

findings during surgery in these patients. We thank Drs. Rothfield and Veselis for their insights, and we again plan to revisit this issue when we next update this practice advisory.

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Different Levels of Ventilation Are a Plausible Explanation for Different Outcomes of Acute Stroke Patients Undergoing Endovascular Therapy

To the Editor:

I read with interest the report of Davis *et al.*¹ and the accompanying editorial,² which describe and discuss the observation that the outcome of endovascular therapy for acute stroke is much worse when accompanied by general anesthesia compared with local anesthesia with sedation. The systolic blood pressures were higher in the sedated patients, and it was suggested that adequate blood pressure control could ameliorate the outcomes observed in the general anesthesia group.

Although I agree that adequate blood pressure control is always to be recommended, I wish to propose that there was another important difference between the two groups that was not addressed in these two reports and could well be significant in contributing to the outcome of the two groups: the partial pressure of arterial carbon dioxide (PaCO₂).

The PaCO₂ of the sedated patients would have been greater than normal because of (hopefully mild) respiratory depression, whereas the PaCO₂ would have been lower than normal in the patients during general anesthesia because patients are traditionally hyperventilated, especially in neurosurgical cases. In response to PaCO₂, there would be cerebral vasodilation in the sedated, hypercarbic group with spontaneous ventilation and cerebral vasoconstriction in the anesthetized, hypocarbic with controlled ventilation.

It has been shown that hyperventilation and hypocapnia in head-injured patients result in poor clinical outcome.³ Similarly, it is quite plausible that hyperventilation is detri-

mental to patients with acute stroke. In fact, the report by Davis *et al.* could be interpreted as showing that hypercarbia might have a salutatory effect on the outcome for these patients.

It is unlikely that arterial blood gases were measured often enough in this retrospective study for meaningful comparisons between the groups. However, prospective studies could be designed to compare the effect of different levels of ventilation on the outcome of acute stroke patients requiring general anesthesia for endovascular therapy.

Until the results of such a study become available, I suggest that the difference in outcome between the two groups of patients (local anesthesia with sedation *vs.* general anesthesia) could, at least partially, be explained by the difference in PaCO₂ between the two groups, and therefore should have been discussed in the article and editorial.

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The Time When Hypotension Occurs May Be Important in the Management of Intraarterial Thrombolysis for Stroke

To the Editor:

The contributions of general anesthesia and blood pressure management, either independently or together, to adverse outcome from intraarterial thrombolysis for stroke may be important. Davis *et al.* have attempted to study this through a retrospective analysis of their patient experience.¹ They concluded “that patients managed with general anesthesia, and its concomitant relative systolic hypotension, during endovascular therapy for acute ischemic stroke have a much lower likelihood of good neurologic outcome, compared to patients managed with local anesthesia.” We note, however, that the lowest average systolic blood pressure in the general anesthesia group, 104 ± 17 mmHg, is exactly the same as the baseline systolic blood pressure. Baseline measurements are usually those made at some time-point before the initiation of general anesthesia, *e.g.*, in the emergency department, the preoperative area, or the first blood pressure on arrival in the operating room.