



Reading Hospital School of Health Sciences

Medical Imaging Program
MI 238: Clinical Seminar III
Mobile Radiography
DEMONSTRATION



Disclaimer: RM current policy does NOT require patient shielding. This demonstration may cause stress to patients used and how it should be placed in order to reduce students of practices that may be seen outside of RM as it is patient requests to be shielded.

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Portable Routine

REVIEW**

- Order Verification/Procedure Check-In
- Isolation Precautions if Applicable
- Gather the Necessary Supplies
- Introduction of Self/Patient identification/LMP/History
- Explanation of Procedure
- Measure
- Align image receptor, SID, Collimation, Artifacts
- Radiation Protection/Communicate "X-Ray"
- Imaging Completed/Review Images/Image Evaluation
 - Annotations and Orientation Addressed
- Images Sent to PACS and EPIC Documentation Completed




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Average Portable Techniques

Procedure:	Optimal kVp	AEC	Receptor	mAs (non-AEC)*
Chest – AP Erect 24cm	90 kVp		Free Detector	1.6 mAs
Abdomen – AP Supine 24cm	80 kVp		Gridded	16 mAs
			Free Detector	
Abdomen – Decubitus 30cm	80 kVp		Gridded	25 mAs
			Free Detector	
Abdomen – Transabdominal 30cm	80 kVp		Gridded	25 mAs
			Free Detector	

- Double mAs if using CR
- If non-grid, change mAs according to grid conversion factor
- mAs used for fixed techniques only
- 8:1 grid – x 4 mAs (going from no grid to grid)
- 6:1 grid – x 3 mAs (going from no grid to grid)

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Portable AP Erect Chest

- Evidence of proper collimation
- No motion; well-defined (*not blurred*) diaphragmatic domes and lung fields.
- Lung fields in their entirety, including costophrenic angles
- Pleural markings
- Ribs and thoracic intervertebral disc spaces faintly visible through heart shadow.
- No rotation, with medial portion of clavicles and lateral border of ribs equidistant from vertebral column.
- Radiographic markers as appropriate (*R or L marker, and any to indicate how the patient is positioned; that is, supine, sitting upright, etc.*)



**RH Criteria – 1-10 ribs above diaphragm, showing good inspiratory effort

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Shift the patient to be centered left and right on the IR

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(R or L marker, and any to indicate how the patient is positioned; that is, supine, sitting upright, etc.)

****RH Criteria – 1-10 ribs above diaphragm, showing good inspiratory effort**



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Portable AP Erect Chest

- Missing Anatomy – Apices
- Collimation – Should not visualize both Humerus
- Better group together wires

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Portable AP Erect Chest

- Apical Lordotic
- Chin over anatomy
- Better group together wires down mid-line of patient

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Portable AP Supine Chest

- Evidence of proper collimation
- No motion; well-defined (*not blurred*) diaphragmatic domes and lung fields.
- Lung fields in their entirety, including costophrenic angles
- Pleural markings
- Ribs and thoracic intervertebral disc spaces faintly visible through heart shadow.
- No rotation, with medial portion of clavicles and lateral border of ribs equidistant from vertebral column.
- Radiographic markers as appropriate (*R or L marker, and any to indicate how the patient is positioned; that is, supine, sitting upright, etc.*)

**RH Criteria – 1-10 ribs above diaphragm, showing good inspiratory effort

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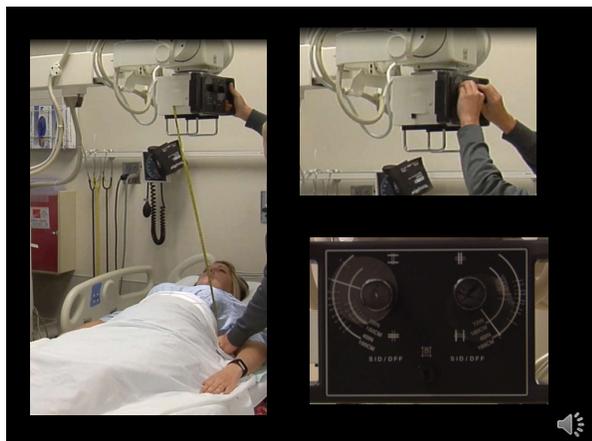
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Portable AP Supine Chest

- Evidence of proper collimation
- No motion; well-defined (*not blurred*) diaphragmatic domes and lung fields.
- Lung fields in their entirety, including costophrenic angles
- Pleural markings
- Ribs and thoracic intervertebral disc spaces faintly visible through heart shadow.
- No rotation, with medial portion of clavicles and lateral border of ribs equidistant from vertebral column.
- Radiographic markers as appropriate (*R or L marker, and any to indicate how the patient is positioned; that is, supine, sitting upright, etc.*)

**RH Criteria – 1-10 ribs above diaphragm, showing good inspiratory effort



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Portable AP Supine Chest

Acceptable



Not Acceptable



- Rotation
- Collimation
- Better group together wires down mid-line of patient

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Portable AP Supine Chest

Acceptable **Not Acceptable**

- Collimation – start with 14" side-side
- Better group together wires down mid-line of patient

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Portable NG Tube Placement

- Image appropriate anatomy *per physician order*
 - Visualize end of feeding tube
 - *Portable Chest Ordered:* IR portrait with top of IR at level of Humerus. Feeding tube will then be at the bottom of the image
 - *Portable KUB Ordered:* IR portrait with centering about 2 inches above crest. Feeding tube will then be at top of the image

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Portable NG Tube Placement

Ordered as a P. Chest **Ordered as a P. Abdomen**

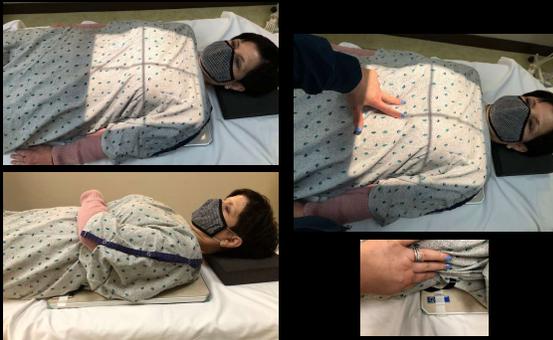
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Ordered as a P. Chest



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Ordered as a P. Chest



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Portable NG Tube Placement

- Image appropriate anatomy per physician order
 - Visualize end of feeding tube

Additional Items:

- * Verbal to the floor
- * **Shield** ALL Males and Females
- * EPIC Charging

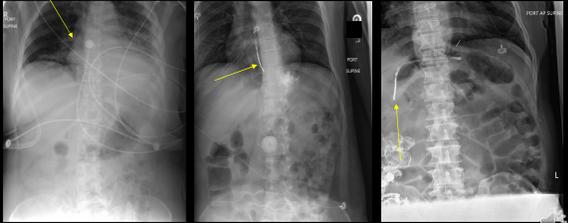


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Portable NG Tube Placement

Incorrect Tube Placement

- Tip Location – Right Main Stem Bronchus; Trachea; Small Intestine
- Wires (artifacts)



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Portable NG Tube Placement

Acceptable



Not Acceptable



• Clipping Tube

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Portable NG Tube Placement

Acceptable



Not Acceptable



- Grossly mis-centered – includes half chest/half abdomen (must include majority of what is ordered)
- Marker/Annotations

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Portable Abdomen AP (KUB)

- Evidence of proper collimation
- No motion.
- Outlines of the abdominal viscera.
- Abdominal region, including pubic symphysis or diaphragm (*both may be seen on some patients*)
- Vertebral column in center of the image
- Psoas muscles, lower margin of the liver, and kidney margins
- No rotation
- Symmetric appearance of vertebral column and iliac wings
- Radiographic markers as appropriate.



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Portable Abdomen AP (KUB)

Special Considerations with AP Abdomen Orders:

KUB's - 1 view Abdomen AP

(not part of an obstructive series):

- If kidneys, ureter and bladder are of primary concern they need to be included.
- ****If KUB is ordered for nausea, vomiting, or diarrhea include all bowel pattern**
- Any Abdomen AP (KUB) order to check for foreign body should be imaged skin to skin, symphysis to diaphragm.
(examples include: MRI clearance, evaluate for IUD, patency capsule etc.)

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Portable Abdomen AP (KUB)

Special Considerations with AP Abdomen Orders:

Obstructive series imaging based on Clinical Impression/Diagnosis of Exclusion:

- Often, 1 view Abdomen AP is ordered when really the patient should be having a full obstruction series. If you receive a KUB (Abdomen AP) order for Obstruction/Ileus or Pneumoperitoneum (Free Air) and rad decides views is “yes”, proceed with imaging an Obstructive Series including a LLD, **Trans abdominal** or Erect image (Send Co-sign required). If there is any question, please consult the Radiologist prior to imaging patient.



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Portable Abdomen AP (KUB)

Special Considerations with AP Abdomen Orders:

MRI Screening Protocol:

- Abdomen AP (supine) prior to patient having MRI study.
- Remove heart monitor and leads; be sure to include the entire liver (need entire diaphragm on image).
 - Also need to include skin to skin, side to side.
- If the diaphragm is clipped check to see if patient has had a chest x-ray within 24 hours before repeating. If there is a CXR within 24 hours, there is no need to repeat; document this info in EPIC.
- All other factors same as regular Abdomen AP.
- **Criteria:** Visualize entire abdominopelvic cavity, skin to skin and diaphragm to symphysis.



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Portable Abdomen AP (KUB)

Special Considerations with AP Abdomen Orders:

Hinton Marker Abdomen AP:

- All bowel visualized.
- Follow instructions per Hinton Marker Policy found in **Policy Manager**.



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Portable Abdomen AP (KUB)

- Evidence of proper collimation
- No motion.
- Outlines of the abdominal viscera.
- Abdominal region, including pubic symphysis or diaphragm (both may be seen on some patients)
- Vertebral column in center of the image
- Psoas muscles, lower margin of the liver, and kidney margins
- No rotation
- Symmetric appearance of vertebral column and iliac wings
- Radiographic markers as appropriate.
- RH - Symphysis pubis to the upper abdomen including kidney shadows must be included
- RH (Obstructive Series) - Entire bowel pattern must be visualized
- RH - Right or Left marker should not be overlying the abdominal contents



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Portable Abdomen AP (KUB)

Acceptable



Acceptable





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Portable Abdomen AP (KUB)

Acceptable



Not Acceptable



- Clipping Symphysis
- Wires
- Marker

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Portable Extremities



- Procedures follow the same positioning/evaluation criteria as would in regular x-ray room (*positioning, 40" SID, etc.*)
- Every effort should be made to obtain the views ordered.
 - Any deviation from what was ordered should be documented in EPIC



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Portable Extremities

- Positioning: Follow regular protocol – **Image as ordered***
 - May have to make modifications to central ray and image receptor to match what the patient position presents or limitations the patient may have
- Views taken depend on what physician orders. Most charges reflect 2 views (AP/PA and Lateral would be views of choice)
 - Some portable orders could indicate 3 views or more
 - Example: Wrist – if this would be ordered 3 views or more then the normal protocol would be followed if it would be trauma or non-trauma.
- Must annotate that the image was obtained portably and also indicate portable in EPIC documentation



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Portable Extremities



- **Do NOT** remove any type of immobilizer or bandaging without asking the patient's nurse for approval
- Use 2 people with any movement of a fractured/injured limb
 - 1 to lift & support the limb on both sides of the fracture or joint
 - 1 to slide the IR/sponge underneath the limb



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Average Portable NICU Techniques

Procedure:	Optimal kVp	AEC	Receptor	mAs (non-AEC)*
Chest *dependent on size/weight			11 x 12 Free Detector	
Babygram *dependent on size/weight			11 x 12 Free Detector	

- NICU/PEDS Imaging is dependent on weight and/or age. Must reference technique chart.
 - Weight can be located in EPIC plus verification of weight with RN to ensure that the weight documented in EPIC is the most current.



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Portable NICU CXR

- Evidence of proper collimation
- Anatomy from apices to costophrenic angles
- No motion
- No blurring of lungs and diaphragm
- No rotation of patient
- Radiographic markers as appropriate.



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Portable NICU CXR

Acceptable



Not Acceptable



- Collimation – Should not visualize head or arms

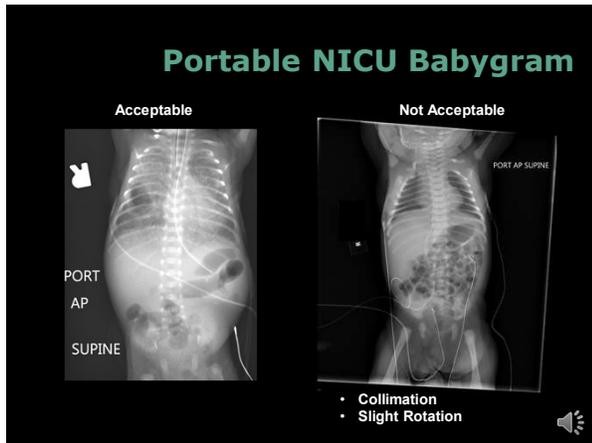
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Portable NICU Babygram

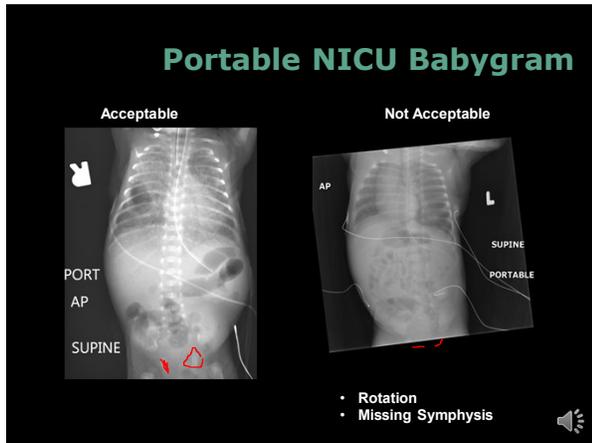
- Evidence of proper collimation
- Anatomy from apices to pubic symphysis in the thoracic and abdominal regions
- No motion
- No blurring of lungs, diaphragm, and abdominal structures
- No rotation of patient
- Radiographic markers as appropriate



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Portable NICU REMINDER***

****RH PROTOCOL:**
NEVER REPEAT A NICU EXAM WITHOUT AUTHORIZATION FROM THE ORDERING PHYSICIAN!!

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