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School of Radiography

Routine Radiographic Procedure Manual



HERITAGE VALLEY
HEALTH SYSTEM

SCHOOL OF RADIOGRAPHY

412-777-6210

25 Heckel Road
Kennedy Township, PA 15136

HeritageValley.org

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UPPER LIMB PROJECTIONS

A. BONE AGE

1. Ages 7-17 years old: PA hand (either right or left), including distal radius and ulna 10x12
 2. Any other age: PA hand (either right or left) 10x12
- Non-dominant hand or hand without fracture

B. ELBOW

Elbow 2 View

1. AP & lateral 10x12

Elbow Complete

1. AP & lateral 10x12
2. AP internal & external obliques 10x12

C. FINGER (if ordered finger only)

1. PA, PA oblique & lateral 8x10

D. FOREARM

1. AP & lateral 14x17
- Include wrist and elbow joints

E. HAND

Hand 2 View

1. PA
2. Fan Lateral

Hand Complete

1. PA & PA oblique 10x12
2. Fan Lateral 8x10

-Spread fingers on lateral

F. HUMERUS

- | | |
|------------|-------|
| 1. AP | 14x17 |
| 2. Lateral | 14x17 |

If unable to abduct arm, do transthoracic lateral.

- | | |
|--------------------------|-------|
| 1. AP | 14x17 |
| 2. Transthoracic lateral | 14x17 |

G. WRIST

Wrist 2 Views

- | | |
|------------|-------|
| 1. PA | 10x12 |
| 2. Lateral | 10x12 |

Wrist Complete

- | | |
|---------------|-------|
| 1. PA | 10x12 |
| 2. PA oblique | 10x12 |
| 3. Lateral | 10x12 |

SHOULDER GIRDLE PROJECTIONS

A. ACROMIOCLAVICULAR JOINTS

- | | |
|-----------------------------------|----------------------|
| 1. AP without weights (bilateral) | 14x17 or (2) 10x12's |
| 2. AP with weights (bilateral) | 14x17 or (2) 10x12's |

- Must be done erect.
- Do both joints on one film for comparison if possible; if unable to fit on one, do each joint individually.
- Hold 10 lb. weight in each hand.

B. CLAVICLE

- | | |
|-------------|-------|
| 1. AP | 10x12 |
| 2. AP axial | 10x12 |

- Angle 20-30 degrees cephalad for axial projection.
- Erect if possible.

C. SCAPULA

- | | |
|------------|-------|
| 1. AP | 10x12 |
| 2. Lateral | 10x12 |

D. SHOULDER

Shoulder 1 View

- | | |
|------------------|-------|
| 1. AP – Any view | 10x12 |
|------------------|-------|
- Per physician order.

Shoulder Complete

- | | |
|-------------------------|-------|
| 1. AP internal rotation | 10x12 |
| 2. AP external rotation | 10x12 |
| 3. Y-lateral | 10x12 |

- Axillary view if unable to perform Y view.

LOWER LIMB PROJECTIONS

A. ANKLE

Ankle 2 View

- | | |
|------------|-------|
| 1. AP | 10x12 |
| 2. Lateral | 10x12 |

Ankle Complete

- | | |
|-------------------|-------|
| 1. AP | 10x12 |
| 2. Medial oblique | 10x12 |
| 2. Lateral | 10x12 |

- Include base of fifth metatarsal on lateral.
- If foot is ordered, do not combine lateral foot and ankle on one film.

B. FEMUR

- | | |
|-----------------------|-------|
| 1. AP upper | 14x17 |
| 2. AP lower | 10x12 |
| 3. Frog lateral upper | 10x12 |
| 3. Lateral lower | 14x17 |

- Include both joints.

C. FOOT

Foot 2 View

- | | |
|------------|-------|
| 1. AP | 10x12 |
| 2. Lateral | 10x12 |

Foot Complete

- | | |
|-------------------|-------|
| 1. AP | 10x12 |
| 2. Medial oblique | 10x12 |
| 3. Lateral | 10x12 |

- Rotate foot 30 degrees internally on medial oblique.

D. FOOT, WEIGHT-BEARING

- | | |
|------------|-------|
| 1. AP | 10X12 |
| 2. Lateral | 10X12 |

E. KNEE

Knee 2 View

- | | |
|------------|-------|
| 1. AP | 10x12 |
| 2. Lateral | 10x12 |

Knee 3 View

- Minimum 3 views, order dependent.

Knee 4 View Complete

- | | |
|---------------------------------|-------|
| 1. AP | 10x12 |
| 2. AP axial (Tunnel) | 10x12 |
| 3. Lateral | 10x12 |
| 4. Tangential patella (Sunrise) | 8x10 |

F. KNEE, WEIGHT-BEARING

- | | |
|--|-------|
| 1. AP erect (bilateral) | 14x17 |
| 2. Lateral erect of affected knee only | 10x12 |

- Do erect.
- Both AP's on one film.
- Lateral of affected side.

G. LOWER LEG

- | | |
|------------|-------|
| 1. AP | 14x17 |
| 2. Lateral | 14x17 |

- Include knee and ankle joint.

H. OS CALSIS

- | | |
|---------------------|------|
| 1. Tangential Axial | 8x10 |
| 2. Lateral | 8x10 |

HIP JOINT AND PELVIC GIRDLE

A. HIP

Hip 1 View

1. Any one view of the hip 10x12

Hip 2+ View Complete

1. AP Pelvis 14x17
2. AP of affected hip 10x12
3. AP Lateral (frog) 10x12

Hip Bilateral with Pelvis

1. AP Pelvis 14x17
2. AP Left Hip 10x12
3. AP Right Hip 10x12
4. Lateral Left Hip 10x12
5. Lateral Right Hip 10x12

-Do cross table if frog leg cannot be obtained.

B. PELVIS

Pelvis 1 View

1. AP 14x17
- Von Rosen View for newborn:
 - o Invert feet 15 degrees; for newborn, abduct leg 45 degrees and rotate femurs internally

Pelvis 2 View

1. AP 14X17
2. AP oblique (Frog) 14X17

- 2 views of pelvis.

- Use for newborn/infant: AP, lateral hips (do 2 pelvis images to include hips).

CHEST PROJECTIONS

A. CHEST, ROUTINE

Chest 1 View

1. Any single view of the chest 14x17

Chest 2 View

1. PA 14x17
2. Left lateral 14x17

Chest 3 View

1. Any 3 views of the chest 14x17

Chest 4 View

1. AP/PA 14x17
2. Lateral 14x17
3. Both Decubitus views 14x17

B. CHEST, DECUBITUS

1. AP or PA projections done with pt. in right lateral and left lateral decubitus positions 14x17

- Elevate thorax on sponge to include all anatomy of “side down”.
- Done bilaterally, decubitus views only.

C. CHEST OBLIQUES

1. AP/PA 14x17
2. Lateral 14x17
3. Both Obliques 14x17

- Be sure to use nipple markers.

D. CHEST, PORTABLE

1. AP 14x17

- If you do a frontal and lateral portable chest, charge for a PA/LAT and comment portable.

E. CHEST APICAL LORDOTIC

1. AP/PA
2. AP Apical Lordotic
3. PA Kyphotic

- Do erect.
- 10-15 degree cephalic angulation for both projections.

F. CHEST SPECIAL VIEWS

- Ex: inspiration/expiration or oblique views only

BONY THORAX PROJECTIONS

A. RIBS

Unilateral (Right or Left)

- | | |
|---|-------|
| 1. AP/PA | 14x17 |
| 2. AP oblique projection, pt. in RPO position | 14x17 |
| 3. AP oblique projection, pt. in LPO position | 14x17 |

- Use inspiration for upper ribs and expiration on lower ribs if unable to fit on one film.

Bilateral

- | | |
|---------------------------------|-------|
| 1. AP/PA of both sides | 14x17 |
| 2. Both oblique's of both sides | 14x17 |

B. STERNOCLAVICULAR JOINTS

- | | |
|--|------|
| 1. PA | 8x10 |
| 2. PA oblique projection, RAO position | 8x10 |
| 3. PA oblique projection, LAO position | 8x10 |

- Pt. rotated 15 degrees for obliques.

C. STERNUM

- | | |
|--|-------|
| 1. Lateral | 10x12 |
| 2. PA oblique projection, RAO position | 10x12 |
| 3. PA oblique projection, LAO position | 10x12 |

- Perform shallow obliques.
- Erect lateral if possible.

SPINE PROJECTIONS

A. CERVICAL

Cervical 1 View

1. Any single view of the cervical spine 10x12

Cervical 2 View

1. AP-angle 15 degrees cephalic 10x12
2. Odontoid, 8x10
3. Lateral view 10x12

- Do swimmers view if necessary.

Cervical Complete

1. Lateral 10x12
2. PA oblique, RAO position (erect) 10x12
3. PA oblique, LAO position (erect) 10x12
4. AP axial 10x12
5. Open mouth (odontoid) 8x10

- 15 cephalad angle for AP axial.

- Do Swimmer's (only if needed for C-7).

B. CERVICAL, FLEXION & EXTENSION

1. Lateral in hyperflexion 10x12
2. Lateral in hyperextension 10x12

- Must be these specific views of cervical spine.

C. CERVICAL, TRAUMA SERIES

1. AP 10x12
2. Odontoid 8x10
3. Lateral 10x12
4. Swimmers 10x12

- Always perform swimmers for C-7 vertebrae - must have 4 views.

D. SACRUM & COCCYX

- | | |
|--------------------|-------|
| 1. AP axial sacrum | 10x12 |
| 2. AP axial coccyx | 8x10 |
| 2. Left Lateral | 10x12 |

- AP sacrum - angle 15 degrees cephalic.
- AP coccyx - angle 10 degrees caudad.
- Include both on lateral.

E. LUMBAR

Lumbar AP & Lateral

- | | |
|---------------|-------|
| 1. AP | 14x17 |
| 2. Lateral | 14x17 |
| 3. L5-S1 Spot | 8x10 |

Lumbar Complete

- | | |
|-------------------------------|-------|
| 1. AP | 14x17 |
| 2. AP oblique in RPO position | 14x17 |
| 3. AP oblique in LPO position | 14x17 |
| 4. Left lateral | 14x17 |
| 5. L5/S1, "spot" | 8x10 |

Lumbar Spine Single View

- | | |
|------------------------------|-------|
| 1. Any single view of lumbar | 14x17 |
|------------------------------|-------|

F. LUMBAR, FLEXION/EXTENSION

- | | |
|------------------------------|-------|
| 1. AP | 14x17 |
| 2. Lateral | 14x17 |
| 3. Lateral in hyperflexion | 14x17 |
| 4. Lateral in hyperextension | 14x17 |

-Do erect.

G. SACROILIAC JOINTS

- | | |
|-------------------------------|-------|
| 1. AP axial sacrum | 10x12 |
| 2. AP oblique in RPO position | 8x10 |
| 3. AP oblique in LPO position | 8x10 |
- AP sacrum - angle 15-20 degrees cephalic.

- AP obliques are shallow (25-30 degrees) with affected side up.

H. SCOLIOSIS STUDY

Scoliosis Survey – 1 View

1. AP entire thoracic to lumbar spine

Scoliosis Survey – 2 Views

1. AP entire thoracic to lumbar spine
2. Lateral entire thoracic to lumbar spine

-Do erect.

- Must include C7 to sacrum (include as much cervical spine as you can).

I. THORACIC SPINE

- | | |
|-----------------|-------|
| 1. AP | 14x17 |
| 2. Left lateral | 14x17 |
| 3. Swimmer's | 10x12 |

SKULL, SINUSES, & SALIVARY GLANDS

A. FACIAL BONES

- | | |
|-----------------------------|-------|
| 1. PA axial, Caldwell | 10x12 |
| 2. Waters | 10x12 |
| 3. Lateral of affected side | 10x12 |

- Do erect if possible.
- If performed recumbent, indicate on images.

B. MANDIBLE

- | | |
|------------------------------|-------|
| 1. AP axial, Townes | 10x12 |
| 2. PA | 8x10 |
| 3. Right axiolateral oblique | 8x10 |
| 4. Left axiolateral oblique | 8x10 |
| 5. Lateral | |

- Omit Panorex; Panorex should be charged separately if requested.

C. MASTOIDS

- | | |
|--|-------|
| 1. AP axial, Townes | 10x12 |
| 2. PA | 8x10 |
| 3. Right and left axiolateral oblique, Stenver's | 8x10 |
| 4. Right and left axiolateral oblique, Laws (or Shuller's) | 8x10 |
| 5. SMV | 10x12 |

- Stenver's: Pt prone or erect; rest head on forehead, nose & cheek; MSP forms 45 degree angle to film; CR is 12 degrees cephalad entering 3- 4" posterior and 1/2" inferior to upside EAM

- Laws: Pt in RAO or LAO position; head in true lateral; rotate MSP 15 degrees toward table; CR angled 15 degrees caudad entering 2" posterior and 2" superior to upside EAM

D. NASAL BONES

- | | |
|-----------|------|
| 1. Waters | 8x10 |
|-----------|------|

2. Right and left laterals 8x10
- Include inferior nasal spine.

E. OPTIC FORAMEN

- Rhese – Both 8x10

F. ORBITS

1. PA 8x10
2. Waters 8x10
3. Right parieto-orbital (Rhese) 8x10
4. Left parieto-orbital (Rhese) 8x10

- Include both orbits on all films.
- Collimate to just orbits.
- Rhese: Pt prone or erect; rest nose, cheek, & chin on table; AML perp to table; MSP forms 53 degree angle to table; CR perpendicular entering 1" superior & 1" posterior to upside TEA
- Optic canal should lie in outer lower quadrant of "side down" orbit

G. SINUSES

1. PA, Caldwell 8x10
2. Waters 8x10
3. Lateral of affected side 8x10
4. SMV 8x10

- Do erect; if recumbent, indicate on films.

H. TEMPOROMANDIBULAR JOINTS

1. Panorex of bilateral TMJ's only

- Do open mouth and closed mouth, include both joints.

I. SKULL

1. PA 10x12

- | | |
|------------------|-------|
| 2. Waters | 10x12 |
| 3. Towne's | 10x12 |
| 4. Both laterals | 10x12 |

- On PA view, petrous ridges should fill orbits.

Skull – Limited

1. Any miscellaneous 3 views or fewer

- Views per Radiologist; Water's and lateral for ages 7 and under.

J. ZYGOMATIC ARCHES

- | | |
|--------------------------|-------|
| 1. PA Caldwell | 10x12 |
| 2. Waters | 10x12 |
| 3. SMV | 10x12 |
| 4. Tangential Projection | 8x10 |

- Tangential - in Base position, rotate 15 degrees toward center of bucky, then top of the head 15 degrees away from bucky.

ABDOMINAL PROJECTIONS

A. ABDOMEN

Abdomen Single View

1. AP- supine or any single abdomen view 14x17

- Supine must include kidneys and bladder.

Abdomen 2 View

1. AP Abdomen plus any combination equal to 2 views 14x17
(AP abdomen supine, AP abdomen erect and/or decub)

- Supine must include kidneys and bladder.
- Erect must include diaphragm.
- If unable to perform erect, do left lateral decub.
- Do not do semi-erect view.

B. ABDOMINAL SERIES:

1. AP abdomen, supine 14x17
(To include from diaphragm to base of bladder)
2. AP abdomen, erect 14x17
(To include diaphragm on both sides)
3. Left lateral decubitus 14x17 grid
(To include diaphragm on both sides)

- Must do 3 different views of abdomen.

C. FOR FOREIGN BODY - INFANT

1. AP supine or erect chest/abdomen; refer to physician order

-Must be done on a single film - include from mouth to rectum; no age limitations as long as it fits on 1 - 14x17.

FLUOROSCOPY

**Radiologists may vary fluoroscopic procedures, according to their preference*

A. BARIUM ENEMA, DOUBLE CONTRAST (AIR)

1. AP abdomen (scout) 14x17

- Connect air tubing and pump
- Enema tip inserted
- Digital fluoroscopy done by radiologist

Images taken:

2. AP 14x17
- take AP high crosswise, if needed 14x17

3. AP angled sigmoid 14x17

4. Right lateral decubitus 14x17

5. Left lateral decubitus 14x17

6. Cross-table lateral rectum 14x17
-enema tipped removed

7. AP abdomen, post evacuation 14x17

- Ask Radiologists what views he/she prefers.

B. BARIUM ENEMA, SINGLE CONTRAST (ROUTINE)

1. AP abdomen (scout) 14x17

- Enema tip inserted
- Digital fluoroscopy done by radiologist

Images taken:

2. AP 14x17
- take AP high crosswise, if needed 14x17

3. AP sigmoid 14x17

4. AP oblique with patient in LPO position 14x17

5. AP oblique with patient in RPO position 14x17

6. Cross-table lateral rectum 14x17
-Enema tipped removed. Enema tip should be removed before patient gets off table.

7. AP abdomen, post evacuation 14x17

C. ESOPHAGRAM (BARIUM SWALLOW)

- 1 bottle thick barium, 1 bottle thin barium, EZ gas.
- Some radiologists use air crystals.
- Barium tables sometimes used.
- Pt. usually started in erect position.
- Scout - AP neck, lateral neck.
- Radiologist will take imaging.

D. MODIFIED BARIUM SWALLOW (COOKIE SWALLOW)

- Done in conjunction with Speech Pathologist.
- Video camera used.
- Scout - lateral neck.

E. SMALL BOWEL STUDY

1. AP abdomen scout 14x17

- Give 2 cups of thin barium - take immediate film.
- Take 20, 40, 60 min images; then every 30 minutes (90, 120, etc.) - some Radiologists prefer a 10 min as well.
- Radiologist may determine time in between images - ask he/she after 2 hours for remaining image times if needed.

F. UGI

1. AP abdomen, survey 14x17
2. Table put in erect position, patient in upright position.
3. Radiologist gives pt. air crystals.
4. Digital fluoro taken with pt. drinking thick barium.
5. Table then placed horizontal, pts. rolls.
6. Pt. drinks thin barium while in RAO position.

G. UGI/SMALL BOWEL

- Follow UGI routine
- SB - take immediate film after barium is gone, take 20, 40, 60 minutes; then every 30 mins (90, 120, etc.) - some Radiologists prefer a 10 min as well
- AP and AP oblique spot images of the TI spots may be done using the compression paddle
- 1 bottle thick barium, 1 bottle thin barium, EZ gas.

Both bottles should be gone for the SB portion of test.
-Radiologist may determine time in between films - ask he/she after 2
hours for remaining films if needed

MISCELLANEOUS PROJECTIONS

A. BONE SURVEY

1. Lateral skull	10x12
2. AP & lateral cervical spine	10x12
3. Bilateral ribs (include AP/PA chest)	14x17
4. AP & lateral thoracic spine	14x17
5. AP & lateral lumbar spine	14x17
6. AP pelvis	14x17
7. AP bilateral femurs	14x17
8. AP bilateral lower legs	14x17
9. AP bilateral ankles	10x12
10. AP bilateral humerus	14x17
11. AP bilateral forearms	14x17
12. PA bilateral wrists	10x12

- Use for metastatic bone survey & trauma bone survey; for suspected child abuse (> 1 year of age) ask a physician or radiologist for necessary views (refer to bone survey infant for views if necessary).

Bone Survey Infant

1. AP supine chest (use bone technique)
2. Lateral chest (use bone technique)
3. AP & lateral skull
4. AP bilateral humerus
5. AP bilateral forearm
6. PA bilateral hand
7. AP pelvis
8. AP bilateral femurs
9. AP bilateral tibias
10. AP bilateral feet
11. Lateral lumbar

- Use for suspected child abuse on patients < 1 year of age only. (Check with Radiologist if bone scan should be ordered instead or in addition to skeletal survey views. If bone scan is performed, skeletal survey views as requested by Radiologist.)

B. SOFT TISSUE NECK

1. AP	10x12
2. Lateral	10x12

- Instruct patient to inhale a steady stream of air through nose while projection is imaged.
- Include nasopharynx; do on inspiration; lighten technique for soft tissue.