GASTRIC EMPTYING STUDY - LIQUID

Radiology Associates of Clearwater

Overview

The Gastric Emptying Study demonstrates the movement of an ingested bolus of liquid from the stomach into the small intestine. Various physiologic parameters may be quantified.

Indications

Diagnosis of functional gastric dysmotility (1-4).
Diabetes Malabsorption
Gastric outlet obstruction Anorexia
Weight Loss Nausea and Vomiting
Abdominal pain Abnormal GI X-rays
Cachexia Abnormal Solid phase study

Unspecified functional disorders of the stomach

*Exams ordered for indications which are not listed above need to be discussed with the Nuclear Medicine Physician.

Examination Time

Less then 1 hour.

Patient Instructions

Schedule in the morning, preferably by 9:00am as the gastric emptying time varies with the time of day (5).

The patient must be NPO a minimum of 4 hours prior to imaging.

Patients with dentures should be advised to bring them.

Have the patient bring a list of all medications they are currently taking.

Anti-nausea medicine, such as Vistaril, Compazine, Tigan and Phenergan should be held if possible, 24 hours prior to the study.

Lab / Image Correlation

Have any prior gastric emptying studies available for comparison.
If the patient has had an upper GI, attempt to have the report available.

**Equipment & Energy Windows**

Gamma camera: Large field of view.

Collimator: Low energy, high resolution, parallel hole.

Energy window: 20% window centered at 140 keV.

Matrix 128x128.

**Radiopharmaceutical, Dose, & Technique of Administration**

Radiopharmaceutical: 99m Tc-SCOL in 300 cc tap water.

Dose: 500uCi (18.5 MBq) P.O.

**Patient Position & Imaging Field**

Patient position: 45 degree supine.

Imaging field: Upper abdomen. Distal esophagus, stomach and small bowel must be in the field of view.

**Acquisition Protocol (14)**

Place the patient in a 45 degree supine position, LAO to the camera (15,16). If patient is unable to tolerate standard positioning, the position used must be clearly noted.

Have the patient drink to liquid as quickly as possible.

Acquire serial 60 second per frame dynamic digital images for 30 minutes.

NOTE: The patient should remain quiescent between image acquisitions because exercise decreases gastric emptying times (17).

**Data Processing**

Draw a region of interest around the entire stomach, but exclude as much small intestine as possible in each image.
The processing software will correct the counts at each time period for radioactive decay.

The computer will plot the results on a graph with "Time" on the X-axis and "Gastric counts" on the Y-axis. The half emptying time will be calculated automatically. Generate raw and fitted curves.

**NOTE**: For Tc-99m-SCOL labeled water the normal fitted T1/2 is <23 minutes.

**Principle Radiation Emission Data - Tc-99m** (30)

Physical half-life = 6.01 hours.

<table>
<thead>
<tr>
<th>Radiation</th>
<th>Mean % per disintegration</th>
<th>Mean energy (keV)</th>
</tr>
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<tbody>
<tr>
<td>Gamma-2</td>
<td>89.07</td>
<td>140.5</td>
</tr>
</tbody>
</table>

**Dosimetry - Tc-99m-DTPA Liquid Meal** (31)

<table>
<thead>
<tr>
<th>Organ</th>
<th>rads/1 mCi</th>
<th>mGy/37 MBq</th>
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</thead>
<tbody>
<tr>
<td>Large intestine</td>
<td>0.46</td>
<td>4.6</td>
</tr>
<tr>
<td>Small intestine</td>
<td>0.24</td>
<td>2.4</td>
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<tr>
<td>Stomach</td>
<td>0.24</td>
<td>2.4</td>
</tr>
<tr>
<td>Ovaries</td>
<td>0.08</td>
<td>0.8</td>
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<tr>
<td>Whole body</td>
<td>0.02</td>
<td>0.2</td>
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<tr>
<td>Testes</td>
<td>0.004</td>
<td>0.04</td>
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**References**


Normal Findings


NOTE: This procedure adheres to ACR standards 1997.

This procedure adheres to the Society of Nuclear Medicine Procedure Guidelines for Gastric Emptying and Motility. Version 1.0, 7 Feb 1999.