In-training Exams, Performance, and Exam Fatigue

To the Editor:

I read with great interest Dr. Zhou *et al.*'s article regarding the effect of instituting the BASIC examination on anesthesiology knowledge acquisition.[1] The authors should be commended for their hard work and dedication to educating future leaders of our specialty.

As a recent graduate of anesthesiology residency in a large tertiary academic medical center, and as a member of the second class to take the American Board of Anesthesiology BASIC examination, my perspective on the examination differs somewhat from that of its developers. Scores on the in-training examination have been shown to correlate poorly with clinical performance in a variety of medical specialties and practice environments,[2–4] and therefore a statistically significant increase in these scores may not translate into any real clinical improvement. In addition, the advent of frequent standardized testing is a likely factor of the burnout epidemic among anesthesiology trainees. I was not immune to this phenomenon, and personally experienced intense periods of detachment and depersonalization during my residency as a result of exam fatigue. This problem is only likely to worsen with the rollout of the new American Board of Anesthesiology Applied examination, which includes an Objective Structured Clinical Exam component in addition to the Standardized Oral Examination exam.

The rollout of the United States Medical Licensing Examination Step 2 Clinical Skills should be a cautionary tale to all in the world of medical education. Initially used as a method for ascertaining the bedside manner and communication skills of foreign medical graduates, it was expanded to include all U.S. graduates. The costs associated with finding a "legitimate failure" are estimated at over $1 million per failure,[5] a sum financed largely by examinees mired in worsening educational debt. Much ink has been spilled (including by the authors of the article under discussion)[6,7] about the rollout of the Objective Structured Clinical Exam exam, but it is important to put a human face to the discussion. The majority of residents experience burnout at some point during their time in education, and most anesthesiology residents personally know someone whose training was interrupted for mental health reasons. Maybe this would happen less if we had to jump through fewer hoops to prove our baseline competence—or maybe not. But we cannot afford to keep adding on exam after exam without serious thought to the toll it's taking on our trainees.

Although an increase in in-training examination scores is impressive and laudable, like everything else in medicine there should be a constant examination of the risks and benefits of our interventions. The question we should be asking ourselves is not whether additional exams raise performance on our exams: Instead, maybe we should think about whether it will make us better anesthesiologists in the long run. We do what we do for the benefit of our patients, and they deserve us to be at our best educationally and in terms of our mental health.

Competing Interests

The author declares no competing interests.

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Does the American Board of Anesthesiology BASIC Examination Really Affect Anesthesiology Resident Knowledge Acquisition?

To the Editor:

We applaud Zhou *et al.* for their recent publication of American Board of Anesthesiology data suggesting that after implementation of the BASIC certification examination, anesthesiology residents' performance improved on the subsequent in-training examination.[1] As opined by Murray in an accompanying editorial, increased transparency and sharing of data from the American Board of Anesthesiology is welcome and useful to the specialty, training programs, and community at

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large that physician anesthesiologists serve.[2] Our program, as we suspect many others have, is focusing educational preparation for the BASIC exam over the two years of clinical base and clinical anesthesia year 1 training, an acknowledged potential benefit and goal.

Both the editorial and article discuss the small effect size (two points in scaled score) in this initial evaluation of the examination process restructure. In the mixed effects model, residents with in-training examination scores were considered, thus implying that a large proportion not taking the in-training examination during the clinical base year and any resident not sitting for subsequent in-training examinations was not accounted for. The method similarly confirms that only residents "who maintained a regular progression of training level" were included. Thus, it is likely that residents lost from the program through attrition (whether for medical knowledge, professionalism, or another competency) may have affected the small signal. This and an additional unintended consequence of the new examination structure is explored.

1. Most programs have incorporated success on the BASIC examination as an objective milestone measure of medical knowledge and many are offering residents only two unsuccessful opportunities, in the summer and fall of the rising clinical anesthesia year 2 year. As such, any deficiency will be apparent *prior* to the next spring in-training examination in the clinical anesthesia year 2 year and any loss of residents (who would naturally be presumed also to be poor performers on the in-training examination) may have *de facto* resulted in an apparent improvement in the cohort's second compared in-training examination score.
2. Similarly, with appropriate increased academic attention and focus on the BASIC exam, it is likely that many clinical base and clinical anesthesia year 1 residents are more committed to the higher stakes first certification BASIC examination, which has implications for successful maturation through the program. The more specific curriculum for the BASIC exam and time required for preparation may unintentionally distract attention from the preceding in-training examination, which for many programs is not a high-stakes examination for satisfactory academic progress. Thus, the in-training examination in the clinical anesthesia year 1 year as the first comparison point may be artificially lower, this also appearing to accentuate the "improvement" in the subsequent in-training examination.

Addition of the BASIC exam as the first step in anesthesiology resident certification appears to be appropriate and useful to residents and programs in the milestone era. Optimism for objective markers of success should remain restrained, however, until the impact of unintended consequences in resident exam preparation priorities and residents missing from the in-training examination through attrition are accounted for. We eagerly anticipate continued distribution of data from the American Board of Anesthesiology on these and other certification processes.

Competing Interests

The authors declare no competing interests.

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In Reply:

The letter from Pivalizza *et al.* confirms that residency programs do respond rapidly to changes in certification requirements.[1] The program directors at this relatively large residency program suggest that both attrition of residents earlier in their training and changes to the curriculum could impact the conclusions about knowledge acquisition in the study by Zhou *et al.*[2] The letter suggests that these factors, especially attrition of residents who likely had lower in-training examination scores, may have contributed to higher in-training examination scores in clinical anesthesia year 2, potentially tainting the "acceleration of knowledge" argument.[2] Information about the training outcomes of residents who do not successfully pass their BASIC exam, either on initial or further attempts, could help alleviate the concerns regarding the representativeness of the resident cohort.

The more important question that this letter, the original article by Zhou *et al.*,[2] and the editorial[1] all allude to is, "What measures would confirm that the changes in examination resulted in increased knowledge acquisition?" As noted in our editorial, if certification requirements stay the same, the ultimate outcome measure would be that a cohort of graduates would be more successful in their first attempt following the move to administering BASIC and ADVANCED examinations.[1] Ideally, this cohort would need to include and account for those residents who entered training but were not allowed to take the ADVANCED examination because they were unsuccessful in passing the BASIC examination.

The letter by Pivalizza *et al.* also highlights an additional implied outcome that will result from a change in the certification requirements. The first certification requirement