Assessment of Neck Pain and Its Associated Disorders

Results of the Bone and Joint Decade 2000–2010 Task Force on Neck Pain and Its Associated Disorders

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Abstract

Study Design: Best evidence synthesis.
Objective: To critically appraise and synthesize the literature on assessment of neck pain.
Summary of Background Data: The published literature on assessment of neck pain is large and of variable quality. There have been no prior systematic reviews of this literature.
Methods: The Bone and Joint Decade 2000–2010 Task Force on Neck Pain and Its Associated Disorders conducted a critical review of the literature (published 1980–2006) on assessment tools and screening protocols for traumatic and nontraumatic neck pain.
Results: We found 359 articles on assessment of neck pain. After critical review, 95 (35%) were judged scientifically admissible. Screening protocols have high predictive values to detect cervical spine fracture in alert, low-risk patients

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seeking emergency care after blunt neck trauma. Computerized tomography (CT) scans had better validity (in adults and elderly) than radiographs in assessing high-risk and/or multi-injured blunt trauma neck patients. In the absence of serious pathology, clinical physical examinations are more predictive at excluding than confirming structural lesions causing neurologic compression. One exception is the manual provocation test for cervical radiculopathy, which has high positive predictive value. There was no evidence that specific MRI findings are associated with neck pain, cervicogenic headache, or whiplash exposure. No evidence supports using cervical provocative discography, anesthetic facet, or medial branch blocks in evaluating neck pain. Reliable and valid self-report questionnaires are useful in assessing pain, function, disability, and psychosocial status in individuals with neck pain.

Conclusion: The scientific evidence supports screening protocols in emergency care for low-risk patients; and CT-scans for high-risk patients with blunt trauma to the neck. In nonemergency neck pain without radiculopathy, the validity of most commonly used objective tests is lacking. There is support for subjective self-report assessment in monitoring patients' course, response to treatment, and in clinical research. (J Manipulative Physiol Ther 2009;32:S117-S140)

Key words: *best evidence synthesis; cervical spine; neck pain; whiplash-associated disorder; assessment; diagnosis*

From the conceptual model presented in Guzman *et al*,[1] people with neck pain may or may not seek care for their symptoms. For those who do, once they enter the clinical setting, the diagnostic process begins.

Diagnostics is the process of identifying a medical condition or disease by its signs and symptoms from the results of a clinical examination and other evaluative procedures. The conclusion reached through this process is called a diagnosis. Diagnostics may be used to either "rule in" or, to "rule out" a condition, disease, or disorder. The term "diagnostic criteria" designates the combination of findings which allows the clinician to ascertain the diagnosis of the respective disease.

Typically, someone with abnormal symptoms will consult a physician, who will then obtain a history of the patient's illness and examine the individual for signs of disease. The clinician will formulate a hypothesis of likely diagnoses and in many cases will obtain further testing to confirm or clarify the diagnosis, before suggesting definitive treatment.

In modern Western medicine the diagnoses of illness, along with the diagnostic accuracy of individual or combined diagnostic tests, serves as the basis for decisions on treatment strategies, referrals, disability assessments, reimbursement, and more.

This article presents the main results of a systematic review looking at the evidence regarding the validity and utility of diagnostic tests and self-reported disability assessment in people with neck pain. It is hoped that our best evidence synthesis approach will serve to inform clinicians on how best to confirm or refute a diagnosis or confirm a diagnosis. (Note: The literature search and critical review strategy are outlined in detail in Carroll *et al*.[2])

Methods

We conducted a systematic search and critical review of the literature using a best evidence synthesis. The search and review strategies are outlined in detail elsewhere.[2] In brief, we systematically searched the electronic library database Medline for literature published from 1980 through 2005 on neck pain and its associated disorders, we systematically checked the reference lists of relevant articles and we updated our search to include key articles from 2006 and early 2007. Details of our electronic search strategy are outlined in Carroll *et al*[2] and online through doi:10.1016/j.jmpt.2008.11.016.

We excluded studies on neck pain that was associated with serious local pathology or systemic disease, such as neck pain from infections, myelopathy, rheumatoid arthritis, and other inflammatory joint diseases, or tumors. We also excluded neck pain from fractures or dislocations, except for diagnostic and assessment studies relating to ruling out fractures and dislocations in neck pain, which were included in the critical review. Screening criteria are outlined in more detail in Carroll *et al*.[2]

Type of Studies Needed to Validate Diagnostic Tests

Three primary features of a diagnostic test are key to understand the accuracy of any test, they are: reliability (or reproducibility), validity *(*or accuracy), and predictive value in different populations. The validity of a diagnostic test refers to its ability to correctly identify people as diseased (positive for disease or at risk for disease) or nondiseased (negative for disease or not at risk for disease).

Reliability. For a test to be valid, it must first be shown to be *reliable*. That is, a test should consistently give the same result when it is repeated on the same person under the same conditions in a set time frame. Differences in results on repetition of a test, even under the same conditions, can arise for several reasons. The commonest are normal biologic variations in the test subject, individual observer inconsistencies (intraobserver variability), differences across observers (interobserver variability) as well as level of experience in applying the test, and differences in the underlying technology of the test equipment.

Validity. The validity or accuracy of a diagnostic test is typically demonstrated by comparing it to a "gold standard." A gold standard is a well-accepted and commonly applied method of identifying the disease or clinical entity of interest.