

## Lung Perfusion

<b>Special Instructions</b>	<b>To be performed at UNMH and SRMC.</b>
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**Radiopharmaceutical:** Tc-99m MAA

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

**Route of Administration:** Intravenous.

**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  
500K counts (1<sup>st</sup> view – Anterior/Posterior) (less for small pediatric patients; discuss with radiologist)  
All other images for time of 1<sup>st</sup> view (RAO/LPO; RT LAT/LT LAT; RPO/LAO)  
\*\*Add a 2-minute static acquisition per image for quantitative assessment of right-to-left shunt

**Patient Positioning:** For the injection: Supine. The patient should be supine for the injection if possible to aid with uniform radiopharmaceutical distribution into the lungs.

For imaging: Upright or supine.

**Procedure:** Imaging is performed immediately after injection.

For each image, position the patient's arms out of the field of view as much as possible. If the patient's arms are between the camera and the patient on some images, this should be noted on the image and/or in the technologist comments.

Obtain the following 8 projections: Anterior, Posterior, R Lat, L Lat, RPO, RAO, LPO, LAO

If the indication for the examination is to assess for a left-to-right shunt, obtain additional three separate posterior static images over the 1) head, 2) lungs, and 3) kidneys for the same amount of time (2 minutes/image).

If the indication for the examination includes need for a split-lung perfusion (e.g., prior to lung surgery or on pediatric patients with congenital heart or lung

## Lung Perfusion (continued)

disease), draw ROIs around the left and right lung and determine counts in each lung on the 1) anterior projection and 2) posterior projection. **The software on the Siemens cameras should also subdivide the lungs into 3 sections (upper/mid/lower), as well as calculating the anterior/posterior geometric mean.**

For outpatients, show images to the radiologist and ask whether a chest radiograph is needed.

### Processing:

#### UNMH:

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.

If the perfusion imaging was performed after aerosol ventilation, notate the posterior view with **number of counts AND acquisition time**, e.g., 'Posterior: 500K counts, 180 secs' (for comparison with the aerosol image in the same view). **It is critical that the count rate (# of counts / time) for perfusion images should be at least four times greater than for aerosol ventilation images.**

**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 quantitative split lung perfusion, also process under planar processing (lung distribution) for Orbiter. Use the posterior lung perfusion image. Determine the counts in each lung by drawing equal-size boxes around each lung; the percent of counts in each lung will be automatically calculated.

For quantitative assessment of left-to-right shunt, draw regions of interest around the additional images of the 1) brain, 2) lungs, and 3) kidneys. Display each image with ROI and total number of counts in each area.

#### SRMC:

Complete the acquisition workflow – Do not save any images at this time

Choose the patient name and click on Lung Display. Click on the flexible display tab and make savescreens of the ventilation and perfusion study:

Process/annotate and save by clicking the button with the sheet of paper with a disk on it

Ensure the ventilation and perfusion image labels contains the number of counts, amount of time and projection by right clicking on the label and click properties to check the appropriate settings

**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.**

## Lung Perfusion (continued)

For quantitative lung perfusion:

Choose the patient name and click QUANT PERF PROC to process the images

Determine the counts in each lung by drawing equal-size boxes around each lung; the percent of counts in each lung will be automatically calculated

Process/annotate and save by clicking the button with the sheet of paper with a disk on it

For quantitative assessment of left-to-right shunt:

Draw regions of interest around the additional images of the 1) brain, 2) lungs, and 3) kidneys. Display each image with ROI and the total number of counts in each area.

For split-lung perfusion (e.g., prior to lung surgery), draw ROIs around the left and right lung and determine counts in each lung on the 1) anterior projection and 2) posterior projection.

### **Items Required For Complete Study:**

- Raw data of all images to PACS
- Lightbox/savescreen of all perfusion images, labeled as above
- **Note arms or other objects obscuring field of view in tech comments or on images**
- Images of quantitation (if applicable)
- Transfer all digital images to PACS
- Complete the examination in RIS