

Portable Chest (Erect)

- Routine:** Portable Chest - Erect
- Position/Projection:** **Upright/Erect (AP)**
- Patient Prep:** Remove all artifacts overlying anatomy; this includes tubing, snaps monitor wires/leads, bra, and jewelry. Heart monitor leads pulled straight down the midline of the body. Oxygen tubing move up and over shoulder.
- Technique:** **90 kVp; 1.6mAs (24cm)**
For every 1 cm thickness change = +/- 2 kVp (variable kVp;fixed mAs)
- Measure anterior to posterior at mid sternal area.
RH Shimadzu DR:
- Use grid on patients who measure 30cm or above, adjust technique accordingly
- SID:** 72" SID
- Collimation:** RH: 17 x 14 Crosswise/Landscape (with appropriate side to side collimation)
- ***Merrill's: 14 x 17 lengthwise or crosswise depending on body habitus***
- At RH reference 2m (78.7") to set appropriate collimation (17x14) for required 72" SID
- Patient Position:** Patient to be in the upright position. You may use pillows cushions, and sponges to place behind IR to keep patient erect. Center the midsagittal plane to the IR. IR positioned about ½ inch – 1 inch above the shoulders (Merrill's: IR to be placed 2 inches above relaxed shoulders but also dependent on the patient's size.) Ensure that the patient's shoulders are relaxed, and the upper torso is not rotated or leaning toward one side.
- Central Ray:** Perpendicular to the long axis of the sternum and the center of the IR. Central ray should enter about 3 inches below jugular notch at the level of T7.

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- Marker Placement:** Place the appropriate right or left marker on the lateral aspect of the IR. If unable to use bubble marker, or if bubble marker is cut off annotate “AP Erect” on image. Also, annotate “Portable”
- Shielding:** Patient gonadal shielding not required at RH
Technologist/MI Students shielded and any patients/visitors also in close proximity
- Breathing Instructions:** Double inspiration
- Purpose/Structures:** Anatomy of the thorax, including the heart, trachea, diaphragmatic domes, and, most importantly the entire lung fields including vascular markings.
- Evaluation Criteria:**
- 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 – 1-10 ribs above diaphragm, showing good inspiratory effort

Portable Chest (Supine)

- Routine:** Portable Chest - Supine
- Position/Projection:** **Supine (AP)**
- Patient Prep:** Remove all artifacts overlying anatomy; this includes tubing, snaps monitor wires/leads, bra, and jewelry. Heart monitor leads pulled straight down the midline of the body. Oxygen tubing move up and over shoulder.
- Technique:** **90 kVp; 1.6mAs (24cm)**
For every 1 cm thickness change = +/- 2 kVp (variable kVp;fixed mAs)
- Measure anterior to posterior at mid sternal area.
RH Shimadzu DR:
- Use grid on patients who measure 30cm or above, adjust technique accordingly
- SID:** 45” SID
- Collimation:** RH: 17 x 14 Crosswise/Landscape (**with appropriate side to side collimation**)
- *Merrill’s: 14 x 17 lengthwise or crosswise depending on body habitus*
- At RH reference 1m (39.4”) to set appropriate collimation (17x14) for required 45” SID
- Patient Position:** Patient to be in the supine position. The IR is placed beneath the patient. Center the midsagittal plane to the IR. IR positioned about ½ inch – 1 inch above the shoulders (Merrill’s: IR to be placed 2 inches above relaxed shoulders but also dependent on the patients’ size. Ensure that the patient’s shoulders are relaxed, and the upper torso is not rotated or leaning toward one side. When the patient is supine, the shoulders may move to a higher position—adjust IR placement accordingly.
- Central Ray:** Perpendicular to the long axis of the sternum and the center of the IR. Central ray should enter about 3 inches below jugular notch at the level of T7.

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- Marker Placement:** Place the appropriate right or left marker on the lateral aspect of the IR. If unable to use bubble marker, or if bubble marker is cut off annotate “AP Supine “on image. Also, annotate “Portable”
- Shielding:** Patient gonadal shielding not required at RH
Technologist/MI Students shielded and any patients/visitors also in close proximity
- Breathing Instructions:** Double inspiration
- Purpose/Structures:** Anatomy of the thorax, including the heart, trachea, diaphragmatic domes, and, most importantly the entire lung fields including vascular markings.

Evaluation Criteria:

- 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

Additional Notes for AP Erect and AP Supine Portable Chest:

- Make sure to clean the IR before and after each use.
- Make sure to cover the IR in plastic, if body fluids are present.
- Those taking the exposure must be shielded.
- Remove others from area, as able.
- Must announce ‘x-ray’ *prior* to breathing instructions.
- Document “Portable AP Supine” or “Portable AP Erect” based on patient position on the image and in the electronic record
- Philips Portable - Use of a grid is not required when grid suppression (SkyFlow) technology is utilized with chest imaging.

Portable Chest (PICC Line Placement)

Routine:	Portable Chest - Supine
Position/Projection:	Supine-RPO (AP)
Patient Prep:	Remove all artifacts overlying anatomy; this includes tubing, snaps monitor wires/leads, bra, and jewelry. Heart monitor leads pulled out of the way as best as possible. Oxygen tubing move up and over shoulder.
Technique:	90 kVp; 1.6mAs (24cm) <i>For every 1 cm thickness change = +/- 2 kVp (variable kVp;fixed mAs)</i> Measure anterior to posterior at mid sternal area. RH Shimadzu DR: <ul style="list-style-type: none">• Use grid on patients who measure 30cm or above, adjust technique accordingly
SID:	45” SID
Collimation:	17x 14 Crosswise (Landscape) At RH reference 1m (39.4”) to set appropriate collimation (17x14) for required 45” SID
Patient Position:	Patient to be in the supine position. Place patient into 15 degrees RPO using a large angle cushion to support the patient. IR positioned about ½ inch – 1 inch above the shoulders. Ensure that IR is placed so the shoulder of insertion site of the PICC line will be included and at least all of the mediastinum within the image.
Central Ray:	Perpendicular central ray entering about 3 inches below Jugular (manubrial) notch at the level of T7 (mid-sternal area). With the light field including the shoulder of the insertion site and at least all of the mediastinum (will possibly be off centered slightly to include shoulder of PICC insertion)
Marker Placement:	Place right marker on the lateral right aspect of the IR. Also, annotate “Portable RPO”

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Shielding: Patient Gonadal shielding not required at RH
Technologist/MI Students shielded and any patients/visitors
also in close proximity

Breathing Instructions: Double inspiration

Purpose/Structures: Anatomy of the thorax, including the heart, trachea,
diaphragmatic domes, and lung fields including vascular
markings. Visualization of the end of an inserted PICC
line.

Evaluation Criteria:

- Shoulder of insertion site included.
- As much of lung fields as possible, or at least all of mediastinum
- Technique that allows visualization of the pleural markings, and T-spine faintly visible through heart shadow.
- No motion, no artifacts over necessary anatomy
- 1-10 ribs above diaphragm, showing good inspiratory effort.
- Correct lead marker visible
- Rotation of patient allowing to see end location of the PICC line.
- Philips Portable - Use of a grid is not required when grid suppression (SkyFlow) technology is utilized with chest imaging.

Additional Notes:

- Make sure the exam gets read immediately by clicking “yes” in EPIC next to verbal report. Document the floor’s phone number of who the image library should contact.
- If alternate positioning is requested, should follow at the discretion of the IV RN

Portable Abdomen (KUB)

- Routine:** Portable Abdomen - KUB
- Position/Projection:** **Supine (AP)**
- Patient Prep:** Remove all artifacts overlying anatomy; this includes tubing, snaps monitor wires/leads. Heart monitor leads and patches can remain on for all obstruction series/2 view abdomen series. They may stay on for general KUB orders however they should be removed for KUB's with the diagnosis of kidney stone. Reminder to keep wires separated and not coiled into a pile on the images
- Lead wires should be moved off to the side or up over chest
- Technique:** **80 kVp; 16mAs (24cm) --Gridded**
*For every 1 cm thickness change = +/- 2 kVp (variable kVp;fixed mAs)
(Measurement must occur where central ray is located. If 2 images are required-2 measurements must be obtained)*
- SID:** 40" SID
- At RH reference 1m (39.4") to set appropriate collimation for required SID
- Collimation:** 14 x 17 Lengthwise/Portrait or 17 x 14 Crosswise/Landscape dependent on body habitus and reason for exam.
- Patient Position:** Place the patient in a supine position. Position the gridded IR to demonstrate abdominal anatomy from pubic symphysis to the upper abdominal region
- Center the IR to the level of the iliac crest with adjustment to ensure that symphysis pubis should be at the bottom of the IR.
 - Place the superior border of the symphysis pubis, one finger width ($\frac{1}{2}$ inch) above the lower margin of the IR to ensure this.
- Ensure that there is no rotation of the patient or gridded IR. Adjust the patient's shoulders and pelvis to lie in the same plane. Move the patient's arms out of the region of the abdomen.

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- Central Ray:** Perpendicular to the center of the grid along the midsagittal plane and at the level of the iliac crests.
- Marker Placement:** Place the appropriate right or left marker on the lateral aspect of the IR (in true field size). If unable to use bubble marker, or if bubble marker is cut off annotate “supine” on image. Also, annotate “Portable”
- Shielding:** Patient gonadal shielding not required at RH
Technologist/MI Students shielded and any patients/visitors also in close proximity
- Breathing Instructions:** Suspended Expiration
- Purpose/Structures:** Anatomy demonstrated of the inferior margin of the liver; the spleen; the kidneys, and psoas muscles; calcifications; and evidence of tumor masses. If the image includes the upper abdomen and diaphragm, the size and shape of the liver may be seen.

Evaluation Criteria:

- Evidence of proper collimation
- No motion.
- Outlines of the abdominal viscera.
- 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
- Merrill’s - Abdominal region, including pubic symphysis or diaphragm (both may be seen on some patients)

Additional Notes:

- When using digital plate with holder/grid be aware of the true IR field size and position accordingly (grid is larger than true IR size)

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KUB's - 1 view Abdomen AP (not part of an obstructive series):

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

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, Erect, or Transabdominal image (Send Co-sign required). If there is any question, please consult the Radiologist prior to imaging patient.

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.
 - COMMUNICATE with nursing prior to removing due to continuous monitoring of patients
- If the diaphragm is clipped check to see if patient has had 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.

Hinton Marker Abdomen AP:

- All bowel visualized. Follow instructions per Hinton Marker Policy found in Policy Manager on the hospital intranet.

Portable Chest/Abdomen (For Feeding Tube Placement)

Routine:	Portable Abdomen or Portable Chest – AP Supine to include lower chest and upper abdomen
Position/Projection:	Supine (AP)
Patient Prep:	Remove all artifacts overlying anatomy; this includes tubing, snaps monitor wires/leads, bra, and jewelry. Heart monitor leads pulled away from abdomen (laterally) away from stomach. Oxygen tubing move up and over shoulder.
Technique:	80 kVp; 16mAs (24cm) --Gridded <i>For every 1 cm thickness change = +/- 2 kVp</i> <i>(Measurement must occur where central ray is located. (variable kVp;fixed mAs)</i>
SID:	40” SID At RH reference 1m (39.4”) to set appropriate collimation for required SID
Collimation:	14 x 17 Lengthwise/Portrait
Patient Position:	Place the patient in a supine position with the midsagittal plane centered to the IR. Off-centering of the IR to the left (stomach side) may be necessary based on patient’s body habitus Ensure that there is no rotation of the patient or gridded IR and they are straight on the IR. Adjust the patient’s shoulders and pelvis to lie in the same plane. Move the patients arms out of the region of the abdomen. Centering will depend on the physician order. <ul style="list-style-type: none">○ If a portable chest is ordered, most of the image should be chest with feeding tube visualized.<ul style="list-style-type: none">▪ <u>Suggestion:</u> Top of IR at the level of the shoulders (not higher than the shoulders)○ If a portable abdomen is ordered include more of the abdomen with feeding tube visualized.<ul style="list-style-type: none">▪ <u>Suggestion:</u> CR at level 2” above crest
Central Ray:	Perpendicular to the center of the gridded IR

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- Marker Placement:** Place the appropriate right or left marker on the lateral aspect of the IR. If unable to use bubble marker, annotate “supine” on image. Also, annotate “Portable”
- Shielding:** Patient gonadal shielding not required at RH
Technologist/MI Students shielded and any patients/visitors also in close proximity
- Breathing Instructions:** Suspended Expiration
- Purpose/Structures:** Anatomy demonstrated of the lower chest and upper abdomen. Visualization of the end of the feeding tube ideally within the stomach.

Evaluation Criteria:

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

Additional Notes:

- We will utilize the imaging order that was entered into EPIC by the provider. This means we should *not* be revising the order as long as portable chest or portable abdomen have been entered. Either procedure description may be used for the procedure.
- Orders for feeding tube placement entered into EPIC by the RN on behalf of the physician should be entered as “Per Protocol; Cosign Required”. Signature is not necessary at time of imaging. The physician has 24 hours to sign the inpatient order.
- May see ordering physician write in EPIC comments: Keofeed, feeding tube, NG tube, OG tube placement
- Make sure the exam is read immediately by clicking “yes” in EPIC next to verbal report. Document the floor’s phone number of who the image library should contact.

Portable Chest NICU

30 SECONDS HAND WASH WITH SOAP AND WATER PRIOR TO IMAGING

Routine: AP Supine

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

Patient Prep: **Technologist: 30 seconds hand wash with soap and water prior to imaging
**See additional notes for further precautions
**RN will move any tubing if possible.

Technique: **Technique determined by patient weight/age – according to the technique chart**

SID: 40” SID to the IR under the baby – OR – 38” SID to the bed (hover, do not touch) if using tray inside the bed.

At RH reference 1m (39.4”) to set appropriate collimation for required SID

Collimation: 11 x 12 digital detector utilized according to isolette tray or lengthwise/portrait directly under patient

- Tight collimation to include only the chest and lead marker
- IR will be placed either in the bed tray or directly under the patient.

Patient Position: IR placement is dependent on isolette or baby bed. IR could be placed directly under the baby (IR must be covered with linen from that baby’s bed only) OR the IR is placed within the isolette/bed tray. Isolette/bed trays often have side measurements along the tray that permits accurate placement of the IR.

RN will hold the baby in a supine position. Let RN know if baby is rotated.

Central Ray: At nipple line

Marker Placement: Disposable R or L obtained from NICU; placed next to baby’s chest. RN will place this marker next to the baby.

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Shielding: Patient gonadal shielding not required at RH
RN must be shielded and any patients/visitors also in close proximity
Technologist/MI Students shielded

Breathing Instructions: Watch breathing; expose on inspiration.

Purpose/Structures: Anatomy of entire chest shown

Evaluation Criteria:

- 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.

Portable Babygram in NICU

30 SECONDS HAND WASH WITH SOAP AND WATER PRIOR TO IMAGING

Routine:	AP Supine
Position/Projection:	Supine (AP)
Patient Prep:	**Technologist: 30 seconds hand wash with soap and water prior to imaging **See additional notes for further precautions **RN will move any tubing if possible.
Technique:	Technique determined by patient weight/age – according to the technique chart
SID:	40” SID to the IR under the baby – OR – 38” SID to the bed (hover, do not touch) if using tray inside the bed. At RH reference 1m (39.4”) to set appropriate collimation for required SID
Collimation:	11 x 12 digital detector utilized according to isolette tray or Lengthwise/Portrait directly under patient <ul style="list-style-type: none">• Tight collimation to include both the chest and entire abdomen, and marker.• IR will be placed either in the bed tray or directly under the patient.
Patient Position:	IR placement is dependent on isolette or baby bed. IR could be placed directly under the baby (IR must be covered with linen from that baby’s bed only) OR the IR is placed within the isolette/bed tray. Isolette/bed trays often have side measurements along the tray that permits accurate placement of the IR. RN will hold the baby in a supine position. Let RN know if baby is rotated.
Central Ray:	At the region of the diaphragm. Light field should include just above the shoulders, and the symphysis pubis.

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- Marker Placement:** Disposable R or L obtained from NICU; placed next to the chest. Often, RN will place this marker next to the baby.
- Shielding:** DO NOT SHIELD THE PATIENT
RN must be shielded and patients/visitors also in close proximity
Technologist/MI Students shielded
- Breathing Instructions:** Watch breathing; expose on inspiration.
- Purpose/Structures:** Anatomy of the entire chest and abdomen is shown

Evaluation Criteria:

- 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

Additional Notes for Portable NICU Images:

- Portable Radiographic Unit:
 - Shimadzu Portable # 8 and # 10 are used to acquire images in NICU
 - Upon entering and exiting NICU, the portable Radiographic unit will be wiped down utilizing Purple Sani Wipes adhering to the 2-minute wet time
- Digital Detector:
 - The 11 x 12 digital detector is housed in NICU and does not leave the area
 - Before and after each use the detector will be cleaned using the Purple Sani Wipes adhering to the 2-minute wet time
 - When placing the IR into the bed tray, you will do one of 2 things:
 - Place the IR directly into the flat tray using the side measurements as your guide for location of CR
 - Place the IR into the IR holder in the tray. RN will center the baby over this area
 - If there is an overhead warmer, it will be moved away last
 - Move the tube out of the way immediately after the exposure
- Lead Markers:
 - Disposable laterality markers kept in NICU will be utilized for the study
 - Often, the RN will place the marker next to the baby for you
- Lead Shielding:

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- Patient lead shields are housed in the NICU and are not to be removed from the area

- Prior to and after use the shield should be wiped with Purple Sani Wipes adhering to the 2-minute wet time
- Shields should be covered with linen from the baby's bed only
- Those taking the exposure must be shielded
- Have other staff removed from area, as able
- Must announce 'x-ray' *prior* to watching the breathing