

Academic Emergency Medicine Editor-in-Chief Pick of the Month

Sounding Off, Again

This month, I picked another ultrasound paper, this time a paper examining ultrasound of the lung to assist in diagnosis and exclusion of pulmonary embolism (PE). To reiterate, my criteria for a paper to be the EIC POTM derives primarily from the assessment that the work might change how we think, or maybe even do, things in emergency care. In the March issue of *AEM*, [Nazerian and colleagues](#) provide data suggesting that transthoracic lung ultrasound can show alternative diagnoses such as pneumonia or pleural effusion (and maybe pulmonary edema) better than the clinician's guess. The alternative diagnosis more likely component of the Wells score for pretest probability assessment for PE remains a vexing, gestalt assessment that comprises the majority of the discriminative power of the Wells score. (1) In my own research, I can say for certain that for about 65% of patients tested for PE in the U.S., clinicians indicate that they have a diagnosis more likely than PE. (However, this is not the case in Europe, where the number is more like 35%.) (2) I have asked thousands of emergency physicians to write down what their alternative diagnosis is, and the majority write either a descriptive term (e.g., "chest pain") or more comically, they write "not PE." I am serious about this. Physicians who say another diagnosis is more likely almost never know the name of that diagnosis.

So, the addition of a more objective method of "seeing" an alternative diagnosis may make this term more explicit. However, not everyone sees it that way. Besides its pragmatic message, another reason that I picked this paper was because it is somewhat controversial. It is not often that we receive a correspondence letter about a paper prior to it being published, but that was the case for this paper. We received correspondence expressing concern about the paper within days of the Nazerian proof being published on Early View (<https://www.ncbi.nlm.nih.gov/pubmed/28008692>). [Incidentally, Early View is the *AEM* website where you can view full length papers that we have recently accepted.

[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1553-2712/earlyview](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1553-2712/earlyview)].

I have to admit that until now, I have been skeptical of ultrasound for PE. Some of its logic just doesn't make sense to me, like how the operator can distinguish a pleural effusion or infiltrate as infection instead of infarction. But the data by Nazerian et al, add to findings of a recent systematic review and meta-analysis showing useful overall diagnostic accuracy (pooled sensitivity 85% and specificity 83%). (3) Taken together, these papers tend to show that lung ultrasound is here to stay and maybe should change how we evaluate patients with suspected PE.

Best wishes,
Jeffrey A. Kline, MD
Editor-in-Chief, Academic Emergency Medicine

1. Kabrhel C, Goldhaber SZ. The contribution of the subjective component of the Canadian Pulmonary Embolism Score to the overall score in emergency department patients. *Acad Emerg Med.* 2005;12(10):915-20.
2. Penaloza A, Kline J, Verschuren F, Courtney DM, Zech F, Derrien B, et al. European and American suspected and confirmed pulmonary embolism populations: comparison and analysis. *JThrombHaemost.* 2012;10(3):375-81.
3. Jiang L, Ma Y, Zhao C, Shen W, Feng X, Xu Y, et al. Role of Transthoracic Lung Ultrasonography in the Diagnosis of Pulmonary Embolism: A Systematic Review and Meta-Analysis. *PLoS One.* 2015;10(6):e0129909

Associate Editor Summary

AEM associate editor D. Mark Courtney, MD, Associate Professor of Emergency Medicine and Medical Social Sciences at Northwestern University Feinberg School of Medicine, interprets how the research benefits patients and is relevant to the everyday practice of emergency medicine:

What is the main message?

In this multicenter prospective study of Italian ED patients being evaluated for PE, authors used point of care lung and extremity ultrasound to obtain

objective data that could be used in place of the traditional components of the standard Wells Score (alternative diagnosis less likely than PE? signs and symptoms of a DVT?). They derived a revised Ultrasound Wells Score (USWs) and compared diagnostic performance against the traditional Wells score (Ws) finding higher sensitivity and specificity for USWs. Inter-observer agreement for components of the USWs was higher than for the traditional Ws.

What is novel and important about this work?

This is an attempt to provide more objectivity to these important, but often misunderstood or overlooked components of the traditional Wells Score. By using US as a tool to seek out specific alternative thoracic diagnoses and search for image based confirmation of DVT, they suggest that a more data driven approach to the Wells score may result in less false positives (by Wells categorization as ≥ 4) which could result in more patients being accurately categorized as PE unlikely and hence eligible for coupling with a D-dimer approach. The later is hypothetical; authors did not formally integrate D-dimer in their study design.

How might this help patients during times of emergency?

In addition to a more accurate means of identifying alternative diagnoses such as pleural effusion, or consolidation, this approach could result in reduced CT imaging, with reduction in associated radiation exposure, time in the ED, and potential for false positive PE diagnosis.

Narrative Summary

Zachary F. Meisel, MD, Associate Professor of Emergency Medicine at the Perelman School of Medicine at the University of Pennsylvania, places the EIC Pick into perspective in the emergency setting:

Once, a resident told me that she does not “do” the Wells Score for suspected PE patients. “Why not?”, I asked. Her answer: “It hurts my brain. I much prefer to either ‘PERC the patient out’ or just order a CT scan.” I didn’t probe as to why the Wells Score hurts brains, but I suspect

it has something to do with two of the Wells Criteria for PE: 1) clinical signs and symptoms of DVT (is that leg a little more swollen? when I squeeze the calf and my patient flinches, does that count as tenderness?) *and* 2) PE is the #1 diagnosis or equally likely (see Dr. Kline's EIC commentary). Among my ultrasound-happy department, I have no doubt that a diagnostic test that allows us to modify/circumvent those two "painful" questions while improving the diagnostic yield, will be rapidly embraced. Adoption and implementation of new techniques and technology in medicine is notoriously slow. Let's watch how quickly Nazarian and colleagues' ultrasound enhanced Wells Score will be adopted. My bet is on quicker than usual. Anything to avoid brain pain.