

## EVIDENCE-BASED ORTHOPAEDICS

# Exercise-Based Physical Therapy Was Not Inferior to Arthroscopic Partial Meniscectomy for Knee Function Over 5 Years in Adults with Degenerative Meniscal Tears

Noorduyn JCA, van de Graff VA, Willigenburg NW, Scholten-Peeters GGM, Kret EJ, van Dijk RA, Buchbinder R, Hawker GA, Coppiters MW, Poolman RW; ESCAPE Research Group. Effect of physical therapy vs arthroscopic partial meniscectomy in people with degenerative meniscal tears. Five-year follow-up of the ESCAPE randomized clinical trial. *JAMA Netw Open*. 2022;5(7):e2220394. 35802374

**Question:** In patients who have a symptomatic meniscal tear, is exercise-based physical therapy (PT) noninferior to arthroscopic partial meniscectomy (APM) for patient-reported knee function over 5 years?

**Design:** Randomized (allocation concealed), blinded (data analysts), controlled noninferiority trial with a mean 62 months of follow-up.

**Setting:** 9 hospitals in the Netherlands.

**Patients:** 321 patients aged 45 to 70 years (mean age, 58 years; 50% women) who had a symptomatic, degenerative meniscal tear confirmed by magnetic resonance imaging. Exclusion criteria were locked knee or trauma needing acute surgery, severe knee osteoarthritis (Kellgren-Lawrence grade 4), related index knee injury (symptomatic partial or total anterior or posterior cruciate ligament rupture), or body mass index > 35 kg/m<sup>2</sup>. 278 patients (87%) completed follow-up at 5 years.

**Intervention:** Patients were allocated to APM (n = 159) or PT (n = 162). APM was done ≤4 weeks after randomization and included a standardized intra-articular inspection of the knee joint followed by surgical removal of the affected area of the meniscus to leave a stable and solid meniscus. After surgery, patients received written instructions that included a home exercise program; at 8 weeks, they could be referred for PT if recovery was delayed. In patients assigned to PT, therapy was started ≤2 weeks after randomization and included an 8-week physical therapist-led incremental exercise pro-

**TABLE I Arthroscopic partial meniscectomy (APM) versus exercise-based physical therapy (PT) in adults with degenerative meniscal tears (intention-to-treat analysis)\***

Outcome	Mean change from baseline to 5 years		Overall unadjusted between-group difference (95% CI)†
	APM	PT	
Patient-reported knee function‡	30	25	3.5 (0.7 to 6.3)§

\*CI = confidence interval, IKDC = International Knee Documentation Committee. †Overall estimate over 5 years including all time points (3 and 6 months, and 1, 2, and 5 years) and corrected for IKDC score at baseline. ‡IKDC Subjective Knee Form score: range, 0 (worst knee function) to 100 (no functional limitations); minimally important change = 11 points. §Positive values indicate benefit with surgery. P < 0.001 for noninferiority, with a noninferiority margin of 11 points.

gram (sixteen 30-minute sessions). If PT was unsuccessful, patients could receive additional sessions or receive APM.

**Main outcome measures:** The primary outcome was patient-reported knee function, assessed using the International Knee Documentation Committee (IKDC) Subjective Knee Form. Other patient-reported outcomes included pain assessed using a visual analogue scale (VAS) (score range, 0 [no pain] to 100 [worst imaginable pain]), physical function assessed using the Knee Osteoarthritis Outcome Score-Physical Functioning Short Form (KOOS-PS) (score range, 0 [best functioning] to 100 [worst functioning]), and quality of life assessed using the EuroQol-5 Dimensions-5 Level (EQ-5D-5L) (score range, 0 [death] to 1 [best quality of life]). Radiographic outcomes were assessed in <80% of randomized patients at 5 years and are not reported here.

**Main results:** 8 patients (5.0%) in the APM group did not have surgery. 52 patients (32%) in the PT group had APM over 5 years, with 47 having the surgery within the first 2 years. At 5 years, PT was noninferior to APM for patient-reported knee function (Table I). Groups did not differ for other patient-reported outcomes at 5 years (mean pain VAS score, 19 vs. 20; mean KOOS-PS score, 20 vs. 23; mean EQ-5D-5L score, 0.87 vs. 0.87).

**Conclusion:** Exercise-based PT was not inferior to APM for patient-reported knee function in adults with symptomatic, degenerative meniscal tears over 5 years.

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## Commentary

The trial by Noorduyn and colleagues provides important insights on the natural history of degenerative meniscal tears; however, the study conclusions should be taken with caution. The authors do not clearly define which type of meniscal tears were included as degenerative tears. There was no documented differentiation by location or type of meniscal tear, weight-bearing alignment, or Kellgren-Lawrence grading (other than excluding grade 4) when considering treatment options. A full-thickness posterior medial meniscal root tear will have a different clinical course than a parrot-beak tear in the white-white zone. Patients with grade-3 Kellgren-Lawrence radiographic changes with a displaced or bucket-handle meniscal tear will have different clinical outcomes than those with grade-3 Kellgren-Lawrence changes with inner margin fraying of the meniscus<sup>1</sup>. Certain types of meniscal tears (e.g., those with displaced or bucket-handle fragments) cause mechanical symptoms and may have better clinical outcomes with surgical intervention<sup>2</sup>. When helping patients decide on nonsurgical or surgical treatment for their meniscal tears, the specific type of tear and whether the patient is experiencing mechanical symptoms (such as catching or locking) are important to consider. In the study by Noorduyn and colleagues, the type of tear and symptom profile were not differentiated. Furthermore, a third “no treatment” group should have been included in this study. Perhaps patients with degenerative meniscal tears would do as well with no treatment as with PT or surgery.

Caution should be taken when interpreting the authors’ conclusion that “physical therapy should therefore be the preferred treatment over surgery for degenerative meniscal tears” because not all meniscal tears can be lumped into a single category and treated the same. In fact, Figure 3 of the study showed that the IKDC questionnaire favored surgical intervention compared with PT at all time points but did not necessarily meet the noninferiority threshold. We should be careful to say that PT is the preferred treatment for degenerative meniscal tears when that may not be the case in all situations.

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## References

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**Disclosure:** The Disclosure of Potential Conflicts of Interest form is provided with the online version of the article (<http://links.lww.com/JBJS/H357>).