

RENAL SCINTIGRAPHY

Primary Indications:

Evaluation of renal perfusion and relative renal function, especially in patients with renal failure; and assessment for obstruction (when done as the first phase of diuretic renal scintigraphy).

Rationale:

The radiopharmaceutical is accumulated by the kidneys (by glomerular filtration in the case of Tc99m DTPA and chiefly by tubular secretion in the case of Tc99m MAG3) and is excreted into the renal collecting system. The initial uptake of the radiopharmaceutical (1-3 minutes after injection) reflects relative renal function at the time of the study.

Radiopharmaceuticals:

Tc99m Merteotide (Tc99m MAG3) is the preferred radiopharmaceutical. Tc99m Pentetate (Tc99m DTPA) may be substituted (after discussion with the physician) and for on-call procedures.

Adult Dose: Tc99m MAG3: 7.5 mCi
Tc99m DTPA: 15 mCi

Pediatric Dose: Tc99m MAG3: 100 uCi/kg with a minimum dose of 1.0 mCi
Tc99m DTPA: 210 uCi /kg with a minimum dose of 2.0 mCi

Route of Administration: Intravenous

Patient Preparation:

Unless otherwise specified by the physician, the patient is to be hydrated prior to starting the study with approximately 16 oz. (500 mL) of water orally.(for a 70 kg. adult) The patient should void immediately prior to the study.

Equipment Setup:

Gamma camera: LFOV camera
Collimator: LEAP
Energy window: 140 keV with 20 % window

Patient Positioning:

Supine for posterior imaging of the majority of the study. Erect (seated), if possible, for the post-void image at the conclusion of the study. The field of view should include the kidneys and (if possible) the bladder. For relatively small camera fields, positioning of the upper

edge of the field of view at the level of the xyphoid should include the kidneys and a portion of the bladder.

Procedure:

The radiopharmaceutical is injected as a bolus with a radionuclide angiogram setup, and the radionuclide angiogram is acquired. Observe the persistence scope and, if needed, shift the camera position during the flow study in order to position the kidneys near the top of the field of view. Immediately following the radionuclide angiogram, sequential images are obtained for a total of 21 minutes of imaging. If possible, the patient should then get up from the imaging table (to allow gravity to aid in renal drainage) and void (to decrease bladder pressure). A post-void image is then obtained, preferably in the erect (seated) position. For catheterized patients, an image of the drainage bag positioned next to the patient's thigh should be obtained. Further images, possibly including a diuretic study, may be obtained at the request of the physician.

Imaging: Flow: 2 seconds per image for 30 images. (128 x 128 matrix)
Sequential images: 60 images for 20 seconds per image, (128 x 128 matrix)
Post-void images: 1 image for 2 minutes, (256 x 256 matrix)

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