

**Chronic Neck Pain
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
1. Aprill C, Bogduk N. The prevalence of cervical zygapophyseal joint pain. A first approximation. <i>Spine</i> 1992; 17(7):744-747.	13	318	To determine if zygapophyseal pain was common using provocative discography and facet block.	53% of patients had symptomatic discs. 26% had symptomatic facet joints either in isolation or in conjunction with symptomatic discography.	2
2. Deans GT, Magalliard JN, Kerr M, Rutherford WH. Neck sprain--a major cause of disability following car accidents. <i>Injury</i> 1987; 18(1):10-12.	13	137	Follow-up study 1-2 years after car accident to determine incidence of neck pain.	85 (62%) had pain at some time. 31 (23%) had pain 1 year after; 5 had continuous pain. Rear impact and seat belts higher incidence.	2
3. Evans RW. Some observations on whiplash injuries. <i>Neurol Clin</i> 1992; 10(4):975-997.	12	N/A	Review whiplash injuries.	Whiplash injuries result in long-term disability with 6% of patients not returning to work after 1 year.	4
4. Gore DR, Sepic SB, Gardner GM, Murray MP. Neck pain: a long-term follow-up of 205 patients. <i>Spine</i> 1987; 12(1):1-5.	13	205	10 year follow-up of patients with neck pain to determine relationships DJD, spinal stenosis or cervical lordosis.	No statistical significant relationship between severity of pain and presence of DJD, narrow sagittal diameter of canal.	2
5. Makela M, Heliovaara M, Sievers K, Impivaara O, Knekt P, Aromaa A. Prevalence, determinants, and consequences of chronic neck pain in Finland. <i>Am J Epidemiol</i> 1991; 134(11):1356-1367.	15	7,216	To describe the distribution, determinants and consequences of chronic neck pain in a representative sample of Finnish adults.	Chronic neck syndrome was diagnosed in 9.5% of the men and 13.5% of the women. When adjusted for age and sex, the prevalence of the neck syndrome was associated with a history of injury to the back, neck, or shoulder and with mental and physical stress at work. There was some independent association between neck syndrome and disabilities, use of physician services, and use of pain killers.	1
6. Pearce JM. Whiplash injury: a reappraisal. <i>J Neurol Neurosurg Psychiatry</i> 1989; 52(12):1329-1331.	12	N/A	To review the facts and fallacies of "whiplash" syndrome.	Difficulty in explaining its mechanism, treatment, prognosis. Personality traits and secondary gain are prominent in these patients.	4
7. Robinson DD, Cassar-Pullicino VN. Acute neck sprain after road traffic accident: a long-term clinical and radiological review. <i>Injury</i> 1993; 24(2):79-82.	13	21	Retrospective review to correlate clinical and radiologic features in patients with acute neck sprain from car accidents.	No radiologic evidence correlates with symptoms or to development or progression of spondylosis.	3
8. Spitzer WO, Skovron ML, Salmi LR, et al. Scientific monograph of the Quebec Task Force on Whiplash-Associated Disorders: redefining "whiplash" and its management. <i>Spine</i> 1995; 20(8 Suppl):1S-73S.	13	3,014	To evaluate the Quebec experience in "whiplash", redefine it and make recommendations re: management.	Excellent cooperative study that developed a flow sheet defining whiplash associated disorders and recommends diagnosis and management.	2

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9. van der Donk J, Schouten JS, Passchier J, van Romunde LK, Valkenburg HA. The associations of neck pain with radiological abnormalities of the cervical spine and personality traits in a general population. <i>J Rheumatol</i> 1991; 18(12):1884-1889.	13	5,440	To examine the association of neck pain with personality traits, disc degeneration and osteoarthritis (OA) on radiographs.	Disc disease causes neck pain in men but not women. Facet OA not related to pain but to personality traits, neuroticism and injury.	1
10. Arana E, Marti-Bonmati L, Montijano R, Bautista D, Molla E, Costa S. Relationship between Northwick Park neck pain questionnaire and cervical spine MR imaging findings. <i>Eur Spine J</i> 2006; 15(8):1183-1188.	13	251	To determine the association between the self-report of pain and disability by means of the Northwick neck pain questionnaire (NPQ) and cervical spine MRI findings.	In patients with neck pain, NPQ scores do not correlate with MRI findings.	2
11. Leak AM, Cooper J, Dyer S, Williams KA, Turner-Stokes L, Frank AO. The Northwick Park Neck Pain Questionnaire, devised to measure neck pain and disability. <i>Br J Rheumatol</i> 1994; 33(5):469-474.	15	44	To provide an objective measure to evaluate outcome in patient with acute or chronic neck pain.	Questionnaires were completed on days 0 and 3-5, and at 1 and 3 months. There was good short-term repeatability (r = 0.84, kappa = 0.62). Mean scores of each of the sections in the questionnaire tended to rise with that of the pain section showing internal consistency.	3
12. Carragee EJ, Alamin TF. Discography. a review. <i>Spine J</i> 2001; 1(5):364-372.	12	N/A	Review of discography articles from 1967-2000.	Clinicians who use discography to determine treatment pathways for their patients need to critically examine the validity of the test.	4
13. Grubb SA, Kelly CK. Cervical discography: clinical implications from 12 years of experience. <i>Spine</i> 2000; 25(11):1382-1389.	13	173 discograms	Report on the prevalence of cervical pathology to determine whether a reproducible pattern of concordant pain could be associated with each symptomatic level identified, and to calculate the rate of complications.	Discography is a safe and valuable diagnostic procedure.	3
14. Hove B, Gyldensted C. Cervical analgesic facet joint arthrography. <i>Neuroradiology</i> 1990; 32(6):456-459.	10	11 (30 joints)	To report experience of cervical analgesic facet joint arthrography in patients.	Procedure is a good diagnostic test to identify the painful facets in patients with pre-existing multilevel disease diagnosed by any means. Can serve also as a preoperative guide but not permanent therapy.	3
15. Ohnmeiss DD, Guyer RD, Mason SL. The relation between cervical discographic pain responses and radiographic images. <i>Clin J Pain</i> 2000; 16(1):1-5.	13	269 discs	To investigate the relation between cervical discographic pain responses and radiographic images.	Of 35 normal appearing discs, pain was provoked in 14.3%; of 234 abnormal appearing discs, pain was provoked in 77.8%. Provocative discography is a good method of identifying pain-producing levels.	2
16. Ortiz AO, Johnson B. Discography. <i>Tech Vasc Interv Radiol</i> 2002; 5(4):207-216.	12	N/A	Review of technique of discography.	Discography is indicated for symptomatic patients with negative or equivocal MRI, CT, or myelographic studies.	4

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17. Roy DF, Fleury J, Fontaine SB, Dussault RG. Clinical evaluation of cervical facet joint infiltration. <i>Can Assoc Radiol J</i> 1988; 39(2):118-120.	3a	21	Retrospective studies to determine the effect of facet joint infiltrations with corticosteroids using fluoroscopic guidance.	91% of patients experienced relief of symptoms. There was no significant difference in response between patients receiving intra-articular or peri-articular injections (chi 2 = 2.283).	3
18. Tong C, Barest G. Approach to imaging the patient with neck pain. <i>J Neuroimaging</i> 2003; 13(1):5-16.	12	N/A	Reviews the imaging approach in patients with neck pain.	History, physical exam and imaging studies are essential for management of neck pain in the ambulatory patient.	4
19. Carragee EJ, Chen Y, Tanner CM, Truong T, Lau E, Brito JL. Provocative discography in patients after limited lumbar discectomy: A controlled, randomized study of pain response in symptomatic and asymptomatic subjects. <i>Spine</i> 2000; 25(23):3065-3071.	8	20	Prospective study to determine the relative pain intensity response to provocative discography in symptomatic and asymptomatic subjects after lumbar discectomy for intervertebral disc herniation.	40% of asymptomatic patients with normal psychometric testing who previously have undergone lumbar discectomy will have significant pain on injection of their discs. This is not significantly different from the experience of symptomatic patients.	3
20. Carragee EJ, Tanner CM, Yang B, Brito JL, Truong T. False-positive findings on lumbar discography. Reliability of subjective concordance assessment during provocative disc injection. <i>Spine</i> 1999; 24(23):2542-2547.	14	8	To determine the reliability of patients' subjective interpretation of pain concordance during provocative disc injection.	Patients with no history of low back pain who had undergone posterior iliac bone graft harvesting for nonlumbar procedures often experienced a concordant painful sensation on lumbar discography with their usual gluteal area pain.	4
21. Anderberg L, Annertz M, Brandt L, Saveland H. Selective diagnostic cervical nerve root block--correlation with clinical symptoms and MRI-pathology. <i>Acta Neurochir (Wien)</i> 2004; 146(6):559-565; discussion 565.	13	30	To assess the ability of cervical selective diagnostic nerve root block (SNRB) to correlate with clinical symptoms and MRI findings in patients with cervical radicular pain.	Correlation of SNRB results and the level with most severe degree of MRI degeneration were 60% and correlation between SNRB results and levels decided by neurological deficits dermatome radicular pain distribution were 28%.	3
22. Arana E, Marti-Bonmati L, Molla E, Costa S. Upper thoracic-spine disc degeneration in patients with cervical pain. <i>Skeletal Radiol</i> 2004; 33(1):29-33.	13	156	To study the relationship of upper thoracic spine degenerative disc changes on MRI in patients with neck pain.	A statistically significant relation was found within the upper thoracic discs, reflecting common pathoanatomical changes.	2
23. Boutin RD, Steinbach LS, Finnesey K. MR imaging of degenerative diseases in the cervical spine. <i>Magn Reson Imaging Clin N Am</i> 2000; 8(3):471-490.	12	N/A	Review the role of MRI in evaluating patients with chronic neck pain.	MRI is single best test to detect and distinguish between the various clinical diagnostic possibilities that may cause neck pain.	4
24. Chen CJ, Hsu HL, Niu CC, et al. Cervical degenerative disease at flexion-extension MR imaging: prediction criteria. <i>Radiology</i> 2003; 227(1):136-142.	13	62	To determine if there were any neutral-positioning criteria that can help predict functional cord impingement at flexion-extension cervical MRI.	31% of patients showed functional cord impingement on extension MRI.	3

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25. Kaale BR, Krakenes J, Albrektsen G, Wester K. Whiplash-associated disorders impairment rating: neck disability index score according to severity of MRI findings of ligaments and membranes in the upper cervical spine. <i>J Neurotrauma</i> 2005; 22(4):466-475.	8	122	To determine whether reported pain and functional disability in whiplash-associated disorders (WADS) patients is associated with specific soft tissue abnormalities in the upper cervical spine, as assessed by MRI.	Symptoms and complaints among WAD patients is linked with structure abnormalities in ligaments and membranes in the upper cervical spine, in particular the alar ligaments.	2
26. Barton D, Allen M, Finlay D, Belton I. Evaluation of whiplash injuries by technetium 99m isotope scanning. <i>Arch Emerg Med</i> 1993; 10(3):197-202.	10	20	To determine if the isotope scan can isolate the anatomic site and quantify the severity of injury in “whiplash” patients.	No correlation.	3
27. Bogduk N, Aprill C. On the nature of neck pain, discography and cervical zygapophysial joint blocks. <i>Pain</i> 1993; 54(2):213-217.	13	56	Patients had provocation discography and cervical zygapophysial joint blocks to determine the incidence of disc pain and zygapophysial joint pain occurring simultaneously in the same segment of the neck.	Discography or facet blocks alone are inadequate to investigate patient with chronic neck pain.	3

Evidence Table Key

Study Type Key

Numbers 1-7 are for studies of therapies while numbers 8-15 are used to describe studies of diagnostics.

1. Randomized Controlled Trial — Treatment
2. Controlled Trial
3. Observation Study
 - a. Cohort
 - b. Cross-sectional
 - c. Case-control
4. Clinical Series
5. Case reviews
6. Anecdotes
7. Reviews
8. Randomized Controlled Trial — Diagnostic
9. Comparative Assessment
10. Clinical Assessment
11. Quantitative Review
12. Qualitative Review
13. Descriptive Study
14. Case Report
15. Other (Described in text)

Strength of Evidence Key

- Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis and results.
- Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.
- Category 3 - The conclusions of the study may be valid but the evidence supporting the conclusions is inconclusive or equivocal.
- Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.