



## UPDATE OF CODE OF PRACTICE FOR CERVICAL SPINE MANAGEMENT (2016)

### Background

Early in 2000, the New Zealand Manipulative Physiotherapists Association (NZMPA) developed a 'New Zealand Cervical Spine Pre-screening Guideline'. The NZMPA, with the support and co-operation of the Australian Physiotherapy Association (APA), then adopted the '2000 APA VBI Guideline' (Magery et al. 2004) and, with the endorsement of the Physiotherapy New Zealand (PNZ), established a code of practice for cervical spine management.

The 2000 APA VBI Guideline is no longer up to date with contemporary research and best practice and therefore the current code is now in need of updating based on more recent evidence particularly, the International Federation of Manipulative Physical Therapists (IFOMPT) International Framework for the examination of the cervical region for potential of cervical artery dysfunction prior to Orthopaedic Manual Therapy Intervention (2012) at [www.ifompt.org](http://www.ifompt.org) and the subsequent paper by Rushton et al. (2014) which announced and endorsed this framework.

### Original messages (2000)

There was a clear message in 2000 that all patients needed to be screened for risk of damage to the vertebral artery. This screening should involve a detailed history, followed by a physical examination that included the assessment of cervical rotation and ligament stability testing. The subjective examination placed an emphasis on asking for symptoms that might indicate vertebrobasilar artery insufficiency (VBI), which included: dizziness, double vision, dysarthria, dysphagia, drop attacks, numbness of the face and tongue and nausea (5D's and 3 N's).

Examination for the presence of symptoms suggestive of VBI was to occur at four stages in the management of a patient with an upper quadrant disorder:

- Subjective examination
- Physical examination
- Assessment of symptoms provoked during treatment of the cervical spine
- Assessment of symptoms following treatment

During the physical examination the minimum testing recommended included:

- Sustained end range cervical rotation to the left and right
- The position or movement which provoked symptoms as described by the patient
- All positions should be sustained for a minimum of 10 seconds, unless symptoms were provoked sooner. The therapist should examine the patient's eyes for the production of nystagmus while the head is held in the sustained position and simultaneously question the patient about the reproduction of symptoms.
- On return to neutral from the sustained position, a period of at least 10 seconds should be allowed before proceeding with the next examination procedure. During this time, the patient should be questioned about the provocation of symptoms and the patient's eyes should again be observed for nystagmus. Therapists should be aware of the potential for a latent response to movement and positional testing.

Whilst the above had been the accepted standard of practice, three key issues have emerged in more recent research:

1. The actual physical tests of cervical rotation have limited diagnostic utility for the reproduction of the VBI symptoms (sensitivity of 0%–21% and specificity of 23%–90%) (Ritcher and Reinking, 2005).
2. The importance of the subjective history in particular health related risk factors now has greater importance in predicting risk than the physical tests (Rushton et al 2014).
3. The physical tests need to include an assessment of blood pressure and potentially the cranial nerves (Rushton et al 2014).

### **New requirements**

Rather than a protocol of ‘pre-screening’, the new change has presented a framework for examination of the cervical region for the potential of Cervical Arterial Dysfunction (CAD) prior to assessment and management of the cervical spine. The following information is a summary of the main areas to consider taken from the IFOMPT website and the Rushton et al. (2014) paper.

#### **1. Subjective interview**

Following the appropriate subjective interview, the following risk factors need to be screened for:

##### **1.1 Cervical arterial dysfunction**

The following risk factors are associated with an increased risk of either internal carotid or vertebrasilar arterial pathology and should be thoroughly assessed during the patient history (Arnold and Bousser, 2005; Kerry et al, 2008):

- Past history of trauma to cervical spine / cervical vessels
- History of migraine-type headache
- Hypertension
- Hypercholesterolemia / hyperlipidemia
- Cardiac disease, vascular disease, previous cerebrovascular accident or transient ischaemic attack
- Diabetes mellitus
- Blood clotting disorders / alterations in blood properties (e.g. hyperhomocysteinemia)
- Anticoagulant therapy
- Long-term use of steroids
- History of smoking
- Recent infection
- Immediately post-partum
- Trivial head or neck trauma (Haneline and Lewkovich, 2005; Thomas et al, 2011)
- Absence of a plausible mechanical explanation for the patient’s symptoms.

**Please note:** the VBI questions (5D’s and 3 N’s) are still relevant part of the subjective examination.

##### **1.2 Upper cervical instability**

The following risk factors are associated with the potential for bony or ligamentous compromise of the upper cervical spine (Cook et al. 2005):

- History of trauma (e.g. whiplash, rugby neck injury, etc.)
- Throat infection
- Congenital collagenous compromise (e.g. syndromes: Down’s, Ehlers-Danlos, Grisel, Morquio)
- Inflammatory arthritides (e.g. rheumatoid arthritis, ankylosing spondylitis)
- Recent neck/head/dental surgery.

### 1.3 Decision-making regarding the physical examination

Based upon the evaluation and interpretation of the data from the patient history, the physical therapist needs to decide:

- Are there any precautions to Orthopaedic Manual Therapy (OMT)?
- Are there any contraindications to OMT?
- What physical tests need to be included in the physical examination?
- What is the priority for these physical tests for this specific patient? This is to inform decisions regarding the order of testing and to determine which tests should be completed at the first visit.
- Do the physical tests need to be adapted for this specific patient?

### Differential diagnosis: Stroke symptoms

	Internal carotid artery disease	Vertebrobasilar artery disease	Upper cervical instability
Early presentation	Mid-upper cervical pain, pain around ear and jaw (carotidynia), head pain (fronto-temporo-parietal); Ptosis; Lower cranial nerve dysfunction (VIII-XII); Acute onset of pain described as "unlike any other".	Mid-upper cervical pain; occipital headache; Acute onset of pain described as "unlike any other".	Neck and head pain; Feeling of instability; Cervical muscle hyperactivity; Constant support needed for head; Worsening symptoms.
Late presentation	Transient retinal dysfunction (scintillating scotoma, amaurosis fugax); Transient ischaemic attack; Cerebrovascular accident.	Hindbrain transient ischaemic attack (dizziness, diplopia, dysarthria, dysphagia, drop attacks, nausea, nystagmus, facial numbness, ataxia, vomiting, hoarseness, loss of short term memory, vagueness, hypotonia/limb weakness [arm or leg], anhidrosis [lack of facial sweating], hearing disturbances, malaise, perioral dysthaesia, photophobia, papillary changes, clumsiness and agitation); Cranial nerve dysfunction; Hindbrain stroke (e.g. Wallenberg's syndrome, locked-in syndrome).	Bilateral foot and hand dysthaesia; Feeling of lump in throat; Metallic taste in mouth (VII); Arm and leg weakness; Lack of coordination bilaterally.

## 2. Physical testing (Objective assessment)

### 2.1 Blood pressure

Hypertension is considered a risk factor for carotid and vertebral artery disease. More acutely, an increase in blood pressure may be related to acute arterial trauma, including of the internal carotid and vertebral arteries (Arnold and Bousser, 2006). Evaluation of blood pressure as part of the physical examination may therefore be a valuable test to inform clinical reasoning. Resting blood pressure should be taken in either sitting or lying, with the arm (brachial pulse site) being at the same level (in relation to gravity) as the heart / 4th intercostal space. A validated monitoring unit should be used ensuring the correct cuff-size. The cuff should be fitted so that two adult fingers can be inserted at the top and bottom when deflated. The patient should remain static in a calm environment for at least five minutes prior to testing. Repeat measurements can be taken leaving two minutes between each measurement. Normotensive range (non-diabetic adult) is systolic 120-140mmHg / 70-90mmHg diastolic (Mancia et al., 2007). Although hypertension is an undoubted strong predictor of cardiovascular disease, interpretation of readings must be in the context of other findings, and sound clinical reasoning.

## 2.2 Craniovertebral ligament testing

Instability of the craniovertebral ligaments could compromise the vascular and neurological structures in the upper cervical region. Mechanisms for causing symptoms and signs include: C1-C2 instability causing abnormal pressure on cervical nerves, vertebral artery compromise (Savitz and Caplan, 2005; Thanvi et al., 2005), and spinal cord compression (Bernhardt et al., 1993; Rao, 2002). Whether to test for instability is therefore an important decision when suspecting carotid and/or vertebral artery disease. The presence of spinal or peripheral joint instability is a clear contraindication to the use of OMT techniques (Gibbons and Tehan, 2006).

### *2.2.1 Symptoms and signs of cervical instability include (Gibbons and Tehan, 2005)*

1. Facial paraesthesia secondary to dysfunction of the connections of the hypoglossal nerve, as well as the ventral ramus (neck-tongue paraesthesia) and the dorsal ramus (facial numbness) of C2
2. Drop attacks
3. Bilateral or quadrilateral paraesthesia or motor deficits including weakness / incoordination
4. Nystagmus
5. Nausea.

## 2.3 Cranial nerve testing

- Examination of the peripheral nerves, cranial nerves, and for an Upper Motor Neurone lesion will assist in evaluating the potential for neurovascular conditions (Fuller, 2008)
- See this link for a comprehensive assessment.  
<http://www.neuroexam.com/neuroexam/content.php?p=15>

Cranial nerve quick tests can be summarised in the following rhyme:

- Smell and see (I, II)
- And look around (III, IV, VI)
- Pupils large and smaller (II)
- Smile, hear! (VII, VIII)
- Then say ah ... (X)
- And see if you can swallow (IX)
- If you're left in any doubt, Shrug and stick your tongue right out (XI, XII)
- Note: Cranial Nerve V (Trigeminal) is not included in this rhyme. Recall this is tested with sensory, motor and reflex testing.

## 2.4 Cervical positional tests

The positional tests of rotation of the cervical spine (i.e. sustained end-range rotation left and right) can still be used but less emphasis must be placed on these than in the past.

## 2.5 Differentiation

Differentiation of a patient's symptoms originating from a vasculogenic cause with complete certainty is not currently possible from the physical examination. Thus, it is important for the physical therapist to understand that headache / neck pain may be the early presentation of an underlying vascular pathology (Rivett, 2004; Taylor & Kerry, 2010). The task for the therapist is to differentiate the symptoms by:

1. Having a high index of suspicion
2. Testing the vascular hypothesis (as detailed above).

**Take home practice tips**

- There is a greater emphasis on a comprehensive history and in particular medical history with identification of vascular risk.
- There is less emphasis on past physical tests such as cervical rotation and a greater emphasis on tests for vascular risk and neurological status that may indicate the presence or likelihood of a stroke.

**Final Message**

If you are using orthopaedic manual therapy to treat patients with cervical spine disorders (mobilisation and/or manipulation) you need to demonstrate your ongoing competency to both assess and treat such patients. A regular update on recent advances in the literature and techniques to manage neck pain are available to members and non-members of PNZ and NZMPA.

Associate Professor Duncan Reid  
Chair Education Committee NZMPA, August 2016

## References

- Arnold M, Bousser G, Fahrni G, et al (2006). Vertebral Artery Dissection Presenting Findings and Predictors of Outcome. *Stroke* 37:2499-2503.
- Bernhardt M, Hyess RA, Blume HW, et al (1993). Cervical spondylotic myelopathy. *The Journal of Bone and Joint Surgery American* 75:119-128.
- Cook C, Brismee JM, Fleming R, et al (2005). Identifiers suggestive of clinical cervical spine instability: a Delphi study of physical therapists. *Physical Therapy* 85(9):895-906.
- Fuller G (2008). *Neurological examination made easy*. 4th Edition, Elsevier.
- Gibbons P, Tehan P (2005). *Manipulation of the Spine, Thorax and Pelvis: An Osteopathic Perspective*, 2nd Edn, Churchill Livingstone.
- Haneline M, Lewkovich G (2004). Identification of internal carotid artery dissection in chiropractic practice. *J Can Chiropr Assoc* 48(3):206-10.
- Kerry R, Taylor AJ, Mitchell JM, et al (2008). Cervical arterial dysfunction and manual therapy: A critical literature review to inform professional practice. *Manual Therapy* 13(4):278-288
- Magarey ME, Rebbeck T, Coughlan B, et al. K. Pre-manipulative testing of the cervical spine review, revision, and new clinical guidelines. *Man Ther.* 2004; 9:95–108.
- Mancia G, De Backer G, Dominiczak A et al (2007). Guidelines for the Management of Arterial Hypertension: The Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *Journal of Hypertension* 25(6):1105-87.
- Rivett DA (2004). Adverse effects of cervical manipulative therapy. In J.D. Boyling and G.A. Jull (eds.), *Grieve's Modern Manual Therapy of the Vertebral Column* (3rd ed). Churchill Livingstone: Edinburgh 533-549.
- Savitz S, Caplan L (2005). Vertebrobasilar Disease. *The New England Journal of Medicine* 352:2618- 2626.
- Taylor AJ, Kerry R (2010). A 'system based' approach to risk assessment of the cervical spine prior to manual therapy. *International Journal of Osteopathic Medicine* 13:85-93
- Rao R (2002). Neck pain, cervical radiculopathy, and cervical myelopathy. *The Journal of Bone and Joint Surgery* 84A (10):1872-1881.
- Ritcher, R and Reinking, M. How does evidence on the diagnostic accuracy of the vertebral artery test influence teaching of the test in a professional physical therapist education program? *Physical Therapy*. Volume 85. Number 6. June 2005
- Rushton et al (2014) International framework for examination of the cervical region for potential of Cervical Arterial Dysfunction prior to Orthopaedic Manual Therapy intervention. *Manual Therapy* (19) 222-228
- Thanvi B, Munshi SK, Dawson SL, et al (2005). Carotid and vertebral artery dissection syndromes. *Postgraduate Medical Journal* 81(956):383-8.
- Thomas LC, Rivett DA, Attia JR, et al (2011). Risk factors and clinical features of craniocervical arterial dissection. *Manual Therapy* 16(4):351-356.