

LETTER TO THE EDITOR

Correspondence

Optic nerve sheath diameter ultrasound: Yes, No, and Maybe?

It was with great interest that I read the article by Wilson et al, "Novice emergency physician ultrasonography of optic nerve sheath diameter compared to ophthalmologist fundoscopic evaluation for papilledema".¹ I applaud the authors for this real world, pragmatic look at optic nerve sheath diameter (ONSD) measurement by point of care ultrasound (POCUS) novices. The authors' findings should give the POCUS community pause, in that the finding of 46.9% sensitivity (95% confidence interval [CI], 32.5% to 61.7%) is much lower than has been described elsewhere, like the pooled sensitivity of 97% (95% CI, 92% to 99%) from a 71 study meta-analysis.² That meta-analysis, however, was limited for application in day to day practice as cutoffs for ONSD ranged from 4.5 to 5.8 mm. Wilson et al identify a single cutoff value, but that may not be how ONSD POCUS should be implemented.

Generally, POCUS is thought of as a powerful tool to answer simple yes/no or present/absent diagnostic questions (ie, Is a deep venous thrombosis present? Is lung sliding present?). But there are some POCUS applications with more nuance in which it still can play a useful role. For example, when looking at the inferior vena cava, most users find the extremes, complete collapse (100%) or non-collapsible (0%), more useful than collapsibility cutoffs (30%, 40%, or 50%?) for estimating right atrial pressure. Similarly, when using E/e' to estimate left ventricular end diastolic pressure (ignoring the problems with that metric), E/e' below 8 and greater than 15 are most useful whereas 8–15 is a gray zone of uncertainty.³

I believe that ONSD should be studied and subsequently interpreted in similar fashion. As others have done before, the authors report results for a single cutoff. Even more useful would be the measurement that maximized sensitivity alongside a separate measurement that maximized specificity. One could envision that, in a resource poor setting, the sensitivity threshold might allow for safe conduct of a lumbar puncture in an immunocompromised patient. While a specificity threshold might indicate when another lumbar puncture was indicated in a patient with known idiopathic intracranial hypertension. As a

degree of uncertainty is inevitable with measurements at the millimeter level, that uncertainty should be clearly defined.

To this end the authors could consider reporting two separate thresholds, ideally each equating to a minimum 90% sensitivity and specificity, respectively. Doing so would generate a framework for pragmatic and clinically applicable interpretation—yes, no, and maybe—that would support the continued measurement of ONSD by novice sonographers rather than discourage it.

Ernest A. Fischer MD, MS

Division of Hospital Medicine, Department of Medicine, MedStar Georgetown University Hospital, Washington, District of Columbia, USA

Correspondence

Ernest A. Fischer, MD, MS, Department of Medicine, MedStar Georgetown University Hospital, 3800 Reservoir RD NW G3041, Washington, DC, USA.

Email: Ernest.A.Fischer@gunet.georgetown.edu

See related article: [10.1002/emp2.12495](https://doi.org/10.1002/emp2.12495)

REFERENCES

1. Wilson CL, Leaman SM, O'Brien C, Savage D, Hart L, Jehle D. Novice emergency physician ultrasonography of optic nerve sheath diameter compared to ophthalmologist fundoscopic evaluation for papilledema. *JACEP Open*. 2021;2(1):e12355. <https://doi.org/10.1002/emp2.12355>
2. Koziazar A, Sne N, Kegel F, et al. Bedside optic nerve ultrasonography for diagnosing increased intracranial pressure. *Annals of Internal Medicine*. 2019;171(12):896. <http://doi.org/10.7326/m19-0812>
3. Ommen SR, Nishimura RA, Appleton CP, et al. Clinical utility of Doppler echocardiography and tissue Doppler imaging in the estimation of left ventricular filling pressures. *Circulation*. 2000;102(15):1788-1794. <http://doi.org/10.1161/01.CIR.102.15.1788>

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2021 The Authors. *JACEP Open* published by Wiley Periodicals LLC on behalf of American College of Emergency Physicians