

A practical checklist for managing chronic neck pain

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Long-term management of neck pain requires multimodal therapy similar to that for managing chronic low back pain. Psychosocial care and education are important options. Other treatments, particularly physiotherapy, are often directed at managing acute neck pain flare-ups.

Chronic neck pain refers to pain lasting for more than three months in the posterior neck area, bounded by the occiput, C7 vertebra and anterior borders of the trapezii. Chronic neck pain may be associated with pain in the shoulders and interscapular zone, and in some cases with widespread body pain. Chronic headache (cervicogenic headache) and/or arm pain may be present in up to 20% of patients with chronic neck pain.¹⁻³ The epidemiology, assessment and management of chronic neck pain parallels that of chronic low back pain.

Chronic neck pain affects 10% of adults at any given time and is more common in women, middle-age and higher socio-economic and urban settings. Risk factors for developing chronic neck pain include severe acute neck pain, whiplash-associated disorder, psychosocial stressors (anxiety, post-traumatic stress disorder, depression), work factors (office-based work, manual labour, work dissatisfaction), chronic headache, sleep disturbance, a sedentary lifestyle and smoking.¹⁻³ Chronic neck pain is a major cause of disability and economic burden, particularly after motor vehicle or workplace accidents.¹⁻³

Given the significant personal and societal impacts associated with chronic neck pain, this article presents information and management strategies using a practical checklist approach that can be applied in primary care.

Causes of chronic neck pain

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Key points

- About 20% of people who sustain a painful acute neck injury will develop chronic neck pain over the following 12 months.
- Risk factors for developing chronic neck pain include severe acute neck pain, whiplash-associated disorder, psychosocial stressors, work factors, chronic headache, sleep disturbance, a sedentary lifestyle and smoking.
- Screening for red and yellow flags at every consultation is vital.
- Treatments are often directed at managing acute pain flare-ups.
- Most studies of physiotherapy treatments report only modest analgesic effects and improvements in function; however, there may be individuals who respond well to certain treatments.
- The checklist outlined in this article offers a practical clinical approach for managing neck pain in primary care; however, there is only limited evidence to support most of the treatments mentioned.

pain over the following 12 months. Common inciting events for chronic neck pain include whiplash, postural loading (lifting, repetitive neck and arm movement, occupational overuse) and sports.¹⁻³ Just as in chronic low back pain, a clear-cut 'pain generator' is not identified in 80% of cases of neck pain.

Where a musculoskeletal neck pain generator is identified, the most common sources are:

- facet joints (40% of cases)

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pain generator (specific or nonspecific) and the presence or absence of headache and/or arm pain. Most arm pain is 'referred' from musculoskeletal structures (e.g. facet joints, trigger points). Radicular arm pain is less frequent (10 to 20% of patients with arm pain) and commonly arises from the C5 or C6 nerve roots. The most frequent classification seen in primary care is chronic nonspecific neck pain.

Pathophysiology

The neck is vulnerable to injury such as whiplash and to physical loading such as occupational overuse. The neck contains numerous myofascial and neural structures that can generate pain. The head, neck and shoulder region is also susceptible to developing central (pain) sensitisation. Connections between the trigeminal nucleus (brainstem) and upper spinal cord (C2 to C4 levels) explain the strong link between neck pain and headaches.^{5,6} Interestingly, stress-related neck pain may reflect our quadruped ancestry, where increased muscle tension in the neck and shoulders allowed for escape from predators during 'fight or flight' situations.

Whiplash-associated neck pain

Whiplash-associated neck pain is a specific syndrome associated with flexion-extension loading of the neck, usually after a motor vehicle crash.¹⁻³ Although in most cases whiplash does not cause structural damage in the neck, it may be associated with facet joint disruption (most frequently of the C5 or C6 joints), discopathy (annular tears), myofascial injury and less commonly, vertebral fracture, traction of the sympathetic chain in the neck or a cervical dural tear, which is associated with postural headaches.

Neck pain after whiplash may lead to injury compensation claims with impacts on work and finances, which can lead to stress, anxiety, catastrophising, depression and substance use (see yellow flags, Box). The best predictors for developing chronic neck pain and disability after whiplash are:

- onset of severe acute pain
- early neck disability
- psychosocial load (especially anxiety)

- intervertebral discs (20% of cases)
- myofascial trigger points, particularly the trapezius.⁴

Less common causes of neck pain include:

- spondylitis
- vertebral fractures
- vertebral end-plate (Modic) changes
- cervical plexus, spinal cord or sympathetic chain pathology

- vascular pathology (e.g. carotid or vertebral artery dissection)
- visceral pathology (i.e. thyroid, lymph glands, pharynx, oesophagus).

Red flag causes of chronic neck pain (Box) are rare, accounting for less than 5% of cases.

Classification

The classification of neck pain is based on timing (acute or chronic), identification of a

Chronic neck pain management checklist

- Red flags** ⇒ MRI of cervical spine (and other tests as appropriate)
 - 'TINT'
 - Tumour
 - Torticollis
 - Inflammation (spondylitis)
 - Infection (discitis)
 - Neurovascular (radiculopathy, plexus, cord, arteries)
 - Trauma (fracture, cervical instability)
 - Age >55 years or age <20 years
 - Cancer
 - Corticosteroid use
 - Injury or fall
 - Horner's syndrome
 - Severe radicular arm pain or neurological signs ⇒ urgent MRI and neurosurgical review
- Yellow flags** ⇒ early psychosocial care (see below)
 - 'CHAMPS'
 - Catastrophising
 - Hypervigilance
 - Anxiety
 - Medicalised
 - Passive-coping
 - Stress
 - Substance or medication overuse
 - 'Sick-of-work'
- Whiplash-associated neck pain**
- Postsurgical neck or arm pain**
- Headache (cervicogenic, migraine, medication-overuse, dural tear)**
- Widespread body pain**
- Simple pain generators**
 - Shoulder pain (trapezius and rhomboid trigger points) ⇒ trigger point release physiotherapy, trigger point injection, dry needling, acupuncture
 - Headache (greater occipital neuralgia) ⇒ greater occipital nerve block with local anaesthetic and corticosteroid
- Pain education and key messages**
 - ⇒ set realistic outcomes and functional goals
 - ⇒ reassure the patient about imaging findings
 - ⇒ help the patient understand that 'hurt doesn't equal harm'
 - ⇒ demedicalise
 - ⇒ refer the patient to pain programs

- Multimodal analgesia**
 - ⇒ paracetamol
 - ⇒ NSAID gel
 - ⇒ tramadol/tapentadol/duloxetine (off-label use)/pregabalin (for radicular pain)
 - ⇒ celecoxib (for pain flare-ups)
 - ⇒ baclofen (for muscle spasms, short term)
- Physical therapies (detailed in Tables 1 and 2)**
- Psychosocial care**
 - Screen for anxiety (post-traumatic stress disorder), depression, sleep disturbance, medication and substance use
 - ⇒ antidepressants (e.g. duloxetine)
 - ⇒ clinical psychology, sleep management
 - ⇒ injury rehabilitation, help with compensation claims
- Pain management procedures**
 - Neck pain radiating into shoulders
 - ⇒ C5/6 FJI or pulsed RF treatment* or thermal RF neurotomy†
 - Radicular arm pain
 - ⇒ MRI to confirm nerve root abnormality
 - X** DO NOT order nerve root sleeve or epidural corticosteroid injection because of the risk of spinal cord or brain infarction with inadvertent particulate corticosteroid injection into spinal arteries of neck and poor efficacy of cervical epidural corticosteroid injections
 - ⇒ consult a specialist pain medicine physician or a neurosurgeon/spinal surgeon
 - Neck pain and headache
 - ⇒ greater occipital nerve/lesser occipital nerve blocks or pulsed RF treatment or cryoneurotomy
 - ⇒ C2 or C3 FJI or pulsed RF treatment,* or thermal RF neurotomy†
 - Neuromodulation or cervical spine surgery
 - ⇒ seek specialist advice
 - Ongoing review
 - ⇒ recycle through the checklist

Abbreviations: FJI = facet joint corticosteroid injection; RF = radiofrequency.

* Function of the medial nerve branch (supplying the facet joint) is inhibited by applying pulsed RF electrical energy through a percutaneous needle.

† The medial nerve branch is cauterised (90°C) using RF electrical energy, producing a neurotomy.

- evidence of pain sensitisation (allodynia) in the neck and shoulders.¹⁻³

Multimodal pain management

Managing chronic neck pain is similar to managing chronic low back pain in that a multimodal, multidisciplinary approach is required. Treatments, particularly

physiotherapy, are often directed at managing acute neck pain flare-ups in patients with chronic neck pain.

Prevention

There is some evidence that minimising whiplash and work- and sports-related neck injuries, and managing severe acute neck pain and psychosocial stressor load

(yellow flags) may reduce the incidence of chronic neck pain and disability; however, further research is required in this area.¹⁻³

Screening for red and yellow flags

Screening for red and yellow flag conditions at every consultation is crucial (Box). Red flags are rare but serious conditions causing

pain, such as neurological deficits, fractures, metastatic cancer or infection, and should not be missed. An MRI scan of the cervical and upper-thoracic spine is the investigation of choice for most red-flag conditions. Yellow flags are psychosocial stressors associated with an increased risk of chronic pain and disability.

Physiotherapy management

Physiotherapy can be effective as part of a multidisciplinary pain management approach for the management of chronic neck pain and related disabilities.⁷⁻¹³ A physiotherapist is often the first professional to perform a comprehensive physical examination of the patient.

Physiotherapy management of chronic neck pain includes:

- comprehensive clinical assessment of the patient
- assessment of neck function and disability levels
- screening for red and yellow flags
- patient education
- managing patient expectations and concerns about their condition
- applying evidence-based multimodal physical therapies (Tables 1 and 2)
- managing associated pain conditions (e.g. headache, shoulder pain, interscapular spinal pain).

In agreement with recent international evidence-based guidelines, the 2002 Neck Pain Evidence-Based Clinical Statement of the Australian Physiotherapy Association recommended a multimodal physiotherapy approach to chronic neck pain, which is associated with improved strength, functional and pain outcomes.^{7,9} The 2017 American Physiotherapy Association evidence-based clinical practice guidelines for the management of chronic neck pain are summarised in Table 1.⁹

The effectiveness of any physiotherapy intervention requires ongoing reassessment to determine if it is the most appropriate treatment for a particular patient. Early referral to a physiotherapist and identification of factors that contribute to chronic pain are essential to preventing chronic neck pain. The risks versus benefits of each

Table 1. Evidence-based physiotherapy for treatment of chronic neck pain⁷⁻¹⁴

Therapy	NHMRC level of evidence*
<i>Education, physical and psychological therapies</i>	
Patient education (key messages)	Level II†
Encouraging normal activities and pacing	Level II
General exercise and aerobic reconditioning (walking)	Level II
Exercise rehabilitation for thoracic and cervical regions	Level I
Ergonomics (e.g. posture, workplace, desk and keyboard set-up, manual handling)	Level II
Relaxation, mindfulness, cognitive and behaviour strategies <ul style="list-style-type: none"> • managing fear avoidance of painful movements • encouragement, reassurance, 'coaching' 	Level I†
<i>Treatments for acute neck pain exacerbations</i>	
Hot or cold packs	Level I†
Yoga	Level I
Manual therapies <ul style="list-style-type: none"> • manipulation • mobilisation • clinical massage • trigger-point release 	Level I
Dry needling of myofascial trigger points (trapezii, rhomboids)	Level II
Acupuncture	Level I
Electrophysical therapies <ul style="list-style-type: none"> • low-level laser therapy • pulsed electromagnetic therapy • repetitive magnetic stimulation • transcutaneous electrical nerve stimulation • interferential low-frequency electrical nerve stimulation 	Level II†
Neural mobilisation therapies (radicular arm pain)	Level I†
Biofeedback	Level II
Intermittent cervical spine traction (radicular arm pain)	Level I
* Level I: evidence obtained from a systematic review of all relevant randomised controlled trials; Level II: evidence obtained from at least one properly designed randomised controlled trial. ¹⁴	
† Evidence is conflicting or the treatment response for neck pain is equivocal or minor.	

treatment must be considered by the therapist (e.g. the potential risks of cervical manipulation, traction, acupuncture or dry needling).

Evidence-based physiotherapy approaches for the treatment of chronic neck pain with NHMRC levels of evidence are listed in Table 1.⁷⁻¹⁴ For most treatments, evidence

is of low-to-moderate quality and often conflicting. Most studies report an equivocal or minor analgesic effect for neck pain over a short period (usually days), with minimal improvement in function. However, following the tenets of personalised medicine, there may be individuals who respond well to certain treatments.

Table 2. Physiotherapy for specific neck pain syndromes⁷⁻¹³

Neck pain syndrome	Treatment
Whiplash-associated neck pain with reduced range of movement	As per Table 1, and specifically: <ul style="list-style-type: none"> • cervico-scapulo-thoracic mobilisation
Whiplash-associated neck pain with impaired motor co-ordination	As per Table 1, and specifically <ul style="list-style-type: none"> • cervico-scapulo-thoracic neuromuscular exercises <ul style="list-style-type: none"> – proprioception – movement co-ordination – postural training – strengthening and endurance training • specific exercise programs <ul style="list-style-type: none"> – McKenzie method^{4,1} • functional and occupational rehabilitation
Radicular arm pain	As per Table 1, and specifically <ul style="list-style-type: none"> • thoracic and cervical mobilisation • thoracic and cervical manipulation • neural mobilisation therapies • intermittent cervical spine traction
Cervicogenic headache	As per Table 1, and specifically <ul style="list-style-type: none"> • myofascial trigger point treatments (trapezii, rhomboids) <ul style="list-style-type: none"> – dry needling or acupuncture • Watson headache approach^{5,6}

Medical management of chronic neck pain: a checklist approach

The checklist outlined in the Box offers a practical clinical approach for managing neck pain in primary care. However, there is only limited evidence to support most of the treatments mentioned.⁵⁻¹³

Conclusion

Chronic neck pain affects 10% of the population and is a leading cause of disability. The neck is vulnerable to injury and dysfunctional mechanical loading associated with whiplash, office or manual work and sports. The head and neck region is also susceptible to developing central (pain) sensitisation. Risk factors for transition to chronic neck pain after neck injury or postural or dynamic loading include severe acute pain, early impairment of neck function (disability) and increased psychosocial stressor load (yellow flags). Pain management requires a multimodal approach, including physiotherapy that is focused on patient education and restoration of neck function, and management of

psychosocial load factors, particularly anxiety disorders. **PMT**

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References

1. Teichtahl AJ, McColl G. An approach to neck pain for the family physician. *Aust Fam Physician* 2013; 42: 774-778.
2. Centre of National Research on Disability and Rehabilitation Medicine (CONROD). Whiplash. Evidence based information resource. Brisbane: CONROD, University of Queensland; 2009. Available online at: <http://www.conrod.org.au/cms/resources-and-tools/whiplash-evidence-based-resource> (accessed June 2018).
3. TRACsa: Trauma and Injury Recovery. Clinical guidelines for best practice management of acute and chronic whiplash-associated disorders. Adelaide: TRACsa; 2008. Available online at: http://implementationcentral.com/doc/Whiplash-Clinical-Guidelines_practitioner.pdf (accessed June 2018).
4. Falco FJ, Erhart S, Wargo BW, et al. Systematic review of diagnostic utility and therapeutic

effectiveness of cervical facet joint interventions. *Pain Physician* 2009; 12: 323-344.

5. Watson DH, Drummond PD. The role of the trigemino cervical complex in chronic whiplash associated headache: a cross sectional study. *Headache* 2016; 56: 961-975.
6. Watson DH, Drummond PD. Cervical referral of head pain in migraineurs: effects on the nociceptive blink reflex. *Headache* 2014; 54: 1035-1045.
7. Costello J, Jull G. Neck Pain Position Statement. Victoria: Australian Physiotherapy Association; 2002.
8. O’Riordan C, Clifford A, Van de Ven P, Nelson J. Chronic neck pain and exercise interventions: frequency, intensity, time, and type principle. *Arch Phys Med Rehabil* 2014; 95: 770-783.
9. Blanpied PR, Gross AR, Elliott JM, et al. Neck pain: revision 2017. Clinical practice guidelines linked to the International Classification of Functioning, Disability and Health from the orthopaedic section of the American Physical Therapy Association. *J Orthop Sports Phys Ther* 2017; 47: A1-A83.
10. Wong JJ, Shearer HM, Mior S, et al. Are manual therapies, passive physical modalities, or acupuncture effective for the management of patients with whiplash-associated disorders or neck pain and associated disorders? An update of the Bone and Joint Decade Task Force on Neck Pain and Its Associated Disorders by the OPTiMA collaboration. *Spine J* 2016; 16: 1598-1630.
11. Moffett JK, Jackson DA, Gardiner ED, et al. Randomized trial of two physiotherapy interventions for primary care neck and back pain patients: ‘McKenzie’ vs brief physiotherapy pain management. *Rheumatology (Oxford)* 2006; 45: 1514-1521.
12. Damgaard P, Bartels EM, Ris I, Christensen R, Juul-Kristensen B. Evidence of physiotherapy interventions for patients with chronic neck pain: a systematic review of randomised controlled trials. *ISRN Pain* 2013; 2013: 567175.
13. Basson A, Olivier B, Ellis R, Coppieters M, Stewart A, Mudzi W. The effectiveness of neural mobilization for neuromusculoskeletal conditions: a systematic review and meta-analysis. *J Orthop Sports Phys Ther* 2017; 47: 593-615.
14. National Health and Medical Research Council. A guide to the development, evaluation and implementation of clinical practice guidelines. Canberra: NHMRC; 1999. Available online at: <https://www.nhmrc.gov.au/guidelines-publications/cp30> (accessed June 2018).

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