death, among an estimated 50 million neck manipulations. Carey suggests that the incidence of CVA from neck manipulations is much lower than previously reported—about one incident per 3 million neck manipulations. Further data from the National Chiropractic Mutual Insurance Company (NCMIC), which insures more than one half of American chiropractors, shows that from 1981 through 1983, there was an annual average of 20 claims settled with payment for CVA. According to national averages, NCMIC's 24,000 chiropractors each perform about 1900 cervical manipulations per year, yielding a rate of less than one stroke per 2 million cervical manipulations.

Malpractice statistics may not always be reliable for estimating risk, but surely they should carry more weight than informal audience polls taken at conventions and unsubstantiated claims made in editorials. If a serious and disabling complication such as stroke really occurred as frequently as one per 20,000 manipulations as the authors imply, it is hard to believe that less than 1% of those injuries are actually reflected in malpractice claims. Considering the full body of research on this topic, a much more reasonable estimate of the risk of stroke from cervical manipulation is one-half to two incidents per million manipulations performed, and the risk of death from manipulation-induced CVA is less than one in 4 million manipulations.

There seems to be a consistent pattern in the medical literature of looking at the risks of manipulation in a clinical vacuum. Rather than focusing solely on the risks of manipulation, it is much more meaningful to ask how manipulation compares with other treatments for similar conditions regarding safety and effectiveness. For example, nonsteroidal anti-inflammatory drugs (NSAIDs), the cornerstone of conservative medical management of musculoskeletal pain, carry significant but often unappreciated risks. One study found an annual death rate of 4 per 10,000 from NSAID-induced ulcers among patients taking them for osteoarthritis and related conditions. Even short-term NSAID therapy carries a considerable risk of serious and potentially fatal gastrointestinal injury. A strong argument can be made that the relative risks of neck manipulation are comparable to or less than the risks of NSAIDs and other conventional treatments for similar conditions. No existing scientific evidence suggests that manipulation is any less effective than these alternatives.

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REFERENCES

The preceding letters were referred to Drs Assendelft and Bouter, who respond as follows:
The issues raised by Winterstein and Lauretti, and the resulting confusion, clearly underline the need for well-designed studies to provide valid estimates of the risk of spinal manipulation for various indications and by different professional groups.

Winterstein argues that we blame the chiropractors too much. However, we addressed this issue by indicating that "their [the chiropractors'] relatively large contribution to the total number of manipulations applied is one of the putative reasons for the high percentage of chiropractic complications." Furthermore, we think that the type of calculation made by Winterstein is not justified. Our review deals with descriptions of complications over a period of several decades, therefore the current percentage of chiropractic manipulations does not apply. In addition, we did not restrict our review to reports from the United States.

Lauretti confuses the number of manipulations applied with the number of patients treated. We decided to extract data from articles without any transformation, implying that we reported the findings from Haynes' as one per 20,000 patients, not manipulations. Based on the assumption of Dabbs and Lauretti, that a typical course for patients with neck pain or tension headache involves 10 to 15 cervical manipulations, the findings of Haynes' can be expressed as one vertebralbasilar accident (VBA) per 200,000 to 300,000 manipulations. Lauretti also questions the credibility of the findings we presented, referring to claim data and surveys. In our opinion, claim data cannot be regarded as valid estimates of the actual incidence. We feel supported in this view by the author of one of the claim-data studies, who concludes: "The actual incidence following manipulation is unknown and this would require a carefully conducted epidemiological study." Lauretti pleads for comparison of the risk of spinal manipulation with that of other treatment for similar conditions, later focusing on NSAIDs. Although from a conceptual point of view this would be informative, data from similar age groups with identical complaints (neck pain or headache) concerning alternative treatment options (spinal manipulation and NSAIDs) are simply not available, reducing every attempt to a compar
son of apples with oranges. The method of data collection used in cohort and case-control studies on complications of NSAIDs are much more trustworthy than those for spinal manipulation. Reviews of the risks of NSAIDs  indicate that the risk of complications is, to a great extent, dependent on comorbidity and comedication, as well as on age. Therefore, a comparison of figures for NSAIDs with those for spinal manipulation, without correction for these factors, is completely unjustified.

Both authors comment on our recommendation not to refer patients to practitioners applying manipulation with a rotatory component. Our point of view was based on the pathophysiology of VBAs and on recommendations made by chiropractic authors.  We appreciate Winterstein's explanation that the different alternative techniques may vary in the stress to the vertebral arteries. It is exactly this type of discussion between referring physician and treating spinal manipulator that we aimed at. However, in view of the potential, though rare, severe consequence, we think that the issue of cervical manipulation techniques should continue to be the subject of debate.

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REFERENCES

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