Supplemental File

**Best Practices for Chiropractic Management of Adult Patients with Mechanical Low Back Pain: A Clinical Practice Guideline for Chiropractors in the United States**

**Search strategy to identify CPGs**

We used the following terms to identify CPG’s: (noninvasive or non-invasive or non-pharmacologic\* or nonpharmacologic\* or “manual therapy” or “manipulation, chiropractic” or “chiropractic” or “musculoskeletal manipulations” or “manipulation, spinal” or spinal manipulation or “manipulation, osteopathic” or osteopathic manipulation or alternative medicine or complementary therapies or acupuncture or biofeedback or mindfulness or psychotherapy or cognitive behavioral therapy or yoga or tai chi or qigong or Pilates or “mind-body” or relaxation or massage or exercise or traction or “ultrasound” or transcutaneous electrical nerve stimulation or low-level laser therapy or interferential or “superficial heat” or “superficial cold” or bracing or physical therapy or stimulation or meditation or “functional restoration” or multidiscipline\* or interdisciplin\*) AND ((back or lumbar or lumbo\* or spine or spinal or radicular) AND (pain))

Filters: Guideline or Practice Guideline; English; publication date from 2015/03/01—2021/09/01

We used reference tracking and consulted topic experts on the SC to identify relevant papers that were not captured in the search. We also used our 2020 CPG on chiropractic management of adults with chronic musculoskeletal pain as a resource.[3](#_ENREF_3) Additional information on search strategy may be found in the Supplemental file.

*Second stage search.* We performed targeted searches on specific interventions and/or topics that were not addressed in detail in the CPGs. For systematic reviews, we used the same search strategy as was used for CPGs but with appropriate filters. Lower level studies were only included by reference tracking or expert recommendations.

**Stakeholder engagement: Dissemination routes for inviting public comments on the draft CGP:**

* Email blast through MailChimp to the Clinical Compass email list, including representatives of U.S. state chiropractic organizations; a number of national chiropractic professional and academic organizations (totaling approximately 900 individuals); and vendors, which included informed laypersons.
* ChiroCongress, a professional organization that represents over 35,000 chiropractors.
* Clinical Compass Facebook and LinkedIn pages, accessible by health professionals and interested laypersons.
* Email list of the Chiropractic Summit (<https://www.chirosummit.org/>), a U.S. organization made up of chiropractic organizations, institutions and individuals.

These routes had some overlap, which we believed would have a reinforcing effect for the dissemination. The comment period was 30 days.

**Strength of recommendations (SoR). SOR** combines the level of the evidence with confidence that beneficial effects of an intervention outweigh possible harmful effects. The balance between benefits and harms, quality of evidence, applicability, and the certainty of the baseline risk are all considered in judgments about the strength of recommendations.22-25 Only evidence rated 1 or 2 were included in our recommendations.

1 = Strong recommendation in favor of the intervention

2 = Weak recommendation in favor of the intervention

3 = Weak recommendation against the intervention

4 = Strong recommendation against the intervention

Grading of Recommendations Assessment, Development and Evaluation system.\*

|  |  |  |
| --- | --- | --- |
| Level of evidence | Quality rating | Explanation of quality rating |
| A | High | Further research unlikely to affect confidence in estimate of effects of intervention   * More than one high-quality study with consistent outcomes |
| B | Moderate | Further research likely to affect confidence in estimate of effects of intervention   * Only one high-quality study *or* * Several lower quality studies |
| C | Low | Further research very likely to affect confidence in estimate of effects of intervention and likely to change the estimate   * One or more studies with severe limitations |
| D | Very Low | Any estimate of effect uncertain   * Only expert opinion *and/or* * No direct research evidence *or* * Very low-quality evidence |

\*Source: GRADE (Grading of Recommendations Assessment, Development and Evaluation) Working Group 2007 (modified by the EBM Guidelines Editorial Team)

<http://www.essentialevidenceplus.com/product/ebm_loe.cfm?show=grade>

**Consensus panel characteristics**

We invited 74 individuals to participate and 69 accepted. The 69-member panel represented 6 health professions (acupuncture, chiropractic, medicine, mental health counseling, nursing and physical therapy). Distribution of professions was 64 DCs, 2 MDs and 2 PTs and 1 acupuncturist. The other professions listed above were represented by dual-trained DCs: acupuncture (7); medicine (2); nursing (1) and mental health counseling (1). Thirty US states were represented.

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Twenty-one of the 69 panelists had a Master’s degree in addition to their professional degree (including MS, MA, MBA, MPH). Two of 69 were full-time faculty and 2 were part-time faculty at a chiropractic institution; 2 were full-time faculty and 4 were part-time faculty at a non-chiropractic institution.

***Practice characteristics*.** Fifty-eight of the 69 panelists were in active practice, with a mean number of years in practice of 22 (range 2-51). Twenty-two of 69 worked either in or with the VA (32%). For practitioners, the mean number of estimated (pre-Covid) patient visits per week they personally managed was 78 (range, 6-280). The mean percent of their patients whose chief complaint was low back pain was 59% (range, 10-90%). The mean percent of estimated patients with whom they use “maintenance care, (defined as *scheduled treatment visits to prevent recurrences or exacerbations of low back pain)* was 18% (range, 0-90%). The mean percent of estimated patients with whom they use “wellness care,” (defined as *scheduled treatment visits for asymptomatic patients to stay healthy and/or improve function and/or well-being) was* 7% (range, 0-60)%. For lifestyle factors, the mean percent of estimated sedentary patients to whom they give advice on being active was 71% (range, 0-100); obese patientswhom they advise on diet and weight management was 49% (0-100) and tobacco userswhom they advised on cessation was 44% (0-100).

**Supplementary materials: Excluded studies from clinical practice guideline search**

1. Advisory Committee Infectious Complications. Practice Advisory for the Prevention, Diagnosis, and Management of Infectious Complications Associated with Neuraxial Techniques: An Updated Report by the American Society of Anesthesiologists Task Force on Infectious Complications Associated with Neuraxial Techniques and the American Society of Regional Anesthesia and Pain Medicine. *Anesthesiology.* 2017;126(4):585-601.

2. Brazilian Medical A, Brazilian Society of N, Cukiert A, et al. Chronic pain treatment with spinal cord neurostimulation. *Rev Assoc Med Bras (1992).* 2018;64(4):299-306.

3. Cocks H, Ah-See K, Capel M, Taylor P. Palliative and supportive care in head and neck cancer: United Kingdom National Multidisciplinary Guidelines. *The Journal of laryngology and otology.* 2016;130(S2):S198-s207.

4. Conte MS, Bradbury AW, Kolh P, et al. Global vascular guidelines on the management of chronic limb-threatening ischemia. *J Vasc Surg.* 2019;69(6S):3S-125S e140.

5. Cote P, Wong JJ, Sutton D, et al. Management of neck pain and associated disorders: A clinical practice guideline from the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration. *Eur Spine J.* 2016;25(7):2000-2022.

6. Deer TR, Grider JS, Pope JE, et al. The MIST Guidelines: The Lumbar Spinal Stenosis Consensus Group Guidelines for Minimally Invasive Spine Treatment. *Pain Pract.* 2019;19(3):250-274.

7. Deer TR, Pope JE, Lamer TJ, et al. The Neuromodulation Appropriateness Consensus Committee on Best Practices for Dorsal Root Ganglion Stimulation. *Neuromodulation.* 2019;22(1):1-35.

8. Expert Panel on Musculoskeletal I, Amini B, Beckmann NM, et al. ACR Appropriateness Criteria((R)) Shoulder Pain-Traumatic. *J Am Coll Radiol.* 2018;15(5S):S171-S188.

9. Expert Panel on Musculoskeletal I, Jacobson JA, Roberts CC, et al. ACR Appropriateness Criteria((R)) Chronic Extremity Joint Pain-Suspected Inflammatory Arthritis. *J Am Coll Radiol.* 2017;14(5S):S81-S89.

10. Expert Panel on Musculoskeletal I, Rubin DA, Roberts CC, et al. ACR Appropriateness Criteria((R)) Chronic Wrist Pain. *J Am Coll Radiol.* 2018;15(5S):S39-S55.

11. Expert Panels on Neurological Imaging IR, Musculoskeletal I, Shah LM, et al. ACR Appropriateness Criteria((R)) Management of Vertebral Compression Fractures. *J Am Coll Radiol.* 2018;15(11S):S347-S364.

12. Franz S, Schulz B, Wang H, et al. Management of pain in individuals with spinal cord injury: Guideline of the German-Speaking Medical Society for Spinal Cord Injury. *Ger Med Sci.* 2019;17:Doc05.

13. Frazer K, Stevermer JJ. PURLs: More isn't better with acute low back pain treatment. *J Fam Pract.* 2016;65(6):404-406.

14. Gharibo C, Sharma A, Soin A, et al. Triaging Interventional Pain Procedures During COVID-19 or Related Elective Surgery Restrictions: Evidence-Informed Guidance from the American Society of Interventional Pain Physicians (ASIPP). *Pain physician.* 2020;23(4S):S183-204.

15. Guy SD, Mehta S, Casalino A, et al. The CanPain SCI Clinical Practice Guidelines for Rehabilitation Management of Neuropathic Pain after Spinal Cord: Recommendations for treatment. *Spinal Cord.* 2016;54 Suppl 1:S14-23.

16. Guy SD, Mehta S, Harvey D, et al. The CanPain SCI Clinical Practice Guideline for Rehabilitation Management of Neuropathic Pain after Spinal Cord: recommendations for model systems of care. *Spinal Cord.* 2016;54 Suppl 1:S24-27.

17. Hoh DJ, Qureshi S, Anderson PA, et al. Congress of Neurological Surgeons Systematic Review and Evidence-Based Guidelines on the Evaluation and Treatment of Patients With Thoracolumbar Spine Trauma: Nonoperative Care. *Neurosurgery.* 2019;84(1):E46-E49.

18. Itz CJ, Willems PC, Zeilstra DJ, et al. Dutch Multidisciplinary Guideline for Invasive Treatment of Pain Syndromes of the Lumbosacral Spine. *Pain Pract.* 2016;16(1):90-110.

19. Jain V, Chari R, Maslovitz S, et al. Guidelines for the Management of a Pregnant Trauma Patient. *J Obstet Gynaecol Can.* 2015;37(6):553-574.

20. Kaye AD, Jones MR, Viswanath O, et al. ASIPP Guidelines for Sedation and Fasting Status of Patients Undergoing Interventional Pain Management Procedures. *Pain physician.* 2019;22(3):201-207.

21. Loeffen EAH, Mulder RL, Font-Gonzalez A, et al. Reducing pain and distress related to needle procedures in children with cancer: A clinical practice guideline. *Eur J Cancer.* 2020;131:53-67.

22. Loh E, Guy SD, Mehta S, et al. The CanPain SCI Clinical Practice Guidelines for Rehabilitation Management of Neuropathic Pain after Spinal Cord: introduction, methodology and recommendation overview. *Spinal Cord.* 2016;54 Suppl 1:S1-6.

23. Manchikanti L, Kaye AD, Soin A, et al. Comprehensive Evidence-Based Guidelines for Facet Joint Interventions in the Management of Chronic Spinal Pain: American Society of Interventional Pain Physicians (ASIPP) Guidelines Facet Joint Interventions 2020 Guidelines. *Pain physician.* 2020;23(3S):S1-S127.

24. Manchikanti L, Kaye AM, Knezevic NN, et al. Responsible, Safe, and Effective Prescription of Opioids for Chronic Non-Cancer Pain: American Society of Interventional Pain Physicians (ASIPP) Guidelines. *Pain physician.* 2017;20(2S):S3-S92.

25. Mehta S, Guy SD, Bryce TN, et al. The CanPain SCI Clinical Practice Guidelines for Rehabilitation Management of Neuropathic Pain after Spinal Cord: screening and diagnosis recommendations. *Spinal Cord.* 2016;54 Suppl 1:S7-S13.

26. Mottola MF, Davenport MH, Ruchat SM, et al. No. 367-2019 Canadian Guideline for Physical Activity throughout Pregnancy. *J Obstet Gynaecol Can.* 2018;40(11):1528-1537.

27. Navani A, Manchikanti L, Albers SL, et al. Responsible, Safe, and Effective Use of Biologics in the Management of Low Back Pain: American Society of Interventional Pain Physicians (ASIPP) Guidelines. *Pain physician.* 2019;22(1S):S1-S74.

28. Oskoui M, Pringsheim T, Billinghurst L, et al. Practice guideline update summary: Pharmacologic treatment for pediatric migraine prevention: Report of the Guideline Development, Dissemination, and Implementation Subcommittee of the American Academy of Neurology and the American Headache Society. *Headache.* 2019;59(8):1144-1157.

29. Qaseem A, McLean RM, O'Gurek D, et al. Nonpharmacologic and Pharmacologic Management of Acute Pain From Non-Low Back, Musculoskeletal Injuries in Adults: A Clinical Guideline From the American College of Physicians and American Academy of Family Physicians. *Annals of internal medicine.* 2020;173(9):739-748.

30. Roofthooft E, Joshi GP, Rawal N, et al. PROSPECT guideline for elective caesarean section: updated systematic review and procedure-specific postoperative pain management recommendations. *Anaesthesia.* 2021;76(5):665-680.

31. Roquilly A, Vigue B, Boutonnet M, et al. French recommendations for the management of patients with spinal cord injury or at risk of spinal cord injury. *Anaesth Crit Care Pain Med.* 2020;39(2):279-289.

32. Rousing R, Jensen RK, Fruensgaard S, et al. Danish national clinical guidelines for surgical and nonsurgical treatment of patients with lumbar spinal stenosis. *Eur Spine J.* 2019;28(6):1386-1396.

33. Suresh S, Ecoffey C, Bosenberg A, et al. The European Society of Regional Anaesthesia and Pain Therapy/American Society of Regional Anesthesia and Pain Medicine Recommendations on Local Anesthetics and Adjuvants Dosage in Pediatric Regional Anesthesia. *Reg Anesth Pain Med.* 2018;43(2):211-216.

34. Tsoumakidou G, Too CW, Koch G, et al. CIRSE Guidelines on Percutaneous Vertebral Augmentation. *Cardiovasc Intervent Radiol.* 2017;40(3):331-342.

35. Wong JJ, Cote P, Sutton DA, et al. Clinical practice guidelines for the noninvasive management of low back pain: A systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration. *European journal of pain (London, England).* 2017;21(2):201-216.

**Factors to consider in obtaining a history**

1. Assessment of red flags and possible contraindications for manipulation, particularly high-velocity, low-amplitude thrust
2. Assessment of yellow flag risk factors (see text.)
3. History of significant physical trauma
4. Onset of current pain and perceptions about initial precipitating factors
5. Pain parameters, including type, severity, location, frequency and duration
6. Provocative and relieving factors Review of systems
7. Previous treatment and response, including medical, surgical, nonpharmacological.
8. History of past, current or considered self-care strategies
9. History of diagnostic tests with results
10. Current medications and nutraceuticals
11. Complicating factors/barriers to recovery, including concurrent conditions; social factors affecting health (examples: social support; financial resources; access to health care; education and health literacy: <https://www.health.gov/healthypeople/objectives-and-data/browse-objectives#social-determinants-of-health>
12. Psychological and behavioral health factors (examples: anxiety, depression, PTSD).
13. Lifestyle factors (examples: drugs/alcohol, diet, exercise/sedentary, tobacco use)

**Delphi rounds, rating system, and data analysis**

The project coordinator entered all ratings by panelist ID into an SPSS file for analysis for median rating and percent agreement. Comments were organized by panelist ID and statement ID and rating. All ratings and comments remained identified only by a code number when circulated to the panelists and the Steering Committee. They received the median rating, percent agreement and comments for each statement. Any statements not reaching 80% agreement were revised by the SC, based upon the panelists’ comments, and were recirculated until the panel reached at least 80% agreement. 80 percent was selected because this was the level used in our previous CPG’s and was supported by the literature.22