

Acute Neck Pain: Adult & Pediatric

Musculoskeletal

Clinical Decision Tools for RNs with Additional Authorized Practice [RN(AAP)s]

Effective Date: February 1, 2022

Background

Acute neck pain is defined as discomfort and limited range of motion (ROM) originating from the structures in the neck (Vanhook, Dunphy, Porter, Martin-Plank, & Luskin, 2019).

Most cases of acute neck pain are due to musculoskeletal conditions (e.g., cervical strain, disc degeneration, osteoarthritis), neurologic conditions (e.g., cervical spondylotic myelopathy), and non-spinal disorders (e.g., infection, giant cell arteritis) (Isaac & Kelly, 2019). 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 that must be screened for during the clinical visit (Blanpied et al., 2017).

Immediate Consultation Requirements

The RN(AAP) should seek immediate consultation from a physician/NP when any of the following circumstances exist:

- severe trauma;
- dangerous mechanism of injury (e.g., fall from 3 feet or more/five stairs, direct force to head, bicycle accident, vehicle rollover or ejection, motorized recreational vehicle accident);
- pain with palpation of cervical spinous processes;
- impaired consciousness;
- nuchal rigidity;
- loss of reflexes;
- neurological findings including sensory and motor deficits (e.g., weakness, gait disturbance);
- loss of bowel or bladder function;
- sudden onset of sexual dysfunction;
- client \leq 12 years of age;
- \geq 50 years of age with new symptoms;
- 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;
- history of immunosuppression, cancer, or intravenous drug use (tumor, infection); moderate to severe neck pain lasting greater than six weeks and affecting sleep or activities of daily living;
- history of malignancy;
- concurrent chest pain, shortness of breath, diaphoresis (myocardial infarction); and/or
- ripping/tearing neck sensation which could be related to arterial dissection (e.g., carotid/vertebral) (Centre for Effective Practice, 2016; Interprofessional Advisory Group [IPAG], personal communication, October 14, 2019; Isaac & Kelly, 2019; Vanhook et al., 2019).

Predisposing and Risk Factors

Predisposing and risk factors for neck pain in adult and pediatric clients include:

- age:
 - infants may present with torticollis, plagiocephaly which may cause pain;
 - middle aged or older adults are more likely to have degeneration of discs or joints, as well as cervical spondylosis.
- female gender (incidence increases around the fifth decade of life);
- recent injury or history of injury to neck (e.g., common injury is whiplash);
- co-existing low back pain;
- conditions that affect the bones and soft tissues of the neck and back, such as osteoporosis, rheumatoid arthritis, cervical spinal stenosis, or scoliosis;
- history of headaches;
- low social or work support;
- poor posture;
- stress or depression;
- heavy physical work;
- smoking;
- drug abuse;
- poor physical condition and lack of exercise; and/or
- repetitive work (Blanpied et al., 2017; Vanhook et al., 2019).

Health History and Physical Exam

Subjective Findings

The circumstances of the presenting complaint should be determined. These include:

- 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);
- presence of systemic complaints including fever, cough, shortness of breath, fatigue, weight loss, and pain or dysfunction in other areas;

- risk of infection (e.g., immunosuppressed, intravenous drug use);
- personal history of malignancy;
- presence of specific symptoms that may 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; and/or
 - pain, stiffness, tightness in upper back or shoulder for a maximum of six weeks.
- presence of specific symptoms that may suggest whiplash associated injury:
 - 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; and/or
 - stiffness and pain with motion (may have difficulty swallowing or chewing).
- presence of specific symptoms that may suggest cervical discogenic pain:
 - pain exacerbated by holding head in one position for long periods of time, and/or
 - muscle tightness and spasms.
- presence of specific symptoms that may suggest myofascial pain:
 - 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.
- presence of specific symptoms that may suggest neuropathic pain:
 - often described as sharp, burning, or aching and often follows the distribution of the affected nerve segment;
 - pain is worsened by movements that stretch the involved nerve or nerve roots;
 - frequently accompanied by sensory and motor disturbances such as hyperesthesia, paresthesia, hypalgesia, and a decrease in muscle strength (Centre for Effective Practice, 2016; Isaac & Kelly, 2019; Vanhook et al., 2019).

Objective Findings

The emphasis of the physical exam should be on discerning any upper (e.g., cord compression) or lower (nerve root) motor neuron involvement. Refer to *Characteristics of Cervical Radiculopathy*.

Clients with neck pain may present with:

- plagiocephaly (pediatric),
- asymmetrical neck posture or positioning (e.g., torticollis),
- atrophy of neck muscles and fasciculations, and
- tenderness with palpation of cervical spine.

The RN(AAP) should also perform a 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),
- special tests:
 - Spurling test, and/or
 - Lhermitte sign.
- cervical strain will reveal:
 - local tenderness, stiffness or tightness in paracervical and trapezius muscles, decreased range of motion, loss of cervical lordosis; and
 - no abnormalities on neurologic or shoulder examination.
- whiplash-associated injury will reveal:
 - neck pain midline or slightly to one side;
 - limited range of motion of the neck;
 - referred pain to shoulders, periscapular area, occiput, or upper arm; and
 - an unremarkable neurologic examination, 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; and/or
 - limited neck range of motion (Bickley, 2021; Blanpied et al., 2017; Bussieres et al., 2016; Centre for Effective Practice, 2016; Vanhook et al., 2019).

Characteristics of Cervical Radiculopathy

Compression of Nerve at:	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

Compression of Nerve at:	Area of Pain	Location of Sensory Loss	Motor Loss	Reflex Loss
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

Differential Diagnosis

The following should be considered as part of the differential diagnosis:

Biomechanical
<ul style="list-style-type: none"> • neck strain, • herniated disc, • spondylosis, • myelopathy, • whiplash associated injury, • fracture, or • cervical facet mediated pain.
Neurological
<ul style="list-style-type: none"> • brachial plexitis, • peripheral entrapment, • neuropathies, • complex regional pain syndrome, • cervical radiculopathy, • cervical spondylotic myelopathy, or • tension headache.

Rheumatological
<ul style="list-style-type: none"> • rheumatoid arthritis, • ankylosing spondylitis, • psoriatic arthritis, • Reiter Syndrome, • myelopathy, • enteropathic arthritis, • polymyalgia rheumatica, • fibromyalgia, • myofascial pain, • diffuse idiopathic skeletal hypertrophy, • microcrystalline disease, or • osteoarthritis.
Infectious
<ul style="list-style-type: none"> • osteomyelitis, • discitis, • meningitis, • Herpes zoster, • Lyme disease, or • pharyngeal abscess.
Neoplastic
<ul style="list-style-type: none"> • osteoblastoma, • giant cell tumor, • hemangioma, • metastases, • multiple myeloma, • chondrosarcoma, • gliomas, • syringomyelia, • neurofibroma, or • apical lung tumor.
Referred
<ul style="list-style-type: none"> • thoracic outlet syndrome, • pancoast tumor, • esophagitis, • shoulder pain, • angina or myocardial infarction, or • vascular dissection (vertebral or carotid artery).

Miscellaneous

- Paget's disease,
- sarcoidosis, or
- diabetes-related neuropathy.

(Blanpied et al., 2017; Isaac & Kelly, 2019; Vanhook et al., 2019)

Making the Diagnosis

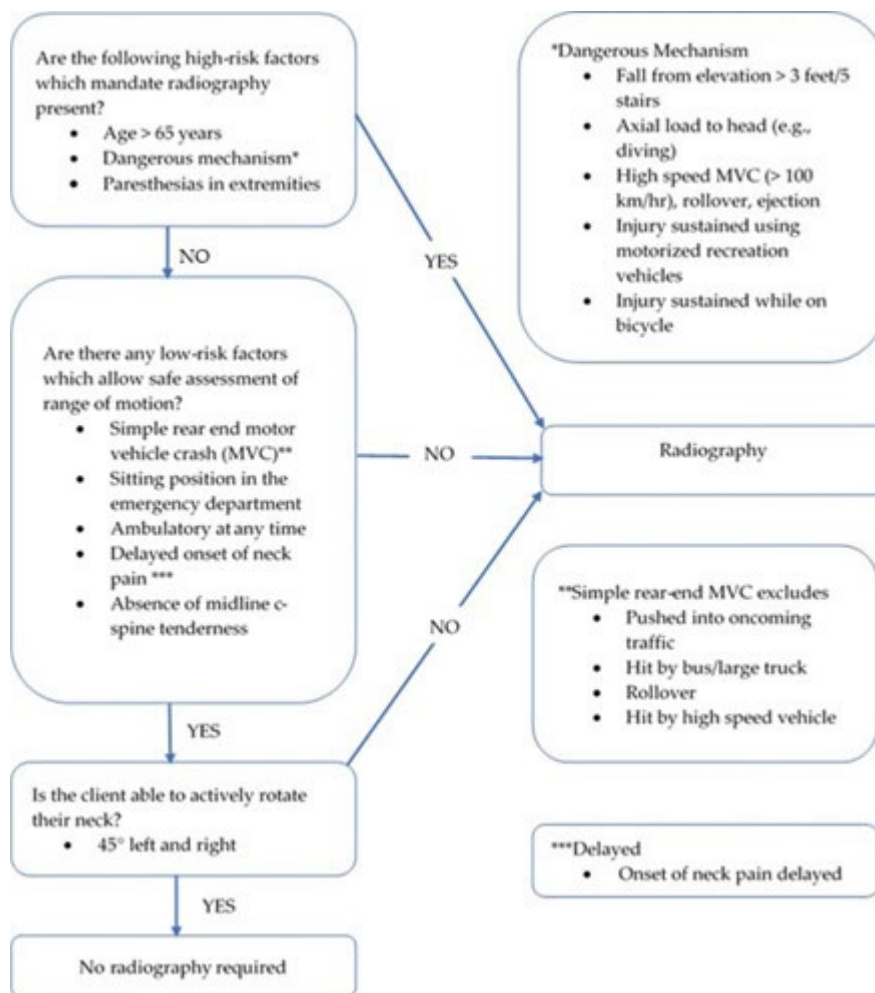
The diagnosis is usually made clinically based on the health history and physical exam (Blanpied et al., 2017; Centre for Effective Practice, 2016).

Investigations and Diagnostic Tests

Most acute neck pain resulting from atraumatic mechanisms does not require imaging (Blanpied et al., 2017). Imaging should be considered in the presence of symptoms identified in the *Immediate Consultation Requirements* section (Centre for Effective Practice, 2016; Isaac & Kelly, 2019) and ordered in consultation with a physician/NP.

The Canadian C-Spine Rule

This validated tool developed by Steil and colleagues (2003) can be used to determine the need for cervical spine imaging if the client presenting with recent trauma, is stable, and has a Glasgow Coma Scale rating of 15 out of 15.



Ramos, 2020; Stiell et al., 2003)

Management and Interventions

Goals of Treatment

The primary goals of immediate treatment are to relieve pain, prevent further injury, prevent or reduce work absence, educate and reassure the client, and prevent chronicity (Isaac & Kelly, 2019).

Non-Pharmacological Interventions

The RN(AAP) should recommend, as appropriate, the following non-pharmacological options:

- ice for the first 48 hours following injury for a maximum of 15 minutes qid may provide analgesia;
- a heating pad or hot water bottle to reduce muscle stiffness, pain, and spasm may provide additional comfort after 48 hours;
- 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 the neck should be worn for a maximum of three hours at a time, and a maximum of two weeks; they may be most useful at night to help facilitate sleep;
- physiotherapy, a graduated physical therapy program may be beneficial in restoring range of motion and overall conditioning of the neck musculature once acute symptoms are under control;
- gentle range of motion and stretching exercises supplemented by massage may be used, although this approach has no proven long-term benefit (Bussieres et al., 2016; Isaac & Kelly, 2019).

Pharmacological Interventions

The pharmacological interventions recommended for the treatment of acute neck pain are in accordance with the *RxFiles: Drug Comparison Charts* (RxFiles Academic Detailing Program, 2021) and *CPS Drug Information* (Canadian Pharmacists Association, 2021.)

Anticonvulsants or antidepressants may be of benefit in the presence of neuropathic pain, consult a physician/NP.

Analgesics

Over the counter analgesics are usually sufficient to manage acute neck pain. RN(AAP)s should optimize pain management and prescribe a non-steroidal anti-inflammatory drug (NSAID), which is preferred, and acetaminophen if an NSAID is contraindicated or not tolerated. Administering two NSAIDs simultaneously is not recommended.

	Drug	Dose	Route	Frequency	Duration
Pediatric					
	Ibuprofen (preferred)	5-10 mg/kg/dose (maximum dose 40 mg/kg/day)	p.o.	q6-8h	regularly for 1-3 days and then prn
AND/OR	Acetaminophen	10-15 mg/kg/dose (maximum dose 75 mg/kg/day)	p.o.	q4-6h prn	regularly for 1-3 days and then prn
Adult					
	Ibuprofen (preferred)	400-600 mg (maximum dose of 3200 mg/day)	p.o.	Q6-8h prn	regularly for 1-3 days and then prn

OR	Naproxen (preferred)	375-500 mg	p.o.	b.i.d.	regularly for 1-3 days and then prn
AND/ OR	Acetaminophen	500-1000 mg (maximum dose of 4 g/day)	p.o.	q4-6h prn	2-4 weeks

Muscle Relaxants

Non-benzodiazepine muscle relaxants may be beneficial in the treatment of acute neck pain. Most pain reduction from these medications occurs in the first seven to 14 days and is thought to be related to their sedative properties.

	Drug	Dose	Route	Frequency	Duration
Adult					
	Cyclobenzaprine	5-10 mg	p.o.	t.i.d. prn	1-2 weeks

Client and Caregiver Education

The RN(AAP) provides client and caregiver education as follows:

- Counsel about appropriate use of medications (dose, frequency, compliance, etc.).
- Educate about symptoms of neurological deterioration that require immediate assessment.
- Advise that most musculoskeletal causes of neck pain without nerve compression have a natural history of improvement. Most clients with mild to moderate pain without nerve compression will improve within two to three weeks.
- Advise that there is a lack of quality evidence to support the effectiveness of manipulative (chiropractic) therapy, and therefore it is not recommended (Blanpied et al., 2017).

Monitoring and Follow-Up

The RN(AAP) should arrange for the client to follow-up at one to two days and then every two weeks to assess for improvement and/or worsening symptoms which may require referral to physician/NP.

Complications

The following complications may contribute to diminished quality of life, both mental and physical:

- permanent nerve damage with compression of nerve root,
- chronic neck pain,
- absenteeism from work, and/or
- disability (long term) (Blanpied et al., 2017).

Referral

Refer to a physician/NP if client presentation is consistent with those identified in the *Immediate Consultation Requirements* section or if there is a failure to respond to the prescribed treatment after six weeks or sooner if symptoms are worsening despite conservative treatment (IPAG, personal communication, October 14, 2019).

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