shoulder joint

Shoulder series:
AP Upright neutral
Lawrence Axillary
Chronic Dislocation, include Westpoint lateral
Dr. may also order Outlet view
Outlet view (Impingement View)
Pt. PA upright 45 degree rotation Central Ray caudal 10-15 degrees Shoulders not rolled forward This is similar to a PA Y view, but the intent is to show all the soft tissue under the acromion

Fresh Post op shoulder—no axillary needed per Dr Szabo