

cies in knowledge in this area.⁵ In particular, research into causes of poor health outcomes for individuals in the compensation system is limited and inconclusive, and not enough is known of the effects of different types of schemes or methods of case management.

Not so long ago in the Journal, Cameron outlined some of the technical and ethical problems doctors face when working within the workers compensation system framework.⁶ Issues of role confusion (gatekeeper versus patient advocate), objectivity in the face of coercion, and patient and insurer mistrust all contribute to many practitioners shying away from workers compensation cases. These concerns were reflected in the issues perceived by the GPs in the survey by Russell and Roach as barriers to effective management of patients with work-related stress.¹

So, what messages can be drawn? Given the recognised adverse health outcomes that commonly occur after lodging a compensation claim, and the obvious stress involved in the process, it is not surprising that many general practitioners elected to temporise rather than immediately commence a compensation claim.

However, patients have rights under workers compensation legislation to receive benefits for work-related illness and injury. These benefits are more generous than those available under the Medicare system (eg, the payment of treatment from a psychologist is able to be reimbursed through workers compensation). Indeed, claiming benefits from Medicare for a workers compensation injury is specifically precluded. There is also a need for systems that enable treatment to occur with certainty of reimbursement of costs while claims are being determined and disputed. Obviously, practitioners would benefit from increased education and skills, and the proposed Western Australian accreditation system may be one way to assist this process.

Increased education and skill sharing of all participants (including consumers and the legal profession) in the com-

pensation system may address some of the concerns about the adversarial system. Another approach may be to change the system itself, particularly by reducing its adversarial nature so that more time and effort is available for patient care. Exploring solutions that recognise “work stress” as a multifactorial problem, often with some of its origins outside the workplace, may be a worthwhile approach. This would necessitate a collaborative approach to managing work-related stress, with all stakeholders contributing their particular skills and perspectives. Finally, confidentiality issues in workers compensation stress claims remain significant barriers in the minds of medical practitioners and their patients. Clearly, there is a need for appropriate research strategies to examine and address these issues systematically to optimise health outcomes in a cost-effective way.

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1. Russell GM, Roach SM. Occupational stress: a survey of management in general practice. *Med J Aust* 2002; 176: 367-370.
2. The Royal Australian College of General Practitioners WA Research Unit. Stress, compensation and the general practitioner. Perth, Western Australia: Workers Compensation and Rehabilitation Commission, 2000.
3. Cassidy DJ, Carroll LJ, Cote P, et al. Effect of eliminating compensation for pain and suffering on the outcomes of insurance claims for whiplash injury. *N Engl J Med* 2000; 342: 1179-1186.
4. Atlas SJ, Chang Y, Kammann E, et al. Long-term disability and return to work among patients who have a herniated lumbar disc: the effect of disability compensation. *J Bone Joint Surg Am* 2000; 82: 4-15.
5. The Australasian Faculty of Occupational Medicine, Royal Australasian College of Physicians, Health Policy Unit. Compensable injuries and health outcomes Sydney: RACP, 2001: 19-21.
6. Cameron SJ. Workers' compensation – what role the doctor? *Med J Aust* 1996; 164: 26-27. □

Manipulation of the neck and stroke: time for more rigorous evidence

To fill this important gap in our knowledge would require collaboration between researchers from the manipulation disciplines and neurologists

MANIPULATION OF THE SPINE is a popular treatment which is used frequently by chiropractors. In the past 25 years, its use has been evaluated by increasingly sophisticated randomised trials. In a recent review of the emergence of the chiropractic profession from “alternative” to more “mainstream”,¹ the results of 20 randomised controlled trials of cervical manipulation (for migraine and tension headache, cervicogenic headache or neck pain) were described: 11 were positive, and nine equivocal. Given this supporting evidence, as well as the frequency of use of manipulation² and the health and social impact of the conditions treated, it is important to consider any suggestions that manipulation may do more harm than good with some care.

In this issue of the Journal, Ernst (*page 376*)³ reviews case reports of serious adverse events associated with cervical spine manipulation. Although Ernst acknowledges the considerable doubt about a causal relationship between the manipulation and the adverse event, he is inconsistent in suggesting that the anecdotal and uncontrolled evidence of the case reports favours the adverse events, often strokes, being an effect of manipulation. Elucidating a causal relationship calls for greater clarity, less ambivalence and generally better science in the present evidence-based climate. Thus, the important question to be answered in the light of Ernst's article is whether the association between neck manipulation and stroke is actually causal and, if so, in what direction?

The incidence of cerebrovascular accidents after neck manipulation has been estimated by various authors to range from 1 in 400 000 to between 3 and 6 per 10 million manipulations.¹ Ernst's article suggests that the mechanism of the strokes associated with neck manipulation tends to be dissection of the vertebral or carotid arteries, an observation also made by others.⁴ However, dissection is not the only mechanism proposed in Ernst's review. Of the 42 cases tabulated, 20 were not attributed to dissection (although only two such cases appear to have been confirmed by angiography). Of these 20, nine seem to be either intracranial events or lesions such as cervical canal stenosis, intradural mass or cervical disc hernias, which are more likely to have been pre-existing conditions.

Strokes following manipulation could also be linked to other pre-existing conditions, such as vasospasm, or kinking of the vertebral arteries and thrombus without dissection.⁵ Smith and Estridge, reporting two cases of stroke after manipulation, suggested that smaller forces than those used in neck manipulation may be all that is required to precipitate stroke in the presence of such pre-existing lesions.⁵ They proposed that some premanipulation testing of the neck in rotation and extension might warn of the presence of such lesions. However, a recent review of the literature⁶ and a study of patients with positive premanipulation tests⁷ failed to demonstrate such a link.

In favour of neck manipulation causing stroke is the fact that it is a mechanical intervention. Particularly if a dissection were already in progress, a mechanical intervention might accelerate it. However, an argument can also be made that the dissection, before manifesting itself as a stroke, causes head or neck symptoms requiring treatment from a chiropractor, osteopath or other manipulation practitioner. The ensuing stroke could be the natural progression of the condition regardless of the manipulation. This hypothesis is further supported by recent evidence that the strain to the vertebral artery conferred by a high-velocity neck manipulation is almost an order of magnitude lower than that required to mechanically disrupt it.⁸ Both hypotheses are reasonable, but bring us no closer to answering the question of whether or not it is more likely that a stroke will follow neck manipulation than occur without manipulation, and, if it is more likely to occur after manipulation, which subgroups of patients are susceptible.

If practitioners of manipulation are precipitating certain types of strokes then they must be made aware of how to recognise these. If, on the other hand, they are mere bystanders in an ongoing process, this also needs to be established. Either way, they may have an important role to play in detection.

There are no high-quality data available to provide the denominator to enable us to calculate either the risk or the odds ratios of stroke following manipulation and to thereby assess causation. To fill this important gap in our knowledge would require collaboration between researchers from the manipulation disciplines and neurologists. Community-based studies could examine exposed and unexposed groups who have or have not been affected by strokes or transient ischaemic attacks. A stroke registry employing rigorous case-ascertainment methods could support this. Considerable care would be needed in selecting controls, matching for stroke risk as well as age and sex. Exposure data would need to be detailed for both cases and controls, including an account of the intervention itself. Careful consideration would need to be given to whether to examine the relationship between manipulation and all strokes, or limit studies to vertebral and carotid artery dissections in younger patients only. The latter subgroup approach would help to provide the statistical power needed to draw conclusions, but the case for dispensing with a more global approach would need to be made carefully.

The increased use of spinal manipulation for its demonstrated benefits in healthcare means that, in the future, even without any causal link to stroke, more of the strokes that do occur will follow manipulation, just as they follow other common events. Given the expectation that has been generated, this is likely to increase public alarm unless this logical fallacy is appreciated and manipulation professionals come to be regarded as responsible partners instead of pariahs.

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1. Meeker WC, Haldeman S. Chiropractic: A profession at the crossroads of mainstream and alternative medicine. *Ann Intern Med* 2002; 136: 216-227.
2. Eisenberg DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States. 1990-1997: results of a follow-up national study. *JAMA* 1998; 280: 1569-1575.
3. Ernst E. Manipulation of the cervical spine: a systematic review of case reports of serious adverse events, 1995-2001. *Med J Aust* 2002; 176: 376-380.
4. Rothwell DM, Bondy SJ, Williams I. Chiropractic manipulation and stroke: a population-based case-control study. *Stroke* 2001; 32: 1054-1060.
5. Smith RA, Estridge MN. Neurologic complications of head and neck manipulations: report of two cases. *JAMA* 1962; 182: 528-531.
6. Haldeman S, Kohlbeck FJ, McGregor M. Risk factors and precipitating neck movements causing vertebral artery dissection after cervical trauma and spinal manipulation. *Spine* 1999; 24: 785-794.
7. Licht PB, Christensen HW, Hoiland-Carlson PF. Is there a role for premanipulative testing before cervical manipulation? *J Manipulative Physiol Ther* 2000; 23: 175-179.
8. Symons BP, Leonard T, Herzog W. Internal forces sustained by the vertebral artery during spinal manipulation therapy. *J Manipulative Physiol Ther*. In press. □