

Exercise-induced osteoarthritis

Adrienne J. Lindblad BSP ACPR PharmD Adam Keough MD CCFP(SEM) Joey Ton PharmD

Clinical question

Does running increase the risk of developing osteoarthritis (OA)?

Bottom line

Based on low-quality observational data, running is not likely to increase the risk of developing OA—except maybe in elite athletes. Recreational running might lower the risk of knee OA. Exercise is one of the most effective treatments for reducing OA pain.

Evidence

- A systematic review of 17 observational studies (7 cohort; N=114829 patients) compared competitive runners (ie, professional, elite, or those who compete internationally), recreational runners, and a control group¹:
 - Overall prevalence of knee or hip OA was approximately 4% in all runners versus 10% in the control group (statistical significance not reported).
 - Separating runners by intensity of activity found a prevalence of roughly 4% in recreational runners, statistically lower than 13% in competitive runners; and roughly 4% in recreational runners, not statistically different than 10% in the control group.
 - There was no difference in hip OA. However, 1 survey found an increased risk in 141 elite runners or cross-country skiers.²
 - Recreational running lowered risk of knee OA to 32% versus 38% for the control group. There was no difference in competitive running versus control.
 - The largest cohort study, which followed 16961 participants for 11 years, found the following³:
 - No association was found between high exercise levels and OA in women or in older men (>50 years).
 - Younger men (<50 years) who ran or walked more than 30 km/week had an increased risk of self-reported knee or hip OA compared to sedentary controls (adjusted hazard ratio of 2.4).
 - Study limitations: controls likely not sedentary, case-control and cross-sectional studies included, most cohort studies small (N<100), and variable OA diagnosis (eg, relied solely on x-ray scan or patient recall).
- A systematic review of all runner types and 15 observational studies found lower risk of knee surgery due to OA (3 case-control studies) in runners compared to nonrunners (odds ratio of 0.46; statistically different).⁴

Context

- There is only a weak correlation between x-ray scan findings and OA symptoms.⁵
- Knee injuries are associated with knee OA; some sports are more prone to causing injury.⁶
- Exercise of any type is one of the most effective treatments for OA pain.⁷

Implementation

Factors including body mass index, occupation, and previous knee injury need to be considered when counseling patients about risks of developing OA.⁸ Running can be recommended for patients interested in improving cardiovascular tolerance and OA pain; however, if patients are unable or unwilling, nonimpact activities like biking, elliptical training, or swimming can be considered. Physical activity prescriptions (with follow-up) could increase physical activity and should include patient-specific goals and monitoring.⁹ 🌿

Dr Lindblad is Associate Clinical Professor and **Dr Keough** is a clinical lecturer, both in the Department of Family Medicine at the University of Alberta in Edmonton. **Dr Ton** is a pharmacist in Edmonton and Clinical Evidence Expert at the College of Family Physicians of Canada.

Competing interests

None declared

The opinions expressed in Tools for Practice articles are those of the authors and do not necessarily mirror the perspective and policy of the Alberta College of Family Physicians.

References

1. Alentorn-Geli E, Samuelsson K, Musahl V, Green CL, Bhandari M, Karlsson J. The association of recreational and competitive running with hip and knee osteoarthritis: a systematic review and meta-analysis. *J Orthop Sports Phys Ther* 2017;47(6):373-90. Epub 2017 May 13.
2. Kettunen JA, Kujala UM, Kaprio J, Koskenvuo M, Sarna S. Lower-limb function among former elite male athletes. *Am J Sports Med* 2001;29(1):2-8.
3. Cheng Y, Macera CA, Davis DR, Ainsworth BE, Troped PJ, Blair SN. Physical activity and self-reported, physician-diagnosed osteoarthritis: is physical activity a risk factor? *Clin Epidemiol* 2000;53(3):315-22.
4. Timmins KA, Leech RD, Batt ME, Edwards KL. Running and knee osteoarthritis: a systematic review and meta-analysis. *Am J Sports Med* 2017;45(6):1447-57. Epub 2016 Aug 20.
5. Chu Miow Lin D, Reichmann WM, Gossec L, Losina E, Conaghan PG, Maillefert JF. Validity and responsiveness of radiographic joint space width metric measurement in hip osteoarthritis: a systematic review. *Osteoarthritis Cartilage* 2011;19(5):543-9. Epub 2011 Mar 23.
6. Thelin N, Holmberg S, Thelin A. Knee injuries account for the sports-related increased risk of knee osteoarthritis. *Scand J Med Sci Sports* 2006;16(5):329-33.
7. Ton J, Perry D, Thomas B, Allan GM, Lindblad AJ, McCormack J, et al. PEER umbrella systematic review of systematic reviews. Management of osteoarthritis in primary care. *Can Fam Physician* 2020;66:e89-98. Available from: www.cfp.ca/content/66/3/e89.long. Accessed 2020 Oct 15.
8. Blagojevic M, Jinks C, Jeffery A, Jordan KP. Risk factors for onset of osteoarthritis of the knee in older adults: a systematic review and meta-analysis. *Osteoarthritis Cartilage* 2010;18(1):24-33. Epub 2009 Sep 2.
9. Lindblad AJ, Raha SS, Lun V. Should family physicians add "physical activity" to their prescription pads? *Tools for Practice* #254. Edmonton, AB: Alberta College of Family Physicians; 2020. Available from: https://gomainpro.ca/wp-content/uploads/tools-for-practice/1583162440_exrxtfp254fv.pdf. Accessed 2020 Aug 31.

This article is eligible for Mainpro+ certified Self-Learning credits. To earn credits, go to www.cfp.ca and click on the Mainpro+ link.

Cet article se trouve aussi en français à la page 829.

Tools for Practice articles in *Canadian Family Physician* are adapted from articles published on the Alberta College of Family Physicians (ACFP) website, summarizing medical evidence with a focus on topical issues and practice-modifying information. The ACFP summaries and the series in *Canadian Family Physician* are coordinated by Dr G. Michael Allan, and the summaries are co-authored by at least 1 practising family physician and are peer reviewed. Feedback is welcome and can be sent to toolsforpractice@cfpc.ca. Archived articles are available on the ACFP website: www.acfp.ca.