Cervical radiculopathy - management in secondary care

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1 Background information

Quick info:

Scope:
- assessment of neck pain in adults (age 18 years and older)
- common causes of neck pain, including:
  - acute torticollis
  - cervical radiculopathy
  - whiplash injury
  - non-specific causes
- investigations in secondary care
- pharmacological and non-pharmacological treatments

Out of scope:
- assessment of neck pain in children (age less than 18 years)

Definition:
- acute torticollis, or wry neck, is a twisted neck
- cervical radiculopathy is usually caused by compression/injury to a nerve root in the cervical spine
- acute whiplash injury usually follows sudden or excessive hyperextension, hyperflexion, or rotation of the neck
- non-specific neck pain has no specific underlying disease causing the pain

Prevalence:
- about 19% of the population may suffer from chronic neck pain at any given time [1]
- lifetime prevalence of neck pain has been reported to be up to about 70% [1,2]
- 12-month prevalence estimates range from 30% to 50% [2]
- predicted to reach epidemic proportions in developed countries with ageing populations in the next 30 years [3]

Classification:
- neck pain can be classified by the duration of symptoms as follows:
  - acute (within four weeks)
  - subacute (4-12 weeks)
  - chronic (more than 12 weeks)
- neck pain can also be classified by the presence/absence of clinical features such as:
  - radiculopathy
  - hyperflexion/extension injury/trauma

Risk factors include:
- workplace-associated risks, such as:
  - awkward neck postures
  - neck flexion
  - arm force/posture
  - prolonged periods of sitting, twisting, or bending of the trunk
  - hand-arm vibration
- excessive use of pillows
- factors that may indicate increased risk for chronicity and disability include:
  - severity and duration of acute injury
  - depression

This information was drawn from the following references:

Cervical radiculopathy - management in secondary care

Surgery > Orthopaedics > Neck pain


NB: This information appears on each page of this pathway.

2  Information resources for patients and carers

Quick info:
Patients and carers in England can access this pathway through NHS Choices at http://healthguides.mapofmedicine.com/choices/map/neck_pain1.html

The following resources have been produced by organisations certified by The Information Standard:

- 'Back and neck pain' (URL) from the Brain and Spine Foundation at http://www.brainandspine.org.uk
- 'Osteopathy' (URL) from Bupa at http://www.bupa.co.uk/
- 'Chiropractic' (URL) from Bupa at http://www.bupa.co.uk/
- 'Non-specific neck pain' (PDF) from Patient UK at http://www.patient.co.uk
- 'Torticollis' (PDF) from Patient UK at http://www.patient.co.uk
- 'Whiplash neck sprain' (PDF) from Patient UK at http://www.patient.co.uk
- 'Cervical spondylosis' (PDF) from Patient UK at http://www.patient.co.uk

Information for carers and people with disabilities is available at:
- 'Caring for someone' (URL) from Directgov at http://www.direct.gov.uk
- 'Disabled people' (URL) from Directgov at http://www.direct.gov.uk

Patient stories describing their care journeys are available at 'Healthtalkonline' (URL) from DIPEx at http://www.healthtalkonline.org

Explanations of clinical laboratory tests used in diagnosis and treatment are available at 'Understanding Your Tests' (URL) from Lab Tests Online-UK at http://www.labtestsonline.org.uk

The Map of Medicine is committed to providing high quality health and social care information for patients and carers. For details on how these resources are identified, please see Map of Medicine Patient and Carer Information.

NB: This information appears on each page of this pathway.

3  Updates to this pathway

Quick info:
Date of publication: 31-Oct-2011
Interim update:
This care map has been updated in line with the following guideline:

Date of publication: 29-Jul-2011
Interim update:
The care map has been updated to remove recommendations on non-invasive therapies, such as light-laser therapy, for treatment of cervical radiculopathy due to a lack of high-level evidence.

Date of publication: 30-Jul-2010
Three nodes now appear at the top of each pathway page. These provide:
- easy access to scope and background information on each page of the pathway whilst reducing repetition between nodes
- easy access to patient resources/leaflets
- information on pathway updates

The pathway has been updated in line with the following guidelines:
Cervical radiculopathy - management in secondary care

Surgery > Orthopaedics > Neck pain


Further information was provided by the following references: [1-3,5,13,15-20].

For further information, please see the pathway's Provenance.

The pathway has been completely restructured and redrafted in line with the Map of Medicine editorial methodology and to bring it in line with current clinical practice.

NB: This information appears on each page of this pathway.

4 Cervical radiculopathy - clinical presentation

Quick info:

Aetiology:
- usually due to compression/injury to a nerve root in the cervical spine, caused by mechanical compression, nerve root irritation, and/or neurotoxicity
- most common causes of cervical radiculopathy are cervical disc herniation and degenerative changes (including apophyseal joint or ligamentous hypertrophy and osteophyte formation)
- nerve root symptoms should normally arise from a single nerve root – involvement of more than one nerve root suggests a more widespread neurological disorder

Presenting symptoms:
- pain:
  - onset is usually gradual, but may be abrupt
  - may be severe enough to wake the person at night
  - usually unilateral, but may be bilateral
  - commonly radiates to an arm
- motor dysfunction
- sensory deficits, altered sensation, or numbness
- alteration in tendon reflexes
- weakness in related muscles

This information was drawn from the following reference:


5 History

Quick info:

Take a thorough history of neck pain:
- nature, onset, site, and duration of pain
- precipitating and relieving factors
- radiation
- associated disability, stiffness, muscle spasm, and spinal pain
- prior neck surgery or injury
- any other potentially-associated injuries

Published: 13-Oct-2011    Valid until: 31-Aug-2013    Printed on: 11-Feb-2013    © Map of Medicine Ltd

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Enquire about the following symptoms:

- headache
- fatigue
- dizziness
- nausea
- paraesthesiae

- facial formication:
  - sensation of ants crawling over the face
  - may indicate posterior cervical sympathetic syndrome
- jaw pain
- associated stress, anxiety, depression, and/or poor concentration

Ask the patient to self-evaluate their level of pain using the neck disability index (NDI):

- score is out of 50 (as recommended by the developer) – caution should be used when reading clinical reports to ascertain which metric was used (may be given as percentage) [1]
- short-term therapy goals should require a minimum of 5-10 points change for whiplash-associated disorders (WADs) [1]
- longer-term treatment goals should be set for a minimum 7-point reduction in score [1]
- when the baseline score is outside of the 10-40 range, supplementation of the NDI with a Patient-Specific Functional Scale should be considered [1]

- Vernon and Mior suggest that a score between [1]:
  - 0-4 represents no disability
  - 5-14 represents mild disability
  - 15-24 represents moderate disability
  - 25 and 34 represents severe disability
  - greater than 35 represents complete disability

- Sterling et al. suggest that a score between [1]:
  - 0-8 represents recovery
  - 10-28 represents mild disability
  - greater than 30 represents moderate-to-severe disability

Assess for presence of co-morbidities, such as:

- immunosuppression
- malignancy
- infection
- bladder/bowel dysfunction
- steroid use
- osteoporosis
- depression

Discuss current medications (including steroid use and chemical dependency if appropriate) and medication allergies.

References:

Examine patient for typical features, such as:

- restricted neck movements or sharp pain that radiates to an arm upon extension/bending/turning to the affected side [7]
- postural asymmetry [7]:
  - head may be held to one side or flexed, as this decompresses the nerve root
  - if the asymmetry is long standing, muscle wasting may be present
- dural irritation – assess with the Spurling test [5]:
  - examiner extends the neck, while flexing laterally and rotating the head, and then applies downward pressure on the head
  - test is positive if pain radiates to the arm ipsilateral to the side the head is rotated towards
- neurological signs, such as [7]:
  - upper limb weakness
  - paraesthesiae
  - dermatomal sensory or motor deficit
  - diminished tendon reflexes at the appropriate level
  - sensory symptoms, eg. shooting pains, numbness, hyperaesthesia [7]

Neurological features of the common cervical radiculopathies [7]:

- typically follow a segmental distribution in the arms
- levels C5 to T1 are most commonly affected
- retro-orbital and temporal pain suggest referral from the upper cervical levels (C1 to C3) and can mimic giant cell arteritis
- C5 nerve root affected:
  - shoulder abduction/flexion and/or elbow flexion muscle weakness
  - reflex changes in biceps/supinator
  - lateral forearm, thumb, and/or index finger sensory changes
- C6 nerve root affected:
  - elbow flexion and/or wrist extension muscle weakness
  - reflex changes in biceps/supinator
  - lateral forearm, thumb, and/or index finger sensory changes
- C7 nerve root affected:
  - elbow extension, wrist flexion, and/or finger extension muscle weakness
  - reflex changes in triceps
  - middle finger sensory changes
- C8 nerve root affected:
  - finger flexion muscle weakness
  - no reflex changes
  - medial side lower forearm, ring and/or little finger sensory changes
- T1 nerve root:
  - finger abduction and adduction muscle weakness
  - no reflex changes
  - medial side upper arm/lower arm sensory changes

NB: The presence of pain or paraesthesia radiating into the arm is not specific for nerve root pain and may also be present in people with non-specific neck pain [7].

References:
Cervical radiculopathy - management in secondary care

Surgery > Orthopaedics > Neck pain

- brachial plexus injury
- cervical disc injuries, such as:
  - prolapse/herniation
  - spondylosis
  - fracture
  - subluxation
- cervical discogenic pain syndrome (CDPS)
- cervical facet syndrome
- cervical spine and strain/sprain injuries
- rotator cuff injuries

Reference:

8 Investigations

Quick info:
Plain cervical radiography:
- usually ordered first, provided no co-morbidities or conditions are present that warrant urgent magnetic resonance imaging (MRI) [5]
- lateral, oblique, and anteroposterior views should be ordered [5]
- disc-space narrowing, subchondral sclerosis, and osteophyte formation are highly suggestive findings [5]
- where more detailed soft tissue and bony assessment is needed, an MRI or computed tomography (CT) scan should be ordered [5] – MRI is usually preferred over computed tomography (CT) for evaluating disc pathology [11]

When interpreting results of investigations, be aware that [11]:
- bulging discs are usually not significant in the absence of spinal stenosis
- disc degeneration and arthritic changes per se are not necessarily painful
- the size of a disc protrusion does not correlate with pain level

Cervical provocation discography (CPD) [16]:
- image-guided procedure in which a contrast agent is injected into the nucleus pulposus of the intervertebral disc
- intended to:
  - identify a painful cervical intervertebral disc
  - depict internal derangements
  - distinguish a painful disc from other potential sources of pain
- includes:
  - morphological evaluation
  - disc stimulation – based on the assumption that if a particular disc is painful, stressing it under circumstances that simulate physiological conditions should reproduce the patient’s pain
- plays a significant role in selecting surgical candidates (may prevent unnecessary surgical intervention) and improving outcomes
- recent systematic review found that CPD performed according to the International Association for the Study of Pain (IASP) criteria may be a useful tool for evaluating chronic cervical pain, without disc herniation or radiculitis
  - 'accepted' false-positive rates range from less than 5% to 27% (higher in patients with chronic neck pain than in asymptomatic patients)
- still remains controversial as a diagnostic intervention:
  - some concern that disc stimulation may provoke pain in normal discs
  - considered hazardous in patients with spinal stenosis or disc bulges that impinge or threaten to impinge on the spinal cord
  - may worsen or precipitate a pre-existing protrusion
  - for injections at C2-3, the larynx may obstruct access to the disc, whereas at C7-T1 the apex of the lung may be encountered
  - however, if conducted carefully and correctly, cervical discography should be a minimal risk procedure
Cervical radiculopathy - management in secondary care
Surgery > Orthopaedics > Neck pain

Diagnostic cervical facet joint nerve blocks [2]:
- controlled diagnostic blocks with two local anesthetics with placebo control
- only means of confirming the diagnosis of facet joint pain

References:

9 General advice and reassurance

Quick info:
Provide reassurance and information – 90% of people are either asymptomatic or only mildly symptomatic after 5 years [7].

Advise [5]:
- gentle exercise (within comfort zone)
- intermittent heat or a cold pack to help reduce pain and spasm
- sleeping on a low firm pillow
- maintaining a good posture

Advise against [5]:
- routine use of a soft cervical collar
- driving (may be difficult to rotate the head to view traffic)

References:

10 Pain relief options

Quick info:
Pain relief is likely to be sufficient for a large proportion of patients, for whom more invasive interventions (eg surgery) are not necessary [5].

Offer analgesia to relieve pain [7]:
- choice of analgesia will depend on the severity and chronicity of pain, personal preferences, tolerability, and risk of adverse effects
- options include:
  - paracetamol or a non-steroidal anti-inflammatory drug (NSAID) taken as required – this will be sufficient for many people
  - paracetamol taken regularly – more likely to be effective for neck pain when used regularly rather than ‘as required’
  - NSAID taken regularly
  - paracetamol and NSAID taken together regularly
  - codeine taken in addition to regular paracetamol/NSAID:
    - consider if the response to either drug is insufficient
    - codeine should be prescribed separately to allow flexibility of dosing and titration of analgesic effect
  - combination products, eg. co-codamol are not recommended
- no evidence to suggest that any particular NSAID is more effective than another for neck pain – ibuprofen is generally preferred because of its lower risk of gastrointestinal adverse effects
- when prescribing NSAIDs:
  - consider prescribing a gastroprotective agent, eg. a proton pump inhibitor (PPI) for patients with increased risk of gastrointestinal bleeding, eg. elderly patients

References:
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- review treatment if the patient has dyspepsia

If the pain has lasted for longer than 4 weeks and appears to be unresponsive to full-dose standard analgesics, consider a trial (1 month) of:

- a low-dose tricyclic antidepressant such as amitriptyline [7]
- also consider pregabalin or gabapentin [21]:

  - titrate the dose according to response and tolerability
  - consider imipramine or nortriptyline (off-label use) if amitriptyline is effective but the patient cannot tolerate the adverse effects
  - consider the treatment if there is satisfactory improvement of symptoms or consider referral if appropriate
  - consider gradually reducing the dose over time if symptom improvement is sustained

- if patients do not achieve satisfactory pain reduction at the maximum tolerated dose:

  - if on amitriptyline or another tricyclic antidepressant (TCA)
    - switch to pregabalin or gabapentin; or
    - combine the TCA with pregabalin or gabapentin

  - if on pregabalin or gabapentin:
    - switch to amitriptyline or another TCA; or
    - combine pregabalin or gabapentin with the TCA

- if the patient still fails to achieve satisfactory pain reduction with drug treatment at the maximum tolerated dose:

  - refer to a specialist pain service or condition-specific specialty, as appropriate:
    - state the medications, doses, and time periods that have been used

  - while awaiting referral:
    - consider a trial of tramadol, alone or in combination with amitriptyline and/or pregabalin – when used in combination therapy, tramadol should be prescribed as a rescue analgesic for breakthrough pain
    - consider topical lidocaine for treatment of localised pain for people who are unable to take oral medication because of medical conditions or disability
    - do not offer any other drug treatment unless initiated by a specialist:
      - specialist treatments may be continued in primary care under a multidisciplinary care plan or local shared-care agreement

References:


11 Consider spinal cord stimulation (SCS)

Quick info:

Spinal cord stimulation (SCS):

- minimally-invasive and reversible procedure that modifies the perception of neuropathic and ischaemic pain by stimulating the dorsal column of the spinal cord [5]
- SCS devices are surgically implanted under the skin in the abdomen/buttock area, with an electrode implanted near the spinal cord [5]
- a remote controller is then used to turn the neurotransmitter on/off and adjust the level of stimulation [5]
- recommended as a treatment option for patients with chronic pain of neuropathic origin who [5]:
  - continue to experience chronic pain (measuring at least 50 mm on a 0–100 mm visual analogue scale) for at least 6 months despite appropriate conventional medical management, eg. pharmacotherapy, nerve blocks
  - have been assessed by a multidisciplinary team (MDT) experienced in chronic pain assessment and management of people with spinal cord stimulation devices
  - have had a successful trial of stimulation under the supervision of the MDT
  - may be delivered in parallel with other therapies and used as part of an overall rehabilitation strategy [17]
  - not recommended as a treatment option for adults with chronic pain of ischaemic origin except in the context of research as part of a clinical trial [5]
• re-intervention may be necessary to replace the SCS device due to:
  • component failures [12]
  • incorrect lead position [12]
  • infection [12]:
    • commonest organism to infect SCS system is *Staphylococcus aureus* [17]
    • patients scheduled for SCS should be screened for methicillin-resistant *S. aureus* less than four weeks prior to procedure and antibiotic prophylaxis given where appropriate [17]
  • depletion of power source [12]

• at present, the majority of radiologists would not advise the use of magnetic resonance imaging (MRI) with an SCS in situ – if MRI is needed, it may be necessary to remove the SCS system [17]

References:

12 Consider epidural injections

Quick info:
Epidural corticosteroid injections:
  • commonly-performed intervention for managing chronic neck pain in the United States [18]
  • a recent systematic evaluation of cervical interlaminar epidural injection showed significant effect in relieving chronic intractable pain and providing long-term pain relief [18]
  • fluoroscopic guidance may help to improve the efficiency with which medications reach the appropriate and desired intervertebral space [18]
  • it is imperative for injectionists to standardize techniques to minimize complications [19]
  • a test dose of local anesthetic should be administered prior to injection [19]
  • preferable to use non-particulate corticosteroid [19]
  • be aware that epidural is invasive and referral usually occurs later in the course of treatment and only on specialist advise [5]

Complications [18]:
  • few and relatively minor
  • in some studies, the rate of complications per epidural steroid injection was found to be 0.8% (incidence of major complications was 0.4%)
  • most common (and concerning) complications relate to the needle placement and drug administration, including:
    • subarachnoid or subdural entry
    • spinal cord trauma or brain damage, eg. due to increased intracranial pressure
    • infection, including:
      • meningitis
      • cervical epidural abscess (extremely rare)
    • haematoma or abscess formation
    • intracranial air injection
    • epidural lipomatous
    • vascular injury, including:
      • vasospasms
      • embolic phenomena
    • cerebrovascular or pulmonary embolus
    • neurologic complications (uncommon) including:
      • intrinsic spinal cord damage
Both therapeutic medial branch blocks and cervical facet joint radiofrequency neurotomy have been shown to demonstrate effective short- and long-term pain relief for chronic cervical facet joint neck pain [5].

References:

13 Consider surgical intervention

Quick info:
Surgical treatment options for cervical spondylotic myelopathy (CSM) [20]:
- in moderate to severe/progressive cases, results in significant improvements in functional status and overall pain (compared with nonsurgically-treated patients)
- considerable controversy over which surgical approach will yield the best outcome
- some evidence to suggest that laminoplasty (LAMP) has fewer complications, greater subsequent range of motion, and similar neurologic recovery when compared with:
  - anterior cervical discectomy and fusion (ACDF)
  - multilevel corpectomy (CORP)
  - laminectomy and fusion (LAMI)
- however, LAMP has also been associated with a significantly higher incidence of persisting bothersome neck pain
- randomized controlled trials are needed to better look at these treatment options

Reference:
Cervical radiculopathy - management in secondary care

Key Dates

Published: 13-Oct-2011, by International
Valid until: 31-Aug-2013

Evidence summary for Cervical radiculopathy - management in secondary care

This pathway has been developed according to the Map of Medicine editorial methodology (http://mapofmedicine.com/whatis/emap/editorialmethodology). The content of this pathway is based on high-quality guidelines [4,6-12,14, 21] and critically appraised meta-analyses and systematic reviews [1-3,13,15,16,18-20]. Practice-based knowledge has been added by the Map of Medicine's Clinical Editorial Team and Fellows [5]. The evidence-based pathway has then been peer-reviewed by experts and any literature endorsed by them has also been included [17].

Search date: Apr-2010

References

This is a list of all the references that have passed critical appraisal for use in the care map Neck pain

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