Our aim in conducting this study was to explore the predictive performance of PPV under ideal conditions. As a result, we did not record the number of patients who were not selected because of atrial fibrillation.

May we offer a more balanced and less jejune set of conclusions than those purportedly “obvious” conclusions drawn by Dr. Sondergaard?

NO; CO measurements alone is not sufficient for optimization of oxygen delivery. Fluid loading impacts hemoglobin concentration, and neither volume expansion-induced changes in PPV nor direct CO measurements reliably reflect this.

NO; because there is no strong and definitive evidence to suggest that “validated” and calibrated dilution methods with continuous, updated arterial curve–based calculation of CO impact on postoperative outcomes, we do not have to use them (“…no monitoring tool, no matter how accurate, by itself has improved patient outcome.”)6

NO; we do not find ourselves compelled to adopt cardiovascular models from giants such as Guyton or Dr. Sondergaard. Eminence is rarely, if ever, a substitute for evidence.

YES, key opinion holders in the European intensive care community should be very cautious about promoting any device or system that has not clearly demonstrated its ability to improve postoperative outcomes.

Having matured beyond Dr. Sondergaard’s preoccupation with dreams of the conceptualization and intellectualization of endeavors past explored, we have actually evaluated PVV to understand its abilities and limitations. Although PPV informs clinicians on how fluid loading impacts on CO, there is a common misconception that fluid loading is required when PPV is high—this requires correcting.

PPV requires engagement, interpretation, and judgment. For this reason, we have developed the grey zone concept, which we offer to Dr. Sondergaard in the hope that he would evaluate it empirically in a clinical study.

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Laterality of Motor Control and Consciousness Shares the Same Hemisphere

To the Editor:
I read with great interest the recent article by Liu et al.1 regarding neural basis of consciousness. However, as a neurologist with interest in laterality of motor control and consciousness,2–5 I would like to add the following perspective for further understanding the problem that they have studied.

Contrary to the assumption of the authors, as delineated in the above-mentioned references, consciousness exclusively lies in the major hemisphere (i.e., hemisphere of speech and action) with the minor hemisphere (i.e., the right in 85% of the population) tasked with functionning at the behest of the major hemisphere for events occurring on the nondominant side of the body/space. It has also been shown that handedness is a fairly authentic representation of the hemisphere housing consciousness, with the nondominant side being farther away from the command center by an interhemispheric transfer time. Sensory-wise, too, stimulations of the nondominant side of the body arrive at the conscious hemisphere at a delay that amounts to an interhemispheric transfer time. All these occur because of the fact that signal traffic within the corpus callosum is one-way; from the major to the minor hemisphere for the somato-motor events and in the opposite direction for the somato-sensory ones. Unfortunately, in the article in question the authors neither refer to the handedness of their participants, nor did they indicate the laterality of the commands to be carried out by their subjects (squeezing the hand of the examiner or taking a deep breath, page 60).

Nevertheless, because in “using functional magnetic resonance imaging, the authors demonstrated that propofol conferred differential changes in functional connectivity of the specific and nonspecific thalamocortical systems, particularly in left hemisphere,” one may conclude that the subjects were indeed right handed. However, ascribing the latter finding to the verbal nature of stimuli and tasks is not justified because

Anesthesiology 2013; 119:724-41
the same finding would have been expected if the subjected pantomimed or imagined the same activities.\(^6\)

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In Reply:
The questions about the duality and hemispheric functional specializations of the human brain have occupied in interested scientists for decades. Experimental findings from split-brain and binocular rivalry research strongly suggest that the two hemispheres of the brain are both actively engaged in constructing and representing different aspects of the content of human consciousness. The seminal research by Sperry\(^1\) and Gazzaniga\(^2\) in the 1960s on split-brain patients led to a novel understanding of functional lateralization of the brain. It is well known that under special circumstances, the two hemispheres can show an amazing amount of autonomy and cognitive functions associated with different contents of internal and external realities. In binocular rivalry experiments with normal participants, visual perception of each eye alternates to become the content of consciousness, which is mediated primarily by one of the hemispheres. Although evidence for functional lateralization is measurable, broad generalization of lateral dominance has yet to be treated carefully. Evidence from various cognitive experiments collectively suggests that hemispheric dominance is related to task,\(^3\) rather than to handedness or the sites for representation of conscious contents. For example, as in the majority of population, when we are speaking and reading, the left brain privileged in language and verbal reporting is dominant, but when we are navigating or appreciating music or an artwork, the right brain is dominant.

The handedness of our study participants was unfortunately not recorded at the time when the experiments were conducted.\(^4\) Nonetheless, we know that the left hemisphere is dominant for speech in approximately 95% of right-handed people and in approximately 70% of left-handed people.\(^5\) This raises the question whether handedness can be regarded as a reliable, authentic representation of hemispherical functional specialization. Moreover, working memory and semantics have been reported to involve mainly left-lateralized brain networks.\(^6,7\) This may explain why in our experiments the task-induced brain activity and connectivity patterns showed pronounced lateralization to the left in the wakeful baseline condition and the absence of this lateralization during deep sedation.\(^8\) In our experiments, there was no motor action performed during imaging scan; behavioral evaluations were conducted only during the interval between scans to assess the level of sedation. However, auditory stimuli were continuously presented during scanning. Thus, it is conceivable that during deep sedation, nonspecific thalamocortical connectivity had to be more suppressed in the left than in the right hemisphere, preventing the incoming stimuli to become the dominant content of consciousness.

In other situations, where the nature of task demands a predominant involvement of the right hemisphere, the results could be dramatically different (e.g., a prominent suppression of right hemisphere activity or connectivity). Thus, we consider our observations of more pronounced suppression of nonspecific thalamocortical connectivity in the left hemisphere, as reported in our publication, to be task related. We thank Dr. Derakhshan for commenting on our work and offering interesting interpretations of the results.

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