

Gastric Emptying Liquid for Reflux and Aspiration

Special Instructions	<p>For <u>gastric emptying only</u> or <u>gastric emptying with reflux</u>: This is generally only performed on infants or young children < 5 years of age. Consult with the radiologist about the appropriateness of this study.</p> <p>If gastric emptying only (without reflux assessment) is needed in a child or adult, the Gastric Emptying – Solid or Ensure Plus 4-hour protocol should generally be used.</p> <p>Consult with the radiologist if the patient is taking any agents that may affect gastric emptying (e.g., metoclopramide/Reglan).</p> <p>For <u>aspiration studies</u>: Patients may need delayed images at 2-6 hours and/or at 18-24 hours if 1) no reflux or aspiration is demonstrated during the initial dynamic images, and 2) if activity still remains in the stomach. The examination can be terminated when no activity remains in the stomach. Schedule these patients for initial imaging in the morning, with brief follow-up static images every 2 hours until the end of the work day, and the next morning (when needed).</p> <p>For <u>all studies</u>: liquids can be administered via gastrostomy tube or nasogastric tube if needed. If using a gastrostomy tube or nasogastric tube, confirm with the patient or patient’s caregiver/nurse that the tip of the tube is positioned in the stomach (not in the small bowel) prior to administering the liquid. If the position of the tip is uncertain, consult with the radiologist for possible radiographic confirmation.</p> <p>Because having a nasogastric tube present can cause reflux, consult with the radiologist about whether the nasogastric tube should be removed after the liquid has been administered.</p> <p>To be performed at UNMH and SRMC.</p>
-----------------------------	--

Radiopharmaceutical:	<p><u>Tc-99m sulfur colloid in liquid, as follows:</u></p> <ul style="list-style-type: none">• For gastric emptying studies without or with reflux, consult with the radiologist about appropriate liquid (typically formula or Pediasure depending on the patient’s age) and volume. Total volume of liquid is typically a usual feeding.• If study is for reflux and/or aspiration only (without gastric emptying), dilute the Tc-99m sulfur colloid in approximately 30 ml of any liquid (milk, juice, water, etc.). Have the patient drink that entire volume. Immediately after that, have the patient drink additional volume of liquid until he/she is full. Total volume should equal that of a usual feeding for that patient (in adults, typically approximately 250 ml).
-----------------------------	--

Dose (Adult/Pediatric): Refer to Nuclear Medicine Dose Chart

Gastric Emptying Liquid for Reflux and Aspiration (continued)

Route of Administration: Oral

Patient Preparation: Please ensure the following:

- For older children and adults, NPO for at least 4 hours.
- For infants and young children, shorter NPO times (~2 hours) are OK.

Equipment Setup: Collimator: LEAP (Orbiter) or High resolution (all others)

Computer set up:

Dynamic Acquisition:

- 128 x 128 matrix
- **Zoom 1.0 (greater for children)**
- 1 min/image for 60 min

Static Acquisition:

- 128 x 128 matrix
- **Zoom 1.0 (greater for children)**
- 3 min/image

Patient Positioning: Supine

Camera position:

Gastric emptying only: LAO

Gastric emptying with reflux: Anterior (and posterior if available); place stomach in lower portion of field. For small children, include the mouth in field of view if possible.

Reflux without or with aspiration: Anterior (and posterior if available); position the top of the stomach at the bottom of the field of view, and include the entire thorax if possible

Procedure:

- Encourage the patient to drink all the liquid as quickly as **comfortably/safely** possible. The patient may drink seated upright on the imaging table, or in whatever position is comfortable.
- Liquids can alternatively be administered via gastrostomy tube or nasogastric tube if needed.
- If using a gastrostomy tube or nasogastric tube, confirm with the patient or patient's caregiver/nurse that the tip of the tube is positioned in the stomach (not in the small bowel) prior to administering the liquid. If the position of the tip is uncertain, consult with the radiologist for possible radiographic confirmation.
- Flush the tube after use. If a tube is used, this should be noted in technologist comments.
- If external tubing remains in place keep below the diaphragm during imaging to avoid false positives.
- Begin imaging immediately after the patient finishes drinking or liquid is administered by tube.

Gastric Emptying Liquid for Reflux and Aspiration (continued)

- Because having a nasogastric tube present can cause reflux, consult with the radiologist about whether the nasogastric tube should be removed after the liquid has been administered.
- For all studies, acquire dynamic images for 60 minutes as noted above.
- For aspiration studies, at the end of the dynamic sequence, obtain a 3-minute static image (anterior or anterior/posterior) of the entire thorax, followed by a 1-minute transmission image in the same position.
- Remove the patient from the camera, and obtain an additional 3-minute image of the background with the camera in the same position (anterior or anterior/posterior).
- If activity remains in the stomach at the end of the 1-hour acquisition, have the patient return for delayed images of the thorax at 2, 4, and 6 hours post administration, and ~24 hours post-administration, only as needed.
- The examination can be terminated when no additional activity remains in the stomach. For each delayed image, again obtain a 3-minute image of the thorax, a 1-minute transmission image, and a 3-minute background image.

Processing:

Process the examination according to the order (including gastric emptying, reflux, and/or aspiration as needed):

Gastric Emptying:

- Draw ROI around stomach
- Decay correct the emptying curve
- Place the beginning of the T1/2 calculation after the lag phase (if there is one)

Reflux:

- Draw three rectangular ROIs above the stomach (for lower, mid, and upper esophagus) and generate curves for each region.

Orbiter:

- Select raw data – invert color (white on black) – planar proc – planar tools – region tool – no stats and curve for whole file – select any image – add no images – no – invert again if necessary – draw rectangular region – create curve from total counts – change size of box - done – draw another region – duplicate a region – enter no 1 – done – position box above previous region by left clicking on 1st box and dragging – done draw another region – duplicate a region – enter 1 or 2- done – add labels – store lightbox – send to PACS – labels – upper, mid and lower esophagus.

Aspiration:

Lungs:

- Merge images to display 5 minutes/frame for the dynamic images. For the 3-minute static images, draw ROIs around the lungs on the transmission static image of the thorax, and draw or copy a similar ROI

Gastric Emptying Liquid for Reflux and Aspiration (continued)

on the 3-minute static and 3-minute background images. Determine the total lung counts (or background counts in the same ROI) on each image and label with the counts.

Items Required For Complete Study:

- Raw data of dynamic emptying images (60 images)
- Lightboxes/savescreens of 1) dynamic emptying plus emptying curve with $T_{1/2}$ calculation (if applicable), 2) reflux ROIs (if applicable), 3) static aspiration images (if applicable)
- Transfer of all digital images to PACS
- Complete the examination in RIS