

## LETTER TO THE EDITOR

## Correspondence

# Why pretest probability matters when we do point-of-care ultrasound

As the clinical indications for point-of-care ultrasound (POCUS) continue to develop, it becomes increasingly important to understand how to optimally integrate POCUS into clinical practice.<sup>1</sup> Although POCUS workflow has been streamlined in many clinical settings, the diagnostic use can be complex and requires a certain level of interpretive skill. We appreciate Dr. Tanael for his feedback and for continuing the discussion on the important topic of the use of pre-test probability in POCUS. Moving forward, clinicians must remember that accurate POCUS interpretation relies on understanding the clinical context and pre-test probability of a given case. Additionally, POCUS should be interpreted through the lens of test characteristics, and the spectrum of illness.

Similar to other imaging modalities, estimating a pre-test probability is the first of several essential steps in clinical integration of diagnostic tools. In the most clear-cut clinical scenarios, if the given patient script matches a particular illness script, we have the most appropriate predictive impact. However, in most cases, these two are not as clear-cut, and there is a need for clinical acumen and often appropriate diagnostic testing to fill in the gaps.

Unparalleled to other imaging modalities, clinicians must recognize the risk of confirmation bias in POCUS application as it is often the same person who both assigns the pre-test probability and interprets the scan. It is also important to note that when pre-test probability of disease is either very high or very low, like other diagnostic tests POCUS is at risk of leading a diagnostic workup astray. In situations where pre-test probability yields either a near-certain or negligible likelihood of diagnosis, further testing is rarely warranted and instead can contribute to false positive or negative results. If a patient's pre-test probability warrants further testing by POCUS, clinicians must next consider the sensitivity and specificity of an indicated scan. It is absolutely crucial that these test characteristics are considered in the individual clinical context as, for POCUS, these values can vary greatly, particularly in the extremes of the spectrum of disease.

Somewhat unique to POCUS, a concept of dynamic pre-test probability calculation can be integrated to direct further workup. This introduces an important dynamic approach to patient workups as specific

characteristics guide POCUS integration and POCUS results either move the pre-test probability gauge to guide further clinical workup or present a clinically valuable post-test probability. In many cases, particularly including ultrasound-first applications, this dynamic pre-test probability is often one of the most important predictors in directing additional imaging or workup.<sup>2</sup>

Incorporating patient-specific, test-specific, and disease-specific factors into the decision to perform POCUS are key to responsible POCUS application and stewardship. These values are often dynamic and can be prone to error if not considered via the lens of the specific clinical context at hand. Understanding and correctly applying these important tools surrounding each POCUS scan can help clinicians avoid common biases or errors in scan interpretation and can improve accuracy of integrating POCUS into clinical decisionmaking.

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