AUC for V/Q Imaging in Pulmonary Embolism. The Elephant in the Room: Planar or SPECT V/Q?

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To the Newsline editor: We read with interest the Appropriate Use Criteria (AUC) for Ventilation–Perfusion (V/Q) Imaging in Pulmonary Embolism (PE) in the May issue of Newsline *(1)*. The document well describes the appropriateness of V/Q scintigraphy in various clinical scenarios involving patients suspected of having PE and highlights the strengths of V/Q scanning, in particular a lower risk of PE overdiagnosis and overtreatment.

Nevertheless, the document does not address a key question that is currently the subject of debates within the nuclear medicine community and, most important, between nuclear medicine physicians and clinicians: how does SPECT compare with planar V/Q or CT pulmonary angiography (CTPA)? From a nuclear medicine perspective, should we favor SPECT rather than planar acquisition in patients suspected of having PE? Indeed, there is currently no consensus on the role of SPECT V/Q imaging in the management of patients with suspected PE. The literature has consistently reported the high diagnostic performance of SPECT V/Q, and the test has many proponents within the nuclear medicine community *(2)*. In particular, SPECT V/Q offers a binary diagnostic conclusion that may simplify algorithms based on V/Q scintigraphy *(3)*. On the other hand, there is still no firm evidence of how it compares with previously validated strategies (based on CTPA or planar V/Q), especially in terms of clinical outcomes. Indeed, no formal management outcome study in which the clinical decision would be based on a SPECT V/Q has been performed. This is consistently pointed out in clinical guidelines and publications from specialists in venous thromboembolism, in which, in the absence of formal validation, SPECT V/Q is always described as an experimental test rather than an established imaging modality *(4–7)*. The paradox of the current situation is that SPECT imaging has already largely replaced planar imaging in most nuclear medicine departments outside the United States and, although clinical guidelines still recommend the use of planar V/Q interpreted according to the probabilistic criteria, this approach is only applied in about 10% of centers *(8)*.

To fill this knowledge gap, we recently initiated a randomized multicenter control trial that will include 3,672 patients suspected of having acute PE. The aim of the study is to ensure that a diagnostic strategy based on SPECT V/Q is noninferior to previously validated strategies (based on CTPA or planar V/Q) in terms of diagnostic exclusion safety but also to detect potential overdiagnosis using one of the imaging modalities (SPECT V/Q, planar V/Q, and CTPA) (ClinicalTrials.gov ID: NCT02983760).

Given the limited data available to date, the AUC could not address this specific issue. While awaiting further SPECT V/Q clinical validation, the use of V/Q scan per the AUC recommendation mainly applies to planar acquisitions.

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