

Shoring up shortcomings in retrospective application of the YEARS criteria (letter to the editor)

TO THE EDITORS: We commend Ye et al¹ for advancing a promising diagnostic strategy for pulmonary embolism (PE) in postpartum patients, who, despite their high risk for PE, have been relatively understudied. The authors have crafted an algorithm that includes adaptations considering the unique postpartum physiology while being simultaneously mindful of the algorithm's future bedside implementation, where both simplicity and performance are equally paramount.

The study's methods of retrospective data collection, despite inherent limitations, are strong on many fronts. As the authors noted, most of the variables needed to complete the algorithm "were recorded and assessed routinely during the postpartum period."¹ One of 3 YEARS variables, however, may not have been routinely recorded during unscripted, real-world patient care, namely, the clinician's impression if PE was the most likely diagnosis, which is needed to accurately calculate YEARS. We faced this same shortcoming in a retrospective study of antenatal PE diagnostics in 524 patients.² We considered validating the pregnancy-adapted YEARS. Unfortunately, we were prohibited from pursuing this line of inquiry when we found that complete YEARS criteria were documented in only 87 patients (16.6%). Without explicit documentation of PE likelihood in 437 cases (83.4%), we could not ascertain in hindsight the ranking of probable diagnoses on the clinicians' differential.

The best way around patchy documentation of PE likelihood as a component of clinical pretest probability (CPTP) is to have clinicians complete a structured data collection tool at the time of patient evaluation. This explains why a meta-analysis of diagnostic studies of antenatal PE included only studies in which patients were "managed according to a pre-defined diagnostic strategy, starting with the determination of CPTP."³ Apart from structured documentation, there are ways to shore up shortcomings of retrospective YEARS application. First, report the prevalence of complete YEARS documentation. Second, if PE likelihood was incompletely documented, how was YEARS calculated retrospectively—what assumptions were made? Third, in the subcohort of patients lacking

documentation of whether PE was the most likely diagnosis, provide sensitivity analyses based on 2 opposing assumptions: (1) Assume all clinicians with incomplete documentation thought PE was the most likely diagnosis and (2) assume they did not. Results from these analyses would give readers 2 retrospectively-derived boundaries within which the true (but elusive) results would lie. Addressing the above 3 issues would strengthen the study's constructive foray into postpartum PE diagnostics. We look forward to prospective studies of this algorithm's performance. ■

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The authors report no conflict of interest.

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Concerns about shortcomings in retrospective application of the YEARS criteria (reply to letter to the editor)

There was a valuable comment by Dr Smith and Dr Vinson regarding our paper.^{1,2} The detailed responses are presented below:

Although retrospective investigations using the YEARS algorithm carry intrinsic limitations, our study cohort comprised patients with suspected acute pulmonary embolism (PE), identified from multiple data sources: respiratory and multidisciplinary consultation records for acute cardiopulmonary symptoms, computed tomography pulmonary angiography imaging reports, and mortality registers documenting PE-related deaths. Enrolment of this high-risk population with specialist consultation guaranteed full documentation of objective positive symptoms, including “clinical signs of deep vein thrombosis and hemoptysis.”

The metric evaluating “whether PE was the most likely diagnosis” introduces subjective bias during chart abstraction—a limitation that persists even in prospective study designs, which we have elaborated on in the limitations section. Nevertheless, given that most of the participants underwent respiratory or multidisciplinary specialist assessment or post hoc mortality review, the subjectivity of this variable could be minimized. Accordingly, we propose that standardized, targeted clinical training can reduce subjectivity in the prioritization of suspected PE diagnosis in routine care.

Notwithstanding the above, the performance of our modified YEARS algorithm requires validation in prospective clinical studies.

CRediT authorship contribution statement

Yunzhen Ye: Writing — review & editing, Writing — original draft. **Xirong Xiao:** Conceptualization. ■

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