Using Chiropractic for Conservative Treatment of Mechanical Pain Syndromes

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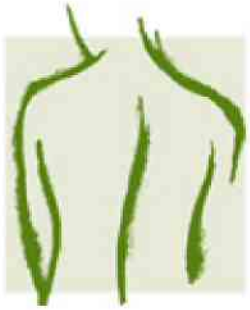
Today's agenda

- Practice and educational background
- Rationale for conservative NMS care
- Conservative NMS interventions
- Principles of case management
- Indications, contraindications, adverse reactions
- Evidence-based models of interdisciplinary management
- Systematic reviews on clinical effectiveness

Practice and educational background



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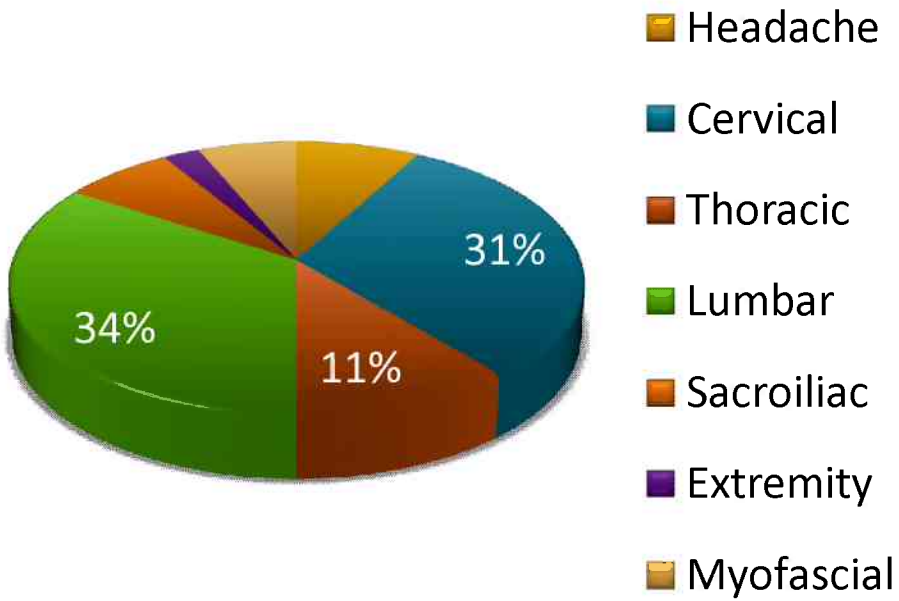
acute and chronic pain options

- Non-surgical spine specialists
- Both portal of entry and referral access
- Coordinate care with internal medicine, rheumatology, physiatry, neurosurgery, orthopedics, physical therapy, psychiatry/psychology

Practice and educational background

- Primary intervention is spinal manipulative therapy (SMT)
- Other manual and physical medicine procedures
- Diagnose and treat mechanical pain syndromes

Types of Presenting Conditions

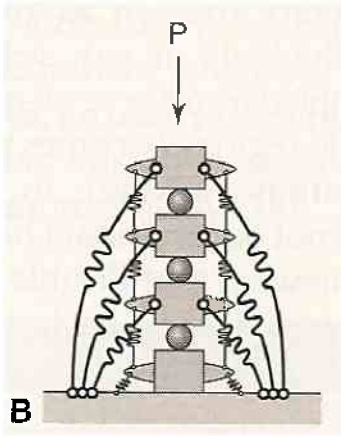


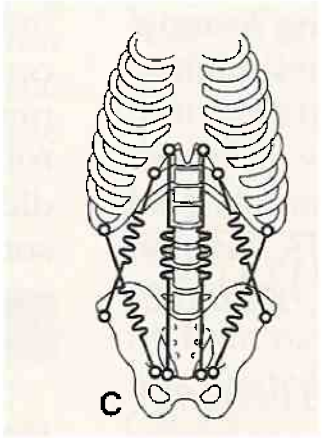
Practice and educational background

- Certified Strength and Conditioning Specialist (CSCS)
  National Strength and Conditioning Association
- Master of Science Degree - Sports Science and Rehabilitation
  Logan University- Graduate Program
- Doctor of Chiropractic Degree
  Logan University- College of Chiropractic
- Bachelor of Business Administration Degree
  Mississippi State University

Rationale for conservative NMS care

- Injury results in joint dysfunction, fascial restrictions, muscular dysfunction, impingement syndromes, myofascial trigger points
- Injury may be in the form of
  - Macro-trauma
    - Obvious examples
  - Micro-trauma
    - Cumulative trauma disorder (CTD)
    - Functional stability deficit leading to spine buckling
    - Cyclic, aberrant loading





Liebenson CL. Rehabilitation of the Spine. 2nd Ed. 2007

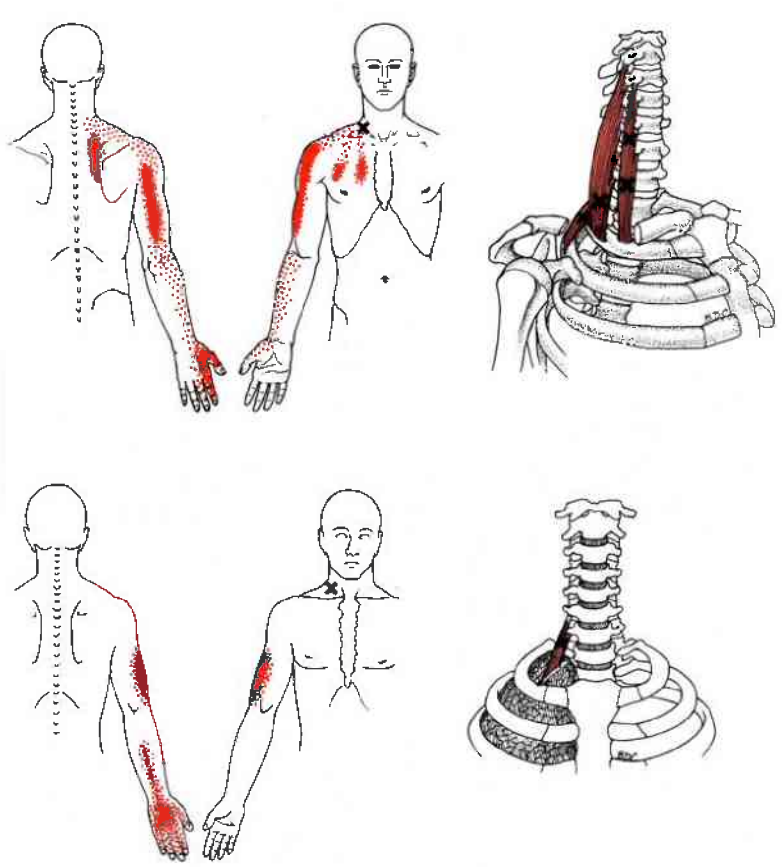
Rationale for conservative NMS care

- Acute facet joint motion restriction (fixation)
  - Decreased active and passive ROM
  - Local inflammation
  - Irritation of nociceptors
  - Mechanoreceptive deficit
- Chronic facet joint motion restriction (fixation)
  - Articular adhesions and degeneration
  - Postural muscle wasting
  - Osteophyte formation

Kirkaldy-Willis WH, Burton CV. Managing Low Back Pain. 3rd ed. 1992.

Rationale for conservative NMS care

- Joint and muscle dysfunction is clinically apparent as:
  - Tension-type headache
  - Orofascial pain and TMD
  - Neck pain
  - Mid/low back pain
  - Myofascial pain syndromes
  - Etc.



Conservative NMS interventions

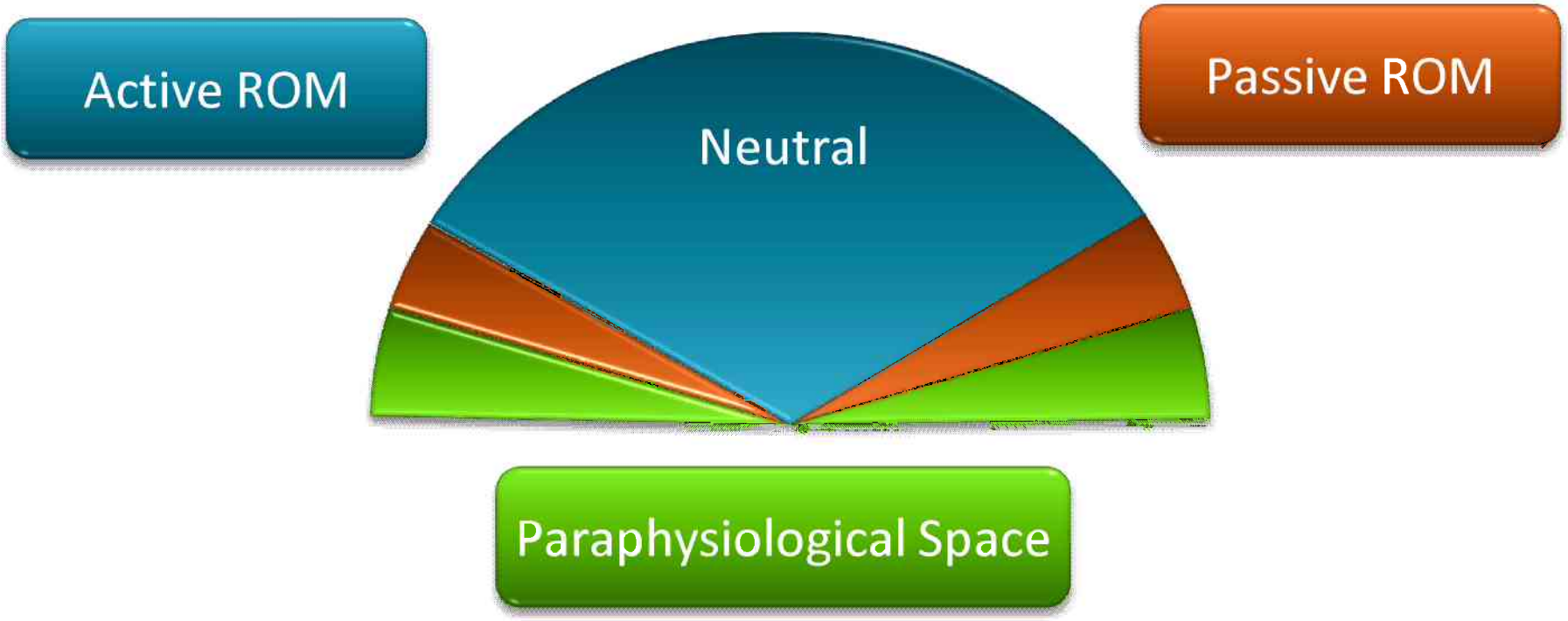
- History, exam (rule out things that mimic MSK)
  - ortho, neuro, and functional movement exam
  - DDX and treatment plan
  - re-assess and redirect or discharge
- Intent is to unload mechanical irritation of pain generator and/or remove key mechanical barriers to movement, inhibiting sensitization of pain pathways

Conservative NMS interventions

- Manual Medicine
  - spinal manipulative therapy (SMT)
  - other joint manipulation and mobilization
  - soft tissue manipulation
  - manual traction

Conservative NMS interventions

- Manipulation and Mobilization



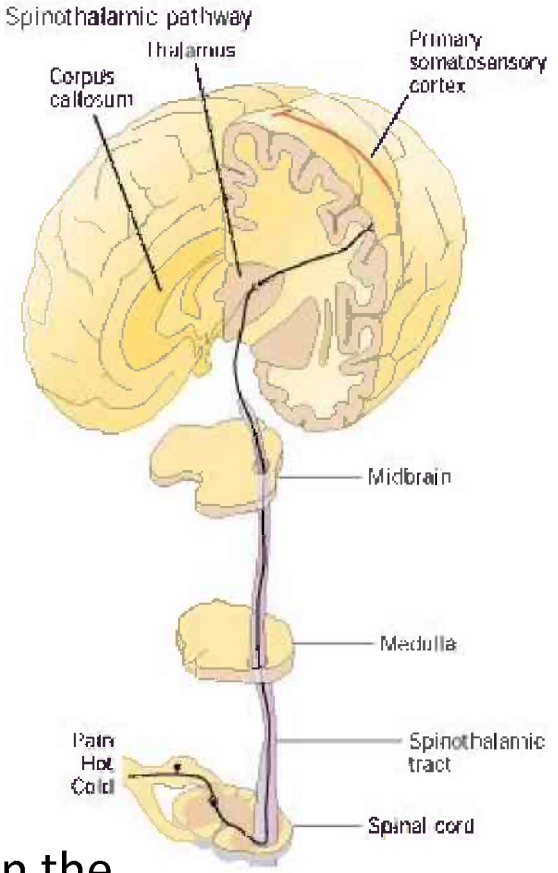
Conservative NMS interventions

- Effect of spinal manipulation
  - Increase active and passive ROM
    - Kawchuk G, Herzog W. Preliminary evidence of changes in tissue stiffness following spinal manipulation. In: International Conference on Spinal Manipulation; 1996: FCER; 1996. p. 18.
  - Gap facet joint
    - Cramer GD, Gregerson DM, Knudsen JT, Hubbard BB, Ustas LM, Cantu JA. The effects of side-posture positioning and spinal adjusting on the lumbar Z joints: a randomized controlled trial with sixty-four subjects. Spine 2002;27(22):2459-66.
  - Improve activation of muscular stabilization
    - Brenner AK, et al. Improved activation of lumbar multifidus following spinal manipulation: a case report applying rehabilitative ultrasound imaging. J Orthop Sports Phys Ther. 2007 Oct;37(10):613-9.
    - Gill NW, Teyhen DS, Lee IE. Improved contraction of the transversus abdominis immediately following spinal manipulation: a case study using real-time ultrasound imaging. Man Ther. 2007 Aug;12(3):280-5.

Conservative NMS interventions

Suggested Analgesic Mechanism

- Manipulation stimulates
  - Lateral periaquaductal gray (PAG)
    - Rostral Ventral Medulla (RVM)
    - Dorsolateral pons
  - Part of the descending inhibitory pathway using serotonin and noradrenalin



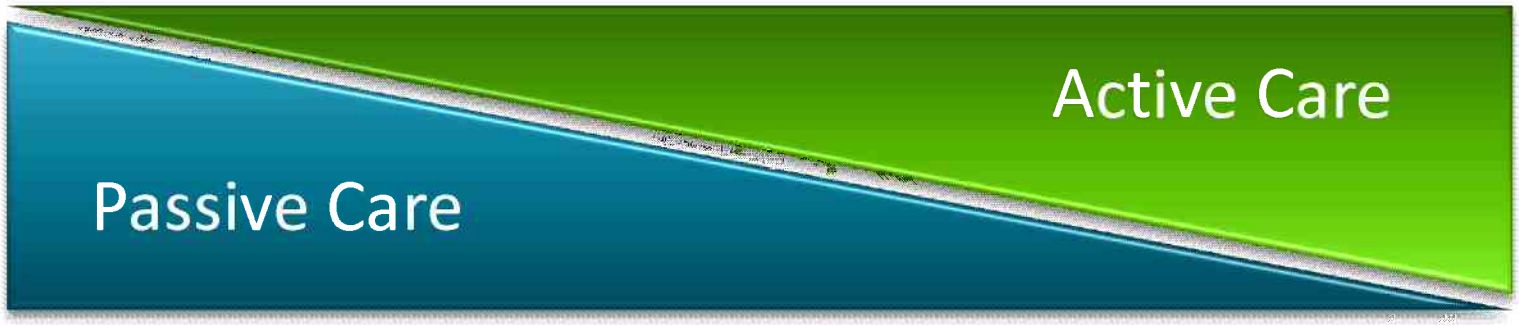
Skyba DA et al. Joint manipulation reduces hyperalgesia by activation of monoamine receptors but not opioid or GABA receptors in the spinal cord. Pain. 2003 Nov;106(1-2):159-68.

Conservative NMS interventions

- Physical Modalities
  - ice/heat
  - interferential current
  - therapeutic ultrasound
- Rehabilitative Techniques
  - therapeutic/corrective exercises
  - exercise prescription

Conservative NMS interventions

- Self Care
  - patient education
  - tissue sparing strategies
  - activity modification
  - transfer locus of control back to patient
  - continuum of care



Principles of case management

- Appropriate utilization of conservative NMS care is team effort
  - Direct patient to the right treatment for the right problem at the right time
- Referral network
- Case complexity matrix
  - Simple – complex
  - Acute – chronic

Principles of case management

Case complexity matrix

Acute Simple
- < 6 weeks
- < 4 episodes over 2 years
- Neuro negative
- Single area

Acute Complex
- Neuro signs and symptoms
- High pain
- Functional loss
- Early biopsychosocial

Chronic Simple
- > 4 episodes, 6 weeks
- Neuro negative
- Single region
- Biopsychosocial involvement

Chronic Complex
- Neuro signs and symptoms
- Multiple regions
- Failed prior interventions
- Major biopsychosocial

Principles of case management

Case complexity matrix- goals

Acute Simple
- Pain relief
- Restore function
- Teach functional first-aid

Acute Complex
- Pain relief
- Restore function
- Avoid chronicity
- Avoid invasive procedures

Chronic Simple
- Improve function
- Fewer, shorter episodes
- Teach self care
- Avoid reliance on passive care

Chronic Complex
- Improve function
- Transfer locus of control
- Manage biopsychosocial
- Teach self care

Indications, contraindications, and adverse reactions to SMT

- Indications for manipulation
  - arthralgia (uncomplicated)
  - decreased spine regional range of motion
  - disc bulge/herniation
  - headache (non-organic)
  - muscle spasm
  - sacroiliac joint dysfunction
  - spine pain
  - sprain/strain (grade I,II)

Shekelle PG, et al. Congruence between decisions to initiate chiropractic spinal manipulation for low back pain and appropriateness criteria in North America. Ann Int Med. 1998;129:9-17.

Indications, contraindications, and adverse reactions to SMT

- Spine
  - bone tumors
  - cord tomor
  - dislocation
  - fracture (acute)
  - inflammatory arthritis (acute)
  - infection (osteomyelitis/ septic discitis)
  - instability
  - hematoma (cord or intracanalicular)
  - malignancy
  - myelopathy
  - radiculopathy (with atrophy, 3/5 muscle weakness)
- Cervical spine
  - Arnold-Chiari malformation
  - atlantoaxial instability
  - cerebral ischemic syndromes
- Thoracic spine
  - aortic aneurysm
  - diastematomyelia
- Lumbar spine
  - abdominal aortic aneurysm
  - cauda equine syndrome
  - conus medullaris syndrome

Indications, contraindications, and adverse reactions to SMT

- Relative contraindications to manipulation; application of treatment is appropriately altered
  - anticoagulant therapy
  - Ehlers-Danlos
  - clotting/bleeding disorders
  - canal stenosis
  - foraminal stenosis
  - fracture (healed w/out instability)
  - osteoporosis
  - pregnancy
  - syringomyelia

Indications, contraindications, and adverse reactions to SMT

- Adverse reactions to spinal manipulation
  - During a 2 week course of 6 manipulations
    - 55% reported episode of local discomfort
    - 12% reported episode of headache
    - 11% reported episode of tiredness
    - 10% reported radiating discomfort
    - all resolved w/in 4-24 hours

    Senstad O, et al. Frequency and characteristics of side effects of spinal manipulative therapy. Spine. 1997;22:435-441.
- It is important to note that no serious complications have been reported from any of the clinical trials investigating manipulation to date.

Indications, contraindications, and adverse reactions to SMT

- The association of stroke with cervical manipulation
  - Small risk of stroke following chiropractic visits
    - 1 in 200,000-2 million manipulations
  - Risk of stroke after chiropractic visit = risk of stroke after medical visit
  - People with prodrome of stroke seek care

Cassidy JD, et al. Risk of vertebrobasilar stroke and chiropractic care: results of a population-based case-control and case-crossover study. Spine. 2008 Feb 15;33(4 Suppl):S176-83.

Evidence-based models of interdisciplinary management

Clinical Guidelines

Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society

Recommendation 7: For patients who do not improve with self-care options, clinicians should consider the addition of nonpharmacologic therapy with proven benefits—for acute low back pain, spinal manipulation; for chronic or subacute low back pain, intensive interdisciplinary rehabilitation, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, or progressive relaxation (weak recommendation, moderate-quality evidence).

Ann Intern Med. 2007;147:478-491.

Evidence-based models of interdisciplinary management

ICSI **Health Care Guideline:**
Adult Low Back Pain

13. Re-Evaluate and Consider Redirection [non-specific LBP unresponsive to 1st line tx]

Request a **non-surgical spine care specialist** who demonstrates competency in providing therapies based on continuing education and effective techniques supported by literature.

Choice of the trained professional will be determined by availability and preference of individual medical providers and organization systems. The patient and/or physician should request a trained non-surgical spine specialist who demonstrates competency in providing therapies for patients with low back pain based on effective techniques supported by literature, as outlined in this guideline.

These therapies include **education**, **exercise programs** and appropriate use of **manual/manipulative therapies** (Nytendo, 2000; Nytendo, 2001). Participants should be in additional training and in ongoing continuing education courses in manual treatment of the spine. Individuals who may have training in these therapies include physical therapists, chiropractic providers, osteopathic or allopathic physicians.

Evidence-based models of interdisciplinary management

ICSI **Health Care Guideline:**
Adult Low Back Pain

17. Active Rehabilitation [chronic LBP not indicating surgery or therapeutic injection]

There is strong evidence that **exercise therapy is effective for chronic low back pain**. However, there is inconclusive evidence in favor of one exercise over the other - flexion, extension, fitness.

High-grade mobilization/manipulation has been shown to be effective early in treatment when followed by appropriate active rehabilitation.

Evidence-based models of interdisciplinary management

ICSI **Health Care Guideline:**
Adult Low Back Pain

The treatment of chronic low back pain should include:

- Written **educational** materials and advice by provider (Burton, 1999)
- Active **self-management**
- Gradual **resumption of normal light activities** as tolerated
- Prevention - good body mechanics
- **Exercise** - many studies show the benefit of an exercise program with chronic low back pain. There is inconclusive evidence in favor of one exercise over the other (flexion, extension or fitness) (Abenliaim, 2000; Scheer, 1997)
- Consider a graded active exercise program (Lindstrom, 1992)
- Consider specific exercises to **strengthen the core trunk stabilizing muscles** (Lindstrom, 1992)
- Consider intensive exercise program (Manniche, 1988)
- Assess and **manage psychosocial factors**
- Multidisciplinary approach (Hildebrandt, 1997; Pfingsten,1997)

Evidence-based models of interdisciplinary management

ICSI **Health Care Guideline:**
Adult Low Back Pain

23. Discuss Options and Consider Possible Surgical or Non-Surgical Spine Specialist [failed active rehabilitation and therapeutic injection]

• The appearance of a disc herniation does not rule out a course of conservative therapy.

Unless "red flag" indications are present, all patients should undergo a trial of conservative therapy.

• The decision to operate is a clinical decision based on the presence of severe, uncontrolled pain, profound or progressive neurological symptoms, or a failure to respond to conservative therapy.

Indications for referral to non-surgical spine specialist may include:

- Back pain for longer than six weeks
- Sciatica for longer than six weeks
- New or progressive neuromotor deficit
- Atypical chronic leg pain
- Chronic pain syndrome

Evidence-based models of interdisciplinary management

SPINE Volume 33, Number 4S, pp S199–S213

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

From Concepts and Findings to Recommendations

In the early stages of Grade I or II neck pain (no radiculopathy or structural pathology) after a motor-vehicle collision, the Neck Pain Task Force recommends the following clinical approach:

- **Reassurance** about the absence of serious pathology.
- **Education** that the development of spinal instability, neurological injury or serious ongoing disability is very unlikely.
- Promotion of timely **return to normal activities** of living.
- If needed, **exercise training and/or mobilization** can provide short term relief.

Evidence-based models of interdisciplinary management

SPINE Volume 33, Number 4S, pp S199–S213

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

From Concepts and Findings to Recommendations

In people with Grade I or II neck pain (no radiculopathy or structural pathology) but no trauma:

- Anti-inflammatory drugs, muscle relaxants, **percutaneous neuromuscular therapy**, **mobilization**, and laser therapy are more effective than placebos.
- **Exercise training**, **mobilization** and acupuncture are more effective in the short term than conventional medical care or "usual care."
- There is no evidence to suggest that one medication is superior to another or to non-medication therapies.

Table 6. Noninvasive Interventions that Help Persons With Neck Pain and Associated Disorders in the Short-term

Scenario and Grade of Pain	Likely Helpful (Worth Considering)	Possibly Helpful (Might Consider)	Likely not Helpful (Not Worth Considering)	Not Enough Evidence to Make Determination
After a car collision, Grade I and II neck pain, (Acute)	Educational video, mobilization, exercises, mobilization plus exercises	Pulsed electromagnetic therapy	Pamphlet/neck booklet alone, collars, passive modalities (heat, cold, diathermy, hydrotherapy), referral to fitness or rehab program, frequent early health-care use, methylprednisolone	Manipulation, traction, NSAIDS, other drugs
After a car collision, Grade I and II neck pain (nonacute)	—	Supervised exercises, coordinated multidisciplinary care	Passive modalities (TENS, ultrasound), corticosteroid injections	Manipulation, traction, NSAIDS, other drugs
Nontraumatic neck pain, grade I and II	Manipulation, mobilization, supervised exercises, manual therapy (manipulation, mobilization, massage) plus exercises, acupuncture, low-level laser therapy, analgesics	Percutaneous neuromuscular therapy, brief intervention using cognitive behavioral principles	Advice alone, collars, passive modalities (heat therapy, ultrasound, TENS, electrical muscle stimulation), exercise instruction, botulinum toxin A	Magnetic stimulation, massage alone, traction, NSAIDS, other drugs
Grade III neck pain (suspected cervical radiculopathy)	—	—	—	All interventions
Cervicogenic headache	—	Manipulation, mobilization, supervised exercises, manipulation or mobilization plus supervised exercises, water pillow	—	Passive modalities, traction, NSAIDS, other drugs
At work, interferes with daily activities	—	Supervised exercises plus strength or endurance training and/or relaxation training with behavioral support	Ergonomic interventions, forced work breaks, rehabilitation programs, stress management programs, relaxation training, physical training, exercise instruction	—

Levels of Evidence

Systematic Reviews on Clinical Effectiveness

Mechanical Neck Pain with and without Headache

- Neither SMT nor mobilization (MOB) were effective alone or in combination with PT
- SMT or MOB with exercise is effective

Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, et al. A Cochrane review of manipulation and mobilization for mechanical neck disorders. Spine. 2004 Jul 15;29(14):1541-8.

Systematic Reviews on Clinical Effectiveness

Neck Pain

- Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders
- 359 invasive and noninvasive intervention articles deemed relevant
- 170 (47%) were accepted as scientifically admissible
- 139 of these related to noninvasive interventions
- Manipulation or mobilization effective for
  - WAD
  - Neck pain

Hurwitz EL, Carragee EJ, van der Velde G, Carroll LJ, Nordin M, Guzman J, 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 Feb 15;33(4 Suppl):S123-52.

Chronic & Recurrent Headache

- Prophylactic treatment of chronic, tension-type headache
  - Amitriptyline more effective than SMT during treatment
  - SMT is superior in short term after cessation of both treatments
- Prophylactic treatment of migraine headache
  - SMT may be an effective treatment option with a short-term effect similar to amitriptyline
- Episodic tension-type headache
  - Adding SMT to massage is not effective

Bronfort G, Nilsson N, Haas M, Evans R, goldsmith C, Assendelft W, et al. Non-invasive physical treatments for chronic/recurrent headache. Cochrane database Syst rev. 2004;3:cd001878

Chronic/Recurrent Headache

- Prophylactic treatment of cervicogenic headache
  - SMT is effective in the short and long term when compared to
    - No treatment
    - Massage or placebo (sham) SMT
- Post-traumatic headache
  - MOB is more effective in the short term than cold packs

Bronfort G, Nilsson N, Haas M, Evans R, goldsmith C, Assendelft W, et al. Non-invasive physical treatments for chronic/recurrent headache. Cochrane database Syst rev. 2004;3:cd001878

Carpal Tunnel Syndrome

- Carpal bone mobilization significantly improved symptoms after three weeks
- However, only one study

O'Connor D, Marshall S, Massy-Westropp Non-surgical treatment (other than steroid injection) for carpal tunnel syndrome. Cochrane Database Syst Rev. 2003;(1):CD003219.

Systematic Reviews on Clinical Effectiveness

Low Back Pain

- 31 studies – 5,202 participants met inclusion criteria
- Acute LBP
  - Moderate evidence that SMT provides more short-term pain relief than MOB and detuned diathermy, and limited evidence of faster recovery than commonly used PT
- Chronic LBP
  - Moderate evidence that SMT has an effect similar NSAID
  - SMT/MOB is effective in the short term when compared with placebo and GP care, and in the long term compared to physical therapy
  - Limited to moderate evidence that SMT is better than physical therapy and home back exercise in both the short and long term.

Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J. 2004 May-Jun;4(3):335-56.

Chronic LBP

- The preponderance of the evidence for efficacy and estimated very low risk of serious adverse events support SMT & MOB as viable options for treatment of chronic LBP
- SMT and MOB at least as effective as other efficacious and commonly used interventions

Bronfort G, Haas M, Evans R, Kawchuk G, Dagenais S. Evidence-informed management of chronic low back pain with spinal manipulation and mobilization. Spine J. 2008 Jan-Feb;8(1):213-25.