



VQ Scan

Approval: K. Shamlou, MD

rev:2

7/15/2026

LUNG VENTILATION AND PERFUSION (VQ) SCAN

Radiopharmaceutical 1: Tc^{99m} Diethylene Triamine Pentaacetic Acid (DTPA) aerosol

Dose: 30 mCi

Radiopharmaceutical 2: Tc^{99m} Macro-aggregated Albumin (MAA)

Dose: 8 mCi

T ½ : 6 hrs.

Energy: 140 keV

CPT: 78562 (ventilation and perfusion) 78579 (ventilation only) 78580 (perfusion only)

Indications:

Approved indications include, but are not limited to:

1. Shortness of breath
2. Pulmonary embolism
3. Elevated D-Dimer

Patient Preparation:

- Patient needs to be aware that this is a two part test
- Patient needs to have a chest x-ray or CT chest within 24 hours of a V/Q scan, for correlation. If this was performed at an outside facility, the patient should bring a copy with them to the appointment.

Equipment:

1. Ge 830 Discovery

Procedure:

1. Prepare aerosol system with appropriate ventilation kit
2. Inject DTPA into ventilation system
3. Connect O₂ tank to system.
4. Instruct patient on the importance of not letting the gas leak from the edges of his or her mouth, to prevent contamination of the external chest. To prevent contamination you may also use a disposal chucks to absorb any possible leakage of aerosol.
5. Ventilate the patient for 5 to 10 minutes. Keep the ventilation kit until patient is under the camera and you have confirmed a proper ventilation. (over 500cpm).
6. Acquire images in the ANT, POST, LAO, RPO, LT LAT, RT LAT, LPO and RAO projections. Be sure to annotate the kcounts/sec from the POSTERIOR view on the history sheet, to be used later for calculating the P/V ratio.
7. Images should be acquired for 300 seconds or 200k counts.
8. After completing the ventilation images **and checking them for quality**, inject the patient with the ^{99m}Tc MAA
9. Acquire perfusion images from the same projections as previously acquired with ventilation (in reverse order, and ensure that the degree angles match from ventilation to perfusion). Acquire images for 300 seconds or 500k counts.
10. Be sure to notate the kcounts/sec from the POSTERIOR view for the perfusion images.

P/V RATION EQUATION:

$$\frac{\text{Perfusion counts} - \text{Ventilation counts}}{\text{Ventilation counts}} = \text{Ratio}$$

Then,

$$\frac{\text{MAA dose (in mCi)}}{\text{Ratio}} = \text{Dose (in mCi) of DTPA to lungs}$$

11. Ratio should be greater than or equal to 4.5- if not, consult radiologist regarding any additional MAA injection.

Acquisition Parameters (Ventilation/Perfusion TOMO):

- Matrix: 128x128
- Zoom: 1.0 (full field)
- Step/Shoot: 140 sec/stop
- Body contour: ON
- Supine, feet first, H-mode
- Acquire during motion: ON
- View angle: 2 8 views

Acquisition Parameters (Ventilation):

- Matrix: 256 x 256
- Zoom: 1.0 (Full Field)
- Total Time: 300 seconds
- Total Kcounts: 200
- Position: Supine
- Orientation: Feet First

Acquisition Parameters (Perfusion):

- Matrix: 256 x 256
- Zoom: 1.0 (Full Field)
- Total Time: 300 seconds
- Total Kcounts: 500
- Position: Supine
- Orientation: Feet First

Processing / PACS data sets

- Screenshot of all ventilation statics in one composite

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- Dynamic spin of all ventilation views (system dependent)
- Screenshot of all perfusion statics in one composite
- Dynamic spin of all perfusion views (system dependent)

