In Reply:

To the Editor:

We thank Koohi et al. for their informative contribution to our recently published manuscript in *Academic Emergency Medicine*.[1] Accuracy (validity), reliability (reproducibility), and predictive values are among the most important features of a diagnostic test.[2]

The validity of a diagnostic test can be demonstrated by comparing it to a criterion standard test. Sensitivity, specificity, positive and negative predictive values (PPV, NPV), positive and negative likelihood ratios, diagnostic odds ratio, and the area under the ROC curve are the parameters that reflect the discriminative ability of a diagnostic study. Diagnostic accuracy is very sensitive to the characteristics of the study population and it is affected by the prevalence or the spectrum of the disease studied. Therefore, it is important to know how to interpret the diagnostic parameters of the tests studied.[3] While sensitivity indicates the capability of a test to recognize subjects with the disease, specificity describes test ability to recognize the cases without the disease. Both sensitivity and specificity are not affected by the prevalence of a disease but can be affected by the spectrum of the disease.[3] PPV and NPV represent proportion of patients with a positive and negative test result in a group of subjects with positive and negative results, respectively. Unlike sensitivity and specificity, PPV and NPV are affected by the prevalence of a disease, and different prevalences in different populations can limit the diagnostic efficacy of these parameters. While sensitivity is more useful for clinicians, PPV is also useful for patients. Likelihood ratios are defined as the ratio of probability of an expected test result in the subjects with the disease to the probability in the subjects without the diseases.[4] Diagnostic parameters of point-of-care ultrasonography (POCUS) and radiology-performed ultrasound (RADUS) in the diagnosis of acute appendicitis are compared in Table 1.

We believe that kappa value should be used with caution. Disease prevalence can affect the kappa value and weighted kappa is preferred when the categories are ordered. The determination of weights for a weighted kappa is also a subjective issue and some experts may, in addition, disagree in a particular setting.[5]

In conclusion, we believe that according to our study results, POCUS has a positive impact on the clinical decision making of emergency physicians.

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Table 1
Comparison of the Diagnostic Parameters of POCUS and RADUS in the Diagnosis of Acute Appendicitis

	POCUS	RADUS
Sensitivity	92.31% (87.20%–95.84%)	76.92% (69.83%–83.05%)
Specificity	95.79% (89.56%–98.82%)	97.89% (92.59%–99.68%)
AUC	0.94 (0.9–0.97)	0.87 (0.83–0.91)
Positive likelihood ratio	21.92 (8.39–57.26)	36.54 (9.25–144.33)
Negative likelihood ratio	0.08 (0.05–0.14)	0.24 (0.18–0.31)
Disease prevalence	64.02% (57.90%–69.80%)	64.02% (57.90%–69.81%)
Positive predictive value	97.50% (93.72%–99.30%)	98.48% (94.62%–99.77%)
Negative predictive value	87.50% (79.57%–93.17%)	70.45% (61.89%–78.07%)

AUC = area under the curve; POCUS = point-of-care ultrasonography; RADUS = radiology performed ultrasonography.

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