

SENTINEL NODE IMAGING
UPDATED: APRIL 2016

CPT CODE: 78195

Indications:

- Determination of lymph node drainage and sentinel lymph node identification in malignancies such as truncal or head and neck melanomas and breast cancer.
- Evaluation of inguinal pelvic and periaortic lymphatic drainage for blockage by tumor (or trauma) and sentinel node identification, e.g., rectal, prostatic, cervical, or vulvar cancer.

Patient Prep:

All sites anticipated as painful, lidocaine 4% cream may be placed on the area to be injected a minimum of 15 minutes before the injections are made. Apply liberally on the surface of the skin. Do not rub cream in all the way. If the site is in the oral cavity aerosol lidocaine can be used.

Also, for the Breast Prep currently a bag of ice is placed over the injection site for 90 seconds prior to the injection.

Scheduling:

For breast imaging

The **Day Before Surgery**, schedule after 4 2:30PM, preferably at 3PM, for 1 ½ hour; with the surgery the next morning

Day of Surgery (short version) schedule for 45 minutes. Ideally, there should be at least 30 minutes between the end of the scan and the surgery time.

Melanoma, Cervial and Endometrial

Allow 2.5 hours. Check with NM physician after initial study to determine if delayed images may be needed.

Radiopharmaceutical

& Dose:

Tc-99m sulfur colloid suspension (unfiltered) standard prep per package insert

Tc-99m sulfur colloid suspension (filtered) with a particle size ≤ 220 nm (small particle size prepared by passing through a 220 nanometer Millipore filter.

Breast Cancer:

- Pre-operative **Day of Surgery** Breast SLN scintigraphy: 0.5 mCi Tc99m-SC in 0.2 mL (filtered to 0.22 micron) provided in a 1cc syringe with 30 gauge needle.
- Pre-operative **Day Before Surgery** Breast SLN scintigraphy: 1.0 mCi Tc99m-SC in 0.2 mL (unfiltered) provided in a 1cc syringe with 30 gauge needle.

Melanoma

Dose/injection ~~for all except cervical~~: Tc99m-SC (filtered) 520 μ Ci/0.12 mL dispensed in each of four 1cc TB syringes.

Cervial Cancer

Dose/injection: Tc99m-SC (filtered) 1.0 mCi (+/- 20) qs to 2.5 ml in 5 ml syringe.

Endometrial Cancer

Dose/injection: Tc99m-SC (filtered) 2.0 mCi (+/- 20) qs to 5 ml in 10 ml syringe.

- Adults (>18 yr) up to 1.5 mCi/region
- Children (<18 yr) up to 1.5 mCi/region

Note: Dose in children is determined by the Nuclear Medicine physician on a case by case basis.

Note: This injection has a validated retention of ~300 µCi in the hub of the syringe; the actual administered dose per syringe used is ~200 µCi. One injection per syringe and one to three injections are made. Those validating the doses will enter into NMIS that actual reading from the dose calibrator without accounting for retention.

Cervical Cancer

Tc99m-SC (filtered) 1 mCi in 2.5 ml in 3ml syringe with leur-tip cap.

Injection:

First, identify the patient using two approved methods. Fully explain the procedure to the patient, and answer all their questions. Obtain patient's verbal approval. Identify the area to be injected, with the patient's help. NM Physician, NM Resident, or Radiology Resident injects the doses, as described below.

Note: For breast sentinel node or other sensitive sites, we must maintain a sense of respect for the patient and their vulnerability. In order to maintain this respect, only same gender technologists are to perform this procedure. If a same gender technologist is not available, then a same gender patient advocate/witness is to be obtained. The patient advocate/witness could be faculty, resident, nurse, or another technologist from another modality. The minimal requirement for the patient advocate/witness is to be present for the lidocaine cream application, and the injection to follow.

MELANOMA: Inject tracer intradermally around the tumor or excision site. Four (4) injection sites are used. It is important to be as close as possible (within 5 mm) to the tumor excision scar site without injecting scar tissue.

BREAST CANCER: Standard injection technique: Single intradermal periareolar injection (Left breast 2 o'clock or Right breast 10 o'clock positions), with adjustments as needed in case of scar or sutures. Optimal injection is determined by the presence of a skin wheal.

- If there is a previous incision there or if there is concern for the radiotracer to get blocked, then the surgeon can specify on the order set a different preferred injection location. A comment box will be available.

Two syringes of Tc99m-SC doses will be provided

1. If the 1st injection is suboptimal, a 2nd dose is injected intradermally in the adjacent periareolar region.
2. If no axillary lymph nodes are visible after the 5 minute post injection images of the injected breast, have patients perform a gentle self-massage, as clinically tolerated, for 30 seconds at 5 minutes intervals for the next 15 minutes and repeat images.

NOTE: Patient is to take care not to disturb sutures or wires in place.

3. In cases where no axillary lymph node uptake is detected at approximately 15 minutes into imaging, with approval from the referring surgeon, a second dose may be injected intradermally in the adjacent periareolar region and imaged for an additional 30 minutes.

NOTE: A 3rd dose will NOT be draw until the referring physician has approved to have this injection performed.

CERVICAL/VULVAR CANCER: Intradermal injection at 3-4 points surrounding the known cancer.

1. Skin preparation with anesthetic cream is recommended for vulvar cancer.
2. For cervical (uterine) the injection is performed by appropriate medical staff off site if necessary. This is determined by the Nuclear Medicine staff for the day.
3. Four separate injections preferred, with perhaps one subdermally. If necessary, call resident/staff looking after patient if injecting staff is uncomfortable with injection.

OTHER SITES: 4 injections at the discretion of NM physician.

Imaging Device:

The GE Infinia with Hawkeye CT is the preferred camera with the LEHR collimator. However, for breast imaging, the GE Millennium can be used.

Imaging Procedure:

MELANOMA IMAGING:

Use the GE Protocol Melanoma in the Lymphoscintigraphy folder. It will have the parameters for all acquisition steps for each type of study listed below.

Lymphatic Flow Study: Immediately post-injection (very rapid injection required) acquire 30-second frames for 20 minutes to identify lymphatic drainage and interval and sentinel lymph nodes. Include **ALL** potential drainage sites in the images.

Regional Lymph Node Study: At 20 minutes, obtain 2-minute images of the expected regional nodal sites beyond the area imaged in the flow study. Often the patient flow study will demonstrate two or more lymphatic draining channels. Obtain transmission scan images with Co-57 markers on appropriate sites.

- A. Axilla: Anterior and lateral views to coordinate localization, using skin markers.
- B. Neck: Anterior, lateral, and oblique views as needed to identify anterior and posterior drainage. Possible SPECT/CT may also be needed.
- C. Pelvis: Anterior and posterior views. Possible SPECT/CT may also be needed.

Delayed Images may be needed: At 2 hours the patient returns for identical images and additional images where appropriate if drainage site(s) have not been successfully identified.

BREAST IMAGING:

Regional Lymph Node Study: At 5 minutes and 15 minutes, obtain two-minute anterior and oblique images of the expected regional nodal sites. Use the appropriate anterior oblique image (RAO on R, LAO on L) if the lesion is lateral to the areola. Include the axilla and sternum/supraclavicular regions in the images. Repeat the anterior and oblique images with transmission views.

Check with a NM staff or resident physician to determine if additional views are indicated.

CERVICAL & VULVAR CANCER INJECTION:

Start dynamic study (30 second images) immediately and at 20 minutes obtain 2-minute images of the groin. Delayed images at 2 hours are obtained of groin region. Transmission planar scan views are suggested, in addition. SPECT/CT images must be obtained with cervical, vulvar, and uterine injections.

Display:

Conventional static images with and without transmission scans including screen caps. With SPECT/CT, see tumor SPECT processing for processing and screen caps.

PACS:

All images should be sent to the PACS, including the flow and static images, and images with and without transmission scans and all SPECT/CT images. Be sure to include the low-dose CT scan images. Include all screen caps.

Interpretation:

Radiopharmaceutical should promptly ascend up the appropriate lymph node chains. Asymmetry in lymph node uptake may indicate obstruction. The drainage pathways and the first lymph node(s) identified may be marked, if requested by the referring physician. (This is usually not done because of the use of the intra-operative probe). In vulvar and cervical carcinomas, it is important to determine if both groins/iliac chains have sentinel nodes.

Comments:

A Nuclear Medicine staff or resident physician should be consulted to determine if additional views are indicated.

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