



# RENOGRAM W or WO LASIX

Approval: E. Alvarez, MD

rev:1

12/2025

**Radiopharmaceutical:** 99mTc-MAG3 (Mertiatide)

**Dose:** 20 mCi

**T1/2:** 6 hours

**Energy:** 140 keV

**CPT:** 78708 (with Lasix); 78707 (without Lasix)

### Indications:

Approved indications include, but are not limited to:

1. Hydronephrosis.
2. Renal calculi or mechanical obstruction.
3. Evaluation of renal function.
4. Evaluation of transplant kidney function.

### Patient Preparation:

- It's preferable to have the patient NPO, though not required.
- Patient should off of any prescribed diuretics for 24 hours prior to study.

### Pharmacologic intervention:

- Standard adult dose of Lasix (furosemide) is 40 mg.
- Pediatric dose is 1 mg/kg.
- If patient has only one kidney or transplant kidney, Lasix dose is 20 mg.
- Consult with radiologist prior to determining proper Lasix dose for any other situation.

### Transplant Kidney Protocol:

- If patient has a transplant kidney, inject 3 mCi of 99mTc-Sulfur Colloid, wait 20 minutes, and acquire a 600 kcount anterior image of kidney.
- Then proceed with MAG3 Renogram with or without Lasix, as ordered.

### Equipment:

1. Philips Skylight (VXUR collimator)
2. Philips Forte (VXUR collimator)
3. Philips Vertex Plus (LEUR collimator)

### Procedure:

1. Position the camera posteriorly for patients with native kidneys, and anteriorly for patients with transplant kidney.
2. Note patient's height and weight for ERPF calculations.
3. Acquire flow study at 1 sec/frame for 60 frames, followed by excretion study at 60 sec/frame for 40 frames.
4. At 15 minutes post injection, administer Lasix IV.
5. Acquire injection site image.
6. At 44 minutes post injection, draw 2 purple top tubes (~8 cc) of whole blood, and centrifuge for 10 minutes to calculate ERPF.
7. If one or both kidneys drained less than 25%, acquire a 5min static 2 hours post injection. 128x128 frame. You can extract and compress the last 5 frames of the excretion phase to use as a 40min comparison image.



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## Acquisition Parameters:

- Matrix: 128 x 128
- Zoom: 1.0 (Full Field)
- Dynamic Flow Time: 1 sec/frame for 60 frames
- Dynamic Excretion Time: 60 sec/frame for 40 frames.
- Planar Injection Site Time: 60 sec
- Position: Supine
- Orientation: Feet First

## Processing:

### Perfusion

1. Left-click REFRAME ULTRA DYNAMIC DISPLAY from the top menu on the Pegasys home screen.
2. Select proper patient, and click PROCEED.
3. Select PERFUSION FLOW data set.
4. Right-click on SELECTION MENU→5→SELECTION MENU→5 STANDARD.
5. Select the 12 zone button.
6. Annotate images using proper PENCIL TOOL default.
7. SNAPSHOT and QUIT.

### Excretion

1. Left-click REFRAME ULTRA DYNAMIC DISPLAY from the top menu on the Pegasys home screen.
2. Select proper patient, and click PROCEED.
3. Select EXCRETION data set.
4. Right-click on SELECTION MENU→4→SELECTION MENU→4 STANDARD.
5. Select the 12 zone button.
6. Change zoom to 2.0, and left-click on MATRIX ZOOM→SELECTION MENU→1.25
7. Annotate images using proper PENCIL TOOL default.
8. SNAPSHOT and QUIT.

### Curves

1. Left-click on RENAL ANALYSIS.
2. Left-click on QUALITATIVE ANALYSIS.
3. Select the PERFUSION data set and then the EXCRETION data set, then click PROCEED 2 times.
4. If patient has both kidneys, left-click on PROCEED on the next screen. Change to the appropriate MODE if patient has only one kidney, or a transplant kidney, then click PROCEED.
5. Follow the ROI LABEL prompts, to draw the appropriate ROIs.
6. If all ROIs are satisfactory, left-click PROCEED. If not, adjust as needed, and then click PROCEED.
7. Note the DIFF PERFUSION numbers at the bottom right of the new screen.
8. Left-click on EXIT→SAVE SELECTED AND PROCEED.
9. Next, left-click on ERPF UAB button and choose the EXCRETION phase only, then click PROCEED 6 times.
10. If patient has both kidneys, leave the MODE field as BOTH KIDNEYS. If patient has only one kidney or a transplant kidney, change to proper setting.
11. Right-click on the arrow next to PHARMACEUTICAL, and change to MAG3.
12. Enter the HEIGHT, WEIGHT, TOTAL INJECTED DOSE (i.e. 20,000  $\mu$ Ci), STANDARD NET COUNTS, STANDARD DILUTION FACTOR (10000), PLASMA SAMPLE NET COUNTS, and TIME PLASMA SAMPLE DRAWN (44 min, unless blood drawn at a different time).

13. Left-click on PROCEED.
14. Draw the respective ROIs in the order requested. Be sure to cut the renal pelvis for normal kidneys.
15. If all ROIs are satisfactory, left-click PROCEED. If not, adjust as needed, and then click PROCEED.
16. Be sure to note the UPTAKE (%) for the left and right kidneys.

**\*\*CLICK ON FULL REPORT TO GET THE TIME TO PEAK COUNTS AND 40 MINUTE COUNTS\*\***

**TTP minute counts-40 minute counts**  
**TTP minute counts**

17. Left-click on EXIT→SAVE SELECTED AND PROCEED.
18. Right-click in the blue background→USER CUSTOM MENU→ERPF DISPLAY.
19. Choose the FLOW CURVE, ERPF CURVE, QRA ROI, ERPF ROI, QRA COMPOSITE, ERPF COMPOSITE, and INJECTION SITE image sets.
20. Right-click on SELECTION MENU→BOTH (if patient has both kidneys, if not, choose the proper MODE).
21. Annotate using the PENCIL TOOL and MAG3 CURVE.
22. Move the arrow on the right graph to show where Lasix was administered, and enter the ERPF differential % numbers, respectively.
23. SNAPSHOT image and QUIT.
24. Right-click in the blue background→DISPLAY/REVIEW→IMAGE DISPLAY→1 ZONE.
25. Choose the ERPF REPORT, and PROCEED.
26. SNAPSHOT AREA IN A BOX, and select the upper half of the displayed data, cutting everything below “URINE COUNTS”.
27. QUIT.
28. Repeat this process for the QRA REPORT, except just SNAPSHOT IN A BOX the information below the upper dashed line.
29. QUIT.
30. Double SNAPSHOT all data ending in “\_SS”.
31. Send all double snapshots, and the raw dynamic data to PACS.
32. Type proper patient history, scan documents, and put online for radiologist interpretation.