

Division of Nuclear Medicine Procedure / Protocol University Hospital and East Madison Hospital

SENTINEL NODE IMAGING
SENTINEL NODE INJECTION ONLY WITHOUT IMAGING

CPT CODE: 78195
CPT CODE: 38792

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Indications:

Determination of lymph node drainage and sentinel lymph node identification in malignancies such as truncal, head and neck, melanomas or breast cancer.

Patient Prep:

Breast, Melanoma, Head and Neck

1. No patient prep prior to coming to Nuclear Medicine Department.
2. The technologist will give the patient a small bag of ice to apply to the injection site prior to the injection for pain reduction.
 - a. For oral injection sites Viscous Lidocaine 2% 15ml unit dose cup (swish and spit) can be used instead of ice at the discretion of the injecting physician.

Gynecologic Patients

1. For gynecologic patients, lidocaine 4% topical antiseptic cream is to be placed on the area of injection twice prior to arriving to Nuclear Medicine Department.
 - a. Once at home and once upon arriving to hospital surgical prep room.
2. Additional cream may be applied upon arrival to Nuclear Medicine if needed.
3. Apply liberally on the surface of the skin. Do not rub cream in all the way.

Scheduling:

Breast Day Before

Schedule patient between 230 to 315 pm the day before surgery for one hour.

Breast Day of Surgery

1. Patients are to be scheduled with at least 30-90 minutes between the end of their Nuclear Medicine appointment and surgery time (90 minutes need if spinal block is scheduled).
2. Appointments should be scheduled for 1 hour.

Breast Day of Surgery injection only (typically in the OR)

Melanoma, Head and Neck, Gynecologic Day of Surgery Injection Only

This exam is scheduled only if ordered as Injection Only, typically in the O.R. and on days where yesterday was not a business day and the surgery itself is a long surgery that is starting before our imaging is available. If Injection Only is not requested, then schedule as Sentinel Node Imaging, which is our default procedure.

Scheduler needs to ask if the Sentinel Node injection is to be performed in the O.R. (typical) or in Nuclear Medicine and send an in-basket message for the Nuclear Medicine Technologists to schedule. This insures proper communication with the Nuclear Medicine MDs.

- If in the O.R.: Total time is 60 minutes on the MD schedule and one of the following NM resources - Inject General, B, E, A, or D. Typically scheduled at 730AM.
- If in Nuclear Medicine: Total time is 30 minutes. This is typically a short notice request on the day of surgery due to an ordering error.
- If the requested appointment time is any other time, gain faculty approval before scheduling.
- Send an email to the faculty assigned to general so this can be placed on their calendar.

Melanoma Day Before

Schedule the patient the Day Before Surgery, between 145 and 215PM for 2.5 hours.

Melanoma, Head and Neck, Gynecologic Day of Surgery

1. Schedule patients with at least 30-90 minutes between the end of their Nuclear Medicine appointment and surgery time (90 minutes need if spinal block is scheduled).
2. Appointments should be scheduled for 2.5 hours.

Radiopharmaceutical

& Dose:

Pharmacy Preparation

- Tc99m sulfur colloid suspension (unfiltered) standard prep per package insert
- Tc99m sulfur colloid suspension (filtered) with a particle size ≤ 220 nm (small particle size prepared by passing through a 220 nanometer Millipore filter).
- Tc-99m tilmanocept (Lymphoseek) ordered from Cardinal Health Nuclear Pharmacy

Dosages

Breast Sentinel Node:

- **Day Before Surgery** scintigraphy:
 - 1.0 mCi Tc99m-Sulfur Colloid in 0.2 mL (unfiltered) provided in a 1cc syringe with 30-gauge needle. Dispense 2 doses for unilateral and 4 doses when bilateral.
 - 0.5 mCi Tc-99m tilmanocept (Lymphoseek)
- **Day of Surgery** scintigraphy:
 - 0.520 mCi Tc99m-Sulfur Colloid in 0.2 mL (filtered to 0.22 micron) provided in a 1cc syringe with 30-gauge needle. Dispense 2 doses for unilateral and 4 doses when bilateral.
 - 0.250 mCi Tc-99m tilmanocept (Lymphoseek). Two doses will be ordered one as the intended dose and the second as a backup if a second injection is needed.
- **Day of Surgery Injection ONLY in the OR:**
 - 1.0 mCi Tc99m- Sulfur Colloid in 4 mL (filtered) provided in a 5cc syringe with 22-gauge needle.
 - 1.0 mCi Tc-99m tilmanocept (Lymphoseek). Two doses will be ordered one as the intended dose and the second as a backup if a second injection is needed.
- **Day of Surgery Injection ONLY in NM:**
 - 0.520 mCi Tc99m- Sulfur Colloid in 0.2 mL (filtered to 0.22 micron) provided in a 1cc syringe with 30-gauge needle. Dispense 2 doses for unilateral and 4 doses when bilateral.
 - 0.250 mCi Tc-99m tilmanocept (Lymphoseek). Two doses will be ordered one as the intended dose and the second as a backup if a second injection is needed. Four doses will be ordered for bilateral studies.

Melanoma, Head and Neck, and all Gynecologic Sentinel Node:

- **Day Before Surgery** scintigraphy or injection only:
 - 0.520 mCi Tc99m- Sulfur Colloid in 0.12 mL dispensed in each of four 1cc syringes.
 - 0.5 mCi Tc-99m tilmanocept (Lymphoseek) in four syringes of 0.125 mCi per syringe
- **Day of Surgery** scintigraphy or injection only:
 - 0.520 mCi Tc99m- Sulfur Colloid (filtered) in 0.12 mL dispensed in each of four 1cc syringes.
 - 0.5 mCi Tc-99m tilmanocept (Lymphoseek) in four syringes of 0.125 mCi per syringe
- Option - for oral injection sites Viscous Lidocaine 2% 15ml unit dose cup (swish and spit) can be used at the discretion of the injecting physician. *Patient may not swallow the Viscous Lidocaine as doing so could violate the NPO status and as such cancel the surgery.*

Gynecologic (Other) Sentinel Node:

- The following dose parameters were discontinued. Gynecologic Sentinel Node is now dosed the same as Melanoma above.
 - ~~Cervical Cancer: Tc99m- Sulfur Colloid (filtered) 1.0 mCi (+/- 20) qs to 2.5 ml in 5 ml syringe.~~
 - ~~Endometrial Cancer: Tc99m- Sulfur Colloid (filtered) 2.0 mCi (+/- 20) qs to 5 ml in 10 ml syringe.~~

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. Patient is to identify site of anticipated surgery.

Second, a formal timeout takes place; it is documented in Health Link by the Nuclear Medicine Technologist using the Universal Protocol.

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 same gender technologist or patient advocate/witness is to be present from time of explanation until injection completion.

Breast Sentinel Node Scintigraphy or Breast Sentinel Node Injection ONLY in Nuclear Medicine: 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/ sutures. Optimal injection is determined by the presence of a skin wheal.

- The surgeon can specify on the order set a different preferred injection location due to specific patient circumstances. A comment box will be available.
- Two syringes/doses will be provided
- After the physician completes sentinel node injection patient is to massage upper breast area (if there no clinical contraindication, such as recent wire localization).
- 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.

Breast Sentinel Node Injection ONLY in the OR: Standard injection technique: Single Subareolar periareolar injection (Left breast 2 o'clock or Right breast 10 o'clock positions), with adjustments as needed in case of scar/ sutures. Optimal injection is determined by the presence of a skin wheal.

Melanoma, Head and Neck, Gynecological Scintigraphy or Injection ONLY: Inject tracer intradermally around the tumor or excision site. 2-4 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.

Imaging Device: All GE Infinia Hawkeye SPECT/CT or Optima 640 SPECT/CT with LEHR collimator. However, for breast imaging, the GE Millennium with LEHR collimator can be used as well.

Imaging Procedure:

Breast Sentinel Node Scintigraphy:

Use the appropriate Breast GE Protocol in the Sentinel Node folder. Parameters for all acquisition steps will be included for each type of study listed below.

- Start imaging 15 minutes post injection. Do not start early if using Tc-99m tilmanocept (Lymphoseek)
- Anterior image to be acquired for 2 minutes
 - Axilla area anterior arm up
- Anterior Transmission acquired for 2 minutes
 - Axilla area anterior transmission arm up
- Appropriate side lateral Image acquired for 2 minutes
 - Axilla area lateral arm up
- Appropriate side lateral Transmission acquired for 2 minutes
 - Axilla area lateral transmission arms up
- If laterals are not possible obliques can be substituted.
- If node is not present following acquisition of these images check with physician to see if second injection or additional imaging is required.

Melanoma, Head and Neck, Gynecological (all) Scintigraphy:

Use the appropriate GE Protocol (melanoma, head and neck, gynecologic) in the Sentinel Node folder. Parameters for all acquisition steps will be included for each type of study listed below.

- Post injection, flow images to be acquired for 20 minutes at 30sec/frame, with injection site at the middle of the field of view
 - If the injection site is posterior it is preferred to have the patient positioned prone for the imaging to eliminate table attenuation. Still acquire with both heads.
- Anterior and Posterior Images acquired 2 minutes (above and below injection site)
 - Axilla area anterior and posterior arms up/out of the field of view
- Anterior Transmission and posterior transmission acquired for 2 minutes
 - Axilla area anterior transmission and posterior transmission arms up/out of the field of view
- Lateral Images acquired for 2 minutes
 - Axilla area lateral arms up/out of the field of view
- Lateral Transmission acquired for 2 minutes
 - Axilla area lateral transmission arms up/out of the field of view
- Verify with physician if SPECT/CT needed

Display: Create screen caps of the conventional static images with and without transmission scans side by side. If SPECT/CT, is performed see Tumor SPECT Processing Protocol for processing and screen caps.

PACS: All images should be sent to the PACS, including the flow and static images, 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.

For the injection only procedures, scan the request form with dose information into PACS.

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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