

Chronic Pain Management: Non-Pharmacologic Treatments

Canada is in the midst of an opioid crisis. Like many organizations across the country, CADTH has made addressing the opioid crisis a top priority. In the last year, we have delivered a large body of evidence to inform decisions on effectively treating opioid use disorder and how we use drug and non-drug interventions to help patients manage pain. But in doing so, we've also revealed some significant gaps in the evidence — areas where evidence is needed but where little or no high-quality evidence can be found.

Knowing where these gaps in the evidence exist can help researchers and research funding bodies better focus their efforts on opioid research and the management of pain.

Following, you'll find a list of gaps in evidence related to the management of chronic pain with non-pharmacologic options that we've identified while carrying out recent rapid reviews through our **Rapid Response Service**.

Other publications in this series will highlight gaps in areas also important to the opioid crisis including *Treating Opioid Use Disorder*; *Opioids for the Treatment of Pain*; *Chronic Pain Management: Pharmacologic Treatments (Not Including Opioids)*; and *Acute Pain Management: Non-Pharmacologic and Pharmacologic (Non-Opioid) Treatments*.

For more information about the CADTH response to the opioid crisis and our evidence, please visit [cadth.ca/opioids](https://www.cadth.ca/opioids) and [cadth.ca/pain](https://www.cadth.ca/pain).

It's important to note that these gaps in evidence have been compiled from multiple CADTH reports from 2014 to the end of 2017. For more details on each identified gap, consulting the full CADTH report is highly recommended. Depending on the date of the report, additional evidence may now be available that addresses the research gaps, as well as evidence from other organizations. And because of the methods used for rapid reviews, it is possible that evidence that could potentially address the research gaps may not have been included.

Exercise for the Management of Knee Osteoarthritis (2017)

Evidence Requested for Decision-Making

- Clinical effectiveness of exercise for osteoarthritis of the knee

What We Found

- Exercise compared with no intervention, placebo, or minimal intervention for knee osteoarthritis appears to be effective.
- In general, outcomes that improved with exercise included pain, physical function, physical performance, and stiffness (with some inconsistencies in the evidence).
- An indirect comparison suggests that exercise may be comparable to opioids for the management of knee osteoarthritis.
- There is limited reporting on potential adverse events; however, falling is the most commonly reported adverse event.
- Evidence suggests that exercise is not associated with increased knee osteoarthritis progression.

Evidence Gaps

What We Did Not Find

High-quality research (addressing the limitations of the current body of evidence such as the potential for measurement and selection bias)

Large randomized controlled trials with well-defined interventions (intensity, frequency, etc.), information on adherence to exercise programs, and adverse event-reporting

Evidence evaluating specific subpopulations of patients with osteoarthritis of the knee

An updated review comparing the clinical effectiveness evidence for different exercise interventions

Manual Therapy for Recent-Onset or Persistent Neck Pain (2017)

Evidence Requested for Decision-Making

- Clinical effectiveness of manual therapy for recent-onset or persistent neck pain in adult or pediatric patients
- Recommendations from evidence-based guidelines regarding manual therapy for recent-onset or persistent neck pain in adult or pediatric patients

What We Found

- Manipulation and mobilization appear to be effective for managing neck pain in adults.
- Massage may be beneficial for neck pain in adults.
- Traction may be beneficial for managing neck pain in adults, but this evidence is of limited quality.
- Two evidence-based guidelines recommend the use of manual therapies for acute and chronic neck pain in adults including manipulation, mobilization, multimodal manual therapy, and massage.
- The guidelines both recommend **not** to use relaxation massage, strain-counterstrain therapy, and/or traction.

Evidence Gaps

What We Did Not Find

Sufficient high-quality studies — authors should provide additional details regarding the type of manual therapy procedure, as well as the frequency and duration of treatments

Longer-term studies

Research evaluating the clinical effectiveness of manual therapy in the pediatric population

Recommendations from evidence-based guidelines specific to the pediatric population

Manual Therapy for Recent-Onset or Persistent Non-Specific Lower Back Pain (2017)

Evidence Requested for Decision-Making

- Clinical effectiveness of manual therapy for recent-onset or persistent non-specific lower back pain in adult or pediatric patients
- Recommendations from evidence-based guidelines regarding manual therapy for recent-onset or persistent non-specific lower back pain in adult or pediatric patients

What We Found

- Low-quality evidence suggests that spinal manipulation and soft tissue therapy may have positive effects on pain and function for acute and chronic low back pain.
- The effectiveness of spinal mobilization (often included as an adjunct to spinal manipulation) is uncertain.
- Traction for low back pain with or without radiculopathy appears not to be effective.
- No serious harms have been reported.
- Three evidence-based guidelines provided recommendations supporting the use of manual therapy (including spinal manipulation) for acute and chronic low back pain in adults.
- One guideline recommended against the use of traction.

Evidence Gaps

What We Did Not Find

Sufficient high-quality research – including detailed information regarding the type of procedure utilized and the dosage of treatments

Research evaluating the clinical effectiveness and safety of manual therapies in the pediatric population

Recommendations from evidence-based guidelines specific to the pediatric population

Physiotherapy Interventions for the Management of Neck and/or Back Pain (2017)

Evidence Requested for Decision-Making

- Clinical effectiveness of physiotherapy interventions for the management of neck and/or back pain
- Cost-effectiveness of physiotherapy interventions for the management of neck and/or back pain

What We Found

- Physiotherapy for neck and/or back pain appears to be effective or neutral (but the body of evidence was limited and largely low to moderate in quality).

Evidence Gaps

What We Did Not Find

High-quality research regarding the clinical effectiveness of physiotherapy for the management of neck and/or back pain

Evidence on adverse events

Studies comparing the clinical effectiveness of physiotherapy to opioids

Evidence on cost-effectiveness of physiotherapy for the management of neck and/or back pain

Occupational Therapy for Chronic Pain Management Using the Biopsychosocial Approach (2017)

Evidence Requested for Decision-Making

- Clinical effectiveness of occupational therapy for chronic pain using the biopsychosocial approach
- Cost-effectiveness of occupational therapy for chronic pain using the biopsychosocial approach
- Recommendations from evidence-based guidelines regarding occupational therapy for chronic pain using the biopsychosocial approach

What We Found

- Multidisciplinary biopsychosocial rehabilitation interventions appear to decrease pain and disability for patients with chronic low back pain compared with usual care (typically pain medication and physical treatment) or physical treatment alone.
- Multidisciplinary rehabilitation seems to be more effective than physical treatment at reducing work absenteeism but not more effective than usual care.
- A multimodal approach may have a better effect on pain, disability, depression, and life satisfaction compared with usual care or no treatment.

Evidence Gaps

What We Did Not Find

High-quality evidence comparing occupational therapy using the biopsychosocial approach with opioids for managing chronic pain

Evidence on the cost-effectiveness of occupational therapy using a biopsychosocial approach

Recommendations from evidence-based guidelines

Multidisciplinary Treatment Programs for Patients with Chronic Non-Malignant Pain (2017)

Evidence Requested for Decision-Making

- Clinical effectiveness of multidisciplinary treatment programs for patients with chronic, non-malignant pain
- Cost-effectiveness of multidisciplinary treatment programs for patients with chronic, non-malignant pain
- Recommendations from evidence-based guidelines regarding multidisciplinary treatment programs for patients with chronic, non-malignant pain

What We Found

- Multidisciplinary management of chronic, non-malignant pain may lead to modest improvement for some (but not all) of the outcomes measured.
- Three guidelines recommended multidisciplinary treatment for the management of chronic, non-malignant pain under specific circumstances.

Evidence Gaps

What We Did Not Find

Research that defines and adequately describes the multidisciplinary interventions with clear and consistent comparators

Studies with adverse event-reporting (included studies had sparse reporting of adverse events)

Evidence on cost-effectiveness of multidisciplinary treatment programs for patients with chronic, non-malignant pain in outpatient settings

Evidence specific to the pediatric population

Orthodontic Treatment for the Management of Pain or Impacted Teeth in Patients with Malocclusion (2017)

Evidence Requested for Decision-Making

- Clinical effectiveness of orthodontic treatment for the management of pain in patients with malocclusion
- Clinical effectiveness of orthodontic treatment for impacted teeth associated with malocclusion
- Evidence-based guidelines regarding the use of orthodontic treatments for the management of pain or impacted teeth in patients with malocclusion

What We Found

- Evidence from pre-post studies suggests orthodontic or orthodontic-surgical treatment of severe malocclusion in adolescents and adults significantly improved measures of oral health, including physical pain and physical disability.

Evidence Gaps

What We Did Not Find

High-quality research including multi-centre controlled studies with broader categories of malocclusion severity, and larger sample sizes

Studies on First Nations population

Qualitative and quantitative studies on orthodontic treatment for impacted teeth associated with malocclusion

Recommendations from evidence-based guidelines

Laser Spine Surgery for Herniated Discs and/or Nerve Root Entrapment (2017)

Evidence Requested for Decision-Making

- Clinical effectiveness of laser spine surgery for adult patients with herniated discs and/or nerve root entrapment
- Cost-effectiveness of laser spine surgery for adult patients with herniated discs and/or nerve root entrapment
- Evidence-based guidelines associated with the use of laser spine surgery for adult patients with herniated discs and/or nerve root entrapment

What We Found

- Evidence from non-randomized and observational research suggests laser spine surgery is effective in reducing pain in patients with herniated disc and/or nerve root entrapment.
- Two randomized controlled trials concluded there are no significant differences in short-term, post-operative back pain or functional disability between patients who underwent surgery using laser versus conventional techniques.
- Significantly higher levels of lumbar back pain, radicular pain, and a higher proportion of patients requiring reoperation with conventional, open surgery at various stages of follow-up were reported in patients who underwent laser spine surgery compared with conventional techniques.

Evidence Gaps

What We Did Not Find

High-quality research

Comparative clinical effectiveness of laser spine surgical approaches against conventional surgical approaches

Canadian studies

Evidence on cost-effectiveness of laser spine surgery in patients with herniated disc and/or nerve root entrapment

Recommendations from guidelines based on high-quality evidence

Behavioural and Psychological Interventions for Chronic Non-Cancer Pain (2016)

Evidence Requested for Decision-Making

- Recommendations from evidence-based guidelines on behavioural and psychological interventions for chronic non-cancer pain

What We Found

- Five evidence-based guidelines provided recommendations on the use of behavioural and psychological interventions for chronic non-cancer pain.
- Cognitive behavioural therapy , or CBT, was recommended across all guidelines.
- Other psychological interventions including hypnosis, relaxation, biofeedback, and mindfulness were also recommended in two or more guidelines.

Evidence Gaps

What We Did Not Find

High-quality research (specific to various underlying causes of pain, durations of pain, and patient populations)

Recommendations from evidence-based guidelines (more specific to various underlying causes of pain, durations of pain, and patient populations)

Home Transcutaneous Electrical Nerve Stimulation for Chronic Pain (2016)

Evidence Requested for Decision-Making

- Clinical effectiveness of home transcutaneous electrical nerve stimulation (TENS) for chronic pain
- Clinical effectiveness of home-based TENS compared with pharmacological interventions for chronic pain
- Cost-effectiveness of home-based TENS for chronic pain
- Recommendations from evidence-based guidelines on the use of home-based TENS for chronic pain

What We Found

- The evidence was mixed, limited in quantity, and inconclusive.
- In general, guidelines do not recommend TENS (not specific to home use) for knee osteoarthritis, chronic neck pain, or chronic low back pain.
- Two guidelines recommend home-based TENS for chronic pain syndrome and chronic low back pain if TENS is shown to be effective in a clinical setting.

Evidence Gaps

What We Did Not Find

High-quality research including adverse effects reporting — included studies were limited in quantity and quality, and harms were not assessed

Canadian studies

Evidence comparing home-based TENS to pharmacologic interventions including opioids

Evidence on the use of home-based TENS specifically for patients with diabetic neuropathy

Evidence on the cost-effectiveness of home-based TENS use

Sufficient evidence-based guidelines (including recommendations for specific chronic pain populations of interest)

Physical Therapy Treatments for Chronic Non-Cancer Pain (2016)

Evidence Requested for Decision-Making

- Recommendations from evidence-based guidelines regarding physical therapy treatments for non-cancer pain

What We Found

- Eleven evidence-based guidelines were identified with recommendations about the use of physical therapy interventions for the management of chronic non-cancer pain.
- Overall, guidelines recommend the use of physical and exercise therapy, manual therapy (i.e., spinal manipulation therapy and mobilization techniques), acupuncture, massage, and yoga.

Evidence Gaps

What We Did Not Find

Research and evidence-based guidelines specific to various pain conditions and for various age groups

Specific guideline recommendations on the frequency and duration of physical therapies for chronic pain

Recommendations from evidence-based guidelines on occupational therapy, weight-loss interventions, and postural therapy

Recommendations from evidence-based guidelines on criteria to determine when continued treatment is warranted

Shockwave Therapy for Pain Associated with Upper Extremity Orthopedic Disorders (2016)

Evidence Requested for Decision-Making

- Clinical effectiveness of shockwave therapy (SWT) for chronic pain associated with upper extremity orthopedic disorders
- Cost-effectiveness of SWT for chronic pain associated with upper extremity orthopedic disorders

What We Found

- For calcific tendinitis of the shoulder, evidence suggests SWT using high energy is effective in reducing pain compared with placebo; but, for non-calcific shoulder tendinitis, no significant benefit was observed with SWT compared with placebo or other treatments.
- For lateral epicondylitis, there were inconsistent findings on the effectiveness of SWT compared with placebo or control.
- Commonly reported adverse events with SWT include pain, small bruises and hematomas, petechial bleeding, and erythema.

Evidence Gaps

What We Did Not Find

High-quality research distinguishing and clearly defining the various types of SWT (i.e., intensity, number of pulses, and number of sessions)

High-quality research comparing SWT with other active treatment modalities for chronic pain associated with upper extremity orthopedic disorders

Evidence on cost-effectiveness of SWT for chronic pain associated with upper extremity orthopedic disorders

Shockwave Therapy for Pain Associated with Lower Extremity Orthopedic Disorders (2016)

Evidence Requested for Decision-Making

- Clinical effectiveness of shockwave therapy (SWT) for chronic pain associated with lower extremity orthopedic disorders
- Cost-effectiveness of SWT for chronic pain associated with lower extremity orthopedic disorders

What We Found

- For plantar fasciitis, limited evidence suggests SWT is more effective than placebo, and equally effective as platelet-rich plasma injection, corticosteroid injection, or surgery.
- For greater trochanteric pain syndrome, limited evidence suggests that SWT is more effective than conservative treatment; but findings are inconsistent when comparing SWT with corticosteroid injection or home-based physical training.
- For patellar tendinopathy, limited evidence suggests that SWT is more effective than conservative treatment or equally effective as surgery; but findings were inconsistent comparing SWT with placebo or corticosteroid injection.
- For medial tibial stress syndrome (shin pain), the addition of SWT to either conservative treatment or to a running program had added benefit.
- Adverse effects reported with SWT included skin reddening, bruising at the site of application, and local swelling and pain.

Evidence Gaps

What We Did Not Find

High-quality research distinguishing and clearly defining the various types of SWT (i.e., intensity, number of pulses, and number of sessions)

High-quality research comparing SWT with other active treatment modalities for chronic pain associated with lower extremity orthopedic disorders

Evidence on cost-effectiveness of SWT for chronic pain associated with lower extremity orthopedic disorders

Interventions for Atypical Facial Pain (2016)

Evidence Requested for Decision-Making

- Clinical effectiveness of pharmacological and non-pharmacological interventions for patients with atypical facial pain
- Evidence-based guidelines regarding interventions for patients with atypical facial pain

What We Found

- Low-quality studies on surgical procedures reported generally poor outcomes related to pain relief, and complications or adverse events.
- Low-quality studies on non-surgical (drug and non-drug) options were found to attenuate pain symptoms in some patients, but not all.
- One guideline recommended pharmacologic agents as first-line treatment, followed by minimally invasive surgical intervention for patients who do not respond to drug therapy.

Evidence Gaps

What We Did Not Find

High-quality research (large prospective studies with appropriate randomization)

Studies on effectiveness of non-surgical interventions (drug and non-drug) in alleviating pain and minimizing treatment-related complications in patients with atypical facial pain

Canadian studies

Recommendations from guidelines that are based on high-quality studies

Prolotherapy for the Management of Musculoskeletal Pain (2014)

Evidence Requested for Decision-Making

- Clinical effectiveness and safety of prolotherapy for the management of musculoskeletal pain

What We Found

- Low-quality evidence suggests dextrose prolotherapy for musculoskeletal pain (including low back pain, tendinopathy, and osteoarthritis) may provide pain relief and improve physical function compared with saline injection control, exercise alone, or pre-prolotherapy treatment.

Evidence Gaps

What We Did Not Find

High-quality studies (addressing the limitations of the current body of evidence)

Longer-term studies with larger sample sizes, optimized and consistent techniques and procedures, and validated outcomes measures

Evidence on effectiveness of prolotherapy compared with corticosteroid injections

Mattresses for Chronic Back or Neck Pain (2014)

Evidence Requested for Decision-Making

- Effectiveness of different mattress types for adults with chronic back or neck pain
- Evidence-based guidelines for mattress attributes to reduce chronic back or neck pain

What We Found

- Limited evidence suggests that the use of a firm mattress was the least effective intervention examined for low back pain.

Evidence Gaps

What We Did Not Find

High-quality research

Recommendations from guidelines

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CADTH is an independent, not-for-profit organization responsible for providing Canada's health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs and medical devices in our health care system.

CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

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