UNM HOSPITALS

# Lung Ventilation - Aerosol

| **Special Instructions** | **To be performed at UNMH and SRMC.** |
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**Radiopharmaceutical:** Tc-99m DTPA

**Dose (Adult/Pediatric):** Refer to Nuclear Medicine Dose Chart; the dose delivered to the patient is typically <10% of the dose injected in the nebulizer.

**Route of Administration:** Inhaled from a nebulizer

**Patient Preparation:** None.

**Equipment Setup:** Gamma Camera: ZOOM as appropriate for small children

Collimator:

Orbiter: LEAP

All others: High resolution

Computer setup: Static acquisition, 256 x 256 matrix

200K counts for 1st view (anterior/posterior), then all subsequent views for same amount of time; OR 3 minutes/view for all views; **whichever is <u>shorter</u>**

Note the amount of time required to take the first image (typically posterior)

**Patient Positioning:** For the inhalation: Supine, semi-erect, or seated (not decubitus)
For imaging: Upright or supine.

**Procedure:**

1. Do not have the patient on the imaging table during the inhalation to avoid contamination.
2. Remove the Venti-Scan IV lead shielded canister top cover.
3. Place lower shield assembly in IV pole mount.
4. Remove the Venti-Scan IV disposable radioaerosol kit from packaging and insert it into the canister by gently lowering it until snug.
5. Connect the $O_2$ tubing to the canister and to the wall.
6. Test the apparatus to ensure the plastic tubing is not compromised. Inject approx. 1mL of saline into the nebulizer port and turn on the oxygen at 10 liters per minute and view the mouthpiece for the fine mist of saline. Also check the tubing for any leaks.
7. Inject Tc-99m DTPA into the nebulizer injection port (not to exceed 5mL, but must be more than 3mL – keep in mind the 1mL used to test the apparatus) with a 22-gauge or larger needle (do not shove the needle through the back of the port elbow).
8. Replace shield top cover, twist to lock and rotate the top cover until closed for maximum shielding.
9. The patient should be sitting in a chair, with a chux pad on their chest like a

bib (attach to gown with tape) and they should wear gloves if they are handling the mouthpiece from the nebulizer.

10. Either in their chair or bed, face the patient towards the door away from the camera in the little hallway to avoid contamination.
11. Adjust the height of the shielded canister for patient comfort.
12. Ask the patient to avoid deep breathing (to avoid hot spots and central deposition)
13. The aerosol can also be administered to intubated patients using appropriate connectors.
14. Apply the nose clip to the patient and have the patient place the mouthpiece in their mouth and ensure a good seal.
15. Turn on the oxygen slowly until the flow is set at 9 to 11 liters per minute.
16. Instruct the patient to breathe for 5 – 6 min. You will hear a bubbling sound that indicates the canister is almost empty.
17. Turn off the flow of oxygen and remove the nose clip and mouthpiece. Place your glove around the mouthpiece and secure with the nose clip.
18. Place the patient on the camera bed, supine, and begin imaging with arms above the patient's head.Obtain the following 8 projections: Ant/Post; RAO/LPO; RT LAT/LT LAT; RPO/LAO.
19. If the patient's arms are between the camera and the patient on some images, this should be noted on the image or in the technologist comments.
20. Note the amount of time required to take the first image (typically posterior), and the number of counts (typically 100-200K).
21. Proceed with the perfusion portion of the examination (following the Lung Perfusion protocol). Note the amount of time required to take the image in the same projection (typically posterior) as the first image acquired above

**Processing:**

Orbiter: Display under 9 view. Label images upright or supine, and label each view.

All others: Processing workflow launches automatically. Label images supine, and label each view.

Ensure that the images are manually zoomed so that the lungs occupy the majority of the 'white space' in each savescreen box. Adjust intensities as necessary to produce visible/readable images of each lung.

For all cameras:

Arrange the projections to be in the same order as for the subsequent perfusion examination.

Label the appropriate image (typically posterior) with the number of counts and amount of time, e.g. 'Posterior: 100K counts, 180 secs'

# Lung Ventilation - Aerosol (continued)

**Items Required For Complete Study:**

- Raw data of all images to PACS
- Lightbox/savescreen of all perfusion images, labeled as above
- Note arms obscuring field of view in tech comments or on images
- Transfer all digital images to PACS
- Complete the examination in RIS