

# XR PROTOCOLS

- Any deviation from the following standard protocols must first be approved by a radiologist. The study will then need to be assigned to the approving radiologist to read.
- Orientation/imaging hanging and window/leveling should be standardized on all images.
- Clothing, jewelry, or any other external artifact must be removed from the entire FOV, not just overlying areas of interest. If the patient is unable, reasoning must be documented. "Patient not changed" is not an acceptable reason.
- Please remember ALARA! Always collimate your images to desired field of view (10X12 vs 14X17) dose and image quality are affected by collimating rather than cropping an already exposed image.
- Always ensure the correct order is used on the requisition. Approved order sets are listed below next to each exam.
- All studies are subject to being QC'd if correct protocol is not used or if positioning, collimation, and exposure needs are not met. It is the technologist's responsibility to monitor the QC list and follow up with QC requests at all times.
- **AS TRAINED, PHYSICAL MARKERS SHOULD BE UTILIZED ON 100% OF PATIENTS. POST PROCESSING MARKERS SHOULD ONLY BE USED WHEN YOUR PHYSICAL MARKER IS NOT VISIBLE DUE TO COLLIMATION AND NOT AS NORMAL PRACTICE.**

## **BONY THORAX**

### **ROUTINE CHEST** (XR Chest 2 Views Routine)

- PA
- Left lateral (spine to the right)

### **PORTABLE/STRETCHER/WHEELCHAIR CHEST** (XR Chest 1 View)

- AP
  - \*Must label with time of exposure and position (erect, semi-erect, supine)
  - \*Must remove all external leads and/or wires from field of view unless instructed not to by RN or MD
  - \*Must remove clothing and bras. "Patient not changed." Is not an acceptable reason.

### **DECUBITUS CHEST LEFT OR RIGHT** (XR Chest Decubitus Left/Right)

- Lateral decubitus (affected side down)

### **APICAL LORDOTIC CHEST** (XR Chest 1 View - if lordotic view only)

- AP lordotic position

**RIBS ROUTINE** (XR Ribs w/ PA Chest Left/Right)

- PA Chest Erect
  - AP or PA upper ribs (Place area of pain closest to the IR)
  - AP or PA lower ribs (Place area of pain closest to the IR)
  - Oblique of affected side
- \*Radiopaque markers should be placed at the site of pain for obliques\*
- \*If bilateral, order should be XR Ribs Bilateral w. Chest 1 view

**STERNUM** (XR Sternum Minimum 2 views)

- RAO
- Lateral

**SC JOINTS** (XR Sternoclavicular Joint(s))

- PA
- RAO
- LAO

**ABDOMEN**

**KUB** (XR Abdomen KUB)

- AP Supine
  - AP Crosswise Supine for diaphragm
- \*Inpt. Portable: Must remove all external leads/wires from field of view\*

**ABDOMEN SERIES** (XR Abdomen Series Routine)

- AP Erect
- AP Erect crosswise for diaphragm
- AP Supine

**ABDOMEN SERIES - NON ROUTINE** (XR Abdomen Series Routine)

- AP Supine
  - Left Lateral Decubitus
- \*When an erect can not be done.

**UPPER EXTREMITIES**

\*All joints should be centered and collimated to ordered anatomy only.\*

**HAND** (XR Hand Complete Minimum 3 Views Left/Right)

- PA
  - Oblique
  - Fan Lateral
- \*If Ball Catcher's requested, a PA and Lateral must be performed under 3 view order.
- \*Hang with fingers up. Ensure fingers are fully extended.

**HAND - NON ROUTINE 2 VIEWS** (XR Hand 2 Views Left/Right)

- PA
- Fan Lateral

\*This order should only be used for studies ordered by Rheumatology or post op. If a 2 view is ordered from ER, it must be changed to 3 views.

**FINGER** (XR 2nd, 3rd, 4th, or 5th Digit Left/Right)

- PA Hand
- PA Finger (cone down)
- Oblique Finger (cone down)
- Lateral Finger (cone down)

\*Hang with fingers up. Ensure fingers are fully extended.

**THUMB** (XR Finger Thumb Left/Right)

- PA Hand
- AP Thumb (cone down)
- Oblique Thumb (cone down)
- Lateral Thumb (cone down)

\*All Thumb images must include scaphoid.

**WRIST** (XR Wrist Complete Minimum 3 Views Left/Right)

- PA
- Oblique
- Lateral

\*Hang with fingers up. PA/Oblique should be exposed with hand flexed.

**WRIST - NON ROUTINE 2 VIEWS** (XR Wrist 2 Views Left/Right)

- PA
- Lateral

\*This order should only be used for studies ordered by Rheumatology or post op. If a 2 view is ordered from ER, it must be changed to 3 views.

**FOREARM** (XR Forearm 2 Views Left/Right)

- AP
- Lateral

\*Must include both joints. Hang with fingers up.

**ELBOW** (XR Elbow Left 3 Views, XR Elbow Right 3 Views)

- AP
- External Oblique
- Lateral

\*Hang with humerus up.

**HUMERUS** (XR Humerus Left/Right)

- AP External Rotation (AP)
- AP Internal Rotation (Lateral)

\*Must include both joints.

**SHOULDER** (XR Shoulder Complete Minimum 2 Views Left/Right)

- AP External Rotation
- AP Internal Rotation
- Y View

\*Should be collimated to include SC Joint/Mid Sternum to skin laterally)

\*Bra straps must be removed.

\*For AP's do not abduct the arm or allow patient to rotate. Annotate position on image.

**SHOULDER - NON ROUTINE** (XR Shoulder 1 View Left/Right)

- AP External (if possible) Neutral if External not possible

\*Only for PACU, Post op, or Post Reduction. Position must be noted on requisition. If a 1 view is ordered on a patient that does not meet the listed criteria, it must be changed to Minimum 2 view.

**CLAVICLE** (XR Clavicle Left/Right)

- AP
- AP Axial

**SCAPULA** (XR Scapula Left/Right)

- AP
- Lateral

**AC Joints** (XR AC Joints Routine Bilateral)

- Bilateral AP without weights
- Bilateral AP with weights

**LOWER EXTREMITIES**

\*All joints should be centered and collimated to ordered anatomy only.\*

**FOOT** (XR Foot Complete Minimum 3 Views Left/Right)

- AP
- Medial/Internal Oblique
- Lateral

\*Must remove socks. Hang with toes up for AP's and ankle up for lateral. Dorsiflex for lateral.

**FOOT - NON ROUTINE 2 VIEWS** (XR Foot 2 Views Left/Right)

- AP
- Lateral

\*This order should only be used for studies ordered by Rheumatology or post op. If a 2 view is ordered from ER, it must BE changed to 3 views.

**TOES** (XR Great Toes, 2nd, 3rd, 4th, or 5th Digit Left/Right)

- AP Foot
  - AP Toe (cone down)
  - Oblique Toe (cone down)
  - Lateral Toe (cone down)
- \*Must remove socks. Hang with toes up.

**ANKLE** (XR Ankle Complete Minimum 3 Views Left/Right)

- AP
  - AP mortise (internal oblique 15-20 degrees)
  - Lateral
- \*Must remove socks.  
\*Must dorsiflex for all views, include bottom of calcaneus, tuberosity of 5th metatarsal, and extend no higher than 10 cm above joint.

**ANKLE - NON ROUTINE 2 VIEWS** (XR Ankle 2 Views Left/Right)

- AP
  - Lateral
- \*This order should only be used for studies ordered by Rheumatology or post op. If a 2 view is ordered from ER, it must be changed to 3 views.

**CALCANEUS** (XR Calcaneus Left/Right)

- Axial Plantodorsal
  - Lateral
- \*Must remove socks. Must dorsiflex.

**LOWER LEG** (XR Tibia/Fibula Left/Right)

- AP
  - Lateral
- \*Must remove socks and pants. Must include both joints. Must dorsiflex.

**KNEE ROUTINE** (XR Knee 3 Views Left/Right)

- AP
  - Medial/Internal Oblique
  - Lateral
- \*Must remove pants.

**KNEE - NON ROUTINE 2 VIEWS** (XR Knee 1 or 2 Views Left/Right)

- AP
  - Lateral
- \*This order should only be used for studies ordered by Rheumatology or post op.  
If a 2 view is ordered from ER, it must be changed to 3 views.

**KNEE - NON ROUTINE 4 VIEWS** (XR Knee Complete 4 or More Views Left/Right)

- AP
- Medial/Internal Oblique
- Lateral
- Special View (Sunrise, tunnel, external oblique, ect.)  
\*This is a non routine study. Should only be used when additional views (outside of the 3 view routine) are specifically requested per ordering physician. Please note, the 4th view should not include all above listed "special views," but only one additional view as ordered.

**STANDING KNEES** (XR Knees Standing AP Bilateral paired with XR Knee 1 or 2 Views)

- AP under standing knee order
- Lateral sent under 1 or 2 Views Right/Left order  
\*If a routine knee is ordered with standing knees, Oblique and Lateral done under 1 or 2 View order.

**FEMUR** (XR Femur Left/Right)

- AP
- Lateral  
\*Must include both joints and have overlap with proximal and distal images.  
\*Remove pants.

**HIP UNILATERAL** (XR Hip Uni W/Pelvis 2-3 VW LT/RT)

- AP Pelvis (crosswise)
- AP Hip (cone down lengthwise on 14x17 from ASIS and below, like an AP prox. femur)
- Frog-leg Lateral hip (cone down on 10x12)  
\*Must remove pants.

**HIP BILATERAL** (XR Hip Bilat W/Pelvis Min 5 VW)

- AP Pelvis (crosswise)
- AP Hip RT (cone down lengthwise on 14x17 from ASIS and below)
- Frog-leg Lateral hip RT (cone down on 10x12)
- AP Hip LT (cone down lengthwise on 14x17 from ASIS and below)
- Frog-leg Lateral hip LT (cone down on 10x12)  
\*Must remove pants.

**TRAUMA HIP UNILATERAL** (XR Hip Uni W/Pelvis 2-3 VW LT/RT)

- AP Pelvis (crosswise)
- AP Hip (cone down lengthwise on 14x17 from ASIS and below)
- Axiolateral (Danelius-Miller) if frog leg is not possible

## **VERTEBRAL COLUMN**

\*All spine work should be centered and collimated to ordered anatomy only.\*

\*Ensure patients are positioned correctly for true AP and lateral images\*

### **PELVIS** (XR Pelvis Routine)

- AP (crosswise)

### **SI JOINTS** (XR Sacroiliac Joint)

- AP Axial
- RPO
- LPO

### **CERVICAL SPINE - ER ROUTINE/POST OP** (XR Spine Cervical 2 or 3 Views)

- Lateral (only to include EAM to T2)
- AP Axial (not to go below T2)
- AP Odontoid
- Swimmers - Unless T1/T2 is included on lateral

\*Ensure all lateral images are TRUE LATERAL for radiologists to rule out subluxation.

### **CERVICAL SPINE - INPT/OUTPT** (XR Spine Cervical 5 Views)

- Lateral (only to include EAM to T2)
- AP Axial (not to go below T2)
- AP Odontoid
- RAO/LPO
- LAO/RPO
- Swimmers - Unless T1/T2 is included on lateral

\*This is routine for all inpatients and outpatients unless ordered specifically by a Neurologist/Neurosurgeon or Orthopedic.

### **CERVICAL SPINE - NEUROSURGERY/FLEX/EXT** (XR Spine Cervical 5 Views)

- Lateral (only to include EAM to T2)
- Lateral Flexion (only to include EAM to T2)
- Lateral Extension (only to include EAM to T2)
- AP Axial (not to go below T2)
- AP Odontoid
- Swimmers - Unless T1/T2 is included on lateral

\*Annotate positions for laterals.

\*Should not be done for the 6-10 week post op appointments. If the order states flex/ext and the patient is in this post op time frame, you MUST call ordering to confirm flex/ext is ok.

\*XR Spine Cervical 7 Views should only be used if obliques and flex/ext are both ordered.\*

**SOFT TISSUE NECK** (XR Neck Soft Tissue)

- AP
  - Lateral
- \*Include entire pharynx - naso, oro, and laryngopharynx  
\*Expose as patient fills pharynx with air.

**THORACIC SPINE** (XR Spine Thoracic 3 Views Routine)

- AP
  - Lateral
  - Swimmers
- \*Ensure all lateral images are TRUE LATERAL for radiologists to rule out subluxation.

**LUMBAR SPINE - ER ROUTINE** (XR Spine Lumbar Survey, 5 Views, XR Spine Lumbar 4 or More Views)

- AP (KUB)
  - AP Cone Down
  - AP Axial
  - Lateral
  - Lateral Spot
- \*Ensure all lateral images are TRUE LATERAL for radiologists to rule out subluxation.  
\*Remove pants from FOV, including elastic waistbands (can cause prominent artifacts.)

**LUMBAR SPINE W/ OBLIQUES** (XR Spine Lumbar 4 or More Views)

- AP Cone Down
  - AP Axial
  - RPO
  - LPO
  - Lateral
  - Lateral Spot
- \*This is routine for all inpatients and outpatients unless ordered specifically by a Neurologist/Neurosurgeon or Orthopedic.

**LUMBAR SPINE W/ FLEX/EXT** (XR Spine Lumbar 4 or More Views)

- AP Cone Down
  - Lateral Neutral
  - Lateral Flexion
  - Lateral Extension
  - Lateral Spot
- \*Annotate positions for laterals.  
\*Should not be done for the 6-10 week post op appointments. If the order states flex/ext and the patient is in this post op time frame, you MUST call ordering to confirm flex/ext is ok.

**LUMBAR SPINE POST OP** (XR Spine Lumbar AP/LAT 2 or 3 Views)

- AP Cone Down
  - Lateral
  - Lateral Spot
- \*Typically only used for post op appointments.



**SCOLIOSIS** (XR SPINE SCOLIOSIS EVAL 2-3 VIEWS)

- AP
  - Lateral
- \*Must send both stitched and non stitched images.

**SACRUM & COCCYX** (XR Sacrum/Coccyx)

- AP Axial Sacrum
- AP Axial Coccyx
- Lateral (include both sacrum and coccyx)

**THORACO-LUMBAR SPINE**

\*Not a part of Radiologist protocol. Get new orders for Thoracic Spine and Lumbar Spine separately.

**SKULL AND FACIAL**

\*Request for head work to be done in CT. Not required, only if the ordering physician agrees.

**SKULL SERIES** (XR Skull < 4 Views Routine)

- AP
- Townes
- Lateral

**SKULL FOR MRI CLEARANCE** (XR Skull < 4 Views Routine)

- AP
- Lateral

**SINUS SERIES** (XR Sinuses Complete Routine)

- PA Caldwell
- Waters
- Lateral
- SMV

**FACIAL BONES** (XR Facial Bones > 3 Views Routine)

- Waters
- Lateral (for Bony and soft tissues)
- SMV

**NASAL BONES** (XR Nasal Bones Minimum 3 Views)

- Waters
- Lateral (for Bony and soft tissues)

**ORBITS** (XR Orbits Complete Bilateral)

- Waters
- AP Cone down
- Lateral Cone down

**ORBITS FOR MRI CLEARANCE** (XR Eye F.B. for MRI)

- Waters open
- Lateral open

**MANDIBLE** (XR Mandible Complete, XR Panorex/Orthopantogram)

- PA
- RAO
- LAO
- Townes
- Lateral of affected side required if unable to see condyles on PA/Obliques  
\*Panorex preferred if available.

**TMJ (XR TMJ Open and Closed Bilateral)**

- PA
- Townes
- Lateral of both sides - open mouth and closed mouth

**MASTOIDS** (XR Mastoids Complete Bilateral)

- Modified Laws
- Stenvers
- Townes

## **SPECIAL STUDIES/SERIES**

### **BONE AGE** (XR Bone Age Studies)

- PA Left Hand only  
\*Exact 40" SID, entire arm on same pane, 90\* flexion of elbow, no deviation in wrist alignment.

### **BONE SURVEY** (XR Bone Survey Complete (Mets))

- Lateral Skull
- Lateral Cervical, Thoracic, Lumbar Spines, and Swimmers
- AP Pelvis
- AP Upper/Lower Ribs
- AP Humerus Bilateral
- AP Forearm Bilateral
- AP Femur Bilateral
- AP Tib/fib Bilateral

### **SHUNT SERIES** (XR Shuntogram Series)

- Skull AP & Lateral
- Cervical AP & Lateral
- AP Chest
- AP Abdomen  
\*Must include shunt port in skull and see ending of shunt tubing in abdomen/pelvis.

### **SHUNT CHECK** - PRE AND POST MRI (XR Skull < 4 Views Routine)

- Oblique view of shunt dial. Both before and after MRI  
\*Image must show the dial completely parallel to IR. Collimate to dial, do not expose the entire skull.  
\*Must annotate PRE MRI and POST MRI on corresponding images. Both images done under the same accession number. Do not complete/verify until both images are done.  
\*Show both images to a Radiologist before letting the patient go.