patient-centered outcomes, will likely not further advance this important field.

So although I commend Tran *et al.* on a comprehensive and excellent dissertation on the transversus abdominis plane block, I suggest that they also push the field forward not just by suggesting that additional trials should be undertaken, but by highlighting the end points that should form the basis for these important trials. There are clearly transversus abdominis plane block–related areas that need further investigation, but they must be done through the right kind of trials.

Competing Interests

The author declares no competing interests.

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Transversus Abdominis Plane Block: Reply

In Reply:

We thank Dr. Grocott[1] for his interest in our review article pertaining to transversus abdominis plane block.[2] In his commentary, Dr. Grocott criticized "the lack of any specific mention of the end points that should be included in potential future trials."[1] Unfortunately, such statement is factually incorrect, as the review advocated for the inclusion of patient-centered outcomes (*e.g.,* postoperative pain, breakthrough opioid consumption), functional outcomes (*e.g.,* return of bowel function), adverse events (*e.g.,* hypotension), as well as hard outcomes (*e.g.,* length of stay) and cost analyses. Despite calling for "relevant" outcomes, Grocott has added no further suggestion to enhance our list.

The purpose of our article was to review the current literature relevant to transversus abdominis plane blocks. We concluded that the latter require further investigation with well-designed trials. Although good study design inherently demands a judicious selection of primary and secondary outcomes, it was not within the scope of the review to map out future trial design by providing an exhaustive list of said outcomes.

Competing Interests

The authors declare no competing interests.

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Anesthesiologist Burnout, Distress, and Depression: Comment

To the Editor:

We read with interest the recent article on burnout among anesthesiology residents by Sun *et al.*[1] Burnout within anesthesiology is of growing concern and

quite rightly so; unaddressed burnout can lead to suboptimal patient care and clinical practice, mental health issues, and long-term physical disease in clinicians.[2] Although an important issue to tackle, the accurate estimation of burnout in large-scale surveys is difficult and poses a significant challenge to academics. Some of these reasons are discussed below and should be considered when interpreting the prevalence of burnout reported in the literature.

Burnout is poorly characterized. Burnout is classified as an "occupational phenomenon" by the World Health Organization (Geneva, Switzerland) and not a medical condition. As such, a diagnostic criterion does not exist. The 11th revision of the *International Classification of Disease* (ICD-11) characterizes burnout by the presence of (1) feelings of energy depletion or exhaustion, (2) increased mental distance from one's job or feelings of negativism or cynicism related to one's job, and (3) reduced professional efficacy. This description reflects a shift in the field to recognize broader areas of "cynicism" and "professional efficacy" as part of the dimensions of "depersonalization" and a perceived sense of "lack of personal achievement" respectively.[2] Nonetheless, these dimensions vary over time and exist on a scale of varying severity, not as dichotomous variables. That said, how does one measure such dimensions reliably and then decide universally what and when is it problematic? Such fundamental questions are part of ongoing debates because moderate or severe symptoms can be present in clinicians who are not burnt out. These uncertainties reflect our limited understanding of the syndrome.

Multiple tools detect burnout, but they can be very inaccurate. The Maslach Burnout Inventory and its variations (*e.g.*, the abbreviated Maslach Burnout Inventory, the Oldenburg Burnout Inventory, and the Copenhagen Burnout Inventory) are some examples of burnout detection tools. Not all tools assess every dimension of burnout, and none are recommended by the World Health Organization. The Maslach Burnout Inventory for humans services is a 22-question survey which is by far the most commonly used and validated tool in clinicians. It assesses all dimensions of burnout but can be time-consuming to complete and costly to administer, especially over several time points. Therefore, academics may find that abbreviated versions can improve response rates in large population studies. One such version, the 12-question survey used by Sun *et al.*,[1] is increasingly used within anesthesiology. However, it has been recently shown to have a poor positive predictive value which can lead to the overestimation of burnout prevalence.[3]

Many criteria for defining burnout and the severity of its symptoms exist, even for the same tool. Because different detection tools assess different dimensions of burnout, the readouts of these tools are expectedly heterogeneous and not always appropriate to compare. Even if comparisons are limited to studies using the Maslach Burnout Inventory, different cut-off values for symptom severity and burnout criteria have been used in literature. These can also vary significantly between the complete Maslach Burnout Inventory and its abbreviated versions. For example, Sun *et al.*[1] reported that burnout prevalence in U.S. anesthesiology residents was 51%, but de Oliveira *et al.*[4] reported that it was 41% using the same tool but different cut-offs of symptom severity. Without doubt, the lack of a universal standard accounts for significant heterogeneity in burnout prevalence reported by systematic reviews and meta-analyses.[5,6]

Considering the above, caution is needed when interpreting burnout prevalence reported in literature. In our experience, we have found that screening for burnout in our cohort of anesthesiology residents was best done without the sole reliance on detection tools because the false-positive rates were high (62.1% detected burnout *vs.* 22.4% actual burnout). This would have unnecessarily strained resources, prolonged training times, and negatively impacted service provision. Being a developed country that uses English as its main language, and having an anesthesiology program that was modeled closely after the United States and accredited by the Accreditation Council for the Graduate Medical Education-International, we believe our experience has relevance to U.S. anesthesiology residencies. Through the use of the full Maslach Burnout Inventory and its abbreviated version, both of which have been validated in non-U.S. and U.S. populations, burnout symptoms in Singapore and U.S. anesthesiology residents were found to be similar.[3] However, we have determined clinically that actual burnout prevalence was low and corresponded more closely to burnout rates reported in United Kingdom anesthesiology trainees and intensive care staff (approximately 25%).[7,8]

Although further research is needed in syndrome characterization and the development of more accurate screening tools, we are of the opinion that greater awareness and trainee self-reporting of burnout is a more practical way forward. Through the education of trainees and trainers on its signs and symptoms, trainees who feel burnt out can be offered a confidential platform to self-report without negative implications. Further validation and clinical correlation through the use of detection tools and multi-source data could then validate findings and improve the accuracy of detection. In so doing, finite support services could then be channeled selectively and efficiently to trainees who require support the most. Screening large populations *en masse* through voluntary surveys is inefficient for providing intervention because it only captures data from responders and further efforts would then be needed to distinguish the true positives from the false positives.

In summary, the sole use and reliance of detection tools may limit the accurate detection of burnout including its prevalence. Better screening tools are needed, and clinical correlation is advised.

Competing Interests

The authors declare no competing interests.

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Anesthesiologist Burnout, Distress, and Depression: Reply

In Reply:

We thank Drs. Ong, Lim, and Ong[1] for their interest in our publication[2] and appreciate the opportunity to discuss burnout, an issue that is relevant well beyond anesthesiology residents. Questions are raised about the poor characterization of burnout, inaccuracy of burnout assessment tools, and the lack of diagnostic criteria to identify burnout. We agree that burnout is a complex issue and that estimates of its prevalence should be interpreted in appropriate consideration of the context.

As stated by Ong *et al.*,[1] burnout is classified as an "occupational phenomenon" by the World Health Organization (Geneva, Switzerland). The manifestation of burnout, as a psychologic syndrome, may depend on personal characteristics, working environment, and even social, political, and economic factors.[3] Both theoretical models and empirical evidence have guided the characterization of burnout, and qualitative work from social, clinical, and industrial-organizational psychologists has identified different dimensions of burnout, including exhaustion, cynicism, and inefficacy.[3,4] These dimensions are reasonably captured by how the *International Classification of Diseases*, 11th edition, characterizes burnout.

Ong *et al.*[1] correctly indicate that there are various proposed scales of burnout based on different conceptualizations. For example, the Maslach Burnout Inventory–Human Services Survey assesses emotional exhaustion, personal accomplishment, and depersonalization, and the Maslach Burnout Inventory–General Survey assesses exhaustion, cynicism, and professional efficacy.[5] Other measures focus on exhaustion alone, including subtypes. The Shirom-Melamed Burnout Measure, for example, distinguishes among physical fatigue, emotional exhaustion, and cognitive weariness.[6] The existence of multiple proposed scales and the availability of thousands of peer-reviewed articles related to burnout speak to the importance—and difficulty—of burnout assessment.

We recognize that richness of information is lost when continuous scores of burnout dimensions must be translated into a dichotomous classification of burnout, and the sensitivity and specificity levels associated with cutoff criteria may not always be provided to inform the reader. Studies of psychologic and somatic symptoms of burnout and associated biomarkers might be helpful in searching for the optimal cutoff criteria.[7] We concur with the recommendation to assess the degree of burnout on a continuous scale,[5] and

join the call for establishing consistent cutoff criteria when a classification is deemed necessary, especially for the same measurement tool.

Ong *et al.*[1] provide examples of discrepancies in the estimates of burnout prevalence, specifically with the use of the abbreviated Maslach Burnout Inventory. They note that de Oliveira *et al.*[8] estimated 41% of anesthesiology residents to be at high risk for burnout in 2013, and our study reported an estimate of 51% among anesthesiology residents and first-year residency graduates from 2013 to 2016.[2] We suspect that different compositions of subgroups and the timing of the studies contributed to the difference in the estimates, although both demonstrate alarmingly high rates. Lim *et al.*[9] reported strikingly different estimates of burnout prevalence among the same group of anesthesiology residents in Singapore when different cutoff criteria were applied—22.4% based on Maslach Burnout Inventory–Human Services Survey and 62.1% based on its abbreviated version. Had the same Maslach-recommended criteria been applied, however, the prevalence of burnout in Lim *et al.*'s study would be estimated at 20.7% based on the abbreviated Maslach Burnout Inventory, which would be close to the 22.4% identified based on the full scale.[9] In addition, the correlation coefficients for the three subscales ranged from 0.92 to 0.96 between the two versions. We argue that Lim *et al.*'s study actually provides some assurance that the abbreviated version offers a reasonable alternative for brevity. Regarding the prevalence of 51% of burnout among U.S. anesthesiology residents[2] *versus* 22% among Singapore anesthesiology residents,[9] the limited generalizability of conclusions in the latter study due to small sample size (N = 58) and imbalance of males (N = 17) and females (N = 41) must be recognized. We also suggest that there are a multitude of sociocultural factors that might impact burnout beyond language and training system.

In summary, we concur with Ong *et al.* that burnout could be better defined, more precisely characterized and measured, and compared with more consistency. Nonetheless, we also want to acknowledge that progress in burnout characterization and assessment has been made since it was first described in the 1970s, and we welcome a continuation of the discussion about its relevance to anesthesiologists.

Competing Interests

Drs. Sun and Zhou are staff members of the American Board of Anesthesiology (ABA); Drs. Culley, Keegan, Macario, and Warner are ABA Directors and receive a stipend for their participation in ABA activities.

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Pectoralis-II Myofascial Block and Analgesia: Comment

To the Editor:

We read with great interest the article by Hussain *et al.*, "Pectoralis-II Myofascial Block and Analgesia in Breast Cancer Surgery: A Systematic Review and Meta-analysis."[1]