

## **Interpretation of Ventilation-Perfusion Scintigraphy**

These criteria are intended to provide an initial framework that can be used for the interpretation of ventilation-perfusion scintigraphy studies. These criteria are often modified by experienced readers (who typically employ a gestalt approach to interpretation).

**The final scintigraphic diagnosis should be based on the combination of findings that gives the highest likelihood ratio.**

### **DEFINITIONS**

**Defect Size:** > 75% of segment = large  
25-75% of segment = moderate  
< 25% of segment = small

### **Defect Description:**

Ventilation-perfusion (V-P) mismatch = perfusion defect without corresponding ventilatory abnormality

V-P match = perfusion defect with corresponding ventilatory abnormality

Reverse V-P mismatch = ventilation abnormality with either no or with much less severe corresponding perfusion abnormality

### **High Likelihood Ratio of Pulmonary Embolism**

- At least 2 moderate or large V-P mismatches, without corresponding radiographic abnormality, that add up to  $\geq 2$  segment-equivalents (e.g., 2 large, 1 large + 2 moderate, 4 moderate)
- If ventilation study is normal, can relax criteria slightly to require  $\geq 1$  segment-equivalent, but still need 2 defects (e.g., 2 moderates, 1 large + 1 moderate)
- Special conditions:
  - If the mismatched component of a perfusion defect is much larger than a partially corresponding radiographic opacity, it is considered a V-P mismatch (i.e., as if there were no radiographic abnormality).
  - The two defects should be separate (non-contiguous).

### **Intermediate Likelihood Ratio of Pulmonary Embolism**

- Perfusion defect corresponding to new or unknown-age radiographic opacity (infiltrate or effusion), regardless of ventilatory findings
  - [Interpretation of V-P studies where the only abnormality is a perfusion defect matching an effusion is controversial, but such studies should be interpreted initially as indicative of an intermediate likelihood ratio if the perfusion defect and the effusion are of the same size.]
- Single moderate or large V-P mismatch
- Extensive ventilatory abnormality reflecting severe obstructive pulmonary disease with inability to assess whether focal perfusion defects clearly correspond to regions of focally worse ventilation (e.g., because of marked severity of diffuse ventilatory abnormality or because oblique ventilation images were not obtained)
- Findings not clearly indicative of a high or low likelihood ratio of pulmonary embolism

### **Low Likelihood Ratio of Pulmonary Embolism**

- Small V-P mismatches
- Focal V-P matches, without corresponding radiographic opacity
- Extensive ventilatory abnormality reflecting severe obstructive pulmonary disease with clear correspondence between focal perfusion defects and regions of focally worse ventilation
- Perfusion defect much smaller than radiographic opacity

### **Ancillary Signs of a Low Likelihood Ratio of Pulmonary Embolism**

- Matched V-P abnormality corresponding to a chronic radiographic abnormality (i.e., a stable radiographic finding known to be present for substantially longer than the patient's symptoms)
- Perfusion defect with a peripheral "stripe" sign
- Chronic perfusion defect (based on comparison with prior V-P study or studies)
- Alternative diagnosis more tenable given all clinical, radiologic, and scintigraphic data