# In-111 White Blood Cell Imaging

**Primary Indications:** In-111 labeled leukocytes using autologous white blood cells to detect: Sites of soft tissue infection, osteomyelitis, vascular and shunt infections and inflammatory bowel disease.

**Rationale:** Labeled leukocytes migrate to sites of infection and inflammation, especially in acute stages when a granulocyte response predominates and before the infection/inflammation has been suppressed by treatment.

**Patient preparation:** A blood leukocyte count exceeding 3,000/mm³ is necessary to ensure a reasonable chance of successful cell labeling.

**Precautions:** To ensure that the correct radiolabeled leukocytes are re-injected into the correct patient, a leukocyte-labeling patient-verification form must be completed, an ID bracelet must be placed on the patient, and ALL blood samples must be labeled. The ID number on the radiolabeled leukocytes to be re-injected and on the patient ID bracelet must match before the radiopharmaceutical is re-injected.

1. **Radiopharmaceutical:** In-111 autologous leukocytes (prepared with In-111 oxine)
   1. 50ml blood is drawn by venipuncture and WBC’s are labeled with In-111 oxine
   2. Ensure correct identification of the patient and blood products prior to injection
   3. 500 uCi of labeled WBC’s are injected IV within 1-2 hours of labeling
   4. Target organ spleen

**Equipment Setup:** Gamma Camera: Whole-body, LFOV or SPECT/CT  
Collimator: medium energy  
Energy Window: (In-111 leukocytes alone): 172 and 247 keV with 20% windows  
Images are acquired 24 hours after injection.

**Imaging protocol:**
1. Whole body images are acquired a 47 minute scan in the anterior and posterior projections at the rate of 5cm/minute. Spot views are acquired In-111 spots match sulfur colloid counts.
2. SPECT-CT is optional: 128 X 128 matrix, 360 degree rotation, 6 degree angle step and 60 seconds per frame.
   - Optional follow up bone marrow imaging (for Osteomyelitis): 10 min spot views are acquired 30 minutes after IV injection of 15 mCi of Tc99 sulfur colloid.
   - Tc99m HMPAO labeled WBC Scintigraphy is preferred in acute infections, pediatric patients, and inflammatory bowel disease. 10 mCi injected IV and 10 min static images are acquired at 1 and 4 hours.
   - When a WBC scan is ordered with a three phase bone scan, the three phase bone scan is performed first and when clinically needed the WBC scan is performed later.
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