

good interrater and intrarater reliability (Kappa 0.24–0.69 and 0.57–0.63). The Acromial angle classification had moderate to good interrater and intrarater reliability (Kappa 0.53–0.60 and 0.59–0.72). The novel Acromial curve classification showed moderate to good interrater and intrarater reliability (ICC 0.66–0.71 and 0.75–0.78, respectively).

**Conclusion** The Acromial curve classification was the only classification method with an ICC value > 0.7. The popular Bigliani method had the worst reliability. The Acromial curve classification produces numerical data, as opposed to the other three classification methods. This could potentially be utilized in future research to establishing cut-off values for treatment stratification.

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### QUADRICEPS OR HIP EXERCISES FOR PATELLOFEMORAL PAIN? A RANDOMIZED CONTROLLED EQUIVALENCE TRIAL

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**Introduction** Exercise therapy comprising exercises for the hip and the knee is recommended for improving pain and function in patients with patellofemoral pain (PFP). However, there is uncertainty about which type of exercises that are most effective. We aimed to assess effectiveness equivalence between two commonly prescribed exercise programs targeting either the quadriceps or the hip muscles in patients with PFP.

**Materials and Methods** This randomised controlled equivalence trial included 200 participants with a clinical diagnosis of PFP. Participants were randomly assigned to either a 12-week quadriceps-focused (QE) or a hip-focused (HE) exercise program. The primary outcome was the change in Anterior Knee Pain Scale (AKPS) (0–100) from baseline to 12-week follow-up. Prespecified equivalence margins of  $\pm 8$  points on the AKPS were chosen to demonstrate comparable efficacy. Key secondary outcomes were the Knee Injury and Osteoarthritis Outcome Score questionnaire (KOOS) pain, physical function, and knee-related quality of life subscales.

**Results** The least squares mean changes in AKPS (primary outcome) were 7.5 for QE and 7.2 for HE (difference 0.3 points, 95% CI –1.9 to 2.4; test for equivalence  $p < 0.0001$ ). None of the group differences in key secondary outcomes exceeded predefined equivalence margins.

**Conclusion** 12-week focused quadriceps and hip focused exercise protocols were equivalent in changes in symptoms and function for patients with PFP.

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### IS MY ACLR STRONG ENOUGH? GRAFT TYPE, ACTIVITY LEVEL INFLUENCE KNEE STRENGTH IN 392 ATHLETES ACROSS FIVE TIME POINTS

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**Introduction** An essential priority in rehabilitation after anterior cruciate ligament reconstruction (ACLR) is the restoration of knee muscle strength. We aimed to describe quadriceps and hamstrings strength after ACLR of an uncomplicated rehabilitation course, categorized into level of activity and graft type (patellar-tendon – BPTBG, hamstring – HSG).

**Methods** Isokinetic concentric strength (body weight – BW-adjusted) was measured in 392 athletes ( $26.2 \pm 6.7$ y) at five time-points (3, 4.5, 6, 7.5, and 9m) following ACLR. Data was analyzed using mixed-effects models and participant specific random effects. Fixed effects included graft type, athlete categorization, and assessment time. We applied Tukey adjustment for multiple comparisons.

**Results** Professional athletes (HSG) displayed greater quadriceps strength than recreational (BPTBG) at all time-points (except 7.5m). No other significant differences were noted.

Professional and recreational athletes' quadriceps strength significantly increased through time (irrespective of graft type). Professionals (HSG) reached >2.5 BW quadriceps strength at 6-months, and recreational >2.3 BW at 7.5-months.

Professional athletes showed significantly greater hamstring strength through time (irrespective of graft type). Both athletic categories reached maximum hamstring strength at 6-months post operatively (>1.7 BPTB and >1.5 HS, BW).

Recreational athletes (BPTBG) displayed a significant increase in hamstring strength (1.4 BW, 4.5m), while for recreational athletes (HSG) strength was consistently improving up to 7.5m.

**Conclusions** Knee strength increases during rehabilitation but at the initial phase of ACLR rehabilitation is influenced by the graft type, while at the end of rehabilitation it is affected by the activity level. The maximum achieved strength is affected mostly by activity level.

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### SEX-DEPENDENT DIFFERENCES ON KNEE FRONTAL MOMENT IN PRE-ADOLESCENT AND ADOLESCENT AGES DURING A CUTTING MANEUVER TASK

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**Introduction** Although the rate of anterior cruciate ligament (ACL) injury is low among children, it increases during adolescence, especially in girls. The injury typically occurs immediately after foot-ground contact during sports activities such as a cutting maneuver (CM). The knee frontal plane moment (KFM) has been implicated as a biomechanical risk factor, but it has not been extensively studied within the injury timeframe. The present study aimed to prospectively investigate sex-dependent changes in the KFM from pre-adolescence to adolescence during the first 70 ms of a CM task.

**Methods** A total of 293 handball and soccer players, aged 9–12 years, were recruited to perform a CM, where kinematic and kinetic data were obtained using marker-based motion capture and force plates. Those who continued sports participation (n=105) returned five years later to repeat the test procedure. A mixed-model analysis of variance (ANOVA) for repeated measures was used for statistical analysis of the KFM during the first 70 ms after foot-ground contact.