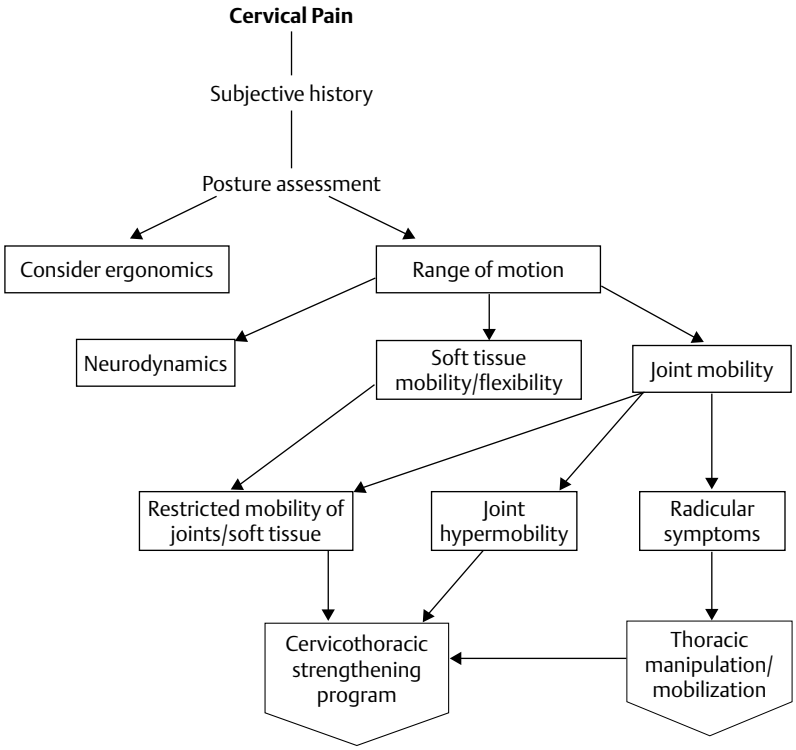

# 24

# Cervical Rehabilitation and Physical Therapy Techniques

**James R. Beazell**

Cervical rehabilitation begins with a focused patient evaluation. The specific physical therapy treatment should be based on the clinically recognized pattern of cervical dysfunction.

## ◆ Classification

Pain patterns generally fall into two categories: radicular pain or somatic pain. Radicular pain is due to the irritation of nerve roots and presents as lancinating pain along the course of a nerve or nerves. In those with radicular pain, the arm component generally outweighs the neck component of the pain. In addition, peripheral nerve symptoms, such as numbness, tingling, or weakness, are often present. Somatic pain is generally more diffuse and may be due to irritation of nocioceptors in tissues such as bone, ligament, zygapophyseal joints, intervertebral disk, tendon, muscle, blood vessels, and the related connective tissues. Muscle imbalances have been reported as contributing to cervical dysfunction and pain. Patient with somatic complaints often complain of a mechanical pain in the neck that is worsened by activities and certain postures. Patients may also have referred pain along the medial boarder of the scapula and can be mapped to specific cervical segments. Not uncommonly, patients experience a combination of radicular, somatic pain and referred pain.

## ◆ Workup

### History

After determination of the location and description of the patient's pain, the aggravating and alleviating factors should be defined. The severity of the condition can be graded by the level of activity the patient can tolerate before symptoms are produced. The presence of any neurologic symptoms should be specifically elicited. A history of trauma at the onset of the symptoms is important to note and may direct the need for radiographic studies prior to the onset of a physical therapy program. Patients with symptoms of spinal cord dysfunction including clumsiness with fine motor activities (buttoning buttons), balance disturbance, or problems with bowel or bladder control should be referred for spinal cord imaging prior to initiating any aggressive exercises program or performing manipulation of the neck.

### Physical Examination

The neck symmetry, and atrophy of the neck, shoulder girdle, and arm muscles should be assessed. The exam should include an inspection of overall posture and observations of spontaneous movements. The amount and quality of movement in the patient's neck and upper limbs should be assessed. The reproduction of symptoms with specific movements should be noted and can provide clues to the specific source of symptoms.

Specific testing of the deep neck flexors and the ability to isolate these muscles without activating other neck muscles should be done. Dysfunction in this muscle group has been found in patients with an insidious onset of neck pain and in patients with whiplash-associated disorder (WAD).

A complete upper and lower extremity neurological examination should be done. This should include manual muscle testing and reflex testing and upper motor neuron tests such as the Hoffmann's test. Sensation should be mapped, including areas of dysesthesia. Neural provocation testing, including the upper limb provocation test 1 (**Fig. 24–1**), is useful in defining irritated nerve roots in the cervical region.

The assessment of segmental mobility in both the cervical and thoracic spine region is useful to diagnose painful vertebral segments. Also, the determination of segmental hypermobility and hypomobility is important in the developing a rationale treatment program.

### Special Diagnostic Tests

The presence of severe trauma or complaints of dizziness, drop attacks, dysphagia, dysarthria, or diplopia should guide the clinician to perform special tests including the craniovertebral stability tests for the alar and transverse ligaments, and screening for vertebral basilar insufficiency (VBI). Complications from manipulative treatment of the cervical spine have been reported in the literature and appear to be most specifically related to high-velocity rotatory techniques applied to the upper cervical spine especially in the presence of VBI.

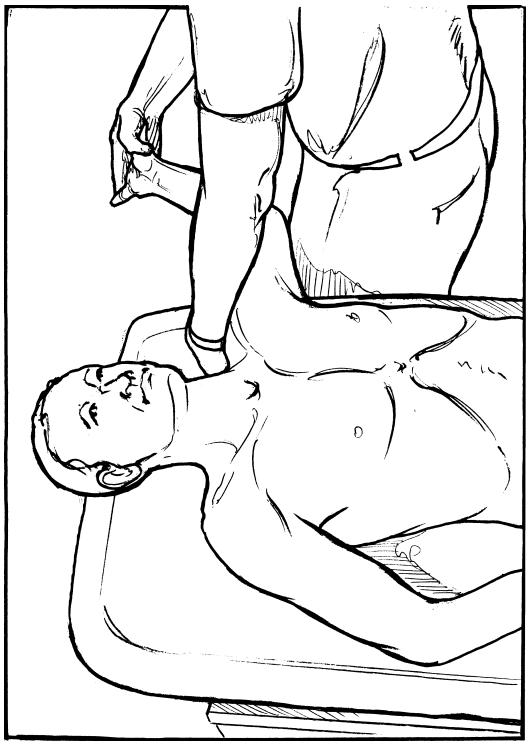

**Figure 24–1** The upper limb tension test with the shoulder in abduction, wrist and finger extension, shoulder external rotation, and elbow extension.

## ◆ Treatment

The initial phase of treatment in cervical patients emphasizes reduction of pain. Modalities can be used in this phase but there is no evidence of their effectiveness. The initiation of an active therapy program is more effective than immobilization, even in the early phase. The specific exercises used should be based on the patient assessment and an understanding of the underlying pathomechanics of the condition. Education of the cervical patient begins with postural instruction for activities of daily living (ADL) and work activities. An emphasis on patient responsibility with monitoring postures and habits recruits the patients as an active participant in their treatment.

Manual therapy can be initiated for identified joint dysfunctions in the cervical area as well as for pain relief. Treatment programs emphasizing the deep neck flexors (longus colli and rectus capitis anterior) have been effective in decreasing pain and improving function (**Fig. 24–2**). Generally, a combination of manual therapy for joint dysfunction and specific active exercises are most useful. Radicular symptoms may require the use of neural tissue release techniques, which can include mobilization of soft tissues around the irritated nerve or specific joint mobilization.

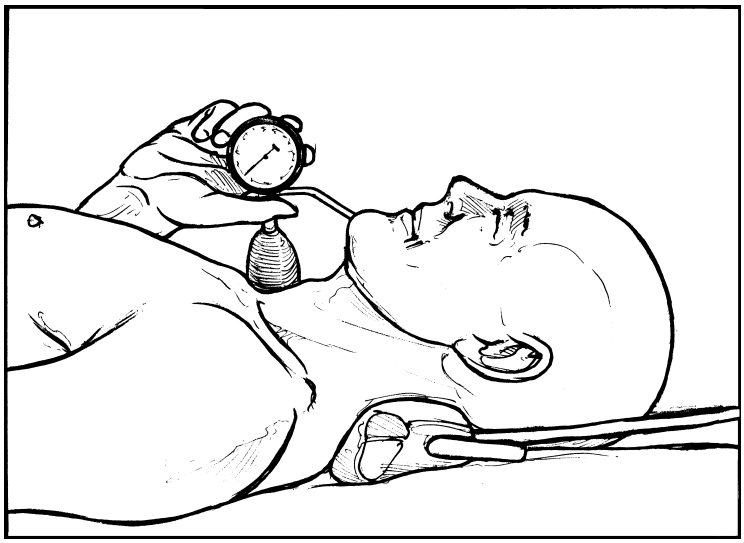

**Figure 24–2** The chin tuck exercise for the deep neck flexors is shown, with the stabilizer elevating the pressure by 6 mm Hg. The patient is monitored so as not to activate the sternocleidomastoid muscle.

## ◆ Outcome

Prognosis in the treatment of the cervical spine is based on the chronicity of the problem, the extent of tissue changes and various psychosocial factors. Most patients improve within 8 weeks. Pain persisting longer than 3 months may indicate more severe injury to the joints, muscles, or connective tissues of the neck. [AQ1]

## Suggested Readings

Aprill C, Dwyer A, Bogduk N. Cervical zygapophyseal joint pain patterns. II: A clinical evaluation. Spine 1990;15:458–461

*Classic article on pain referral patterns from cervical zygapophyseal joints. Study repeated more recently by Fukui et al.*

Bronfort G, Evans R, Nelson B, et al. A randomized clinical trial of exercise and spinal manipulation for patients with chronic neck pain. Spine 2001;26:788–797

[AQ2] *For chronic neck pain, the use of strengthening exercise, whether in combination with spinal manipulation or in the form of a high-technology MedX program, appears to be more beneficial to patients with chronic neck pain than the use of spinal manipulation alone. The effect of low-technology exercise or spinal manipulative therapy alone, as compared with no treatment or placebo, and the optimal dose and relative cost effectiveness of these therapies, need to be evaluated in future studies.*

Falla D, Jull G, Hodges PW. Feedforward activity of the cervical flexor muscles during voluntary arm movements is delayed in chronic neck pain. Exp Brain Res 2004;157:43–48

*It is concluded that the delay in neck muscle activity associated with movement of the arm in patients with neck pain indicates a significant deficit in the automatic feed-forward control of the cervical spine. As the deep cervical muscles are fundamentally important for support of the cervical lordosis and the cervical joints, change in the feed-forward response may leave the cervical spine vulnerable to reactive forces from arm movement.*

Jull G. For self-perceived benefit from treatment for chronic neck pain, multimodal treatment is more effective than home exercises, and both are more effective than advice alone. Aust J Physiother 2001; 47:215

*At the 12-month follow-up assessment, both manipulative therapy and specific exercise had significantly reduced headache frequency and intensity, and the neck pain and effects were maintained ($p < .05$ for all). The combined therapies were not significantly superior to either therapy alone, but 10% more patients gained relief with the combination. Effect sizes were at least moderate and clinically relevant. Conclusion: manipulative therapy and exercise can reduce the symptoms of cervicogenic headache, and the effects are maintained.*

Jull G, Trott P, Potter H, et al. A randomized controlled trial of exercise and manipulative therapy for cervicogenic headache. Spine 2002;27:1835–1843

*Manipulative therapy and exercise can reduce the symptoms of cervicogenic headache, and the effects are maintained.*

Sterling M, Treleaven J, Jull G. Responses to a clinical test of mechanical provocation of nerve tissue in whiplash associated disorder. Man Ther 2002;7:89–94

*Within the whiplash population, subjects whose arm pain was reproduced by the BPPT demonstrated significantly less range of motion (ROM) on both the symptomatic and asymptomatic sides when compared to the whiplash subjects whose arm pain was not reproduced by the BPPT ($p = .003$) and significantly less ROM and higher visual analog scale (VAS) scores than those whiplash subjects with no arm pain ($p = .003, .01$). Only the whiplash subjects whose arm pain was reproduced by the BPPT demonstrated differences between the symptomatic and asymptomatic sides. These generalized hyperalgesic responses to the BPPT support the hypothesis of central nervous system hypersensitivity as contributing to persistent pain experienced by WAD patients.*

[AQ3]

## Queries

AQ1: Are there complications?
AQ2: What does MedX mean?
AQ3: Define BPPT.

## Alden Query

Q1: We have inserted a short title. Please approve or provide an alternative.