SOLID PHASE 4 HOUR GASTRIC EMTPYING STUDY

Approval: E. Alvarez, MD	rev:1	12/2025

Radiopharmaceutical: Tc99m Sulfur Colloid in 2 egg whites with 2 pieces of bread, butter and jelly 120 ml water.
Dose: 1 mCi
T1/2: 6 hours
Energy: 140 keV
CPT: 78264

Indications:
Clinical indications for a gastric emptying study include, but are not limited to:

1. Gastroparesis
2. Abdominal pain
3. Early satiety
4. Nausea
5. Vomiting
6. Diarrhea

Radiopharmaceutical:

- 1 mCi Tc99m Sulfur Colloid in egg white meal with 120 ml of water. Oatmeal may NOT be substituted for patients allergic to eggs
- Pediatric patients to receive 0.06 mCi/kg of body weight

Pharmacological intervention: None

Patient instruction:

- NPO for at least 6 hours
- Withhold any gastric medications for 24 to 48 hours (unless physician request they be taken)
- Scan time is approximately 4 to 4 ½ hours
- Upon scheduling if patient has any pertinent prior studies, please instruct either the patient or the physician's office to make those available for comparison

Equipment:

1. Philips Skylight (VXUR collimator) These studies are done at TLI and POI only

Procedure:

- Acquire a 1 minute static image from the anterior and posterior projections at 0 min (immediately after ingestion of egg meal) 60, 120, 180 and 240 minutes post ingestion of radioactive egg white meal

Acquisition Parameters:

· VXUR collimator
· Matrix 128x128

Processing:

1. Left click on IMAGE/CURVE/ROI MANIPULATION from the process menu
2. Left click on IMAGE APPEND
3. Choose the anterior images 0, 60, 120, 180 and 240 min in that order
4. Left click on proceed
5. When image loads, assure proper alignment, motion correct if necessary….blue background…manual process…motion correct
6. Left click on EXIT, then change the name to ANTERIOR DYNAMIC, then left click on SAVE SELECTED and PROCEED
7. Repeat this for the posterior images, naming the output image as POSTERIOR DYNAMIC
8. Right click in the blue background…right click USER MENU…right click CUSTOM APPLICATIONS…right click GEOMETRIC MEAN DISPLAY
9. Select the ANTERIOR DYNAMIC then select the POSTERIOR DYNAMIC (choose motion correct data sets if motion correction was applied) left click on PROCEED
10. This will generate a geometric mean data set for you to process
11. Left click on QUIT then on SAVE SELECTED AND PROCEED
12. To calculate the gastric emptying time, right click on the blue screen on the Pegasys background…right click on USER CUSTOM MENU…right click on GASTRIC EMPTYING (MIN)
13. Choose GEOMETRIC MEAN image set
14. Left click on CINE in bottom right corner of screen and cycle through images until a suitable image is found. Draw ROI around stomach. Be sure to include any activity in the esophagus.
15. Left click on PROCEED
16. Move the green limit lines to the edges of the graph, encompassing the entire curve
17. Left click on PROCEED
18. With CINE tool use a suitable frame to display with the curve
19. If you need to center the image left click on PAN tool to move. Left click on PROCEED
20. If you moved the image…right click at the top of the window and then right click on REFRESH to remove extra ROI that was produced by using PAN tool
21. Change intensity to LOG 2

22. Left click on stomach image to remove frame
23. Left click on pencil tool to annotate graph
24. Right click on LOAD DEFAULTS…4HRGES_CURVE
25. CANCEL annotation tool
26. Right click on CAMERA TOOL…left click on SNAPSHOT AREA IN A BOX
27. Hold down middle button at top left corner of curve and drag down to bottom right area of stomach image. Be sure to cut the information at the bottom of the window.
28. Left click on PROCEED
29. Left click on EXIT and PROCEED WITHOUT SAVING
30. At the top of the screen left click ALL DYNAMIC DISPLAY
31. Select GEOMETRIC MEAN data set PROCEED
32. Left click on the 8 frame button, change intensity to LOG2. Adjust the brightness as needed.
33. Left click on the PENCIL TOOL. Right click on LOAD DEFAULTS and right click on GE_MEAN_COMPOSITE
34. Left click on CANCEL and snapshot the image
35. Right click in the blue background…right click on GLOBALQ MENU…right click on GENERAL NUCLEAR MEDICINE…and right click on GEOMETRIC GASTRIC EMPTYING
36. Select the ANTERIOR DYNAMIC and POSTERIOR DYNAMIC image sets (use the motion corrected data sets if study was motion corrected)
37. Draw ROI around anterior image set…left click on PROCEED…left click on OK when error message regarding time for scans not matching (this is because we summed multiple images together)
38. Draw ROI around posterior image set …left click on PROCEED…left click on OK when error message regarding time for scans not matching
39. Middle click and grab the green line on the right and move all the way over to the right side of the graph…left click on PROCEED
40. Do the same for the posterior graph
41. This will generate a curve display. Label the anterior and posterior images.
42. Right click on snapshot tool…right click on SNAPSHOT AREA IN A BOX
43. Left click and drag the tool box to an area that is outside the way of your expected region. Hold middle click starting at the top left corner of the image and drag down and right to just below the bottom double yellow lines
44. Left click on PROCEED
45. Left click on QUIT
46. Left click on PROCEED WITHOUT SAVING
47. Double snap your images ending in "_SS"

48. Calculate “amount remaining” at 0,60,120, 180 and 240 minutes (this information will be required for the history sheet on RIS)
49. From the PROCESS menu left click IMAGE/CURVE/ROI MANIPULATION
50. Left click ROI ANALYSIS
51. Left click GEOMETRIC MEAN
52. Middle click and draw ROI around the stomach, write down the total counts…a window will pop up…label this O min and ENTER
53. Left click the image to highlight the frame…left click CINE button on the far bottom right of the screen
54. Left click to arrow over to the next image
55. Left click redraw...draw ROI around the stomach and write down the total counts…do this for all remaining images so you have ROI counts for 0 min, 60 min, 120 min, 180 min and 240 min images
56. To calculate the amount remaining

$$counts \div decay\ factor \div zero\ minute\ counts$$

4 hour gastric emptying decay factors
0 min =1
60 min= 0.8912
120 min= 0.7943
180 min= 0.7079
240 min= 0.6309

57. DICOM and send all double snaps ANTERIOR DYNAMIC, POSTERIOR DYNAMIC and GEOMETRIC MEAN data sets to PACS