

WBC Imaging

Special Instructions For pediatric SPECT-CT examinations, confirm with the radiologist whether the CT is required.

For *in vitro* white blood cell labeling, 60 mL of blood must be drawn from the patient using heparinized syringes. Follow Radiology - Nuclear Medicine - Reinjection of Blood Products procedure.

To performed at UNMH.

To be performed at SRMC only with Attending Radiologist approval, typically when no CT is needed.

Radiopharmaceutical: In-111 oxine or Tc-99m HMPAO labeled WBCs

Dose (Adult/Pediatric): Refer to Nuclear Medicine Dose Chart

Route of Administration: Intravenous

Patient Preparation: None.

Equipment Setup: Collimator (all):

- In-111: Medium energy
- Tc-99m: High resolution

Computer setup (all):

Anterior/posterior whole-body sweep (top of head to feet, arms down):

- Static acquisition, 256 x 1024 matrix
- ZOOM 1.0 (spot views and greater zoom for pediatric patients)
- Scan speed 6 cm/min (In-111), 12 cm/min (Tc-99m)

Spot views (as needed; also use for small pediatric patients):

- Static acquisition, 128 x 128 matrix
- ZOOM 1.0 (more for small pediatric patients)
- 10 min/image (In-111), 5 min/image (Tc-99m)

SPECT or SPECT-CT images:

- High resolution collimator, 128 x 128 matrix
- ZOOM 1.0

WBC Imaging (continued)

- 180 degrees, CW (clockwise)
- 64 steps, 30 sec/step (In-111), 15 sec/step (Tc-99m)
- Noncircular, continuous

Simultaneous Dual-Isotope Acquisition Tc-99m SC/In-111 WBC*

- **Spot views (In111 & Tc99m): Static acquisition, 128 x 128 matrix, 1.00 zoom, 10 min/image**
 - **In-111: peak for 247 keV (15% window) and 174 keV (5% window)**
 - **Tc-99m: peak for 140 keV (10% window)**
- **Whole-body sweep (if needed): 256 x 1024 matrix, 1.00 zoom,**
 - **Scan speed 10 cm/min**

*Palestro CJ, Love C, Tronco GG, Tomas MB, Rini JN, "Combined labeled leukocyte and technetium 99m sulfur colloid bone marrow imaging for diagnosing musculoskeletal infection," Radiographics. 2006 May-Jun;26(3): 859-70.

Patient Positioning: Feet first, supine

Procedure:

Imaging time post re-injection of WBCs:

- 24 hours for In-111 or 4 hours for Tc-99m unless otherwise specified by the radiologist.
- Obtain planar spot view and/or whole-body views as requested by the radiologist.
- Check with the radiologist for SPECT or SPECT-CT. If chest, abdomen, or pelvis SPECT-CT is performed, arms should usually be up. If neck SPECT-CT is performed, arms should usually be down.

Processing:

- Dual-intensity static display of whole-body images if applicable.
- Static display of any spot views.

SPECT-CT:

- Follow automatic processing workflow

If SPECT-CT:

- Process CT in soft tissue (B30) and bone (B60) algorithm; should have attenuation corrected and non-attenuation corrected SPECT tomo files

If SPECT only:

- Should have reconstructed tomographic file and axial/coronal/sagittal lightboxes/savescreens

WBC Imaging (continued)

Items Required For Complete Study:

- Processing and transfer of all images to PACS and/or Leonardo as appropriate
 - Raw data of all planar images to PACS
 - Planar:
 - Lightbox/savescreen of all planar images to PACS, including dual-intensity display of anterior/posterior whole-body images and display of any additional spot views
 - SPECT:
 - Reconstructed Tomo to Leonardo and PACS, Lightboxes/savescreens of axial/coronal/sagittal SPECT to PACS. Rename files by region imaged (e.g., In-111 WBC Reconstructed Tomo – Abdomen).
 - SPECT-CT:
 - Attenuation Corrected and Non Attenuation Corrected Tomo Reconstructions, CT (B30 and B60) to Leonardo and PACS. Rename SPECT and CT files by region imaged (e.g., In-111 WBC Abdomen - AC).
- Complete the examination in RIS