

INITIAL EVALUATION AND MANAGEMENT OF NECK PAIN

Jeffrey W. Ralph, MD

University of California, San Francisco

Let me guess: You are reading this right now because you (like many attendees at the annual meeting) see patients with neck pain nearly every day in clinic. Knowing firsthand the high prevalence of this problem, you have a desire to improve your skills in evaluating and managing these patients. You may have an uneasy feeling that you are either testing too much or little. Using the latest evidence whenever possible, this presentation will present facts and algorithms that will improve your work-up and treatment of patients with neck pain.

For this discussion, and per the International Association for the Study of Pain guidelines,¹ neck pain will be defined as pain perceived as arising from anywhere within the region bounded superiorly by the superior nuchal line and inferiorly by an imaginary transverse through the tip of the first thoracic spinous process. It is important to understand that neck pain is not synonymous with cervical radicular pain. The latter topic will be discussed in detail in a separate talk at this educational session.

How big of a problem is neck pain? In Western societies, the one-year prevalence of neck pain of any duration is approximately 20%.² If the definition of neck pain stipulates a duration of 2 weeks, the prevalence drops to approximately 10% among individuals aged 45–64 years. A large study of male employees showed that cervical pain occurred one-half to one-quarter as often as lumbar spine pain.² For reasons that are not clear, neck pain leads to less lost work than low back pain.

Any innervated structure in the cervical region is considered a potential pain source. Innervated structures include the neck muscles, zygapophyseal joints, cervical intervertebral discs, vertebral bodies, anterior and posterior spinal ligaments, dura mater, and major neck arteries. The location of the pain generally depends on the segmental innervation of that structure. Damage to the zygapophyseal (facet) joint or intervertebral disc of a certain level could produce nearly identical pain. This principle can lead to false localizations if provocative testing is done. On the other hand, targeted nerve blocks of neck structures can lead to precise localization of the pain generator. For example, if pharmacologically blocking a medial spinal nerve branch produces pain relief, then there is a very high likelihood that zygapophyseal joint disease is responsible for the pain. No information is available on the actual prevalence with which acute neck pain arises from any of these structures.

Damage to the high cervical structures (e.g., C2-C3 zygapophyseal joints) can produce head pain. Primary headache disorders are also associated with neck pain. The mechanism of this bidirectionality of pain is believed to be the convergence of afferent inputs to common neurons in the central nervous system. Likewise, injury to spinal structures can lead to chest pain. Cardiac ischemia in turn can manifest as neck pain, though rarely in isolation. Pain from visceral pathology can sometimes be referred to the neck as well.

In most cases, the cause of isolated neck pain remains obscure. Serious but rare causes of neck pain include vertebral tumors, discitis, septic arthritis, meningitis, osteomyelitis, epidural abscess, arterial dissection, and epidural hematoma. Other recognized causes of neck pain include rheumatoid arthritis, ankylosing spondylitis, crystal arthropathies, polymyalgia rheumatica, longus colli tendinitis, fractures, and synovial cysts. Spondylosis/degenerative joint disease is often mentioned as a cause of neck pain, but the evidence for this association is fairly weak. The odds ratios for disc degeneration or osteoarthritis as predictors of neck pain are only 1.7 and 1.8 for men, respectively, and 1.1 and 0.97 for women.³ Neurological disorders associated with neck pain include thoracic outlet syndrome, spinal cord tumors, nerve injuries, myelopathy, and radiculopathy.

Taking a good history is the most important part of the evaluation of patients with neck pain. By taking a careful history, the possibility of a dangerous cause of neck pain can be recognized or effectively ruled out. A list of review systems items useful in the evaluation of those with neck pain is attached (Table 1).⁴ Almost always, *cervical spinal pain* is located posteriorly. Anterior neck pain is usually associated with throat pathology, and it has a distinct differential diagnosis that will not be discussed here. A history of trauma alerts the clinician to the possibility of cervical fracture. History of fever, age > 70 years, chills, weight loss, immunosuppression, prior cancer, or intravenous drug use increases the concern for infection or tumor. Neck pain with neurological signs or symptoms may increase the concern for myelopathy or radiculopathy.

The physical examination is an expected part of the work-up of patients who present with neck pain. While the reliability of some aspects of the physical exam is high, no part of it has proven validity in terms of understanding the cause of isolated neck pain. The examination of the neck includes inspection, palpation, and range of motion assessments. Inspection of the neck may reveal deformities relevant to the pain complaint. The

main purpose of palpating the neck is to find regions of tenderness. Palpation for tenderness over the articular pillars of the cervical zygapophyseal joints is a reliable test. However, the diagnostic significance of finding tenderness at this location has not been validated. It is important to note that most of the cervical spinous processes cannot be palpated. Taking note of the range of motion of a patient's neck offers a description of the patient's capabilities (and therefore disability). Unfortunately, limited range of motion usually does not point to a specific diagnosis.

Most patients with atraumatic acute neck pain (< 6 weeks) require no imaging.

If the history and physical exam raise concern for infection or malignancy, then an MRI scan of the neck is indicated. The yield of plain X-rays in discovering tumor or infection is low, though some guidelines suggest getting X-rays always as the initial imaging modality. In my opinion, when infection or malignancy are suspected, the MRI scan should be the initial imaging study. Some argue that an MRI scan of the neck is indicated for neck pain persisting longer than 6 weeks.

There are established diagnostic algorithms to assist in the decision-making regarding imaging in the context of neck trauma.⁵ Depending on the situation, CT imaging or plain X-rays may be ordered. The main purpose of the studies is to exclude fracture. Spine imaging does not need to be done in a patient who is alert and sober with full range of neck motion and no pain complaints. If X-rays are done, the protocol should include at the minimum lateral, anterior-posterior, and open-mouth views.

The utility of electrophysiological testing for neck pain in the absence of neurological signs or symptoms (i.e., no limb pain) is low.

Perhaps the most important part of managing acute neck pain is to reassure the patient that things will get better. In a retrospective study of 205 patients previously seen for neck pain, 43% reported no pain. Only 7% of the patients had severe pain. The remainder reported mild or moderate pain (25% in each category).⁶ Data on the efficacy of anterior spinal fusion for patients with neck pain not associated with radicular pain are incomplete. There is evidence that neck exercises improve outcomes. A combination of home exercises and physiotherapy may be most effective. Analgesics or nonsteroidal anti-inflammatory drugs are reasonable treatments for acute neck pain. Chronic pain may respond to SNRI-type antidepressants. Other interventions may include acupuncture, transcutaneous/cold nerve stimulation, and cervical traction. The evidence of efficacy for all these treatment modalities is lacking, but individual patients may respond. Multidisciplinary care may help behavioral aspects related to the pain, but the pain usually persists. Percutaneous radiofrequency neurotomy for cervical zygapophyseal joint pain has been shown to be effective in a double-blind, placebo-controlled trial.⁷ It is the only treatment has been shown to provide complete pain relief.

Table 1.

Name:			Neck Pain Review of Systems					
MRN:								
Trauma	Y	N	Neurological			Endocrine		
Fever	Y	N	Symptoms/signs	Y	N	Corticosteroids	Y	N
Night sweats	Y	N	Cerebrovascular	Y	N	Diabetes	Y	N
Recent surgery	Y	N	Vomiting	Y	N	Hyperparathyroid	Y	N
Catheterization	Y	N	Cardiovascular			GI	Y	N
Venipuncture	Y	N	Risk factors	Y	N	Dysphagia	Y	N
Illicit drug use	Y	N	Anticoagulants	Y	N	Musculoskeletal		
Immunosuppression	Y	N	Urinary			Pain elsewhere	Y	N
Awkward posture	Y	N	UTI	Y	N	Skin		
Manipulation	Y	N	Hematuria	Y	N	Infections	Y	N
History of cancer	Y	N	Retention	Y	N	Rashes	Y	N
Weight loss	Y	N	Reproductive			Respiratory		
Exotic exposure	Y	N	Uterine	Y	N	Cough	Y	N
Overseas travel	Y	N	Breast	Y	N	Skin	Y	N

Modified from Bogduk N, McGuirk B. Management of Acute and Chronic Neck Pain: An Evidence-based Approach. Elsevier, London, 2006.

Select References:

1. Mersky H, Bogduk N (eds). Classification of Chronic Pain Syndromes and Definitions of Pain Terms, 2nd edn. IASP Press, Seattle, 1994: 11.
2. Borenstein DG, Wiesel SW, and Boden SD. Neck pain: medical diagnosis and comprehensive management. WB Saunders Company, Philadelphia, 1996: 26.
3. Van der Donk J, Schouten JSAG, et al. The associations of neck pain with radiological abnormalities of the cervical spine and personality traits in a general population. *J Rheumatol* 1991; 18:1884-1889.
4. Bogduk N, McGuirk B. Management of Acute and Chronic Neck Pain: An Evidence-based Approach. Elsevier, London, 2006.
5. Stiell IG, Wells GA, Vandemheen KL et al. The Canadian C-spine rule for radiography in alert and stable trauma patients. *JAMA* 2001; 286: 1841-1848.
6. Gore DR, Sepic SB, Gardner GM, Muray MP. Neck pain: a long-term follow-up of 205 patients. *Spine* 1987; 12: 1-5.
7. Lord SM, Barnsley L, Wallis BJ, McDonald GJ, Bogduk N. Percutaneous radio-frequency neurotomy for chronic cervical zygapophysial-joint pain. *N Engl J Med* 1996; 335: 1721-1726.