evidence before deciding on manipulation as part of the clinical management.

It is not clear what type of techniques were applied to produce these adverse reactions, nor how well the techniques were applied. If you apply manual procedures to your clients, when did you last review your own techniques?

Have the pre-manipulative procedures exaggerated the risks of manipulation? Reports of risk of stroke following manipulation vary from 1:1,000,000 to 1:163,000 (Rivett and Reid 1998). A manipulative physiotherapist who manipulates three or four upper cervical spines per week will not perform 163,000 manipulations in a practising lifetime.

The new guidelines may meet with greater compliance as a result of the changes. The requirement for a thorough subjective examination emphasising a high level of clinical reasoning is essential. Perhaps there should be an equally strong emphasis on the need for a high level of technical skill and application in performing the manipulation.

**Duncan Reid and Wayne Hing**

_Auckland University of Technology_

**References**


**Pre-manipulative testing: predicting risk or pretending to?**

Clinical practice guidelines should be evidence-based and useful. Unfortunately, the APA guidelines largely are not. Their recommendations include:

**History taking:** It is prudent to avoid cervical manipulation in patients with pre-existing cerebrovascular disease, whether vertebrobasilar or carotid in location. The guidelines give a list of possible vertebrobasilar symptoms, including neck pain and headache. They do not, and perhaps cannot, provide accurate discriminative information, since the list is open-ended and contains many non-specific symptoms. Furthermore, many stroke victims have been young adults without obvious risk factors or warning symptoms.

**Examination:** Screening tests should be valid and reliable predictors of risk. Pre-manipulative provocative testing has neither of these qualities, with available scientific evidence failing to show predictive value or justify its use (Cote et al 1996, Di Fabio 1999, Licht et al 2000). Testing does not determine that manipulation will be safe. Briefly sustained end of range movements and the other manoeuvres described (with or without Doppler) cannot reliably determine the safety of cervical manipulation proper, after which arterial dissection and intimal contusion with thrombosis can occur, rather than simply transient flow changes related to neck position. Yet provocative testing is recommended by the APA guidelines, including for those with pre-existing symptoms and in whom riskier techniques are planned.

Screening procedures should not be harmful. However, provocative testing may have some risk. There is a case for avoiding end-range cervical rotation of any kind (screening or manipulation proper) in patients with cerebrovascular symptoms. Yet in these patients, the guidelines promote most rigorous provocative testing.

**Informed consent:** This is the last but strongest element of the guidelines. The patient has the right to know the nature of his or her problem and treatment options with potential risks and benefits. Patients need to be informed of the small but significant risk of serious complications, including stroke, and their unpredictable occurrence. Treatment should also have proven benefit that outweighs any risks. Adequately informed patients may decide to avoid cervical manipulation with end-range rotation techniques and/or high-velocity thrust techniques, since no scientific evidence favours these over other available physical techniques.

**John Dunne**

_Royal Perth Hospital_

**References**


**Do the guidelines do what they are supposed to?**

The unwritten purpose of the guidelines appears to be to reduce risk to patients of cervical manipulation and to provide legal indemnity to physiotherapists. Do the guidelines achieve this purpose?

**Do the guidelines decrease risk from manipulation?** To be effective, the guidelines must address all known and potential risk factors. Despite this, only symptoms of vertebrobasilar insufficiency (eg dizziness) are mentioned.
in the guidelines, whereas the potential risk factors of neurological disorders, systemic inflammatory, infectious and malignant diseases, use of selected medications and disordered mental status are not mentioned, but could be identified through simple questioning.

In the physical examination, the guidelines recommend performance of sustained rotation in addition to the routine tests. Further “additional” or optional tests include extension, rotation combined with extension, and the simulated manipulation position. Inclusion of these tests was based on evidence that blood flow could be reduced in the vertebral and internal carotid arteries during extension and rotation, but the tests’ validity for reducing risk from manipulation is unknown.

Do the guidelines reduce physiotherapists’ legal liability?
The guidelines do not constitute a legally binding document. However, because they have been endorsed by the APA Board of Directors they may be considered legally to reflect the standard of care expected of a competent physiotherapist performing cervical manipulation. Such guidelines may therefore form the basis of expert opinion about minimum safety requirements. Nevertheless, because the decision to manipulate relies heavily on clinical reasoning, a physiotherapist could still be held liable in the event of an accident, despite having adhered to the guidelines. Thus, adherence to the guidelines does not, of itself, make a manipulation safe.

Thus, although some patients at risk from cervical manipulation may be identified by application of the new guidelines, the guidelines do not, in general, achieve their purpose. Ultimately, clinicians must rely on clinical reasoning to judge the wisdom of manipulating a particular patient.

Kathryn Refshauge
The University of Sydney

A valid pre-manipulative screening tool is needed

The Australian Physiotherapy Association’s Clinical Guidelines for Pre-Manipulative Procedures for the Cervical Spine represent a positive step towards the goal of reducing the incidence of vertebobasilar strokes following neck manipulation. Nevertheless, the predictive value of the guidelines is largely contingent upon the validity of the physical screening tests, particularly sustained end-range cervical rotation. The primary issue is the sensitivity of the tests for detecting patients with vertebral artery occlusion and vertebobasilar insufficiency, and who are at high risk of experiencing significant forces during manipulation which could result in intimal dissection.

Recently, Rivett et al (2000) used duplex ultrasound with colour Doppler flow and power Doppler imaging capabilities to measure vertebral artery haemodynamic parameters at the atlanto-axial region during pre-manipulative testing in 100 patients classified as either positive or negative to clinical testing. It was found that there were no significant differences in haemodynamic changes in any of the test positions (including end-range rotation) between the two groups. Furthermore, 20 patients exhibited total occlusion or partial occlusion (no diastolic flow) during testing, but only two patients reported potential ischaemic symptoms at the time. It was concluded that pre-manipulative tests are usually incapable of distinguishing between patients with varying degrees of flow impedance and are therefore unlikely to detect the patient at risk of stroke. Clearly, further research into alternative screening tools is urgently needed.

Given the limited validity of current pre-manipulative tests, the potential value of continuous-wave Doppler ultrasound as a pre-manipulative screening tool could be worthy of investigation. There is preliminary evidence that an experienced but unqualified operator can reliably detect a major reduction in vertebral artery blood flow in the atlanto-axial region during contralateral rotation compared with duplex scanning (Haynes 2000). Because continuous-wave ultrasound units are portable, relatively inexpensive and simple to operate, they may well have appeal to clinicians. However, further studies are needed to determine the reliability, validity and clinical feasibility of physiotherapists using such a device as a pre-manipulative screening tool.

Darren A Rivett
The University of Newcastle

Guidelines for pre-manipulative testing of the cervical spine - an appraisal

Are the guidelines valid? It is not clear if recommendations were derived from evidence of high quality or from evidence that is much more liable to error. The majority of evidence is based on low level evidence; that is, physiology, bench research, or “first principles” (Sackett et al 2000). Studies of moderate level evidence, where inappropriate sampling and a narrow spectrum of study individuals was used, revealed vertebobasilar insufficiency tests to be invalid. Information on the validity of the diagnostic studies, their accuracy, and detailed instruction for applying that evidence to our patients (Sackett et al 2000) was not reported in the guidelines.