UNM HOSPITALS

Lung Ventilation - Xenon

Special Instructions	**Patients with severe dyspnea may not be able to tolerate this examination.** **To be performed only at UNMH.**

Radiopharmaceutical: Xe-133 gas

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

Route of Administration: Inhalation from a Xe-133 gas delivery system.

Patient Preparation: None.

Equipment Setup:

Gamma Camera: ZOOM as appropriate for small children

Collimator:

Orbiter: LEAP

SPECT-CT/ECAM/Evo/Symbia E: High resolution

Computer setup:

- Static acquisition
- 128 x 128 matrix
- Zoom 1.0 (greater for small children)—ensure that the lungs fill a significant portion of the detector for small patients
- 10 sec/image for inspiration
- 30 sec/image for all other images

Patient Positioning:

Orbiter:

- Seated upright on a stool (preferred) with the detector posterior to the patient. Supine if necessary

All others:

- Supine

Procedure:

- If the patient is able to sit upright on a stool for the examination, perform the ventilation portion of the examination on the Orbiter if available.
- Before beginning the study, explain the breathing maneuvers required; the patient should rehearse these maneuvers.
- Place the mask on the patient and ensure that it fits snugly.

- Inspiration (Single-breath) Image:
  - Instruct the patient to exhale completely and then to take a deep breath as the Xe-133 gas flows in.
  - The patient should hold his/her breath for 10 sec (if possible) while posterior (and anterior if on a dual-headed camera) imaging is performed.

Lung Ventilation - Xenon (continued)

- Equilibrium (Rebreathing/Wash-in) Images:
  - The patient should then breathe normally for 3 images (90 seconds).
  - For a seated patient, the images should be acquired in this order: RPO, LPO, Posterior.
  - For a supine patient, all images should be posterior (and anterior if on a dual-headed camera).
  - If the patient's arms are in the field of view on the RPO/LPO images, this should be notated on the images or in the tech comments.

- Wash-out Images:
  - The patient should then breathe normally, as the gas delivery system valves are changed so that the patient breathes in room air and exhales the Xe-133.
  - Obtain 5 posterior (and anterior if on a dual-headed camera) images (30 seconds each).

Processing:

Orbiter:

- Display under 9 view.
- Label images with the time (30 sec/image), upright or supine, and phase (Inspiration, Equilibrium, and Washout).
- May need to merge ventilation images in order to display as 9 view.

SPECT-CT/ECAM/Evo/Symbia E:

- Follow automatic processing workflow.
- Label images with the time (30 sec/image), upright or supine, and phase (Inspiration, Equilibrium, and Washout).
- If the patient's arms are in the field of view on the RPO/LPO images, this should be notated on the images or in the tech comments.

- If quantitative lung ventilation is requested, also process under planar processing (lung distribution).
- Use the first (inspiration/single-breath) posterior image.
- Determine the counts in each lung by drawing equal-size boxes around each lung; the percent in each lung is calculated automatically.

Lung Ventilation - Xenon (continued)

Items Required For Complete Study:

Raw data of all images to PACS

- Lightbox/savescreens of all ventilation images (separate lightboxes/savescreens for anterior and posterior images if both were obtained)
- If the patient's arms are in the field of view on the RPO/LPO images, this should be notated on the images or in the tech comments.
- Transfer all digital images to PACS
- Complete the examination in RIS