CHIROPRACTIC MANAGEMENT OF NECK RELATED DISORDERS

—

A Literature Synthesis by the Research Commission of the Council on Chiropractic Guidelines and Practice Parameters

A literature synthesis is an academically rigorous analysis of all the available scientific literature on a specific topic. Reviewers use internationally accepted tools to rate each article according to specific criteria. These include the type of study (randomized controlled trial, case series, etc), the quality of the study, size of the study and many other factors that influence the credibility and strength of the study's conclusions. Each reviewer independently rates all the available articles, and the ratings are compared among the members of the review team. When there is disagreement among the reviewers regarding the conclusions, a formal consensus process is followed to arrive at an overall conclusion upon which all reviewers can agree. The resulting conclusions do not represent the reviewers' own beliefs but rather what the literature actually supports. A literature synthesis is a starting point. It indicates only what we can conclude with supportable, scientific evidence. Appropriate therapeutic approaches will consider the literature synthesis as well as clinical experience, coupled with patient preferences in determining the most appropriate course of care for a specific patient.

This document is solely a survey of existing studies, and only expresses the opinion of CCGPP. It is not intended to, nor does it establish a standard of care in specific communities, specific cases, or as to the care of any particular individual or condition. Each case must be determined on the basis of a careful clinical examination and diagnosis of the patient, giving due consideration to the specific condition presented and the individual's informed choice as to care and treatment. No part of this document is intended to support any litigation or proceeding involving the standard of care, medical necessity or reimbursement eligibility.

Stakeholder review draft. Not for distribution otherwise or for attribution.

Literature Synthesis: Chiropractic Management of Neck Related Disorders

Team membership for neck related disorders:
Donald R. Murphy, DC – Team Captain
Clinical Director, Rhode Island Spine Center
Clinical Assistant Professor, Department of Community Health, Alpert Medical School of Brown University
Adjunct Associate Professor, Department of Research, New York Chiropractic College

Paul Dougherty, DC
Assistant Professor, NYCC
Affiliate faculty, Geriatric Medicine Program
University of Rochester School of Medicine and Dentistry

Jaroslaw (Jerry) P. Grod, DC
Professor & Director, Continuing Education
Canadian Memorial Chiropractic College

Gary Tarola, DC
Private practice
Allentown, Pennsylvania

Lawrence H. Wyatt, D.C., DACBR, FICC
Professor
Division of Clinical Sciences
Texas Chiropractic College
Pasadena, Texas

The CCGPP Neck Related Disorders team engaged in extensive discussion regarding the adoption of the work of the Bone and Joint Decade Neck Pain Task Force (NPTF) literature synthesis on Neck Pain and its Association Disorders. The result was a unanimous decision to adopt this work. Upon further discussion by the Neck Related Disorders team it was felt that there were two groups of conditions for which supplementary information would be useful, cervical radiculopathy and dizziness/ vertigo. Cervical radiculopathy was covered by the NPTF, but it was reported that no conclusions could be drawn about the management of this condition due to the absence of randomized, controlled trials. Dizziness/ vertigo was not covered by the NPTF for unstated reasons. The team felt that cervical radiculopathy and dizziness/ vertigo are neck related disorders that are commonly seen by chiropractors, and it would be of benefit to

DRAFT COPY
CHIROPRACTIC
CLINICAL COMPASS
Produced by CCGPP

all stakeholders to be made aware of the literature available on these topics. However, dizziness/ vertigo was covered by the CCGPP Nonmusculoskeletal/Special Populations team. Thus it was decided that the results of the search of cervical radiculopathy by the Neck Related Disorders team would be presented.

The team was asked to examine whether loss or reversal of the sagittal curve of the cervical spine, and treatments directed at this, should be considered. The team discussed this and determined that because there is no evidence that alterations in the cervical curve have a relationship with neck pain and related disorders (Christensen ST, Hartvigsen J. Spinal curves and health: a systematic critical review of the epidemiological literature dealing with associations between sagittal spinal curves and health. J Manipulative Physiol Ther. 2008;31(9):690-714.), this finding would not be considered a "neck related disorder" and thus would not be included in the chapter.

Presented first is a synopsis of the findings of the NPTF. The purpose of this synopsis is to present a general overview and it is *not* to be taken as a substitute for the NPTF document itself.

Sections of the NPTF document covered in this review:

Carroll LJ, Cassidy JD, Peloso PM, et al. Methods for the best evidence synthesis on neck pain and its associated disorders: the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine. 2008;33(4 Suppl):S33-8.

Carroll LJ, Hogg-Johnson S, van der Velde G, et al. Course and prognostic factors for neck pain in the general population: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine. 2008;33(4 Suppl):S75-82.

Carroll LJ, Hogg-Johnson S, Cote P, et al. Course and prognostic factors for neck pain in workers: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine. 2008;33(4 Suppl):S93-100.

Carroll LJ, Holm LW, Hogg-Johnson S, et al. Course and prognostic factors for neck pain in whiplash-associated disorders (WAD): results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine. 2008;33(4 Suppl):S83-92.

Nordin M, Carragee EJ, Hogg-Johnson S, et al. Assessment of neck pain and its associated disorders: results of the Bone and Joint Decade 2000-2010 Task

DRAFT COPY CHIROPRACTIC CLINICAL COMPASS Produced by CCGPP

Force on Neck Pain and Its Associated Disorders. Spine. 2008;33(4 Suppl):S101-22.

Hurwitz EL, Carragee EJ, van der Velde G, et al. Treatment of neck pain: noninvasive interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine. 2008;33(4 Suppl):S123-52.

Carragee EJ, Hurwitz EL, Cheng I, et al. Treatment of neck pain: injections and surgical interventions: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine. 2008;33(4 Suppl):S153-69.

DRAFT COPY
CHIROPRACTIC
CLINICAL COMPASS
Produced by CCGPP

The Bone and Joint Decade 2000–2010 Task Force on Neck Pain and Its Associated Disorders

Carroll et al: Spine 2008 33(4S): S33-38

Background: In 1995, the Quebec Task Force on Whiplash Associated Disorders released the first systematic review of the literature on whiplash injuries. This review did not included injuries associated with occupational injuries or consider neck pain in the general population. The Bone and Joint Decade Neck Pain Task Force was charged with making recommendations that would result in reducing the medical, social, and economic consequences of neck pain and its associated disorders. To fulfill this mandate the NPTF undertook two phases: 1) A systematic search, critical review and synthesis of the literature and 2) Original research on neck pain. This summary will only focus on the **methodology** of number 1, the methods of the systematic search, critical review and synthesis.

Literature search:
The scientific literature published in 1980–2006 was searched. Seminal papers published before 1980 were identified by Neck Pain Task Force Scientific Secretariat members in consultation with professional groups and the Neck Pain Task Force Advisory Committee.

The primary source of literature was citations indexed in the electronic library database, Medline between the years 1980 and 2005. The search was updated (update procedures described below) for articles published in 2006 and early 2007. MeSH terms such as “neck pain,” “neck injuries,” and “intervertebral disc,” supplemented by text words, such as “cervical pain,” “neckache,” and “whiplash.” All identified citations were entered into a bibliographic management software program called Reference Manager.

Inclusion Criteria for Full-Length Manuscripts.
1. Studies were included if they were published since 1980 till date. Articles published before 1980 could be included if they were studies that continue to have a substantial impact on clinical practice or they are cited consistently in current research reports (seminal papers).
2. English, French, and Swedish language original research manuscripts and systematic reviews/meta-analysis, published in peer-reviewed journals were included, as were conference proceedings, technical reports, unpublished manuscripts, and book chapters with original data.
3. Studies that examined the risk for neck pain were included; as were studies looking at the assessment, prevalence, incidence, interventions, rehabilitation, course, prognosis, prevention or economic cost of neck pain with or without its associated disorders.

Stakeholder review draft. Not for distribution otherwise or for attribution.

4. Scientific guidelines specific to the assessment or treatment of neck pain with or without its associated disorders were included.
5. Clinical case series were included if they were judged to be of special relevance to the Neck Pain Task Force report (e.g., if they were frequently cited in the literature, recommended by a member of the Scientific Advisory Board or professional society, if they might contribute evidence of safety of interventions, and/or if they were on a topic for which there was little or no other information available from reports involving greater methodological rigor).

Exclusion Criteria. Studies were excluded if they did not include at least 20 human subjects with neck pain, or 20 subjects at risk of neck pain.
Studies were excluded if:
1. They were about neck pain that was associated with serious local pathology or systemic disease, such as neck pain from infections; fractures or dislocations; myelopathy; rheumatoid arthritis and other inflammatory joint diseases; or tumors.
2. Studies about disorders not associated with neck pain were excluded.
3. Opinion articles, letters to the editor, and articles without scientific data or a report of their methodology were excluded.
4. If they contained no neck pain-specific data (e.g., if all the findings in the study combined neck and back pain, with no separate findings reported for neck pain).
5. Case series (except as indicated in the inclusion criteria) and nonsystematic review articles were excluded.
6. Clinical guidelines not specific to neck pain with or without its associated disorders were excluded. Guidelines without details of their methodology were also excluded.
7. Studies using cadavers or nonhuman subjects, such as crash test dummies and animals were excluded, as were laboratory simulations.

Review process:
Each citation (usually title and abstract) found in the literature search was reviewed by 3 members of the Neck Pain Task Force Secretariat, in rotating groups. The citation was deemed probably relevant, irrelevant, or unknown based on the agreement of at least 2 of the 3 members. No attempt was made to evaluate scientific quality of the study at the abstract screening stage.

Updating the Literature Review. The authors did not systematically or formally search Medline for articles published in 2006 or 2007. However, they included articles published in 2006 or early 2007 if they were judged to inform their findings. This would apply to randomized controlled trials, large longitudinal studies, those studies that addressed issues for which prior studies had produced little or no evidence, and those identified as important articles by individual Scientific Secretariat members.

Stakeholder review draft. Not for distribution otherwise or for attribution.

Critical Review of the literature:
All studies found during the literature search, which were judged relevant to the Neck Pain Task Force mandate, were subjected to a process of critical review and subsequent data abstraction. These critical reviews were performed by the Scientific Secretariat and assessed each study's scientific quality, with an emphasis on its internal scientific validity and its clinical relevance to the Neck Pain Task Force mandate. The authors used *a priori criteria* and computerized critical review forms, modified from the review forms used by the Québec Task Force on Whiplash-Associated Disorders and the WHO Collaborating Centre for Neurotrauma, Prevention, Management, and Rehabilitation Task Force on Mild Traumatic Brain Injury. The critical review forms were used as a guide to identify methodological strengths and sources of bias, and to facilitate the Scientific Secretariat's discussions of the methodological and clinical features of each study.

Analysis of the literature:
The authors synthesized the literature according to the principles of best evidence synthesis.

Results:
A total of 31,878 citations were identified in Medline. After applying the inclusion/exclusion criteria to these studies and those identified in our other search strategies, 1203 studies were deemed relevant to the Neck Pain Task Force mandate and were therefore subjected to the critical review process. Of these, 552 (46%) were accepted as scientifically admissible, and comprise the Best Evidence Synthesis

Conclusion: The NPTF's efforts are to be commended. This is the most comprehensive literature synthesis that has been performed to date to attempt to bring evidence to the discussion on how to best evaluate and treat neck pain.

DRAFT COPY
CHIROPRACTIC CLINICAL COMPASS
Produced by CCGPP

Epidemiology and risk factors (Carroll, et al pg 75-82; 83-92; 93-100):

In the General Population:

Course: 30-50% of adults will experience some form of significant neck pain in any given year.
50-75% of people who have an episode of neck pain will report neck pain 1-5 years later.
48% of children with neck pain will report neck pain of similar severity 1 year later.

Prognostic factors:

Worse prognosis – female gender (conflicting evidence, weak risk factor at most), older age (consistent but weak), high initial pain intensity, longer initial pain duration, difficulty with activities, previous history of neck pain, prior neck injury, co-morbid LBP (all odds ratios—OR— <2), self-perceived poor health, unemployed, passive or inappropriate (anger, frustration) coping (most ORs between 2 and 6)

Better prognosis – vitality, high social support, active coping, optimism, decreased need to be social (most ORs between 2 and 6)

No effect on prognosis – exercise (bicycling a risk factor in 1 study), marital status

No evidence – pre-existing degenerative changes, societal factors, genetic factors

In Whiplash Associated Disorders (WAD):

Course: 50% of people with WAD will continue to have pain at 1 year (however, in the general population 20-40% will report pain in the previous month).
Patients commonly complain of NP attributed to motor vehicle collision for longer periods, but these percentages are similar to those in the general population.
In children, mean duration of symptoms 9 days, maximum 2 months

Prognostic Factors:

There is conflicting evidence regarding the role of age and gender in prognosis, with some studies demonstrating decreased prognosis in females and older age

DRAFT COPY
CHIROPRACTIC CLINICAL COMPASS
Produced by CCCPP

groups, and other revealing no effect of gender or age. In the studies that did find an effect, the size was modest. Thus, it is doubtful that gender or age plays a large role in prognosis.

There is conflicting evidence as to whether educational level plays a role in prognosis. Type of occupation and its relation to education level may be the explanation for this, but there is no evidence upon which to make this determination.

There is conflicting evidence regarding the role of pre-injury NP plays in prognosis, with 2 studies showing that this factor predicts a negative prognosis and one showing no effect. The retrospective nature of these studies, with its potential for recall bias, limits their usefulness.

No studies were found that evaluated the role of pre-existing disc degeneration in prognosis.

Collision factors have generally not been shown to have any impact on prognosis. These factors include:
Crash vector (rear-end, side, frontal)
Position within the vehicle (driver, front seat passenger, rear seat passenger)
Awareness of impending impact
Use or type of headrest
Use or type of seatbelt
Head position (forward or turned)
Speed differential between vehicles

There is consistent evidence that increased WAD Grade (According to the Quebec Task Force classification) is associated with slower recovery.

There is consistent evidence that initial symptom severity (greater initial pain, greater number of symptoms, more parts of the body in pain, pain-related limitations) is predictive of poorer outcome.

Several psychological factors have been found to be predictive of slower recovery:
Fear
Catastophizing
Passive coping (later in recovery, but not initially)
Depression
Anxiety
Helplessness

DRAFT COPY
CHIROPRACTIC CLINICAL COMPASS
Produced by CCGPP

Legal system (tort vs No Fault) has an impact on prognosis, with claim closure occurring more rapidly in a No Fault system (in which individuals cannot sue for pain and suffering) than in a tort system (individuals can initiate a lawsuit against the driver at fault). Also, one study found that those individuals who initiated a lawsuit within one month of injury had slower recovery than those who did not. This evidence is preliminary and needs to be verified in other jurisdictions.

No studies were found that evaluated the role of genetic factors in prognosis.

No studies were found that evaluated the role of pre-injury physical fitness or exercise.

Initial intensity and type of health care (more frequent health care visits, seeing a chiropractor, consulting specialists or chiropractors and general practitioners, attending a multidisciplinary rehabilitation program) was found to be predictive of slower recovery.

No studies were found that assessed the role of cultural factors on prognosis.

There were sections on "***Prognostic Factors for Other Outcomes of WAD***", including tender points, widespread pain and psychological problems resulting from WAD. These were not included in this review as they did not relate to neck disorders *per se*. It is noted that these were also not included in the Discussion section of the NPTF document.

In Workers:

Course: Prevalence of NP varies depending on type of occupation, with greatest frequency amongst those working in hospitals and offices, and lowest frequency among workers in industrial/service and forestry sectors.

Over 60% of workers with NP will report NP 1 year after injury. It is not clear whether this represents continuous NP or recurrence.

Prognostic Factors:

There is some evidence that prognosis is less favorable amongst women than men, but the evidence is conflicting and any effect is modest.

There is evidence that older age is a predictor of a new episode of NP, but age has been found not to be a factor in prognosis.

DRAFT COPY
CHIROPRACTIC
CLINICAL COMPASS
Produced by CCGPP

NP severity combined with a prior history of sick leave due to NP is predictive of poor prognosis. Prior sick leave for reasons other than NP was also predictive. General health status was not found to be predictive of poor prognosis.

No studies were found that evaluated the role of degenerative changes on prognosis.

There is some evidence that occupational factors play a role in prognosis. Blue collar workers are more likely to have a poor prognosis than white collar workers, metal workers are more likely to have poor prognosis than welders and enlisted service personnel are more likely to have poor prognosis than officer. Sewing machine operators are more likely to have a positive outcome if they change jobs as compared to those who remain at the same job.

Most physical job demand and ergonomic factors do not have an impact on prognosis and for those in which an association has been found the effect is modest.

Most studies that have looked at psychosocial factors have not shown these to have an impact on prognosis. These factors include perceived psychological and work stress, job satisfaction, depressive symptoms, psychological load, satisfaction with colleagues and social support. One study found that perceived lack of influence over work was prognostic of increased likelihood of future NP. No studies were found that assessed factors such as fear, catastrophizing, coping strategies, anger or frustration.

No studies were found that assessed the role of workers' compensation on prognosis.

Consistent evidence was found that exercise was a positive prognostic factor. No studies were found that assessed the impact of body mass index, smoking, or other health-related lifestyle factors on prognosis.

No studies were found that assessed the role of cultural factors or genetic factors on prognosis.

One study found that prior treatment for 2 disc levels, and requiring additional surgery were both predictive of prognosis in a group of military service personnel who had undergone cervical disc herniation surgery.

DRAFT COPY
CHIROPRACTIC CLINICAL COMPASS
produced by CCCPP

Evaluating Diagnostic Studies (Nordin, et al pg. 101-122)

Clinical evaluation of the musculoskeletal system typically includes inspection, range of motion, strength, palpation and additional tests, frequently followed by laboratory and radiographic tests. Initial evaluation attempts to identify whether there is a serious underlying cause of the patients neck pain. In the emergency care setting, it is necessary to identify the presence of fracture, dislocation, instability, or other structural injury requiring special care and/or surgical correction, and in the non-emergency patient where fracture and/or instability can be associated with conditions such as cancer, infection, systemic disease, inflammatory arthritis and neurologic compromise. Other factors that might affect the decision to proceed with additional diagnostic testing beyond the physical examination in the clinical setting include demographics, past experience with the health care system, patients past therapies, work place vs. non-work place neck pain, patient's compensation status, the nature of the surrounding health care system and legal systems.

Section 1

Clinical Emergency Assessment

A. **Screening for serious neck injury in patients with blunt trauma to the neck; patient seeking care in an emergency room for neck pain after blunt trauma to the neck**. Evidence suggests that to rule out fracture dislocation, subluxation, and/or evidence of spinal cord injury, CT scan is preferable to plain radiographs.
B. **Alert low risk patients with blunt trauma to the neck**. Evidence suggests that the Canadian C-Spine Rules (CCR) or the Nexus Low Risk-Criteria (NLC) are reliable for practitioners to rule out serious injury, and the need for further imaging in adult patients at low risk of neck injury. Flexion-extension radiographs and five-view radiographs (cross table lateral, anterior-posterior and odontoid) in the acute stage of blunt neck trauma in adults or children, added little to static radiography in predictability and accuracy.

Section 2

Non-Emergency Clinical Assessment

Although no scientifically admissible studies were found evaluating patient history as a diagnostic tool for patients with neck pain, the task force recommends a system of "red flags" similar to those for the evaluation of low back pain, for practitioners to rule out serious pathology in patients seeking care for neck pain

DRAFT COPY CHIROPRACTIC CLINICAL GUIDELINES Produced by CCGPS

without blunt trauma. Serious disorders to rule out include; pathologic fractures, neoplasm, systemic inflammatory diseases, infections, cervical myelopathy and/or previous cervical spine or neck surgery, or open injury. There is some evidence that suggests that self reported questionnaires regarding past medical care may not have a high accuracy. The evidence suggests that people reporting continued axial pain after MVA may systematically underestimate previous low back and neck pain problems and co-morbidities associated with poor recovery.

Physical Examination

A. **Inspection;** Has low to moderate inter-examiner reliability for findings such as muscle wasting, swelling, redness, scars, nodules and ganglions of the neck and upper extremity.
B. **Range of Motion;** Both passive and active range of motion are moderately reliable, but reliability does not seem to increase whether it is assessed by the clinician or self described by the patient, nor whether range of motion is tested actively, passively or with or without a device.
C. **Muscle Strength and Endurance;** The evidence indicates that muscle testing of the neck and upper extremity by a clinician for diagnostic purposes had consistent slight to moderate inter-examiner reliability in patients with neck pain, with or without radiculopathy.
D. **Palpation for Tender Points and Trigger Points:** There is moderate to high predictive value and fair to moderate inter-examiner reliability for the evaluation of tender points and trigger points in patients with acute or chronic neck pain, with or without radiculopathy.
E. **Provocation Tests for Neck Pain with Radicular Involvement;** Evidence suggests that there is high positive predictive value for manual provocation tests designed to elicit nerve root compression in the cervical spine (extension/rotation maneuvers). These tests have been compared to the gold standards i.e. MRI, Nerve Conduction-EMG, and Myelography.
F. **Blood Testing and Electro-diagnostics;** There is no significant evidence to suggest that laboratory studies provide any significant value in the evaluation of the neck pain patient. There is no significant evidence suggesting that surface, dermatomal, or quantitative sensory electrophysiological studies provide useful ancillary information. Although not specifically studied, needle EMG examination remains the gold standard for cervical radiculopathy.
G. **Diagnostic Imaging (Radiograph, Myelography, CT scan, Discography and MRI);** For patients with non-acute neck pain with or without radiculopathy, there is no significant evidence supporting the utility of plain radiographs, CT scanning, or MRI studies. They provide no unique role in detecting a cause of neck pain independent of the history and

Stakeholder review draft. Not for distribution otherwise or for attribution.

clinical examination. In patients with radiculopathy, an MRI may aid in determining the site and level of neurologic compression.

H. **Injections;** The evidence does not support that anesthetic facet joint injections and provocative discography can definitively identify primary and specific lesions causing serious neck pain, i.e. facet joint pain or discogenic pain, utility is not proven based on improved outcomes, and are not recommended as a routine part of clinical practice.

I. **Self-Assessment Questionnaires;** Self-Assessment questionnaires commonly used in clinical practice generally attempt to identify perceived pain, perceived disability, ability or inability to cope with neck pain, ability or inability to function and/or health care utilization. These questionnaires are often clinically useful to provide an insight into the impact of neck pain, monitor change over time, establish the patient's perceived functional deficit and/or psychosomatic status, and to help choose appropriate and effective treatment. The instruments sited have demonstrated acceptable reliability, good content validity and are responsive to changes in the patient's self reported status. It is less clear whether these instruments are useful in predicting long term outcome related to pain, disability and employment.

DRAFT COPY
CHIROPRACTIC
CLINICAL COMPASS
Produced by CCGPP

Treatment of Neck Pain: Noninvasive Interventions (Hurwitz et al pg 123–152)

Studies of Noninvasive Interventions for Persons with Whiplash-Associated Disorders

Education or Advice:
- Ferrari *et al* found no beneficial effect of a one-page pamphlet of evidence-based whiplash prevention information on patient perceived recovery at 2 weeks or 3 months.
- Pamphlets emphasizing the good prognosis of whiplash were distributed to all participants in the Kongsted *et a*l trial, which found no clinically meaningful differences between rigid collar, usual care with an emphasis on fear reduction and resuming normal activities, and active mobilization at 1 year.
- Educational videos were shown to have beneficial effects on improvement in pain among acute whiplash patients in an RCT and a pseudo randomized study.
- The pseudo randomized trial found that, compared with patients receiving usual care, patients who watched at bedside a 12-minute psycho educational video emphasizing behavioral and home exercise interventions and breathing relaxation for muscle tension had lower pain ratings at 1, 3, and 6 months; they also used much less medication and had lower rates of health-care utilization.

Exercise Interventions:
- On average, acute or subacute WAD patients in intervention groups that included eye fixation exercises or active McKenzie-type exercises had better prognoses than patients assigned to passive modalities or soft collars.
- Patients receiving physical therapy care that included a large exercise component did not fare better than those receiving care from GPs who focused primarily on education.
- However, 12 weeks after starting therapy, patients with subacute WAD (duration of 6 weeks to 3 months) who received supervised physical training were using less analgesic medication and showed greater improvements in self-efficacy, fear of movement, and pain related disability than did the group instructed to exercise at home.
- Patients treated with mobilization exercises did not fare better than those given either rigid collars or advice in the aforementioned Kongsted trial.
- Referral to fitness training or to outpatient or inpatient multidisciplinary rehabilitation programs for whiplash resulted in similar or slower self-reported recovery rates than usual care alone in a population-based cohort study.

Medications:
- Corticosteroid injections were not efficacious for patients with chronic zygapophysial joint pain.

Stakeholder review draft. Not for distribution otherwise or for attribution.

- however, infusion of methylprednisone in acute whiplash patients took fewer sick days over 6 months and experienced less disabling pain than those in the placebo group.
- unable to identify any studies that evaluated the effectiveness of commonly used analgesic medications, including acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs), and narcotics, or studies of muscle relaxants and antidepressant medications in WAD.

Manual therapies:
- Interventions involving *mobilization* were more effective than usual care (including soft collars) or general advice.
- Compared with *passive* modalities, multimodal treatment—including relaxation training and manual treatment—resulted in quicker return to work and greater satisfaction with recovery.

Physical Modalities:
- One study found that acute WAD patients assigned to low-energy, high-frequency, PEMT had less pain and reduced use of analgesics compared with similar patients assigned to an inactive unit.
- Another study found that passive modalities [*e.g.*, transcutaneous electrical nerve stimulation (TENS), ultrasound] were inferior to a package of physical and psychological interventions.

Collars:
- Were found to be of either no benefit or less benefit when compared with active therapies, advice that patients should rest, and usual care.
- Immobilization in rigid collars for 2 weeks followed by active mobilization was found to be no more effective than active mobilization within 72 hours of symptom onset in acute whiplash.

Combined Approaches:
- Immobilization in rigid collars for 2 weeks followed by active mobilization was found to be no more effective than active mobilization within 72 hours of symptom onset in acute whiplash.

Patterns of Care:
- In 1 cohort, GP patients with 1 or 2 visits had the fastest time to claim closure.
- Chiropractic patients with more than 6 visits had the slowest time to claim closure.

DRAFT COPY
CHIROPRACTIC CLINICAL COMPASS
Produced by CCGPP

- In the other cohort, medical patients without chiropractic visits had the fastest time to claim closure; GP patients with more than 6 chiropractic visits had the slowest time to claim closure.

Systematic Reviews:
- 1995 Quebec Task Force concluded that manual and physical therapies which facilitate mobilization, as well as certain prescription medications may be beneficial.
- Also concluded that surgery is rarely indicated, and that soft collars and rest may be harmful in whiplash-related disorders.
- A 1999 review of treatments used by physiotherapists also found evidence to support active and passive movements in the early stage after whiplash but found weaker evidence for manipulative treatment.
- Exercise alone was of no benefit in increasing these patients' range of motion.
- The effectiveness of electrotherapies in the treatment of acute neck pain was found lacking in a recent Cochrane review.
- Because of conflicting evidence and few high-quality studies, no firm conclusions could be drawn about the most effective noninvasive interventions for patients with chronic WAD.

Cost and Cost Benefit:
- Two population-based cohort studies found positive associations between high health-care utilization and slower rates of recovery from WAD. This suggests that health care may promote passive coping.

Studies of Noninvasive Interventions for Persons with Other ("Nonspecific") Neck Pain and Associated Disorders

Education or Advice:

- Advice geared toward self-efficacy with no physical therapeutic intervention yielded benefits when compared to usual physical therapy care (simple advice, modalities, mobilization, and exercise).
- advice to stay active was less effective than naprapathic manual treatment at 7 and 12 weeks for persons with neck pain of at least 2 weeks' duration.

Exercise Interventions:

- for nonacute neck pain, strengthening exercises alone or combined with SMT resulted in better pain and disability outcomes than did SMT alone after 1 and 2 years.
- compared with usual analgesic use, massage and at-home strength and mobility exercises reduced the intensity and number of trigger points among patients with chronic neck-shoulder trigger points.

DRAFT COPY
CHIROPRACTIC CLINICAL COMPASS
Reproduced by CCCPP

- Twelve weeks of isometric shoulder endurance *versus* shoulder strength training yielded equivalent clinical outcomes among females with work involving repetitive motion and gradual onset neck or shoulder pain.
- females with chronic or recurrent neck pain, both endurance and strength training yielded better 12-month pain and disability outcomes than did an exercise advice control group118 and only the training groups experienced increased pressure pain thresholds.
- twelve sessions of exercises as part of a 6-week physical therapy program were less effective than manual therapy but more effective than usual general practitioner care in the short-term for patients with "nonspecific" neck pain lasting 2 weeks or more.
- However, compared with physiotherapy and chiropractic care, a 6-week program of intensive training of the cervical musculature resulted in greater endurance for chronic neck-pain patients, but there was no difference in pain and disability after 6 months.
- in the aforementioned trial by Chiu *et al*, patients who received exercise and TENS fared similarly; both modalities resulted in greater reductions in neck pain and disability compared with infrared irradiation during the 6-week treatment period and after 6 months' follow-up.
- An intervention that included advice and exercise for patients with "nonspecific" neck pain was found to be just as effective as interventions that also included manual therapies or shortwave diathermy.
- Compared with symptomatic care alone, exercises focusing on improving eye-neck coordination and proprioception resulted in much greater pain reduction and perceived improvement in patients with neck pain from baseline until the 10-week follow-up.
- In the only study of exercises for cervicogenic headache, patients assigned to 8 to 12 sessions of low-load therapeutic exercise with or without cervical manipulation reported fewer headaches and better overall perceived effect after 1 year than patients assigned to manipulation alone or to a no-treatment control group.
- Among female home-care nursing aides and assistants with or without neck or shoulder pain, a physical training program was no more effective than a stress management program or a nonintervention control for reducing or preventing neck and shoulder pain over 12 and 18 months.
- Workers assigned to computer software-stimulated work breaks with or without physical exercise had similar improvement in neck pain as computer workers in a nonintervention control group; however, workers in the intervention groups were more likely to perceive recovery and less likely to perceive deterioration.

<u>Medications:</u>

- Mobilization plus salicylate was found superior to salicylate alone in the Brodin study.

Stakeholder review draft. Not for distribution otherwise or for attribution.

- cervical spondylosis patients on benorylate (an analgesic) in combination with chlormezanone (a muscle relaxant anxiolytic) for 4 weeks perceived more pain reduction, improved sleep, and greater overall effectiveness than when on either drug alone or placebo, though clinical relevance is questionable.

Manual Therapies:

- Cervical mobilization was more effective than salicylate alone or sham physical therapy in the Brodin study.
- GP, physiotherapy (exercises, massage, modalities), manual therapy (manipulation or mobilization), and sham treatment were essentially indistinguishable in the Koes *et al* trial at 3, 12, and 52 weeks.
- strengthening exercises alone or in combination with SMT were more effective than SMT alone after 1 and 2 years
- compared with usual analgesic use, myofascial massage therapy in combination with strengthening and stretching exercises reduced the number and intensity of trigger points but yielded no differences in neck pain
- Relative to an active regimen of physical therapy (exercise sessions) or usual GP care, mobilization resulted in better short-term (7 week) but not longer term (13 and 52 weeks) pain and functional outcomes for patients with “nonspecific” neck pain for at least 2 weeks.
- In patients with chronic neck pain, massage was somewhat inferior to needle acupuncture 1 week after administration of treatments.
- A physiotherapy intervention including mobilization resulted in 6-week and 6-month outcomes comparable to acupuncture; no differences in short- or long-term outcomes were detected between chronic neck-pain patients assigned to intensive training, active physical therapy (mobilization and traction), or to chiropractic manipulation.
- Among mostly subacute and chronic primary-care neck-pain patients enrolled in a factorial trial of physical modalities and manual therapies, chiropractic manipulation and mobilization resulted in comparable pain and disability outcomes through 6 months follow-up.
- in another trial, mean pain reduction and cervical range of motion improvements were greater immediately following high velocity, low-amplitude manipulation than following mobilization.
- An intervention including advice, exercise, and manual therapy was found to be no more effective than advice and exercise alone or a combination of advice, exercise and shortwave diathermy; outcomes were similar in all 3 groups.
- Reductions in neck pain were greater immediately after thoracic manipulation than they were following a sham manipulation among manipulation-naive patients with “mechanical” neck pain.

Stakeholder review draft. Not for distribution otherwise or for attribution.

- Favorable effects on pain, pressure pain threshold, and skin conductance were observed immediately following passive mobilization *versus* placebo and control (no physical contact) procedures in a crossover trial in persons with mid- or lower cervical pain lasting more than 3 months.
- In persons with neck pain lasting at least a month, series of mechanically assisted (instrumental) manipulations and high-velocity, low-amplitude cervical spine manipulations yielded similar improvements in neck pain and disability and also in cervical range of motion during the 1-month treatment period and 1 month later.
- A 6-week series of naprapathic manual treatments (manipulation, mobilization, massage, and stretching) for persons with neck pain of at least 2 weeks' duration was the only study of its kind accepted into our best evidence synthesis. Researchers found these treatments to be more effective —in terms of pain and disability reduction and perceived improvement—than physician-delivered advice and support to stay active and exercise at 7 and 12 weeks from baseline. This finding is generally consistent with the aforementioned trial comparing osteopathic manipulative treatment with intramuscular ketorolac for patients with acute neck pain, although only short-term outcomes were reported in the latter study.
- A study looking at 4 groups of cervicogenic headache patients found no difference in headache outcomes after 12 months among those assigned to manipulative therapy (8–12 sessions), to exercise therapy, or to a combination of both. However, outcomes in all 3 treatment groups were superior to those in the no treatment control group.

<u>Physical Modalities:</u>

Eight trials assigned neck-pain patients to receive 1 or more physical treatment modalities,
including ultrasound, diathermy, hydrotherapy, electrical muscle stimulation, traction, percutaneous neuromodulation therapy, TENS, and infrared irradiation.

- Mobilization fared better than physical modalities in the Brodin study; and sham and active ultrasound resulted in equivalent outcomes in the Gam study.
- Neck-pain patients with or without radiation assigned to static, intermittent, or manual neck traction had similar pain and range of motion outcomes after 6 weeks, and only slightly better outcomes than patients in the control (non-traction) group.
- Cervical disc disease patients on dermatomally applied percutaneous neuromodulation therapy reported greater immediate post-treatment decreases in pain and improved sleep and more physical activity after 3 weeks in a crossover trial.

Stakeholder review draft. Not for distribution otherwise or for attribution.

DRAFT COPY CHIROPRACTIC CLINICAL COMPASS Produced by CCCPP

- Electrical muscle stimulation was also clinically ineffective.
- An intervention that combined advice, exercise and shortwave diathermy was found to be no more effective than advice and exercise alone or advice and exercise combined with manual therapy.
- In a trial involving myofascial pain patients, neck pain and disability reductions were greater in the TENS group than in the placebo group after the 10-day intervention period; but this was not the case 1 and 3 months later, when repetitive magnetic stimulation showed benefits relative to both TENS and placebo.

Acupuncture:

Six trials of subacute or chronic neck-pain patients included acupuncture arms.

- Short-term clinical outcomes favored needle acupuncture *versus* massage in the Irnich *et al* study, but little difference was observed between patients undergoing needle and sham laser acupuncture 3 months post-treatment.
- Immediate post-treatment pain and perceived improvement outcomes favored needle acupuncture *versus* myofascial trigger point therapy or sham laser acupuncture in a crossover trial.
- Among female sedentary office workers, a 10-session, 3-to-4 week protocol of body acupuncture and electroacupuncture, along with ear acupressure yielded greater reductions in neck, shoulder, and headache pain than did sham electroacupuncture during the treatment period. These differences remained or had grown by the 3-year follow-up assessment.
- General practice patients with neck pain of more than 6 months' duration experienced much greater reductions in neck pain and disability (from baseline to 3-months) when randomized to a 3-month course of up to 15 sessions of needle acupuncture. More than twice as many acupuncture patients improved by 20% or more (56.5% *vs.* 21.6%).

Laser and Magnetic Therapy:

Seven studies tested the effectiveness of laser or magnetic therapies, including magnetic necklace, low-level laser therapy (LLLT),50,145–148 and repetitive magnetic stimulation.

- Wearing magnetic and nonmagnetic necklaces reduced the intensity and frequency of pain equally well among persons with chronic (1 year or more) neck or shoulder pain during a 3-week intervention period.
- LLLT was comparable to placebo with respect to pain and function for patients with trigger points in a double-blind randomized crossover trial. However, mean pain and disability reductions were greater in osteoarthritis patients assigned to low-power laser therapy than to placebo after 10 consecutive days of therapy in a parallel-group RCT.

Stakeholder review draft. Not for distribution otherwise or for attribution.

DRAFT COPY CHIROPRACTIC CLINICAL COMPASS Produced by CCCPP

- A double-blind, placebo-controlled RCT of patients with myofascial pain syndrome of the neck and shoulders found that LLLT was associated with greater reductions in pain and disability, fewer trigger points, and better quality of life scores after 2, 3, and 12 weeks. Another double-blind RCT of patients with neck pain (more than 3 months' duration) found that, after 12 weeks, pain reduction and self-assessed global improvement were also greater in the LLLT group *versus* the placebo group.
- Pulsed infrared diode laser therapy for patients with myofascial pain resulted in greater pain reductions than placebo, both during the 24-day intervention period and 2 months later.

Combined Approaches:

Interventions encompassing various combinations of single treatment modes, packages of individualized care or comprehensive rehabilitation programs were included as arms in 4 studies.

- Patients with neck, shoulder, or upper arm pain who took part in an active multidisciplinary rehabilitation program had comparable sick-leave outcomes compared to patients who received other care (including physiotherapy, medication, and other "as needed" treatment). However, patients in the rehabilitation program experienced improved mobility over 2 years, whereas those receiving other care did not.
- Pain and global outcomes were observed among patients with neck-shoulder trigger points; some received active or sham ultrasound along with treatment which consisted of massage and home exercises; a control group was treated with analgesic pain relievers. After 6 months, no differences were observed on pain and global outcomes among all 3 groups; however, those who received ultrasound plus massage and home exercise, and those who received sham ultrasound plus massage and home exercise had fewer and less intense trigger points than the group using analgesic medications only.
- Outcomes that included reductions in neck symptoms and improvements in work ability were studied in 3 groups of workers with recurrent or chronic neck pain. Those who were assigned to a 12-week program of stabilization and relaxation training and behavioral support did better than those given advice on exercises with or without 2 sessions of practical training.
- For patients with chronic cervicobrachial pain, those receiving individually adapted physiotherapy modalities (traction, mobilization, exercises, ergonomic, and postural advice) for 3 months did as well as those who underwent surgery with no physiotherapy for 3 months. Outcomes were comparable with respect to 3-month pain and functional outcomes and

DRAFT COPY CHIROPRACTIC CLINICAL GUIDELINES Produced by CCPP

better than outcomes with a cervical collar, but differences among all groups after 15 to 16 months were negligible.

Other Interventions:

Other treatments included among the scientifically admissible studies were occlusal adjustment, various pillows, cervical collar, a brief physiotherapist intervention involving cognitive behavior therapy principles, botulinum toxin A, and, in a pilot study, applied relaxation.

- Occlusal adjustment was ineffective for persons with chronic neck or shoulder pain.
- Compared with a usual or roll pillow, a water pillow resulted in increased pain relief and improved sleep quality among patients with neck pain with or without cervicogenic headache.
- Patients with subacute or chronic neck pain who underwent several sessions of usual physiotherapy fared only slightly better than those assigned to a brief cognitive-behavior intervention. Patients who said they preferred the brief therapy did at least as well as those assigned to physiotherapy after 12 months of follow-up.
- A double-blind, placebo-controlled RCT looked at using botulinum toxin A *versus* placebo in the treatment of people with disabling neck pain of at least 3 months' duration. The study found similar decreases in mean neck pain and disability scores and increases in trigger point pressure thresholds in both groups over 16 weeks post-treatment; however, adverse reactions were much more frequent in the botulinum toxin A group.
- Patients with chronic cervicobrachial pain assigned to wear a rigid cervical collar for 3 months did not improve, whereas those assigned to surgery or to multimodal care showed reductions in pain and increases in function; however, after 15 to16 months, clinical outcomes were similar across all 3 groups.
- In the randomized pilot study, patients with neck pain of greater than 3 months' duration who were randomized to 7 weekly sessions of applied relaxation focusing on body awareness and active coping perceived more control over their pain and consumed fewer analgesics after 20 weeks than patients assigned to 11 physiotherapy sessions.

Workplace Interventions:

- Computer software programs designed to stimulate regular work breaks were not effective at reducing the intensity or frequency of neck symptoms or sick leave among subjects with work-related neck disorders. However,

DRAFT COPY
CHIROPRACTIC CLINICAL COMPASS
Produced by CCCPP

workers in the intervention groups were more likely to report recovery, were more productive, and were less likely to report deterioration.

- In a nonrandomized (cohort) study, male video display unit users given multiple ergonomic interventions had clinically irrelevant reductions in neck pain intensity and frequency, whereas those not given the interventions had increases in pain 2 years after the interventions.6 The differences observed between groups may be more reflective of the poor ergonomic environment in the control group rather than the effectiveness of the interventions, however.
- In the aforementioned RCT of female home-care nursing aides and assistants with or without neck or shoulder pain, physical training, or stress management was no more effective in preventing or reducing neck and shoulder pain than no intervention at all over 12 and 18 months.

Safety of Intervention:

STROKE
In a population-based case-control study, Rothwell *et al* showed an increased risk of VBA dissection within a week of a chiropractic visit among persons under age 45 years (odds ratio_5.03, 95% CI_1.32, 43.87). As part of the Neck Pain Task Force mandate, Cassidy *et al* extended these findings using both a case-control and case crossover research design (a research design in which cases serve as their own controls until the event). This study confirmed an increased risk of VBA, but found a similar increase in risk of this form of stroke after visiting a primary care physician for neck pain. These findings suggest that the increased risk of VBA stroke associated with chiropractic and primary care physician visits is likely due to patients with headache and neck pain from VBA dissection (in the prodromal stage) seeking care before their stroke.54 Thus, although cervical spine manipulation cannot be ruled out as a potential cause of some VBA strokes, any potential risk is very small.

INJECTIONS
The overall risk for complications for fluoroscopically guided interlaminar cervical epidural injections was 16.8%. All complications were transient and did not require hospitalization.

Another case series of 151 patients and 306 cervical and lumbosacral selective nerve root injections detected no major complications (*e.g.*, death, paralysis, infection, nerve root injury), although 40% of patients reported transient side effects following the injection.

Conclusion

Stakeholder review draft. Not for distribution otherwise or for attribution.

1. Mobilization and exercises appear more beneficial than usual care or physical modalities,
2. collars and high health-care utilization may delay recovery, and
3. an educational video focusing on self efficacy in addition to usual medical care appears promising.

For other neck disorders without radicular signs or symptoms (Grades I and II), the evidence suggests that manual (manipulation or mobilization) and exercise interventions, LLLT, and perhaps acupuncture are more effective than no treatment, sham, or alternative interventions; however, none of these treatments is clearly superior to any other in either the short- or long-term.

For both WAD and neck disorders without trauma, the evidence favors supervised exercise sessions with or without manual therapy over usual or no care. Of the manual therapies, manipulation and mobilization yield comparable clinical outcomes.

The association between chiropractic visits (which frequently include cervical manipulation) and VBA stroke is similar to the association between physician visits and VBA stroke. This suggests that, on average, patients who seek chiropractic care for neck pain or headaches, and who then developed a VBA stroke may have actually been in the prodromal phase of a stroke when consulting the chiropractor.

Because of the lack of scientifically acceptable studies on acute nontraumatic neck disorders and disorders with radiation and neurologic signs (Grade III neck pain), we cannot make any conclusions regarding the risks and benefits of noninvasive interventions for these conditions. Evidence for the effectiveness of neck-pain prevention strategies in the workplace and elsewhere is lacking. Future efforts should focus on the design and evaluation of neck-pain prevention strategies, and on intervention strategies for persons with acute nontraumatic neck disorders, disorders with radicular symptoms, and cervicogenic headache.

DRAFT COPY
CHIROPRACTIC
CLINICAL CONGRESS
Produced by CCGPP

Treatment of Neck Pain: Injections and Surgical Interventions (**Carragee, et al pg 153–169)**

Cervical Injections for Neck Pain and Radiculopathy
There is evidence supporting short-term symptom improvement of radicular symptoms from the neck, when treatment involves a short course of epidural or selective nerve root injections with corticosteroids. This is true when patients are not involved in litigation. Multiple injections (>3) or repeated courses are unsupported by the evidence.
There is, however, no evidence that the use of cervical nerve root or epidural injections can reduce the rate of surgery in seriously symptomatic radiculopathy patients.

Open Surgical Treatment of Cervical Radiculopathy
It remains unclear whether long-term outcomes are improved with the open surgical treatment of cervical radiculopathy, when compared with non-operative procedures. On the other hand, relatively rapid and substantial pain relief, along with impairment reduction in the short-term (6 to12 weeks post- surgery) following surgical treatment of cervical radiculopathy seems to be reliably achieved.
The use of anterior cervical plates, in single and double-level fusions seems to reduce the progression of kyphosis after cervical spine surgery.
Complex open surgical procedures for cervical radiculopathy (e.g., fusion, cage or plate instrumentation, or fusion augmentation with bone morphogenic protein) have not proven to provide clinically important superior outcomes when compared to simple cervical decompression alone.
Results from early trials involving cervical disc arthroplasty for radicular symptoms from the cervical spine, seem to show similar 1- to 2-year outcomes to anterior fusion surgery. The long-term safety of cervical disc arthroplasty remains unknown.

Open Surgical Treatment for Neck Pain Without Radiculopathy
The current evidence does not support the use of anterior cervical fusion or cervical disc arthroplasty for neck pain without radiculopathy or serious underlying pathology.
When signal changes within the upper cervical ligaments are seen on MR imaging after whiplash injury, there has not been adequate testing, and therefore no supportive evidence, for surgical intervention for suspected upper cervical ligamentous injury.

Complications Associated With Surgical Interventions for Neck Pain
Serious adverse events associated with cervical foraminal or epidural injections are very uncommon (1%), but there are relatively frequent minor adverse events (5%–20%).

Stakeholder review draft. Not for distribution otherwise or for attribution.

Acute, potentially serious, complications after open surgical procedures performed on the cervical spine, are seen in approximately 4% of patients. These are more common in older patients, after combined anterior and posterior surgery, and after surgery for myelopathy, as opposed to neck pain alone or radiculopathy.
Minor complications after open surgical procedures on the cervical spine (e.g., dysphagia, hoarseness, donor site pain) are frequently reported and usually resolve with time.

DRAFT COPY
CHIROPRACTIC
CLINICAL COMPASS
Produced by CCGPP

We then reviewed our literature search to see if there were any cohort studies of interventions that are used by chiropractors for cervical radiculopathy. Because only one cohort study was found, we chose to deviate slightly from the typical CCGPP format and include cases series. We found the following studies:

Cervical radiculopathy – cohort study:
Murphy DR, Hurwitz EL, Gregory AA, Clary R. A nonsurgical approach to the management of patients with cervical radiculopathy: A prospective observational cohort study. J Manipulative Physiol Ther. 2006;29(4):279-87.

Cervical radiculopathy – case series:
BenEliyahu DJ. Magnetic resonance imaging and clinical follow-up: study of 27 patients receiving chiropractic care for cervical and lumbar disc herniation. *J Manipulative Physiol Ther*. 1996;19(9):597-606.

Schliesser JS, Krsue R, Fallon LF. Cervical radiculopathy treated with chiropractic flexion distraction manipulation a retrospective study in a private practice setting. *J Manipulative Physiol Ther*. 2003;26(9):592-6.

Dougherty P, Bajwa S, Burke J, Dishman, JD. Spinal manipulation postepidural injection for lumbar and cervical radiculopathy: a retrospective case series. *J Manipulative Physiol Ther*. 2004;27(7):449-55.

The findings of these studies are briefly described:

Murphy DR, Hurwitz EL, Gregory AA, Clary R. A nonsurgical approach to the management of patients with cervical radiculopathy: A prospective observational cohort study. J Manipulative Physiol Ther. 2006;29(4):279-87.

This is a prospective observational cohort study in which 35 patients with cervical radiculopathy were treated according to a diagnosis-based clinical decision rule. The treatment received by each patient was determined individually, based on the diagnosis, but all patients were treated with cervical manipulation, neural mobilization and a basic cervical stabilization exercise. Other treatments included a detailed cervical stabilization exercise program, end range loading, home traction, anti-inflammatory medication, epidural steroid injection and combined education and graded exposure. Outcome measures were self-rated improvement, the Bournemouth Disability Questionnaire (BDQ) and the Numerical Rating Scale (NRS) for pain intensity. They found at the end of treatment 89% of patients rated their improvement as either “excellent” or “Good”. The mean self-rated percentage improvement was 75%. The mean percentage improvement in BDQ was 53%. Clinically meaningful improvement in BDQ was seen in 77.4% of patients. The mean improvement in NRS was 4.3 points. They then followed up patients an average of 8 months after cessation of

treatment and found the mean self-rated percentage improvement was 88%. The mean percentage improvement in BDQ was 78%. Clinically meaningful improvement in BDQ was seen in 92.6% of patients. The mean improvement in NRS was 4.9 points. Patients were seen an average of 11.7 visits.

BenEliyahu DJ. Magnetic resonance imaging and clinical follow-up: study of 27 patients receiving chiropractic care for cervical and lumbar disc herniation. *J Manipulative Physiol Ther*. 1996;19(9):597-606.

This is a case series of 27 patients with radiculopathy secondary to disc herniation, of which 11 were cervical. Outcome measures were post-treatment MRI scans, Visual Analogue Scale (VAS) for pain intensity and return to work. Treatment included traction, flexion distraction, spinal manipulative therapy, physiotherapy and rehabilitative exercises. They did not specify the results of the cervical patients alone, however, they found that 80% of patients had VAS scores of <2 by the end of treatment. Mean improvement in VAS was 5 points. Reduction in size or resolution of the disc herniation was seen in 77% of patients. At one-year follow up, 78% of patients had returned to work.

Schliesser JS, Krsue R, Fallon LF. Cervical radiculopathy treated with chiropractic flexion distraction manipulation a retrospective study in a private practice setting. *J Manipulative Physiol Ther*. 2003;26(9):592-6.

This is a retrospective report of 22 patients diagnosed with cervical radiculopathy, although the sole criterion for the diagnosis was neck pain with pain radiating into one or both upper extremities. Even patients whose upper extremity pain was deemed to be “sclerotogenous”, as opposed to arising from a nerve root, were included. The outcome measure was visual analogue scale (VAS) for pain intensity. All patients were treated with cervical flexion-distraction as well as some form of adjunctive therapy such as low-volt galvanic, ultrasound and hot/ cold packs. The mean improvement in VAS score was 41.4 points. Patients were seen an average of 13.2 visits.

Dougherty P, Bajwa S, Burke J, Dishman, JD. Spinal manipulation postepidural injection for lumbar and cervical radiculopathy: a retrospective case series. *J Manipulative Physiol Ther*. 2004;27(7):449-55.

This is a retrospective review of 80 patients with radiculopathy, 20 of whom were cervical, who had exhibited “suboptimal improvement” with treatment consisting of manipulation, stretching and stabilization exercises. They were treated epidural steroid injection followed immediately by spinal manipulation. Based on

DRAFT COPY CHIROPRACTIC CLINICAL GUIDELINES Produced by CCGPP

the response, a second or third procedure was performed on some patients, with one patient receiving four procedures. Outcome was classified as significant improvement, temporary improvement or no change, based on practitioner assessment. Of the cervical patients, 50% were deemed to have had significant improvement, 30% temporary improvement and 20% no improvement.

DRAFT COPY
CHIROPRACTIC
CLINICAL COMPASS
Produced by CCGPP

Stakeholder review draft. Not for distribution otherwise or for attribution.