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In Reply:

We thank Pivalizza *et al.* for their comments on the Practice Guidelines for Central Venous Access.[1] We acknowledge that data from nonanesthesiologist practitioners were used in our analysis for the utility of real-time ultrasound; however, at this time there is insufficient published evidence that directly assesses whether anesthesiologists perform the task of catheter insertion better – or differently – than physicians in other specialties.

Pivalizza *et al.* are correct that the meta-analytic data report heterogeneity for successful internal jugular (IJ) line insertion when using real-time ultrasound guidance as compared with the landmark technique. However, other Category A1 outcomes, such as first-attempt success rate, reduced access time, and decreased rate of arterial puncture, are homogeneous. Regarding hemothorax and pneumothorax, the few randomized controlled trials reporting these outcomes demonstrated lower frequencies for real-time ultrasound.[2,3] In addition to the cited randomized controlled trials, we took into consideration studies with observational findings showing high rates of success when using ultrasound.[4–8]

Regarding the survey information, Pivalizza *et al.* neglected to note that more than 75% of the expert consultants agreed, and less than 10% disagreed, that real-time ultrasound should be used with the IJ. Although 48.2% of the randomly selected members agreed, less than 29% disagreed. These findings likely represent a gap in practice between expert practitioners and the random sample of American Society of Anesthesiologists members.

The value and enhanced safety that real-time ultrasound affords is most likely because the operator can look beneath the skin at the anatomy and the relationship of the IJ to the carotid artery. Significant anatomic variation in the relationship of the IJ to the carotid artery has been documented[9–12]: 1–5% of the time, the IJ lies medial to the carotid; 3–18% of IJ veins are absent or thrombosed; and in more than half of patients, 50–75% of the surface of the vein overlies the carotid.[9–12] These anatomic variables cannot be ascertained *via* the landmark approach. Using real-time ultrasound, one can see the anatomy and direct the needle away from the carotid artery.[13]

Regarding "studies not being scored by traditional methods to assess for bias and scientific rigor," we use a standard analytical (statistical) approach, and our review process and basic classification system has been in place for more than 20 yr. The review procedures we have in place to control for bias surpass most, if not all, other literature assessment methods in use today.

The American Society of Anesthesiologists guidelines are consistent with other organizations in recommending real-time ultrasound. The Society of Cardiovascular Anesthesiologists, along with the American Society of Echocardiography, recently published their own guidelines, recommending "that properly trained clinicians use real-time ultrasound during IJ cannulation whenever possible to improve cannulation success and reduce the incidence of complications associated with the insertion of large-bore catheters."[14] In 2001, the Agency for Healthcare Research and Quality identified the use of real-time ultrasound guidance during central venous catheter insertion as one of the patient safety practices with the greatest strength of supporting evidence.[15] Other societies and organizations have also recommended it.†[16]

Within our specialty, the Society of Cardiovascular Anesthesiologists, the Society of Critical Care Anesthesiologists, and the Society of Pediatric Anesthesia have endorsed the American Society of Anesthesiologists guidelines.[1] We are delighted that the American Society of Anesthesiologists House of Delegates approved these recommendations and hope the members of our specialty will embrace these enhanced safety practices.

We thank Keegan and Mueller for their thoughtful and informative letter detailing the potentially grave risks associated with removal of central venous catheters. In our guidelines, we were explicitly focused on the events and practices to improve safety at the time of central venous catheter placement. Their letter serves to remind all of us that there is a comprehensive set of considerations for maintenance and access of indwelling central lines. Although these issues were beyond the scope of our endeavor, we will add them to the list of potential topics to be included in a future update to the guidelines.

† http://www.facs.org/fellows_info/statements/st-60.html. Accessed June 16, 2012.

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Alternatives to Preoperative Transfusion Should Be Preferred in Anemic Cardiac Surgical Patients Instead of Useless Transfusion

To the Editor:

We read with great interest the recent article published by Karkouti *et al.* about prophylactic erythrocyte transfusion in anemic patients scheduled for cardiac surgery.[1] We are very concerned by the concept of "prophylactic packed erythrocyte transfusion" before elective surgery.

The authors stated "this pilot study showed that in anemic cardiac surgical patients, prophylactic transfusion of 2 units of erythrocytes 1 to 2 days before surgery safely reduces perioperative anemia and erythrocyte transfusions, and may reduce plasma iron level."

This statement is not in accordance with the title of the article. More importantly, it is not supported by the data presented.

On the one hand, the study was not powered to assess the safety of prophylactic transfusion in this population. According to the reported incidence of immediate complications associated with packed erythrocytes transfusion, a much higher number of patients had to be studied. As estimated by the authors, inclusion of 1,000 patients should be necessary to show a statistically significant improvement in renal function. With this larger population, side effects associated with erythrocyte transfusion might appear. These side effects may have potentially severe consequences for patients' outcome, especially if they have resulted in a report of the surgical intervention. Of note, the total number of erythrocyte units transfused in the perioperative period was not different between the two studied groups.

On the other hand, the statement that "the increase in postoperative iron and transferrin saturation levels was more pronounced in the control arm than in the treatment arm" could not be inferred from the statistical analysis used. Indeed, a two-way ANOVA test should have been performed to demonstrate an interaction between "group" and "time" effects. Moreover, as observed in the treatment arm, transferrin saturation levels may increase after cardiac surgery because of several other factors that have to be taken into account.

It is increasingly recognized that preoperative anemia and perioperative transfusion are both independently associated

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