population, dose and duration of therapy, adherence to therapy, and immortal time bias are some of the many factors that contribute to difficulties in assessing the true effectiveness of a drug. We also agree that randomized, controlled trials remain the standard for the evaluation of drug efficacy and effectiveness.

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Traumatic Intracranial Hypertension

TO THE EDITOR: We think that Stocchetti and Maas, in their review article (May 29 issue), should have provided more information on the use of transcranial Doppler ultrasonography for noninvasive monitoring of intracranial pressure. With the use of this approach, the pulsatility index, which is dependent on distal vascular resistance, is strongly correlated with intracranial-pressure values in various clinical conditions. This approach also allows evaluation of the autoregulation of cerebral blood flow, which cannot be evaluated by means of invasive devices. However, transcranial Doppler ultrasonography cannot replace invasive monitors of intracranial pressure, since it is not a continuous-monitoring device. Its best role might be as a screening tool to determine which patients have elevated intracranial pressure.

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TO THE EDITOR: Stocchetti and Maas highlight the factors that contribute to increased intracranial hypertension. However, their article overlooks head position as a major factor that affects intracranial hypertension in patients with traumatic brain injury.

Patients with traumatic brain injury benefit from increased cerebral venous outflow, which results from elevation of the head and maintaining the head in a neutral position. Elevation by 15 to 30 degrees is also associated with a shift of the cerebrospinal fluid from the intracranial compartment to the spinal compartment. The consequent reduction in intracranial pressure, cerebral blood flow, or both after this elevation of the head is favorable in most patients. If this maneuver is performed during monitoring of systemic arterial and intracranial pressure, to maintain appropriate cerebral perfusion pressure,
the transducers must be appropriately set to zero at the level of the foramen of Monro or (more practically) at the level of the external auditory meatus.

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THE AUTHORS REPLY: Cotte and coworkers underscore the potential of transcranial Doppler ultrasonography for noninvasive assessment of intracranial pressure. The evidence supporting transcranial Doppler ultrasonography as an indicator of elevated intracranial pressure is extremely controversial. This method has been used to identify children who are at risk for elevated intracranial pressure, with unreliable results. After initial enthusiasm about the use of this method in adults, worrisome results have been reported, especially in patients with pre-existing vascular diseases. A comprehensive analysis by the Cambridge Group involving 290 patients with head injury concluded that “overall the value of transcranial Doppler ultrasonography to assess intracranial pressure noninvasively is very limited.” As Cotte and coauthors admit, transcranial Doppler ultrasonography cannot replace invasive monitoring of intracranial pressure. In our opinion, its potential for screening patients who are at risk for elevated intracranial pressure remains insufficiently proved.

Mahmoodpoor and Golzari recommend elevation of the head. We fully agree that venous outflow from the brain is extremely important and that any cause of elevated venous pressure, as in the case of neck torsion or compression, should be avoided, as we proposed in Table 2 of our article and in our algorithm for the treatment of intracranial pressure (Fig. 2 of the article). However, we strongly suggest that cerebral perfusion pressure should be preserved when intracranial pressure is treated. Rosner and Coley warned that elevation of the head was associated with a risk of reducing intracranial pressure at the expense of an even greater reduction in cerebral perfusion pressure. In their series involving 18 patients, 4 had further increases in intracranial pressure after the decrease in perfusion pressure induced by elevation of the head. In the study by Feldman et al. that was cited by Mahmoodpoor and Golzari, 5 patients (23%) had reduced cerebral blood flow owing to elevation of the head, although no adverse effects on cerebral perfusion pressure and cerebral blood flow were reported when data were averaged for the whole group.

It is our practice to check whether moderate elevation of the head (by 15 to 30 degrees) may contribute to control of intracranial pressure without dangerous reductions in cerebral perfusion pressure in individual patients. In many cases, as indicated by our colleagues, slight elevation of the head helps, but in some cases it does not. Perhaps this is a good example of individualized therapy, which we advocated in our criticism of “one size fits all” approaches.

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