

DEFINITION

- Neck pain, acute and chronic, is commonly seen in the primary care practice setting and can be related to:
 - myofascial pain which:
 - is the most common type of acute and chronic neck pain.
 - most frequently involves the upper trapezius and levator scapulae muscles.
 - neuropathic pain which:
 - may involve nerves or nerve roots lying along the transverse processes or the paravertebral region of the spinal cord.
- The type of pain experienced may provide clues to the underlying anatomical structure(s) involved, as well as the primary disease process.
- Organic diseases affecting the cervical spine are rare but important causes of pain.

IMMEDIATE CONSULTATION REQUIRED IN THE FOLLOWING SITUATIONS

- Severe trauma
- Impaired consciousness
- Loss of reflexes
- Sensory and motor deficits (e.g., weakness, gait disturbance)
- Loss of bowel or bladder function, sexual dysfunction
- Headache, shoulder or hip pain, and/or visual changes in an older adult (rheumatologic diseases)
- Constitutional symptoms such as fever, chills, and/or unexplained weight loss along with immunosuppression, cancer, or intravenous drug use (tumour, infection)
- Nuchal rigidity
- Concurrent chest pain, shortness of breath, diaphoresis
- Ripping/tearing neck sensation which could be related to arterial dissection (e.g., carotid/vertebral)

CAUSES

- Biomechanical disorders that occur secondary to overuse, trauma or deformity, constitute the most common cause of neck pain. Typically, these disorders are

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characterized by correlating exacerbation or alleviation of symptoms with certain physical activities.

Biomechanical disorders without nerve compression

- Most biomechanical disorders of the cervical spine without nerve compression have a natural history of improvement.
- Most clients with mild to moderate pain without nerve compression will improve within 2-3 weeks.
- Clients with pain only in the cervical area, trapezii, and shoulders may have one of many disorders of which cervical strain, cervical facet syndrome, and cervical discogenic pain are the most common.
 - Cervical Strain
 - Injury to cervical paraspinal muscles and ligaments
 - May be related to posture and sleeping habits
 - Not a cause of chronic pain
 - Cervical Facet Syndrome
 - Common causes: rear-impact motor vehicle crashes, falls, diving accidents, other sports injuries or due to an occupation where neck extension is required repeatedly
 - May involve damage to soft tissues, ligaments, nerves, intervertebral discs, and/or bony structures
 - Some clients remain symptomatic for years
 - Cervical Discogenic Pain
 - Most common cause of neck pain
 - Degeneration in the intervertebral disc

Biomechanical neck problems with spinal compression

- Most often occurs secondary to compression of the spinal cord or nerve roots in the spinal canal.
- The symptoms are known as cervical radiculopathy.
- Causes acute and chronic neck pain. In addition, arm pain may be present with or without sensory and motor deficits.
- The location, duration, and size of lesions influence the severity and distribution of symptoms.

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- Compression usually results from a combination of osteophyte growth and degenerative disc disease but can also be due to cervical foraminal stenosis, cervical herniated disc, herpes zoster, Lyme radiculopathy, or diabetic radiculopathy.
- The C6-C7 levels are the most commonly affected.

PREDISPOSING AND RISK FACTORS

- Age
 - People who are middle aged or older are more likely to have degeneration of discs or joints, as well as cervical spondylosis.
- Recent injury or history of injury
 - A common injury to the neck is whiplash.
- Conditions that affect the bones and soft tissues of the neck and back, such as osteoporosis, rheumatoid arthritis, cervical spinal stenosis, or scoliosis
- A history of headaches
- Poor posture at home or at work
- Stress or depression
- Heavy physical work
- Smoking or drug abuse
- Poor physical condition and lack of exercise
- Repetitive work

HISTORY

- Mechanism of injury or events occurring just prior to pain, if known
- Onset and course of symptoms
- Radiation of pain (shoulders, chest, arm, scapula, occiput, face)
- Neuropathic signs (e.g., paresthesia, numbness, weakness)
- Enquire about systemic complaints including fever, cough, shortness of breath, fatigue, weight loss, and pain and dysfunction in other areas. The generalized conditions that may mimic primary neck pain are tumours or infection in the apex of the lung, disease processes that involve or irritate the diaphragm, coronary artery obstruction, and inflammatory arthritides such as rheumatoid disease.
- Enquire about infection risk (e.g., immunosuppressed, intravenous drug use)

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- Enquire about history of malignancy
- Enquire about symptoms that suggest:
 - Cervical Strain
 - Pain in middle or lower portion of the posterior neck
 - Pain may be diffuse or localized to both sides of the spine
 - Spasm of cervical and upper back muscles
 - Pain, stiffness, tightness in upper back or shoulder for a maximum of 6 weeks
 - Cervical Facet Syndrome (whiplash)
 - Flexion-extension injury to soft tissue structures
 - Occupation requiring repeated neck extension
 - Sympathetic ganglia may be damaged, resulting in nausea, hoarseness, or dizziness
 - Intervertebral disc injuries occur with severe trauma
 - Stiffness and pain with motion; may also have difficulty swallowing or chewing
 - Cervical Discogenic Pain
 - Pain exacerbated by holding head in one position for long periods of time
 - Often muscle tightness and spasms
- Myofascial pain is often described as dull, aching, or burning and is referred from active trigger points (hyper-irritable spot within a taut band of skeletal muscle or muscle fascia) that are tender on compression.
- Neuropathic pain is usually described as sharp, burning, or aching and often follows the distribution of the affected nerve segment. The pain is worsened by movements that stretch the involved nerve or nerve roots. It is frequently accompanied by sensory and motor disturbances such as hyperesthesia, paresthesia, hypalgesia, and a decrease in muscle strength.

PHYSICAL FINDINGS

- Observe posture, symmetry, and muscle bulk. Note any muscle atrophy and fasciculation.
- Inspect for previous scars
- Palpate cervical spine

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- This may elicit focal tenderness which in the appropriate clinical context may increase the clinician's suspicion for sinister pathology.
- Perform neurological and musculoskeletal examination including:
 - Cranial nerves
 - Cervical range of motion in all planes of movement
 - Upper and lower limbs (strength, sensation, deep tendon reflexes, abnormal reflexes, range of motion)
 - Emphasis should be on discerning any upper (e.g., cord compression) or lower (nerve root) motor neuron involvement. Refer to Appendix A.
- Perform special tests
 - Spurling test
 - Lhermitte sign
- Cervical Strain will reveal:
 - local tenderness, stiffness or tightness in paracervical and trapezial muscles, decreased range of motion, loss of cervical lordosis.
 - no abnormalities found on neurologic or shoulder examination.
- Cervical Facet Syndrome (whiplash) will reveal:
 - neck pain midline or slightly to one side; more severe than extremity pain.
 - limited neck range of motion.
 - referred pain to shoulders, periscapular area, occiput, or upper arm.
 - neurologic examination often unremarkable, with the exception of occasional Horner syndrome.
- Cervical Discogenic Pain will reveal:
 - no abnormalities on neurologic examination.
 - neck pain on range of motion (mechanical neck pain), more severe than extremity pain.
 - limited neck range of motion.

DIFFERENTIAL DIAGNOSIS

- **Biomechanical**
 - Neck strain
 - Herniated disc
 - Spondylosis
 - Myelopathy

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- Whiplash
- Fracture
- Cervical facet mediated pain
- **Neurologic**
 - Brachial plexitis
 - Peripheral entrapment
 - Neuropathies
 - Complex regional pain syndrome
 - Cervical radiculopathy
 - Cervical spondylotic myelopathy
 - Tension headache
- **Rheumatologic**
 - Rheumatoid arthritis
 - Ankylosing spondylitis
 - Psoriatic arthritis
 - Reiter syndrome
 - Myelopathy
 - Enteropathic arthritis
 - Polymyalgia rheumatic
 - Fibromyalgia
 - Myofascial pain
 - Diffuse idiopathic skeletal hypertrophy
 - Microcrystalline disease
 - Osteoarthritis
- **Infectious**
 - Osteomyelitis
 - Diskitis
 - Meningitis
 - Herpes zoster
 - Lyme disease
 - Pharyngeal abscess
- **Neoplastic**
 - Osteoblastoma
 - Giant cell tumour

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- Hemangioma
- Metastases
- Multiple myeloma
- Chondrosarcoma
- Gliomas
- Syringomyelia
- Neurofibroma
- Apical lung tumour
- **Referred**
 - Thoracic outlet syndrome
 - Pancoast tumour
 - Esophagitis
 - Angina or myocardial infarction
 - Vascular dissection (vertebral or carotid artery)
- **Miscellaneous**
 - Paget disease
 - Sarcoidosis
 - Diabetic neuropathy
 - Shoulder pain

COMPLICATIONS

- Permanent nerve damage with compression of nerve root
- Chronic neck pain
- Absenteeism from work
- Disability (long term)

INVESTIGATIONS AND DIAGNOSTIC TESTS

- Imaging should generally be avoided, unless any of the following risk factors are present:
 - > 50 years of age with new symptoms
 - Constitutional symptoms (e.g., loss of weight, anorexia, fevers)
 - Infection risk (e.g., immunosuppressed, intravenous drug use)
 - Moderate to severe neck pain lasting > 6 weeks
 - Neurological findings

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- History of malignancy
- Dangerous mechanism of injury (e.g., fall from 3 feet or more/5 stairs, direct force to head, bicycle accident, vehicle rollover or ejection, motorized recreational vehicle accident)
- The choice of imaging modality is dependent on the clinical indication. All imaging should begin with plain radiography; whereby different views enable different anatomical abnormalities to be identified. However, degenerative radiographic changes in the cervical spine are common in people > 30 years of age and such changes are only weakly correlated with pain.
- Clinicians must therefore be mindful that radiography alone is non-diagnostic and should be used as an adjunct to history taking in diagnosing neck pain.
- Magnetic resonance imaging (MRI) and computerized tomography (CT) are indicated when malignancy, infection, spinal cord compression, and disc herniation are suspected.
 - CT better delineates bony pathology, whereas MRI is superior at imaging soft tissue abnormalities and, in particular, potential neurological compromise, such as cord or nerve root compression.
- The [Canadian C-Spine Rule](#) can be used with all trauma clients who may have a cervical spine injury and have a Glasgow Coma Scale of 15 and are stable. Refer to Appendix B.
- Electromyography
 - Can reveal nerve dysfunction, muscle dysfunction or problems with nerve to muscle signal transmission.

MAKING THE DIAGNOSIS

- The diagnosis is usually made clinically based on the health history and physical exam.

MANAGEMENT AND INTERVENTIONS

Goals of Treatment

- Relieve pain
- Promote rapid recovery and prevent chronicity
- Prevent further injury
- Prevent or reduce work absence

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- Educate and reassure the client

Appropriate Consultation

- Presentation consistent with those identified in the Immediate Consultation Required in the Following Situations section.
- Consult a physician/RN(NP) for moderate to severe neck pain, especially if the client is > 50 years of age, has neurologic abnormalities, has a psychological comorbidity, or if an underlying organic cause for the pain is suspected.
- Consult a physician/RN(NP) if client's pain is not appropriately managed with acetaminophen and/or non-steroidal anti-inflammatory drugs (NSAIDs).
- Clients < 12 years of age.

Non-Pharmacological Interventions

- Clients without systemic disorders should be treated with non-operative therapy for 3-6 weeks.
- Ice for a maximum of 15 minutes qid provides additional analgesia in some cases.
- Heat may decrease muscle tightness and improve range of motion.
- Posture modification (e.g., sitting straight with shoulders back, driving with shoulders slightly shrugged, not carrying over the shoulder bags, limiting time sitting in one position), including while sleeping (e.g., should have head and neck aligned with body, sleep on back with pillows under thighs).
- Soft cervical collars (to support, but not extend neck) should not be used for long periods of time as they may delay improvement; wear for a maximum of 3 hours at a time, and for a maximum of 2 weeks; they may be most useful at night when there may be increased pain (to help the client sleep).
- Avoid aggravating activities.
- Resume usual activities as soon as possible.
- Avoid work absences, if possible.
- Refer to physiotherapy as a graduated physical therapy program may be beneficial in restoring range of motion and overall conditioning of the neck musculature.
 - In the first 6 weeks after onset of pain, gentle range of motion and stretching exercises supplemented by massage and modalities such as heat, ice, and

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electrical stimulation may be used, although this approach has no proven long-term benefit.

- As the pain improves, a gradual, isometric strengthening program may be initiated with progression to active range of motion and resistive exercises as tolerated.

Pharmacological Interventions

- Analgesics to relieve back pain:
 - Ibuprofen (Advil, Motrin) 400-600 mg orally qid prn for 2-4 weeks
Or
 - Naproxen (Naprosyn) 375-500 mg orally bid prn for 2-4 weeks
Or
 - Toradol (Ketorolac) 30 mg IM q6-8h for the first 24 hours
 - Acetaminophen (Tylenol) 650-1000 mg orally q4-6h (maximum dose 4 g/day)
- Do not use ibuprofen or naproxen if there are contraindications to the use of aspirin or NSAIDs (e.g., allergy to aspirin or NSAIDs or peptic ulcer disease).
- Non-benzodiazepine muscle relaxants
 - Most pain reduction from these medications occurs in the first 7-14 days, but the benefit may continue for up to 4 weeks.
 - Cyclobenzaprine (Flexeril) 5-10 mg orally tid
Or
 - Baclofen 5-10 mg orally tid
- Antiepileptics may be of benefit, consult a physician/RN(NP)

If pain is moderate to severe, or if first-line agents are contraindicated, poorly tolerated or fail to control discomfort, consult a physician/RN(NP) as the client may require a short course of opioids.

Client and Caregiver Education

- Counsel client/caregiver about appropriate use of medications (dose, frequency, compliance, etc.).
- Most biomechanical disorders of the cervical spine without nerve compression have a natural history of improvement. Most clients with mild to moderate pain without nerve compression will improve within 2-3 weeks.

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- Because of these risks and the lack of high quality evidence to support its effectiveness, manipulative therapy cannot be recommended for the treatment of cervical radiculopathy.

Monitoring and Follow-Up

- Arrange follow-up at 1-2 days, at 7 days and then every 2 weeks to assess response to treatment.
- Start range of motion exercises within pain free range once symptoms are controlled.
- Advise client to begin a stretching and strengthening program when full range of motion is regained.
- Refer to physiotherapy.

Referral

- Presentation consistent with those identified in the Immediate Consultation Required in the Following Situations section.
- Approximately one third of clients with cervical radiculopathy who are treated nonoperatively have persistent symptoms.
- Clients should be referred to a spine subspecialist for consideration of surgical intervention if there is an intractable radicular symptom unresponsive to nonoperative management over a 6 week period, motor weakness persisting for more than 6 weeks, progressive neurologic deficit at any point after symptom onset, signs or symptoms of myelopathy, or instability or deformity of the spine.

DOCUMENTATION

- As per employer policy

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Appendix A

Characteristics of Cervical Radiculopathy Caused by Compression of Cervical Nerve Root

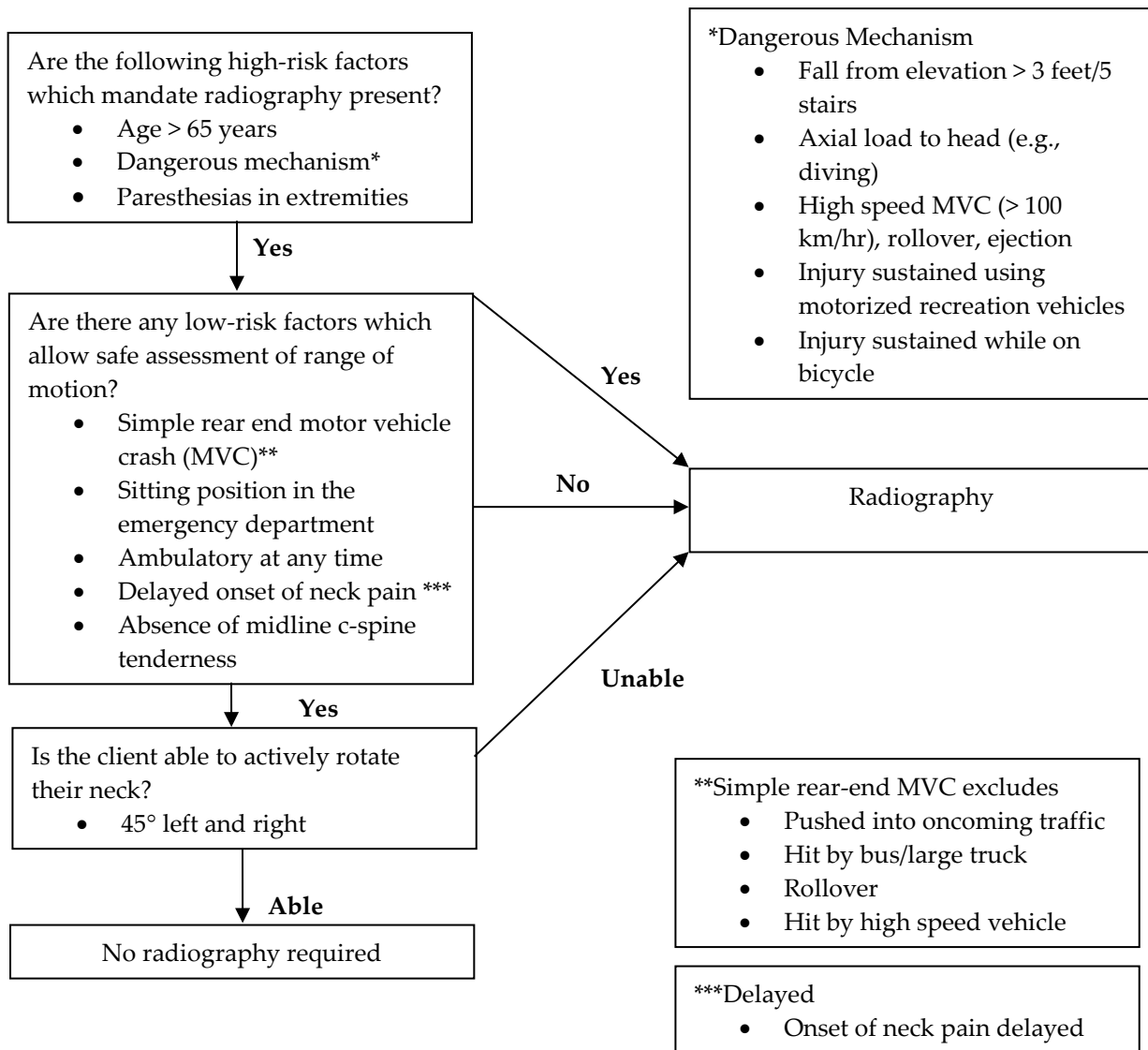
- Neck pain, weakness
- Arm pain
- Neurologic changes (reflexes, motor and/or sensory)

Nerve Root	Area of Pain	Location of Sensory Loss	Motor Loss	Reflex Loss
C4	Neck to scapula	Across shoulders	Shoulder elevation	None
C5	Neck to outer shoulder, scapula	Lateral arm	Shoulder abduction, external rotation, elbow flexion, forearm supination	Biceps, brachioradialis
C6	Shoulder, scapula, outer arm to thumb, index finger	Lateral forearm, index finger and thumb	Shoulder abduction, external rotation, elbow flexion, forearm supination and pronation	Biceps, brachioradialis
C7	Shoulder, hand, middle finger	Index and middle fingers, palm	Elbow and wrist extension (radial), forearm pronation, wrist flexion	Triceps
C8	Shoulder, inner forearm to ring and little fingers, medial hand	Inner forearm, medial hand, ring and little fingers	Finger and wrist extension, distal finger flexion, extension, abduction and adduction, distal thumb flexion	None

Appendix B

Canadian Cervical Spine Rules

This guideline can be applied to all stable trauma clients who are alert and orientated (Glasgow Coma Scale = 15) where cervical injury is a consideration.



(Ottawa Health Research Institute, n.d.)

SASKATCHEWAN REGISTERED NURSES' ASSOCIATION

RNs WITH ADDITIONAL AUTHORIZED PRACTICE CLINICAL DECISION TOOL DECEMBER 1, 2016

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