

General Reference:

THE SNMMI AND EANM PRACTICE GUIDELINE FOR RENAL SCINTIGRAPHY IN ADULTS

Common Indications:

Hydronephrosis, ureteropelvic junction (UPJ) obstruction, mechanical vs functional obstruction, nephrolithiasis, renal failure, crossing vessel obstructing ureter, evaluation of transplanted kidney, pre-surgical evaluation of kidney donor

With the exception of pre-surgical evaluation of a renal donor (or in the unusual circumstance where GFR calculation has been requested), virtually every examination should be performed with Lasix (furosemide) challenge. If Lasix challenge has not been requested, consult with nuclear medicine physician *prior to scanning the patient*.

Pre-scan Clinical History:

Determine history related to stated clinical history. Locate any pertinent imaging results which describe related findings.

Patient Preparation:

Patients should generally be well hydrated prior to this procedure. for patients with renal failure or patients undergoing dialysis, the referring physician should be asked prior to any request to hydrate the patient.

For patients with kidneys drained by nephrostomy tubes, the referring physician should be asked whether the drainage tubes should be *open or clamped* for the duration of the examination.

Relative Contraindications (if present, consult with nuclear medicine physician prior to scan):

1. Recent nuclear medicine studies
2. Pregnancy

Radiopharmaceutical and Route of Administration:

6 to 8 mCi Tc99m MAG-3 IV, or

6 to 8 mCi Tc99m DTPA IV if exam ordered for GFR calculation (pre-transplant evaluation)

For pediatric patients, use (0.15)(weight in kg), minimum dose 0.75 mCi, maximum dose of 4 mCi. Lasix - standard adult dose is 40mg IV (pediatric patients, use 1mg/kg, maximum 40mg)

Procedure:

1. Encourage the patient to void before starting the exam. This will improve their comfort level, and prevent the need to get up to void while the acquisition is running.
2. Start an IV line; assure good access.
3. Instruct the patient to lie supine on the imaging table. Position the xiphoid process at the top of the field of view. Neither the camera nor the patient can move once the acquisition is started.
4. Acquire the study **in the posterior view** using the following parameters:
 - a. LEHR, 128x128 matrix, zoom nominally 1.25
 - b. Flow - 60 frames at 3 seconds per frame for 3 minutes
 - c. Dynamic - 148 frames at 15 seconds per frame for 37 minutes

At frame 68 of the dynamic (20 minutes after radiopharmaceutical injection), inject Lasix slowly over 3-4 minutes. Flush the line with a 10ml 0.9% saline flush, then remove the IV line.

5. Process all images and show them to a nuclear medicine physician. At a minimum, the screen capture images must document:

- a. Injected radiopharmaceutical and Lasix doses
- b. renal and background regions of interest
- c. differential perfusion
- d. differential time to peak activity
- e. differential washout (peak to T1/2)
- f. GFR normalized to body surface area (if so ordered)

Review:

Prepare images and documents for clinical review as per **Nuclear Imaging Acquisition and Presentation Guidelines**.