

# Non-Pharmacological Methods for Managing Chronic Pain: Preventive Methods

**A summary of the evidence for clinicians (e.g., physicians, physiotherapists, nurses, nurse practitioners, pharmacists, occupational therapists, massage therapists, and chiropractors)**

Because of the prevalence and burden of chronic pain, and because relying on opioids alone carries substantial risks and may be ineffective, health care providers are looking for the best multifaceted approach to pain treatment. The *2017 Canadian Guideline for Opioids for Chronic Non-Cancer Pain*<sup>1</sup> recommends optimizing non-opioid pharmacotherapy and non-pharmacological therapy before trialling opioids for patients with chronic, non-cancer pain.

Pain medications commonly work by mimicking the body’s own pain relief system; many non-pharmacological therapies work by producing those chemicals naturally or by mitigating the adverse stimuli causing the pain. Non-pharmacological therapies can be divided into three categories: psychological, physical, and preventive. These therapies can be used on their own or in combination with pharmacotherapy, which is often more effective when prescribed in conjunction with these non-pharmacological therapies. To help support evidence-informed decision-making regarding the management of chronic pain, CADTH has reviewed and summarized the evidence from various sources for some of the interventions that fall into these three categories.



Here you'll find the evidence highlights and practical considerations for some interventions that fall into the preventive category. These preventive methods can help patients manage their pain and keep it from getting worse. They may also prevent pain from leading to other health problems. Using splints or braces, keeping a healthy weight, and wearing a foot orthotic are some preventive methods that may help to safely manage chronic pain. For online access to all of the clinician and patient handouts for non-pharmacological methods for managing chronic pain, visit [www.cadth.ca/chronicpain](http://www.cadth.ca/chronicpain).

## Bottom Line



### Splints and Braces

Splinting or bracing may lower pain for people with tennis elbow, carpal tunnel syndrome, osteoarthritis of the thumb or fingers, and osteoarthritis of the wrist.<sup>a</sup>



### Healthy Weight

Maintaining a healthy weight through diet and exercise may lower pain for people who are overweight and have low back pain or knee osteoarthritis.<sup>a</sup>



### Foot Orthotics

Foot orthotics may lower pain for people with low back pain, rheumatoid arthritis (with foot pain), and painful flexible flatfoot.<sup>a</sup>

<sup>a</sup> Note that there is uncertainty in these findings as the strength or quality of the evidence varied depending on the patient population, the duration of each intervention, and the length of follow-up for each intervention. More research is needed.

## Bottom Line:

Splinting or bracing may lower pain for people with tennis elbow, carpal tunnel syndrome, osteoarthritis of the thumb or fingers, and osteoarthritis of the wrist.

**Table 1: Research Findings and Practical Considerations of Splints and Braces for Chronic Pain**

Pain condition	Research findings	Limitations of the evidence	Practical considerations <sup>a</sup>
<p><b>Pain related to:</b><sup>b</sup></p> <ul style="list-style-type: none"> <li>• Tennis elbow</li> <li>• Carpal tunnel syndrome</li> <li>• Osteoarthritis of the thumb or fingers</li> <li>• Osteoarthritis of the wrist</li> </ul>	<ul style="list-style-type: none"> <li>• Evidence suggests the use of splints may reduce pain and improve functional performance, range of motion, pinch strength, and hand strength in patients with osteoarthritis involving the fingers and thumb base, or for those diagnosed with tennis elbow or carpal tunnel when compared to controls. Use of splints may also reduce pain and improve functional performance in patients with osteoarthritis of the wrist when compared to controls.<sup>b</sup></li> <li>• Splinting was not found to cause serious harms.<sup>b</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Evidence was of limited quality<sup>b,c</sup></li> <li>• High risk of biases among the primary studies<sup>b</sup></li> <li>• Variety of splints and length of follow-up make it difficult to draw conclusions regarding the optimal approach to splinting<sup>b</sup></li> <li>• Limited data on harms<sup>b</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Splints and braces are recommended for joints that require limitation of mobility, or to optimize joint positioning and function during activities. They are appropriate for joints that are hypermobile or unstable due to ligament damage, cartilage degeneration, neurological or motor impairments, or to limit end range stress on inflamed joints and soft tissues. Splints are also prescribed to increase or maintain mobility in an ankylosed or contracted joint.</li> <li>• Braces that immobilize a painful body part are not beneficial if the need for immobilization is not substantiated by clinical assessment. Braces limit normal mobility and may reinforce a patient’s perception of frailty, contribute to loss of joint range of motion, proprioception, and normal motor recruitment.</li> <li>• Braces should not be worn at night unless they are constructed for night use and prescribed by a physical or occupational therapist or orthotist for that purpose.</li> <li>• Warn patients about the potential for superficial skin irritation or nerve impingement (depending on body location). These can be addressed by adjusting the splint or brace position, reshaping a moldable splint or brace, or using moleskin to evenly distribute pressure. Advise patients to seek advice from the splint or brace prescriber urgently if skin breakdown or nerve impingement occurs.</li> </ul>

<sup>a</sup> “Practical considerations” were developed by the Saskatchewan Health Authority, and reviewed by the Canadian Pain Task Force and its External Advisory Panel.

<sup>b</sup> As outlined in the CADTH Rapid Response report *Orthotic Bracing or Splinting of Upper Extremities in Patients with Chronic, Non-Cancer Pain: A Review of Clinical Effectiveness*.<sup>2</sup>

<sup>c</sup> The quality or strength of the evidence can be described as unclear, low, moderate, or high. The lower the quality or strength, the less confidence there is in the results. With low-quality or low-strength evidence, there is a need for high-quality research to be certain of the interventions’ effect.

## Bottom Line:

Maintaining a healthy weight through diet and exercise may lower pain for people who are overweight and have low back pain or knee osteoarthritis.

**Table 2: Research Findings and Practical Considerations of Healthy Weight for Chronic Pain**

Pain condition	Research findings	Limitations	Practical considerations <sup>a</sup>
<b>Knee osteoarthritis<sup>b</sup></b>	<ul style="list-style-type: none"> <li>Evidence suggests losing weight through diet and exercise for overweight patients with knee osteoarthritis may reduce pain and improve physical function when compared to controls.<sup>b</sup></li> <li>Evidence suggests diet alone and exercise alone as weight-loss interventions for overweight patients with knee osteoarthritis had mixed results for pain reduction and improvements in physical function, either favourable or not significantly different compared to control.<sup>b</sup></li> <li>No serious adverse events were reported for diet and exercise. There were numerically more nonserious gastrointestinal issues associated with diet interventions compared to non-diet groups.<sup>b</sup></li> </ul>	<ul style="list-style-type: none"> <li>Low to moderate quality evidence<sup>b,c</sup></li> <li>Variability among included studies (e.g., differences in patient population, types of diets and exercises, duration of treatment, follow-up)<sup>b</sup></li> <li>Assessed outcomes lacked standardization<sup>b</sup></li> <li>Not always reported if the changes in pain were meaningful to the patients<sup>b</sup></li> <li>Higher representation of the female population in most studies<sup>b</sup></li> <li>No studies identified for the underweight patient population<sup>b</sup></li> </ul>	<ul style="list-style-type: none"> <li>Chronic pain is more prevalent in both underweight (Body Mass Index [BMI] &lt;18.5) and obese (BMI ≥ 30) adults.</li> <li>Chronic pain tends to be localized to weight bearing body parts in those who are obese, but more generalized hypersensitivity in those who are underweight. Chronic pain in underweight may be related to comorbidities such as osteoporosis, frailty, and muscle weakness.</li> <li>Weight related stigma is associated with psychological distress, maladaptive coping, loneliness, and less social support, which may influence the experience of pain.</li> <li>Health care providers are urged to consider ways their beliefs, language, or behaviours towards patients may contribute to stigma and discrimination (e.g., requiring a patient to show behaviour change for weight loss before offering other pain treatments).</li> <li>Overweight patients understand general principles of weight management, but barriers such as the inability to break down principles into specific actions, dislike of exercise, past weight-loss failure, and lack of social support interfere with the ability to make changes.</li> <li>A supportive partnership with the patient is important for weight-loss efforts, providing consistent, positive reinforcement and follow-up (e.g., “Last visit we talked about walking every day. How often were you able to walk?”).</li> <li>Refer patient to a dietician when appropriate.</li> </ul>
<b>Low back pain<sup>b</sup></b>	<ul style="list-style-type: none"> <li>Evidence from one non-randomized study suggests losing weight through a multidisciplinary weight management program may reduce low back pain prevalence for overweight patients.<sup>b</sup></li> </ul>	<ul style="list-style-type: none"> <li>Non-randomized single-arm study<sup>b</sup></li> <li>No studies identified for the underweight patient population<sup>b</sup></li> </ul>	<ul style="list-style-type: none"> <li>Overweight patients understand general principles of weight management, but barriers such as the inability to break down principles into specific actions, dislike of exercise, past weight-loss failure, and lack of social support interfere with the ability to make changes.</li> <li>A supportive partnership with the patient is important for weight-loss efforts, providing consistent, positive reinforcement and follow-up (e.g., “Last visit we talked about walking every day. How often were you able to walk?”).</li> <li>Refer patient to a dietician when appropriate.</li> </ul>

<sup>a</sup> “Practical considerations” were developed by the Saskatchewan Health Authority, and reviewed by the Canadian Pain Task Force and its External Advisory Panel.

<sup>b</sup> As outlined in the CADTH Rapid Response Report *Body Weight Modification Interventions for Chronic Non-Cancer Pain: A Review of Clinical Effectiveness*.<sup>3</sup>

<sup>c</sup> The quality or strength of the evidence can be described as unclear, low, moderate, or high. The lower the quality or strength, the less confidence there is in the results. With low-quality or low-strength evidence, there is a need for high-quality research to be certain of the interventions’ effect.

## Bottom Line:

Foot orthotics may lower pain for people with low back pain, rheumatoid arthritis (with foot pain), and painful flexible flatfoot.

**Table 3: Research Findings and Practical Considerations of Foot Orthotics for Chronic Pain**

Pain condition	Research findings	Limitations	Practical considerations <sup>a</sup>
<b>Foot pain:<sup>b</sup></b> <ul style="list-style-type: none"> <li>• Rheumatoid arthritis</li> <li>• Painful flexible flatfoot</li> </ul>	<ul style="list-style-type: none"> <li>• The evidence was mixed for orthotics use in patients with rheumatoid arthritis foot pain when compared to controls. Some studies reported statistically significant reductions in pain, while others reported no difference.<sup>b</sup></li> <li>• Evidence from one study suggests orthotics may reduce pain for painful flexible flatfoot when compared to sham insoles. No adverse events were reported.<sup>b</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Evidence was of variable or unclear quality<sup>b, c</sup></li> <li>• Limited data on harms<sup>b</sup></li> <li>• Not always reported if the changes in pain were meaningful to the patients<sup>b</sup></li> <li>• Small sample sizes<sup>b</sup></li> <li>• Variability existed among the included studies (e.g., differences in orthotic materials, length of follow-up)<sup>b</sup></li> </ul>	<ul style="list-style-type: none"> <li>• It can take several months to build tolerance to foot orthotics. Slowly increase wear time until they are worn comfortably and consistently for all activities throughout the day.</li> <li>• Patients should consider purchasing several pairs of orthotics for different shoe types.</li> <li>• Consistent use of orthotics is more effective than intermittent use.</li> <li>• Both prefabricated and custom orthotics should be reviewed every two to four years. Changes in body composition, general health, and activity levels may change the need for foot orthotics.</li> <li>• Orthotics take up room in the shoe and may require the patient to wear a shoe with a wider toe box or taller cut from top to bottom; longer shoes are usually not needed. Lace-up shoes and boots are most suitable for orthotics, but not necessary.</li> </ul>
<b>Low back pain<sup>b</sup></b>	<ul style="list-style-type: none"> <li>• Evidence from one study suggests orthotics may reduce pain and disability for patients with chronic low back pain when compared to a waitlist control. No adverse events were reported.<sup>b</sup></li> </ul>		

<sup>a</sup> “Practical considerations” were developed by the Saskatchewan Health Authority, and reviewed by the Canadian Pain Task Force and its External Advisory Panel.

<sup>b</sup> As outlined in the CADTH Rapid Response report *Customized or Prefabricated Shoe Inserts for Chronic, Non-Cancer Pain: A Review of Clinical Effectiveness*.<sup>4</sup>

<sup>c</sup> The quality or strength of the evidence can be described as unclear, low, moderate, or high. The lower the quality or strength, the less confidence there is in the results. With low-quality or low-strength evidence, there is a need for high-quality research to be certain of the interventions’ effect.

Not all pain conditions were captured in the evidence that was reviewed by CADTH. This doesn't mean these methods to manage pain won't work for other types of pain, it may simply mean research has not been done or has not been reviewed on the specific pain condition yet. In addition, not every intervention listed will achieve the lowering of pain that is desired by the patient as every individual responds differently to each method of managing pain. As a result, patients and their health care providers need to work together to find the methods that work best for them.

To access a PDF of this handout visit [www.cadth.ca/chronicpain](http://www.cadth.ca/chronicpain).



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## References

1. Busse JW, Craigie S, Juurlink DN, Buckley DN, Wang L, Couban RJ, et al. Guideline for opioid therapy and chronic noncancer pain. CMAJ [Internet]. 2017 May 8 [cited 2018 Apr 26];189(18):E659-E666. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5422149>
2. Orthotic Bracing or Splinting of Upper Extremities in Patients with Chronic, Non-Cancer Pain: A Review of Clinical Effectiveness. Ottawa: CADTH; 2020 Mar. (CADTH rapid response report: summary with critical appraisal). <https://www.cadth.ca/orthotic-bracing-or-splinting-upper-extremities-patients-chronic-non-cancer-pain-review-clinical>
3. Body Weight Modification Interventions for Chronic Non-Cancer Pain: A Review of Clinical Effectiveness. Ottawa: CADTH; 2020 Mar. (CADTH rapid response report: summary with critical appraisal). <https://www.cadth.ca/body-weight-modification-interventions-chronic-non-cancer-pain-review-clinical-effectiveness>
4. Customized or Prefabricated Shoe Inserts for Chronic, Non-Cancer Pain: A Review of Clinical Effectiveness. Ottawa: CADTH; 2020 Apr. (CADTH rapid response report: summary with critical appraisal). <https://www.cadth.ca/customized-or-prefabricated-shoe-inserts-chronic-non-cancer-pain-review-clinical-effectiveness>

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