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Practice Guidelines for Central Venous Access: Comment

To the Editor:

We read with great interest the updated report by the American Society of Anesthesiologists Task Force on Central Venous Access about the practice guidelines for central venous access 2020.[1]

The relation between internal jugular vein and carotid artery at various head positions may deserve special attention. In a prospective observational study of 1,136 patients, 54% of the patients had internal jugular vein overlying the carotid artery (internal jugular vein overlying more than 75% of the carotid artery in an ultrasound image plane aligned in the direction of cannulating needle).[2] The vessel overlap would increase the incidence of accidental carotid puncture, which is the most common complication during cannulation of internal jugular vein (associated with 6.3% to 9.4% of procedures).[3]

Several studies have demonstrated the progressive increase in overlap between internal jugular vein and carotid artery with the incremental head rotation to opposite side.[4–7] While performing internal jugular vein cannulation, in addition to the Trendelenburg position and use of ultrasound, minimizing head rotation to the contralateral side may help to decrease the incidence of carotid artery puncture and enhance safety.[8]

Competing Interests

The author declares no competing interests.

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Practice Guidelines for Central Venous Access: Reply

In Reply:

Dr. Shrestha's letter[1] highlights the value of real-time or dynamic ultrasound needle guidance during central venous catheterization. Our literature and survey findings both strongly support this intervention.[2]

Our evidence model did not include head position/rotation as an intervention to evaluate for a recommendation. However, if a sufficient evidence base exists (preferably randomized, controlled trials), we agree that the issue may be relevant to future updates of the Practice Guidelines for Central Venous Access. The evidence linkage would need to support the premise that an optimal degree of head rotation will minimize the chance of inadvertent carotid artery puncture.

We agree with several of Dr. Shrestha's points and have some comments:

1. Current evidence indicates that the relationship of the internal jugular to the carotid artery is highly variable. This anatomic variability may be one of the strongest arguments supporting our recommendation to use real-time or dynamic ultrasound guidance during line insertion.
2. The literature reports that the overlap between the internal jugular vein and carotid artery increases as one progressively rotates the head to the contralateral side. However, no consensus optimal degree of rotation has yet been identified.
3. Dr. Shrestha's letter raises a potential safety implication: Targeting a segment of the internal jugular vein that overlaps the carotid artery may increase the risk of carotid puncture. Although this implication seems self-evident, it deserves empiric testing because targeting other segments of the internal jugular may increase the risk of pneumothorax or other complications.

Importantly, our current Guideline has this recommendation: "Use static ultrasound imaging before prepping and draping for prepuncture identification of anatomy to determine vessel localization and patency when the internal jugular vein is selected for cannulation." If supported by our rigorous guideline process, Dr. Shrestha's comments regarding head position may modify this recommendation in future revisions.

On behalf of the American Society of Anesthesiologists (ASA) Task Force on Central Venous Access and the ASA Committee on Standards and Practice Parameters, we thank Dr. Shrestha for the thoughtful letter. Such letters illustrate the importance of practitioner input for developing and periodically updating ASA Practice Parameters. These concerns will assist the Committee on Standards and Practice Parameters in the identification of new topics as well as in the selection of new practice parameters.

Competing Interests

Dr. Tung receives salary support from the International Anesthesia Research Society as section editor for the section on critical care. The other authors declare no competing interests.

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Perioperative Neurocognitive Disorder: Comment

To the Editor:

We read with great interest the review article by Eckenhoff *et al.* on the different approaches used in preclinical perioperative neurocognitive disorder research.[1] In this review, the authors provided data on the various preclinical models used in scientific literature to study perioperative neurocognitive disorder that include molecular, cell culture, brain slices, and animal models. Surprisingly, the possible role of mechanical ventilation as cause of perioperative neurocognitive disorder is not mentioned.

There is growing preclinical and clinical evidence on the relevance of mechanical ventilation–induced neurocognitive damage.[2–5] Various mechanisms have been described to explain how mechanical ventilation–induced alveolar stretching might trigger neuroinflammation: local brain action of systemic lung-derived inflammatory cytokines, afferent neuronal signaling by vagal-mediated dopaminergic lung–brain axis, and histopathologic changes in blood–brain barrier and brain deposition of β-amyloid.[2] These are also known as "brain–lung" cross-talk.[2] Despite the ample preclinical evidence on mechanical ventilation–induced neurocognitive damage, there are no clinical studies designed to evaluate the effect of mechanical ventilation on neuroinflammation and perioperative neurocognitive disorder, but there is evidence that mechanical ventilation duration is a risk factor for neurocognitive impairment in critically ill patients and that, in neurocritical care patients, mechanical ventilation setting is associated with functional outcome.[3,4] Furthermore, a retrospective study in patients resuscitated after out-of-hospital cardiac arrest proved that lower tidal volume associates with better neurocognitive outcome.[5]

We wonder if, considering this evidence, Eckenhoff *et al.* agree that mechanical ventilation–related neuroinflammation might ultimately contribute to perioperative neurocognitive disorder and therefore deserves to be addressed in appropriately designed preclinical and clinical studies.

Competing Interests

The authors declare no competing interests.

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Perioperative Neurocognitive Disorder: Reply

In Reply:

We thank Giordano *et al.*[1] for their interest in our review[2] and perioperative neurocognitive disorder in general.