

Is Running Bad For the Knees?

Study compares before and after MRI scans

It has often been said that distance running will ruin your knees. But is this true? Are long-term runners at higher risk of knee arthritis? Is there an age one should stop running? What if a person already has some arthritis? Should they stop running? This study examined the data to find out.



Abstract

- **Background:** The general health benefits of running are well-established, yet concern exists regarding the development and progression of osteoarthritis.
- **Aim:** To systematically review the immediate (within 20 min) and delayed (20 min–48 h) effect of running on hip and knee cartilage, as assessed using magnetic resonance imaging (MRI).
- **Method:** Studies using MRI to measure change in hip or knee cartilage within 48 h pre- and post-running were identified. Risk of bias was assessed using a modified Newcastle–Ottawa Scale. Percentage change in cartilage outcomes were estimated using random-effects meta-analysis. Certainty of evidence was evaluated with the Grading of Recommendations Assessment, Development and Evaluation tool.
- **Results:** Twenty-four studies were included, evaluating 446 knees only. One third of studies were low risk of bias. Knee cartilage thickness and volume decreased immediately after running, with declines ranging from 3.3% (95% confidence interval [CI]: 2.6%, 4.1%) for weight-bearing femoral cartilage volume to 4.9% (95% CI: 4.43.6%, 6.2%) for patellar cartilage volume. T1p and T2 relaxation times were also reduced immediately after running, with the largest decline being 13.1% (95% CI: -14.4%, -11.7%) in femoral trochlear cartilage. Tibiofemoral cartilage T2 relaxation times recovered to baseline levels within 91 min. Existing cartilage defects were unchanged within 48 h post-run.
- **Conclusions:** There is very low certainty evidence that running immediately decreases the thickness, volume, and relaxation times of patellofemoral and tibiofemoral cartilage. Hip cartilage changes are unknown, but knee changes are small and appear transient suggesting that a single bout of running is not detrimental to knee cartilage.

This study compared MRI images of runners before running and then 48 hours later. In the studies where imaging was done immediately after running, there was a post-run decrease in the volume of the cartilage by about 3-4%. However, within 48 hours of the run, these changes reversed back to pre-run levels. A study of marathoners found no difference in cartilage thickness between baseline and 12 hours after the marathon. It appears that healthy knees bounce back well, although these are small numbers. But what do we know about arthritic knees? Not much is known but a pilot study suggests that the arthritic cartilage took longer to recover than the healthy cartilage, suggesting that the cartilage can recover. This is potentially good news for people with mild arthritis. It may be ok to run but allow extra recovery time for your cartilage. Healthy cartilage seems to recover after running, and there is not an ongoing effect of 'wear and tear.' So lace up the shoes and go running!

Is running good or bad for your knees? A systematic review and meta-analysis of cartilage morphology and composition changes in the tibiofemoral and patellofemoral joints. *Osteoarthritis and Cartilage*. November 16, 2022.

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