IJSPT
INTERNATIONAL JOURNAL OF SPORTS PHYSICAL THERAPY

Rambaud AJ, Morel G, Prill R, van Melick N, Forelli F. Is Knee Osteoarthritis an Inevitable Consequence for Athletes after Anterior Cruciate Ligament Injury? Response to the Letter to the Editor. *IJSPT*. 2026;21(11):1075-1077. doi:10.26603/001c.172916

Letter to the Editor

Is Knee Osteoarthritis an Inevitable Consequence for Athletes after Anterior Cruciate Ligament Injury? Response to the Letter to the Editor

Alexandre JM Rambaud, PT, PhD[1,2,3], Grégory Morel, PT, MSc[2,4], Robert Prill, PT, MSc[5], Nicky van Melick, PhD[6], Florian Forelli, PT, PhD[1,3,7,8]

[1] International Sports and Exercise Physiotherapy Association, Switzerland, [2] Physiotherapy School of Saint Etienne, St Michel Campus, Saint Etienne, France, [3] SFMKS Lab, Asnières sur Oise, France, [4] University Hospital of Saint-Étienne, Department of Sports Medicine, Saint-Étienne, France, [5] Center of Orthopaedics and Traumatology, University Hospital Brandenburg/Havel, Brandenburg Medical School Theodor Fontane, Germany, [6] KneeSearch, the Netherlands, [7] Haute-Ecole Arc Santé, HES-SO University of Applied Sciences and Arts Western, Switzerland, Delémont, Switzerland, [8] Orthopaedic Surgery Department, Clinic of Domont, Ramsay Healthcare, @OrthoLab, Domont, France

https://doi.org/10.26603/001c.172916

International Journal of Sports Physical Therapy

Vol. 21, Issue 11, 2026

Dear Editors of IJSPT and Dr. Hewett and Mr. Nutarelli,

We are delighted to receive your commentary and learn that you share our concerns about the risk of post-traumatic osteoarthritis (PTOA) after an Anterior Cruciate Ligament (ACL) injury. We appreciate your suggestions, which will help improve the management of these athletes.

Indeed, physiotherapists, particularly sports physiotherapists, play a crucial role in detecting early signs of PTOA and educating athletes on adopting a healthy approach to knee care. Importantly, this role should extend beyond short-term recovery to secondary prevention and long-term joint-health management, given that Webster and Hewett estimated knee OA in approximately 36% (95% CI, 19.7%-53.0%) of patients around 10 years after ACL reconstruction, with a near eightfold increase in odds compared with uninjured controls (OR 7.70, 95% CI, 6.05-9.79).[1]

An ACL injury represents a risk factor, not an inevitable cause of PTOA. Thank you for highlighting this in your commentary. This distinction was also the intent of our deliberately interrogative title. However, it is a substantial risk that should be discussed with the athlete, medical staff, and performance staff.

An additional distinction is important when discussing these long-term data: radiographic or structural PTOA should not be considered synonymous with symptomatic disease. In a prospective cohort 10-15 years after ACL reconstruction, Øiestad et al. reported radiographic OA (Kellgren-Lawrence grade ⩾2) in 71% of participants and moderate-to-severe OA (grades 3-4) in 24%. Yet Kellgren-Lawrence grade ⩾2 was not significantly associated with pain, function, or knee-related quality of life, although symptoms were higher and severe radiographic OA (KL 4) was associated with worse pain, sport/recreation function, and quality of life.[2] Similarly, a systematic review of 41 long-term ACL studies found that only two studies clearly differentiated symptomatic from radiographic OA; symptomatic OA was reported in 35% for the tibiofemoral joint and 15% for the patellofemoral joint.[3] This distinction matters clinically because structural change and the athlete's symptomatic and functional burden are related, but not interchangeable outcomes.

This prevention must focus on educating patients/athletes to recognize the signs of knee pain: athletes must take those signs seriously. But, as the authors point out in their commentary, we must also offer hope. No need for alarmism. Regular exercise is essential, involving exercises that target the quadriceps and the key muscles involved in dynamic knee control. We're thinking of the stabilizing muscles of the hip and ankle. It is essential for patients/athletes who have suffered an ACL injury to follow a regular exercise routine while progressively restoring their capacity to tolerate load across the knee and other joints in the lower limb. Even in the absence of pain or with only mild discomfort, athletes should be aware that symptoms do not necessarily mirror structural status and should remain attentive to changes in their knee's response to load. We also agree that the early rehabilitation period deserves particular attention from a load-management perspective. The issue is not simply to reduce loading, but to dose and progressively restore it. Van Ginckel et al. compared 15 patients six months after ACL reconstruction with 15 matched controls and found altered cartilage composition and diminished recovery after a 30-minute running task; medial femoral cartilage T2 was 45.44 ms versus 37.19 ms (P=.028). These findings suggest that cartilage composition and in vivo resiliency may remain altered when sport-specific loading is being reintroduced.[4] More recently, Watanabe et al. followed 13 patients for 10 years and found that medial tibial cartilage T1ρ values at baseline and one year were associated with 10-year whole-joint MRI degeneration (r=0.604 for both; P=.031), while one-year T2 was also associated with the 10-year WORMS total score (r=0.566; P=.046).[5] Importantly, these observations support the biological relevance of the early post-injury and post-operative period, but they do not establish that a specific loading dose, timing, or progression prevents structural PTOA.

The available interventional evidence reinforces this caution. The OPTIKNEE systematic review identified only

five randomized controlled trials (365 participants) assessing structural or molecular joint-health outcomes after primary ACL injury, including three trials comparing postoperative rehabilitation approaches. No differences in structural or molecular biomarkers were found between the postoperative rehabilitation strategies, and the certainty of evidence was very low.[6] Accordingly, rather than framing the question as loading versus unloading, the clinical challenge is to determine how much load, how early, how progressively, and according to which individual biological and functional responses.

Like you, we believe that research in this field is essential to improve our practices and prevent long-term complications. We share your optimism about reducing the risk and long-term burden of PTOA related to injuries, but unfortunately, this initiative is often forgotten or implemented too late.

We would be happy to discuss these issues further with you and exchange knowledge on how to protect the knee health of athletes.

Sincerely,

Alexandre JM Rambaud PT, PhD, Grégory Morel PT, MSc, Robert Prill PT, MSc, Nicky van Melick PhD, and Florian Forelli PT, PhD

Published: November 01, 2026 CDT.
© The Author(s)

This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CCBY-NC-4.0). View this license's legal deed at https://creativecommons.org/licenses/by-nc/4.0 and legal code at https://creativecommons.org/licenses/by-nc/4.0/legalcode for more information.

REFERENCES

1. Webster KE, Hewett TE. Anterior cruciate ligament injury and knee osteoarthritis: An umbrella systematic review and meta-analysis. *Clin J Sport Med*. 2022;32(2):145-152. doi:10.1097/JSM.0000000000000894

2. Øiestad BE, Holm I, Engebretsen L, Risberg MA. The association between radiographic knee osteoarthritis and knee symptoms, function and quality of life 10-15 years after anterior cruciate ligament reconstruction. *Br J Sports Med*. 2011;45(7):583-588. doi:10.1136/bjsm.2010.073130

3. Lie MM, Risberg MA, Storheim K, Engebretsen L, Øiestad BE. What's the rate of knee osteoarthritis 10 years after anterior cruciate ligament injury? An updated systematic review. *Br J Sports Med*. 2019;53(18):1162-1167. doi:10.1136/bjsports-2018-099751

4. Van Ginckel A, Verdonk P, Victor J, Witvrouw E. Cartilage status in relation to return to sports after anterior cruciate ligament reconstruction. *Am J Sports Med*. 2013;41(3):550-559. doi:10.1177/0363546512473568

5. Watanabe S, Kaibara T, Ma CB, et al. Relationship between early cartilage degeneration with T1ρ and T2 analysis in medial tibial cartilage and 10-year posttraumatic osteoarthritis progression after ACL reconstruction. *Am J Sports Med*. 2025;53(11):2562-2570. doi:10.1177/03635465251360800

6. Holm PM, Juhl CB, Culvenor AG, et al. The effects of different management strategies or rehabilitation approaches on knee joint structural and molecular biomarkers following traumatic knee injury: A systematic review of randomized controlled trials for the OPTIKNEE consensus. *J Orthop Sports Phys Ther*. 2023;53(4):172-193. doi:10.2519/jospt.2023.11576