

CADTH RAPID RESPONSE REPORT: REFERENCE LIST

# Sleep Interventions for Chronic, Non-Cancer Pain: Clinical Effectiveness and Guidelines

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## Research Questions

1. What is the clinical effectiveness of sleep-related, non-pharmacological interventions for chronic, non-cancer pain?
2. What are the evidence-based guidelines regarding sleep-related interventions for chronic, non-cancer pain?

## Key Findings

Three systematic reviews (two with meta-analyses), one randomized controlled trial, and eleven non-randomized studies were identified regarding the clinical effectiveness of sleep-related, non-pharmacological interventions for chronic, non-cancer pain. Three evidence-based guidelines were identified regarding sleep-related interventions for chronic, non-cancer pain.

## Methods

A limited literature search was conducted by an information specialist on key resources including Medline and PsycINFO via OVID, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused Internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were sleep and chronic pain. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2015 and January 20, 2020. Internet links were provided, where available.

## Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

**Table 1: Selection Criteria**

<b>Population</b>	Adults living with chronic non-cancer pain, excluding pregnant patients
<b>Intervention</b>	Sleep-related non-pharmacological interventions (including interventions given at a sleep clinic or provided by a physician, e.g., sleep apnea interventions [e.g., continuous positive airway pressure therapy], behavioural therapy)

<b>Comparator</b>	Q1: Pharmacological interventions specific to pain management No treatment (no sleep interventions) Usual care (if usual care is pharmacological interventions only) Q2: Not applicable
<b>Outcomes</b>	Q1: Clinical effectiveness (pain reduction, functional performance, quality of life, disability level, safety, global impression of recovery, adverse events) Q2: Recommendations
<b>Study Designs</b>	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies, and evidence-based guidelines

## Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports and systematic reviews are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

Three systematic reviews<sup>1-3</sup> (two with meta-analyses), one randomized controlled trial,<sup>4</sup> and eleven non-randomized studies<sup>5-15</sup> were identified regarding the clinical effectiveness of sleep-related, non-pharmacological interventions for chronic, non-cancer pain. No relevant health technology assessments were identified. Three evidence-based guidelines<sup>16-18</sup> were identified regarding sleep-related interventions for chronic, non-cancer pain.

Additional references of potential interest are provided in the appendix.

### Health Technology Assessments

No literature identified.

### Systematic Reviews and Meta-analyses

1. Zou L, Yeung A, Quan X, Boyden SD, Wang H. A systematic review and meta-analysis of mindfulness-based (Baduanjin) exercise for alleviating musculoskeletal pain and improving sleep quality in people with chronic diseases. *Int J Environ Res Public Health*. 2018;15(2):25.  
[PubMed: PM29370149](#)
2. Minnesota Evidence-based Practice Center. Management of insomnia disorder. (*Comparative effectiveness review no. 159*). Rockville (MD): Agency for Healthcare Research and Quality; 2017:  
<https://effectivehealthcare.ahrq.gov/products/insomnia/research/>.  
Accessed 2020 Jan 23.
3. Bawa FL, Mercer SW, Atherton RJ, et al. Does mindfulness improve outcomes in patients with chronic pain? Systematic review and meta-analysis. *Br J Gen Pract*. 2015;65(635):e387-400.  
[PubMed: PM26009534](#)

## Randomized Controlled Trials

4. Yeh CH, Suen LK, Shen J, et al. Changes in sleep with auricular point acupuncture for chronic low back pain. *Behav Sleep Med*. 2016;14(3):279-294.  
[PubMed: PM26244591](#)

## Non-Randomized Studies

5. Burgess HJ, Rizvydeen M, Kimura M, et al. An open trial of morning bright light treatment among US military veterans with chronic low back pain: a pilot study. *Pain Med*. 2019;20(4):770-778.  
[PubMed: PM30204903](#)
6. Burns JW, Gerhart J, Rizvydeen M, Kimura M, Burgess HJ. Morning bright light treatment for chronic low back pain: potential impact on the volatility of pain, mood, function, and sleep. *Pain Med*. 2019;09:09.  
[PubMed: PM31816075](#)
7. Goldway N, Ablin J, Lubin O, et al. Volitional limbic neuromodulation exerts a beneficial clinical effect on fibromyalgia. *Neuroimage*. 2019;186:758-770.  
[PubMed: PM30408596](#)
8. Volpato MP, Albano Breda IC, Carolina de Carvalho R, et al. Single cupping therapy session improves pain, sleep and disability in patients with nonspecific chronic low back pain. *Journal Acupunct Meridian Stud*. 2019;21:21.  
[PubMed: PM31760207](#)
9. Delivet H, Dugue S, Ferrari A, Postone S, Dahmani S. Efficacy of self-hypnosis on quality of life for children with chronic pain syndrome. *Int J Clin Exp Hypn*. 2018;66(1):43-55.  
[PubMed: PM29319458](#)
10. Russo M, Cousins MJ, Brooker C, et al. Effective relief of pain and associated symptoms with closed-loop spinal cord stimulation system: preliminary results of the Avalon study. *Neuromodulation*. 2018;21(1):38-47.  
[PubMed: PM28922517](#)
11. A DIC, Minganti C, Quaranta F, et al. Effectiveness of a new cervical pillow on pain and sleep quality in recreational athletes with chronic mechanical neck pain: a preliminary comparative study. *J Sports Med Phys Fitness*. 2017;57(9):1154-1161.  
[PubMed: PM27607589](#)
12. Palermo TM, Beals-Erickson S, Bromberg M, Law E, Chen M. A single arm pilot trial of brief cognitive behavioral therapy for insomnia in adolescents with physical and psychiatric comorbidities. *J Clin Sleep Med*. 2017;13(3):401-410.  
[PubMed: PM27923435](#)
13. Ramineni T, Prusik J, Patel S, et al. The impact of spinal cord stimulation on sleep patterns. *Neuromodulation*. 2016;19(5):477-481.  
[PubMed: PM26846456](#)
14. Wilson KG, Kowal J, Ferguson EJ. Clinically important change in insomnia severity after chronic pain rehabilitation. *Clin J Pain*. 2016;32(9):784-791.  
[PubMed: PM26626293](#)

15. Latorre-Roman PA, Rentero-Blanco M, Laredo-Aguilera JA, Garcia-Pinillos F. Effect of a 12-day balneotherapy programme on pain, mood, sleep, and depression in healthy elderly people. *Psychogeriatrics*. 2015;15(1):14-19.  
[PubMed: PM25515521](#)

## Guidelines and Recommendations

16. VA/DoD clinical practice guideline for the management of chronic insomnia disorder and obstructive sleep apnea. Washington (DC): Department of Veterans Affairs, Department of Defense; 2019:  
<https://www.healthquality.va.gov/guidelines/CD/insomnia/VADoDSleepCPGFinal508.pdf>. Accessed 2020 Jan 23.  
*See: VI. Recommendations (p.27-29)*
17. Geenen R, Overman CL, Christensen R, et al. EULAR recommendations for the health professional's approach to pain management in inflammatory arthritis and osteoarthritis. *Ann Rheum Dis*. 2018;77(6):797-807.  
[PubMed: PM29724726](#)
18. Assessment to management of adult insomnia. Calgary (AB): Towards Optimized Practice; 2015: <http://www.topalbertadoctors.org/CPGs/Lists/CPGDocumentList/Adult-Insomnia-CPG.pdf>. Accessed 2020 Jan 23.  
*See: Chronic Insomnia – Non-Pharmacologic Treatment (p.3)*

## Appendix — Further Information

### Previous CADTH Reports

19. Multidisciplinary Treatment Programs for Patients with Acute or Subacute Pain: A Review of Clinical Effectiveness, Cost-Effectiveness, and Guidelines; 2019. <https://www.cadth.ca/multidisciplinary-treatment-programs-patients-acute-or-subacute-pain-review-clinical-effectiveness-0>
20. Multidisciplinary Treatment Programs for Patients with Chronic Non-Malignant Pain: A Review of Clinical Effectiveness, Cost-effectiveness, and Guidelines – An Update; 2019. <https://www.cadth.ca/multidisciplinary-treatment-programs-patients-chronic-non-malignant-pain-review-clinical-0>
21. Current Practice Analysis: Interventions for Insomnia Disorder; 2017. [https://www.cadth.ca/sites/default/files/pdf/OP0527\\_Current\\_Practice\\_Analysis\\_Insomnia%20Disorder.pdf](https://www.cadth.ca/sites/default/files/pdf/OP0527_Current_Practice_Analysis_Insomnia%20Disorder.pdf)
22. Therapeutic Bedding for Chronic Pain: Clinical Effectiveness; 2016. <https://www.cadth.ca/therapeutic-bedding-chronic-pain-clinical-effectiveness-0>

### Systematic Reviews

#### *Unclear Intervention*

23. Forte ML, Butler M, Andrade KE, Vincent A, Schousboe JT, Kane RL. *Agency for Healthcare Research and Quality (US)*. 2015 01:01. [PubMed: PM25719189](#)

#### *Mixed Population*

24. Tang NK, Lereya ST, Boulton H, Miller MA, Wolke D, Cappuccio FP. Nonpharmacological Treatments of Insomnia for Long-Term Painful Conditions: A Systematic review and Meta-analysis of Patient-Reported Outcomes in Randomized Controlled Trials. *Sleep*. 2015 Nov 01;38(11):1751-1764. [PubMed: PM25902806](#)

### Randomized Controlled Trials

#### *Alternative Comparator*

25. Roseen EJ, Gerlovin H, Femia A, et al. Yoga, Physical Therapy, and Back Pain Education for Sleep Quality in Low-Income Racially Diverse Adults with Chronic Low Back Pain: a Secondary Analysis of a Randomized Controlled Trial. *J Gen Intern Med*. 2020 Jan;35(1):167-176. [PubMed: PM31667747](#)
26. Braun Janzen T, Paneduro D, Picard L, Gordon A, Bartel LR. A parallel randomized controlled trial examining the effects of rhythmic sensory stimulation on fibromyalgia symptoms. *PLoS ONE [Electronic Resource]*. 2019;14(3):e0212021. [PubMed: PM30822311](#)
27. Soal LJ, Bester CM, Shaw BS, Yelverton C. Changes in chronic neck pain following the introduction of a visco-elastic polyurethane foam pillow and/or chiropractic

treatment. *Health Sa Gesundheit*. 2019;24:1099.

[PubMed: PM31934412](#)

28. Vanti C, Banchelli F, Marino C, Puccetti A, Guccione AA, Pillastrini P. Effectiveness of a "Spring Pillow" Versus Education in Chronic Nonspecific Neck Pain: A Randomized Controlled Trial. *Phys Ther*. 2019 09 01;99(9):1177-1188.

[PubMed: PM30939188](#)

29. Innes KE, Selfe TK, Kandati S, Wen S, Huysmans Z. Effects of Mantra Meditation versus Music Listening on Knee Pain, Function, and Related Outcomes in Older Adults with Knee Osteoarthritis: An Exploratory Randomized Clinical Trial (RCT). *Evidence-Based Complementary & Alternative Medicine: eCAM*. 2018;2018:7683897.

[PubMed: PM30245732](#)

30. Mateu M, Alda O, Inda MD, et al. Randomized, Controlled, Crossover Study of Self-administered Jacobson Relaxation in Chronic, Nonspecific, Low-back Pain. *Altern Ther Health Med*. 2018 Nov;24(6):22-30.

[PubMed: PM30982021](#)

31. Nandini B, Mooventhan A, Manjunath NK. Add-on Effect Of Hot Sand Fomentation To Yoga On Pain, Disability, And Quality Of Life In Chronic Neck Pain Patients. *Explore (NY)*. 2018 09;14(5):373-378.

[PubMed: PM30100129](#)

32. Wiklund T, Linton SJ, Alfoldi P, Gerdle B. Is sleep disturbance in patients with chronic pain affected by physical exercise or ACT-based stress management? - A randomized controlled study. *BMC Musculoskelet Disord*. 2018 04 10;19(1):111.

[PubMed: PM29631567](#)

### *Unclear Comparator*

33. Jiao J, Russell IJ, Wang W, Wang J, Zhao YY, Jiang Q. Ba-Duan-Jin alleviates pain and fibromyalgia-related symptoms in patients with fibromyalgia: results of a randomised controlled trial. *Clin Exp Rheumatol*. 2019 Nov-Dec;37(6):953-962.

[PubMed: PM30789154](#)

34. Murphy SL, Harris RE, Keshavarzi NR, Zick SM. Self-Administered Acupressure for Chronic Low Back Pain: A Randomized Controlled Pilot Trial. *Pain Med*. 2019 Dec 01;20(12):2588-2597.

[PubMed: PM31237610](#)

### Non-Randomized Studies

#### *Alternative Intervention*

35. de la Vega R, Racine M, Castarlenas E, et al. The Role of Sleep Quality and Fatigue on the Benefits of an Interdisciplinary Treatment for Adults With Chronic Pain. *Pain Pract*. 2019 04;19(4):354-362.

[PubMed: PM30447174](#)

#### *Alternative Comparator*

36. Bjornsdottir SV, Arnljotsdottir M, Tomasson G, Triebel J, Valdimarsdottir UA. Health-related quality of life improvements among women with chronic pain: comparison of



two multidisciplinary interventions. *Disabil Rehabil.* 2016;38(9):828-836.

[PubMed: PM26122546](#)

## Clinical Practice Guidelines

37. Maness DL, Khan M. Nonpharmacologic Management of Chronic Insomnia. *Am Fam Physician.* 2015 Dec 15;92(12):1058-1064.

[PubMed: PM26760592](#)