

CADTH RAPID RESPONSE REPORT: REFERENCE LIST

Physical Activity for Chronic Non-Cancer Knee Pain: Clinical Effectiveness, Cost- Effectiveness and Guidelines

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Research Questions

1. What is the clinical effectiveness of physical activity for chronic, non-cancer knee pain?
2. What is the cost-effectiveness of physical activity for chronic, non-cancer knee pain?
3. What are the evidence-based guidelines regarding physical activity for chronic, non-cancer knee pain?

Key Findings

Nineteen systematic reviews (10 with meta-analyses) were identified regarding the clinical effectiveness of physical activity for chronic, non-cancer knee pain. Additionally, nine evidence-based guidelines were identified regarding physical activity for chronic, non-cancer knee pain.

Methods

A limited literature search was conducted by an information specialist on key resources including PubMed, 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 exercise and knee pain. Filters were applied to limit the retrieval to health technology assessments, systematic reviews, and meta analyses, economic studies, and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2014 and October 15, 2019. 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

Population	Adults living with chronic non-cancer knee pain from any cause, excluding pregnant patients
Intervention	Physical activity (e.g., strength training, resistance training, aerobic exercise, running, cycling, swimming, excluding physical activity/therapy guided by a physical therapist or physiotherapy exercises and Pilates, yoga)

Comparator	Q1-2: Pharmacological interventions No treatment (e.g., waitlist, sham interventions) Usual care (if usual care is pharmacological interventions only) Q3: Not applicable
Outcomes	Q1: Clinical effectiveness (e.g., pain reduction, functional performance, quality of life, disability level, safety, global impression of recovery, adverse events, skin reactions) Q2: Cost-effectiveness (e.g., incremental cost per quality adjusted life year gained, incremental cost-effectiveness ratio, quality adjusted life years) Q3: Guidelines
Study Designs	Health technology assessments, systematic reviews, meta-analyses, economic evaluations, and evidence-based guidelines

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by economic evaluations and evidence-based guidelines.

Nineteen systematic reviews (10 with meta-analyses) were identified regarding the clinical effectiveness of physical activity for chronic, non-cancer knee pain.¹⁻¹⁹ Additionally nine evidence-based guidelines were identified regarding physical activity for chronic, non-cancer knee pain.²⁰⁻²⁸ No relevant health technology assessments and economic evaluations were identified regarding the clinical effectiveness and cost-effectiveness of physical activity for chronic, non-cancer knee pain.

Additional references of potential interest are provided in the appendix.

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

1. Charlesworth J, Fitzpatrick J, Perera NKP, Orchard J. Osteoarthritis- a systematic review of long-term safety implications for osteoarthritis of the knee. *BMC Musculoskelet Disord.* 2019 Apr 9;20(1):151.
[PubMed: PM30961569](#)
2. Chen SC, Ding SB, Xie BC, Tian H, Lu CY. Are aquatic exercise efficacious in postmenopausal women with knee osteoarthritis? A meta-analysis of randomized controlled trials. *J Sports Med Phys Fitness.* 2019 Apr 30.
[PubMed: PM31062542](#)
3. Ferreira RM, Torres RT, Duarte JA, Goncalves RS. Non-pharmacological and non-surgical interventions for knee osteoarthritis: a systematic review and meta-analysis. *Acta Reumatol Port.* 2019 Jul 29.
[PubMed: PM31356585](#)
4. Goh SL, Persson MSM, Stocks J, et al. Efficacy and potential determinants of exercise therapy in knee and hip osteoarthritis: a systematic review and meta-analysis. *Ann Phys Rehabil Med.* 2019 Sep;62(5):356-365.
[PubMed: PM31121333](#)

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[PubMed: PM29699963](#)
8. Skelly AC, Chou R, Dettori JR, et al. AHRQ Comparative Effectiveness Reviews. *Noninvasive nonpharmacological treatment for chronic pain: a systematic review*. Rockville (MD): Agency for Healthcare Research and Quality (US); 2018.
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[PubMed: PM28366821](#)
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[PubMed: PM28825779](#)
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[PubMed: PM27007113](#)
12. Henriksen M, Hansen JB, Klokke L, Bliddal H, Christensen R. Comparable effects of exercise and analgesics for pain secondary to knee osteoarthritis: a meta-analysis of trials included in Cochrane systematic reviews. *J Comp Eff Res*. 2016 Jul;5(4):417-431.
[PubMed: PM27346368](#)
13. Li Y, Su Y, Chen S, et al. The effects of resistance exercise in patients with knee osteoarthritis: a systematic review and meta-analysis. *Clin Rehabil*. 2016 Oct;30(10):947-959.
[PubMed: PM26471972](#)
14. Tanaka R, Ozawa J, Kito N, Moriyama H. Effects of exercise therapy on walking ability in individuals with knee osteoarthritis: a systematic review and meta-analysis of randomised controlled trials. *Clin Rehabil*. 2016 Jan;30(1):36-52.
[PubMed: PM25691583](#)
15. Fransen M, McConnell S, Harmer AR, Van der Esch M, Simic M, Bennell KL. Exercise for osteoarthritis of the knee. *Cochrane Database Syst Rev*. 2015 Jan 9;1:CD004376.
[PubMed: PM25569281](#)
16. Lu M, Su Y, Zhang Y, et al. Effectiveness of aquatic exercise for treatment of knee osteoarthritis: systematic review and meta-analysis. *Z Rheumatol*. 2015 Aug;74(6):543-552.

[PubMed: PM25691109](#)

17. van der Heijden RA, Lankhorst NE, van Linschoten R, Bierma-Zeinstra SM, van Middelkoop M. Exercise for treating patellofemoral pain syndrome. *Cochrane Database Syst Rev.* 2015 Jan 20;1:CD010387.
[PubMed: PM25603546](#)
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[PubMed: PM25140112](#)

Economic Evaluation

No literature identified.

Guidelines and Recommendations

20. Royal Australian College of General Practitioners (RACGP). Guideline for the management of knee and hip osteoarthritis. 2nd Ed. East Melbourne, Victoria (Australia): RACGP; 2018 Jul:
<https://www.racgp.org.au/FSDEDEV/media/documents/Clinical%20Resources/Guidelines/Joint%20replacement/Guideline-for-the-management-of-knee-and-hip-OA-2nd-edition.pdf>
See: 3.1 Non-pharmacological interventions
Accessed 2019 Oct 21
21. Rausch Osthoff AK, Niedermann K, Braun J, et al. 2018 EULAR recommendations for physical activity in people with inflammatory arthritis and osteoarthritis. *Ann Rheum Dis.* 2018 Sep;77(9):1251-1260.
[PubMed: PM29997112](#)
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[PubMed: PM28183194](#)
24. Crossley KM, van Middelkoop M, Callaghan MJ, Collins NJ, Rathleff MS, Barton CJ. 2016 Patellofemoral pain consensus statement from the 4th International Patellofemoral Pain Research Retreat, Manchester. Part 2: recommended physical interventions (exercise, taping, bracing, foot orthoses and combined interventions). *Br J Sports Med.* 2016 Jul;50(14):844-852.
[PubMed: PM27247098](#)
See: Exercise therapy: the treatment of choice

25. Jones BQ, Covey CJ, Sineath MH, Jr. Nonsurgical management of knee pain in adults. *Am Fam Physician*. 2015 Nov 15;92(10):875-883.
[PubMed: PM26554281](#)

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[PubMed: PM24462672](#)

27. National Institute for Health Care and Excellence. Osteoarthritis: care and management (*Clinical guideline CG177*); 2014 Feb;
<https://www.nice.org.uk/guidance/cg177/resources/osteoarthritis-care-and-management-pdf-35109757272517>
Accessed 2019 Oct 21
See: 1.4.1: Exercise and manual therapy

28. The Non-Surgical Management of Hip & Knee Osteoarthritis Working Group (VA/DoD). The Non-surgical management of hip & knee osteoarthritis. Washington, DC: U.S. Department of Veterans Affairs, Department of Defense; 2014:
<https://www.healthquality.va.gov/guidelines/CD/OA/VADoDOACPGFINAL090214.pdf>
Accessed 2019 Oct 21
See: Module B: Core Non-Surgical Treatment Principles

Appendix — Further Information

Previous CADTH Reports

29. Edge R, Farrah K. Exercise for the management of knee osteoarthritis: a review of clinical effectiveness (*CADTH Rapid Response report: Summary with Critical Appraisal*); 2017 Aug:
<https://www.cadth.ca/sites/default/files/pdf/htis/2017/RC0901%20Physio%20for%20OA%20Final.pdf>
 Accessed 2019 Oct 21

Systematic Reviews and Meta-analyses

Alternative Comparator

30. Hurley M, Dickson K, Hallett R, et al. Exercise interventions and patient beliefs for people with hip, knee or hip and knee osteoarthritis: a mixed methods review. *Cochrane Database Syst Rev*. 2018 Apr 17;4:CD010842.
[PubMed: PM29664187](#)
31. Neelapala YVR, Bhagat M, Shah P. Hip muscle strengthening for knee osteoarthritis: a systematic review of literature. *J Geriatr Phys Ther*. 2018 Nov 6.
[PubMed: PM30407271](#)
32. Geneen LJ, Moore RA, Clarke C, Martin D, Colvin LA, Smith BH. Physical activity and exercise for chronic pain in adults: an overview of Cochrane Reviews. *Cochrane Database Syst Rev*. 2017 Apr 24;4:CD011279.
[PubMed: PM28436583](#)
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[PubMed: PM28121996](#)
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[PubMed: PM26644699](#).

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39. Quintrec JL, Verlhac B, Cadet C, et al. Physical exercise and weight loss for hip and knee osteoarthritis in very old patients: a systematic review of the literature. *Open Rheumatol J*. 2014;8:89-95. [PubMed: PM25489352](#)

Comparator Not Specified in Abstract

40. Lim HY, Wong SH. Effects of isometric, eccentric, or heavy slow resistance exercises on pain and function in individuals with patellar tendinopathy: a systematic review. *Physiother Res Int*. 2018 Oct;23(4):e1721. [PubMed: PM29972281](#)
41. Fernandopulle S, Perry M, Manlapaz D, Jayakaran P. Effect of land-based generic physical activity interventions on pain, physical function, and physical performance in hip and knee osteoarthritis: a systematic review and meta-analysis. *Am J Phys Med Rehabil*. 2017 Nov;96(11):773-792. [PubMed: PM28323761](#)
42. Anwer S, Alghadir A, Brismee JM. Effect of home exercise program in patients with knee osteoarthritis: a systematic review and meta-analysis. *J Geriatr Phys Ther*. 2016 Jan-Mar;39(1):38-48. [PubMed: PM25695471](#)
43. Thomson C, Krouwel O, Kuisma R, Hebron C. The outcome of hip exercise in patellofemoral pain: a systematic review. *Man Ther*. 2016 Dec;26:1-30. [PubMed: PM27428378](#)
44. Uthman OA, van der Windt DA, Jordan JL, et al. Exercise for lower limb osteoarthritis: systematic review incorporating trial sequential analysis and network meta-analysis. *Br J Sports Med*. 2014 Nov;48(21):1579. [PubMed: PM25313133](#)

Economic Evaluations

Type of Exercise Not Specified in Abstract

45. Losina E, Smith KC, Paltiel AD, et al. Cost-effectiveness of diet and exercise for overweight and obese patients with knee osteoarthritis. *Arthritis Care Res*. 2019 Jul;71(7):855-864. [PubMed: PM30055077](#)

Clinical Practice Guidelines

46. Health Quality Ontario. Osteoarthritis: care for adults with osteoarthritis of the knee, hip, or hand. Toronto (ON): Health Quality Ontario; 2018: <https://www.hqontario.ca/Portals/0/documents/evidence/quality-standards/qs-osteoarthritis-clinician-guide-en.pdf>
Accessed 2019 Oct 21
See: *Quality Statement 5: Therapeutic Exercise*

47. Collins NJ, Barton CJ, van Middelkoop M, et al. 2018 Consensus statement on exercise therapy and physical interventions (orthoses, taping and manual therapy) to treat patellofemoral pain: recommendations from the 5th International Patellofemoral Pain Research Retreat, Gold Coast, Australia, 2017. *Br J Sports Med*. 2018 Sep;52(18):1170-1178.
[PubMed: PM29925502](#)

Review Articles

48. Collins NJ, Hart HF, Mills KAG. Osteoarthritis year in review 2018: rehabilitation and outcomes. *Osteoarthritis Cartilage*. 2019 Mar;27(3):378-391.
[PubMed: PM30529739](#)