

# Radiologic Evaluation of Chronic Neck Pain

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For many years, there were no guidelines for evaluating patients with chronic neck pain. However, in the past 15 years, considerable research has led to recommendations regarding whiplash-associated disorders. This article summarizes the American College of Radiology Appropriateness Criteria for chronic neck pain. Imaging plays an important role in evaluating patients with chronic neck pain. Five radiographic views (anteroposterior, lateral, open-mouth, and both oblique views) are recommended for all patients with chronic neck pain with or without a history of trauma. Magnetic resonance imaging should be performed in patients with chronic neurologic signs or symptoms, regardless of radiographic findings. The role of magnetic resonance imaging in evaluating ligamentous and membranous abnormalities in persons with whiplash-associated disorders is controversial. If there is a contraindication to magnetic resonance imaging, computed tomography myelography is recommended. Patients with normal radiographic findings and no neurologic signs or symptoms, or patients with radiographic evidence of spondylosis and no neurologic findings, need no further imaging studies. (*Am Fam Physician*. 2010;82(8):959-964. Copyright © 2010 American Academy of Family Physicians.)

Patients with chronic neck pain present physicians with a diagnostic and therapeutic dilemma.<sup>1-4</sup> There is considerable controversy in the literature regarding the etiology of chronic neck pain and the role of imaging in the evaluation of the condition. The literature focuses on two general etiologic categories: posttraumatic and degenerative. Posttraumatic etiologies include gross injuries and whiplash syndrome (i.e., any injury to the cervical vertebrae and adjacent soft tissues as a result of sudden jerking). Whiplash syndrome includes extension-flexion mechanisms sustained in rear-end motor vehicle collisions and abrupt lateral flexion mechanisms. Studies in Canada and Scandinavia have identified signs and symptoms that constitute whiplash-associated disorders.<sup>4-6</sup> Degenerative etiologies of chronic neck pain include spondylosis, degenerative disk disease, and acute disk herniation. Degeneration may also be secondary to previous injury. In addition, many anecdotal reports of other etiologies exist, including carotid or vertebral artery dissection, arteriovenous malformations, and neoplasms.

Previously, there was little research on the use of imaging modalities in the evaluation of patients with chronic neck pain. Most studies cited the use of radiography, particularly to

diagnose spondylosis, degenerative disk disease, or posttraumatic malalignment.<sup>4,7</sup> From a radiologic standpoint, a diagnosis of spondylosis could be made if osteophytes, disk space narrowing, or facet disease are present. Other imaging options included facet injections<sup>8-10</sup> and provocative tests using diskography.<sup>11-14</sup> More recent literature has focused on the use of magnetic resonance imaging (MRI), particularly in those with whiplash-associated disorders.<sup>5,6,15-21</sup> However, the ability of MRI to identify specific soft tissue changes in persons with whiplash-associated disorders is controversial.

With many diagnostic imaging techniques available to evaluate patients with chronic neck pain, guidance is needed to prevent unnecessary studies (as demonstrated in the Clinical Example below). This article reviews the American College of Radiology (ACR) Appropriateness Criteria for chronic neck pain (*Table 1*).<sup>22</sup> For each clinical scenario, the ACR Appropriateness Criteria indicate the optimal imaging study. The scenarios include patients younger than 40 years with or without a history of remote trauma, and patients of any age with a history of malignancy or remote surgery. Seven clinical scenarios were considered for these ACR Appropriateness Criteria, which included patients in whom radiographs were