

1. The normal response to decreased ventilation of a pulmonary segment is:
 - a. Decreased perfusion *
 - b. Maintained perfusion
 - c. Increased perfusion
 - d. Increased right to left shunt

2. Decreased ventilation in an entire lung with relatively preserved perfusion can be seen with:
 - a. A large central unilateral pulmonary embolus
 - b. Right to left pulmonary shunt
 - c. Mediastinal fibrosis
 - d. Mucus plug*

3. The correct size of MAA (macroaggregated albumin) particles for perfusion imaging studies is:
 - a. 1-50u
 - b. 5-50u
 - c. 5-100u*
 - d. 50-150u

4. On a ventilation-perfusion lung study, one moderate size ventilation-perfusion mismatch (i.e. perfusion defect, ventilation preserved) is consistent with:
 - a. Low or intermediate probability for acute pulmonary embolus depending on chest radiograph findings.
 - b. Intermediate probability for acute pulmonary embolus.*
 - c. Low or intermediate probability for acute pulmonary embolus depending on intensity of mismatch.
 - d. Low probability for acute pulmonary embolus if a stripe sign is present regardless of chest radiograph findings.

5. On a ventilation-perfusion scan, if the kidneys have increased tracer activity, this can be related to:
 - a. Left to right intracardiac shunt
 - b. Recent smoking by the patient*
 - c. Air emboli
 - d. Large ventilation-perfusion mismatches

6. On a ventilation-perfusion lung study, two large size ventilation-perfusion mismatches (i.e. perfusion defect, ventilation preserved) is consistent with:
- Intermediate or high probability for acute pulmonary embolus depending on chest radiograph findings.
 - High probability for acute pulmonary embolus
 - Intermediate probability for acute pulmonary embolus if a stripe sign is present regardless of chest radiograph findings
 - Intermediate probability for acute pulmonary embolus
7. The percentage of total pulmonary blood flow supplied by the bronchial circulation is (choose 1 correct answer):
- 2%
 - 5%
 - 15%
 - 25%
8. A minimum of how many particles of labeled MAA for acceptable counting statistics are usually injected into a patient for a lung perfusion imaging study? (choose 1 correct answer):
- 11/04
- 50,000
 - 100,000
 - 200,000
 - 400,000
9. The percent of capillaries blocked by MAA is typically (choose 1 correct answer):
- 0.01%
 - 0.1%
 - 1.0%
 - 10%
10. Aggregates of MAA (macroscopic) will result in (choose 1 or more correct answers):
- Perfusion images with subsegmental defects
 - Perfusion images with poor counting statistics
 - Focal hot spots in the lungs

d. Deposition of tracer in the brain and kidneys

11. Which (one or more) of the following is not a ventilation agent for use in ventilation-perfusion lung scans:

- a. Tc-99m DTPA aerosol
- b. Xe-133 gas
- c. Xe-121 gas
- d. Kr-81m gas
- e. Xe-127 gas

12. Regarding Tc-99m aerosol, which of the following is not true (choose all that apply):

- a. It is an inexpensive method of performing ventilation
- b. It yields poor images in patients with COPD
- c. Multiple views of the lungs can be obtained
- d. The washout images are sensitive to early COPD
- e. It cannot be used in patients on a respirator

13. Regarding Kr-81m gas, which of the following is not true (choose all that apply):

- a. It is an inexpensive method of performing ventilation
- b. It yields poor images in patients with COPD
- c. Multiple views of the lungs can be obtained
- d. The washout images are sensitive to early COPD
- e. It cannot be used in patients on a respirator

14. Regarding the radioisotopic Xe gas, which of the following is not true (choose all that apply):

- a. It is an inexpensive method of performing ventilation
- b. It yields poor images in patients with COPD
- c. Multiple views of the lungs can be obtained
- d. The washout images are sensitive to early COPD
- e. It cannot be used in patients on a respirator

15. On a ventilation-perfusion scan, the kidneys just happen to be included in the field of view and tracer activity is seen on the perfusion image. This can be related to which of the following (choose one or more correct answers):

- a. Right to left pulmonary shunt
- b. Recent smoking by the patient
- c. Diffuse pneumonia

d. Large ventilation-perfusion mismatches

16. Decreased perfusion in an entire lung with relatively preserved ventilation can be seen with (choose one or more correct answers)::

- a. A large central unilateral pulmonary embolus
- b. A hilar region mass
- c. Mediastinal fibrosis
- d. Mucus plug

17. On a ventilation-perfusion lung study, one moderate size ventilation-perfusion mismatch (i.e. perfusion defect, ventilation preserved) is consistent with (choose one correct answer):

- a. Low or intermediate probability for acute pulmonary embolus depending on chest radiograph findings.
- b. Intermediate probability for acute pulmonary embolus.
- c. Low or intermediate probability for acute pulmonary embolus depending on intensity of mismatch.
- d. Low probability for acute pulmonary embolus if a stripe sign is present regardless of chest radiograph findings.

18. On a ventilation-perfusion lung study, two large size ventilation-perfusion mismatches (i.e. perfusion defect, ventilation preserved) is consistent with (choose one correct answer):

- a. Intermediate or high probability for acute pulmonary embolus depending on chest radiograph findings.
- b. High probability for acute pulmonary embolus
- c. Intermediate probability for acute pulmonary embolus if a stripe sign is present regardless of chest radiograph findings
- d. Intermediate probability for acute pulmonary embolus

19. In patients with proven pulmonary thromboembolus, what fraction will have ventilation-perfusion scans with a high probability interpretation? (choose one correct answer)

- a. Less than half (<50%)
- b. About 2/3 (66%)
- c. Over 9/10 (>90%)

20. A normal or near normal pulmonary perfusion scan: (choose one correct answer)

- a. For practical purposes excludes pulmonary embolus
- b. For practical purposes excludes pulmonary embolus in patients with a normal chest radiograph
- c. Indicates a low probability for acute pulmonary embolus regardless of chest radiograph
- d. Excludes pulmonary embolus only in patients with no clinical COPD

21. On a VQ scan, decreased perfusion is observed in the apices, but ventilation is relatively preserved. Which is the most likely explanation? (Choose one)

- a. Thromboembolus to the apical segments of the upper lobes.
- b. Alpha-1 antitrypsin deficiency
- c. Apical emphysema is present
- d. Upright position of the patient during the ventilation portion of the study
- e. Upright position of the patient during the perfusion portion of the study

22. Regarding Xe radioisotope gas lung ventilation studies (Choose one or more correct answers):

- a. An anterior view is routinely obtained
- b. Single breath images are most sensitive for detection of obstructive airway disease
- c. Washout images are most sensitive for detection of obstructive airway disease
- d. Equilibrium images are most sensitive for detection of obstructive airway disease
- e. Total lung volume is best assessed on single breath images

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