provides increased opportunity for consulting each other and sharing knowledge. This is good in principle for patient safety and is satisfying from a professional standpoint. We agree that more studies are needed to evaluate the impact of handoffs on patient outcomes so we can provide the best care for our patients while creating a safe and rewarding working environment for providers.

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https://doi.org/10.1016/j.annemergmed.2019.06.010

Funding and support: By *Annals* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (see www.icmje.org). The authors have stated that no such relationships exist.

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Using High Sensitivity Troponin to Rule Out Myocardial Infarction

To the Editor:

Many thanks to Mirkin et al[1] for the Journal Club showing the problems with the study by Nowak et al[2] on the use of generation 5 high-sensitivity troponin T assay to rule out myocardial infarction. Because this was a derivation study, the results should be more transparent and give readers insight into the process of selecting a cutoff point. The cutoff point derived would then be used in follow-up validation studies.

It appears that the initial selection of the cutoff point of less than 6 ng/L was derived from a previous study.[3] However, the results of that study should have included (warning: nerdy concept coming up) the area under the curve (AUC) of the receiver operating characteristic (ROC) curve. It appears that this was not calculated, and their derived value should have been given in the introduction to this study.

The ROC curve gives the combined results of sensitivity and specificity for the possible cutoff points of the test being studied. The researchers can determine whether the test is reasonable by measuring the AUC, which gives an overall estimate of the value of the test. The AUC ranges from 0 to 1, with a value of 0.5 equivalent to the toss of a coin. In general, the higher the result, the better the test, and an excellent test would have an AUC greater than 0.9.[4]

This study apparently derived another test cutoff of less than 8 ng/L and a 30-minute Δ value of less than 3 ng/L. This requires that the authors create an ROC curve to find the optimal value for this "new" test. In reporting the results of this study, giving negative predictive values and sensitivity alone without also giving specificity and positive predictive values is dishonest and provides only half the picture. How many more patients will need admission to the hospital to be ruled out as a result of using this testing strategy?

A relatively minor issue is that the numbers do not add up. There were 569 patients in the evaluable cohort for the initial rule-in or rule-out part of the study. There were only 543 patients in the "ruled out" plus "ruled in" groups in Table 1. There were 539 in the "baseline/30-minute" algorithm. The "missing" patients should have been accounted for in the final results and in Figure 1.

It appears that the authors do have some connections to the manufacturer of the test, which should be acknowledged in the Journal Club and deserves further discussion. Because we know that industry influence in clinical studies is often associated with unrealistic results, it is important to further explore the potential for bias in the results.

Addressing these issues will improve our ability to use this test after appropriate validation studies.

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https://doi.org/10.1016/j.annemergmed.2019.04.029

Funding and support: By *Annals* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this

article as per ICMJE conflict of interest guidelines (see www.icmje.org). The author has stated that no such relationships exist.

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In reply:

In the reinvented *Annals* Journal Club, we aimed to narrowly focus our attention on 1 to 2 salient educational topics from a selected article. The points raised by Dr. Mayer are certainly valid, but beyond the scope of this exercise.

As discussed by Dr. Mayer, the cutoff of 6 ng/L was originally examined in a previous cohort. This cutoff was selected not because it represented an ideal threshold but rather because it represented the level of quantification, or the level at which the signal-to-noise ratio of the test itself becomes unacceptable. However, the work by Nowak et al[1] concerns derivation of an optimal test threshold. The threshold of 8 ng/L at presentation and a change of 3 ng/L at 30 minutes met predefined sensitivity and negative predictive requirements for ruling out acute myocardial infarction. A prospective trial is necessary to validate these cutoffs.

Dr. Mayer raises a point in regard to the reporting of receiver operating characteristic (ROC) curves. The area under an ROC curve describes the test characteristics of a diagnostic test by summation at all points along its continuum. At times this can be an effective way to determine how any test sacrifices sensitivity for specificity. The authors' intent, however, was simply to identify the maximum value providing 100% sensitivity. Because of the specific question asked by these authors, the generation 5 troponin assay's performance along its entire diagnostic continuum, and thus its area under the ROC, does not necessarily add additional useful information.

Finally, we thank Dr. Mayer for his insightful comments and look forward to continued correspondence.

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https://doi.org/10.1016/j.annemergmed.2019.04.028

Funding and support: By *Annals* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (see www.icmje.org). The authors have stated that no such relationships exist.

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CORRECTION

Correction to 'The Ultimate Emergency Medicine Guide: The Only EM Book You Need to Succeed' [*Annals of Emergency Medicine* 73 (2019) 699–699]

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In the book review of *The Ultimate Emergency Medicine Guide: The Only EM Book You Need to Succeed* published in the June issue of *Annals of Emergency Medicine*, a mistake was made to the author's name. The author's name should be listed as "Khan S."

The authors would like to apologize for any inconvenience caused.