

EXERCISE AND SPORT SCIENCES REVIEWS



ESSR Journal Club

Covered Article: “Joint Loading in Runners Does Not Initiate Knee Osteoarthritis” by Ross H. Miller. *Exercise and Sport Sciences Reviews*. 45(2), April 2017.

1. Many theories on the initiation and progression of osteoarthritis propose a major role for joint-level mechanics. What is the evidence in humans that loading of the knee joint in activities of daily living can play a causal role in the development of osteoarthritis?
2. Based on this evidence, why might the natural expectation be that runners would have a very high risk of developing knee osteoarthritis? Is it surprising to you that runners do not seem to have a high risk of this disease?
3. Suppose you have an accurate measure of an individual’s knee joint contact force. What additional information would you need to confidently estimate their cartilage stress and strain? How would you go about examining the validity of these estimates?
4. Relatedly, why might cartilage stress and strain not be particularly high even if joint contact forces are high?
5. What is the basis for the “cumulative load” hypothesis suggested by the author? How would you design a study to test this hypothesis?
6. What is the basis for the “cartilage conditioning” hypothesis suggested by the author? How would you design a study to test this hypothesis?
7. Assuming the evident resistance to knee OA in runners is not purely genetic, what does the “cartilage conditioning” hypothesis suggest concerning physical activity recommendations for joint health across the lifespan?
8. Relatedly, what are some issues to consider when attempting to generalize the evident relationship between joint loading and knee OA in runners to other populations? Give two examples, one for a population with a high level of physical activity and one for a population with a low level of physical activity.