measurement, 8 between first and second strength measurements, and 9 between the second and third strength measurements. Peak knee extension torque was lower for the BFR (96 Nm) group than traditional (111 Nm) group at the first strength measurement session (p = 0.03) but was similar between groups at the second (118 Nm vs 134 Nm, p = 0.1) and third (138 Nm vs 130 Nm, p = 0.39) strength measurement sessions. There was no difference among BFR and traditional groups in the change of knee extension peak torque or change in KER between testing sessions. KER was lower at the second strength measurement in the BFR group (0.81) compared to the traditional group (0.90, p = 0.02), though no differences existed at the first or third strength measurements. **CONCLUSION:** Sequential knee extension strength measurements following ACLR in a young patient cohort demonstrated improvements irrespective of BFR use. There were no differences in the change of strength measures between testing sessions when comparing BFR and traditional rehabilitation groups. Both groups demonstrated similar strength improvements over time, and BFR did not accelerate strength gains compared to traditional rehabilitation. However, as the BFR cohort had lower starting yet similar final strength measurements compared to the traditional rehabilitation cohort, a role for BFR over the long term in at risk patients cannot be excluded.

**Category:** Knee - ACL Post-Surgery

**Stress Index Indicates Muscle Fibre Spectrum Change 5 Years After Cruciate Ligament Rupture**

*Abstract* ID# 23266

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**Summary:**
The cross-sectional study determined long-term deficits in lower limb muscle strength and performance after ACL surgery. 

*Data:* Athletes often complain about persistent instability after anterior cruciate ligament (ACL) reconstruction and rarely reach their previous level of performance. There is an increased risk of re-rupture or injury on the contralateral side, probably due to proprioception deficits and inadequate muscle function. For this study, we hypothesized that athletes would have long-term deficits in lower limb muscle strength and performance after ACL surgery. Maximal strength deficits during isometric and isokinetic exercises were investigated. In addition, an isoinertial single-leg jump and a strength endurance test were performed to identify the nature of the deficits. In a cross-sectional study, 17 judokas (26 ± 3.9 years old) were examined at a mean time of 5.1 ± 1.1 years after ACL rupture (group A) and 27 judokas (27 ± 2.4 years old) without knee injury (group B). All judokas were currently training at the national or international competition level. Single-leg countermovement jumps, isokinetic (0.2 and 0.6 m/s) and isometric test procedures (6s in 30° knee flexion) for maximum strength and a strength endurance test with 30 repetitions at 0.2 m/s in the closed chain were performed. A piezoelectric force plate and a Contrex leg press were used. The individual force parameters were recorded in a performance index to determine the direction of these. Subjects in group A showed significantly lower maximum strength values in all isokinetic (87.3% at 0.6 m/s, 92.50% at 0.2 m/s concentric, 89.9% at 0.2 m/s eccentric), isometric (80.6%) and isoinertial strength tests (83.8%) after 5 years compared to the unaffected lower extremity (p < 0.01). The judo-specific strength index also showed serious deficits. The stronger leg of the athletes in group B had a higher index than the weaker one with a 95% CI of (1.04-1.08). The injured leg achieved a value of 1.18 with a 95% CI of (1.12-1.24) compared to the formerly injured leg. The athletes showed lower maximum forces but significantly less fatigue in a logarithmic regression coefficient of strength endurance on the ACL rupture side (-23.71x+1604N) compared to the contralateral side (y = -30.98x +1828N; p < 0.05). Thus, 5 years after ACL rupture, athletes showed significant deficits in all relevant maximal strength tests. These findings could explain the poor performance of these athletes and the higher risk of a new ACL rupture without deficits in strength endurance. Changes in the composition of muscle fibres from type II to type I thus seem likely. Further studies are needed to assess the impact of this phenomenon on athletes' performance, especially with regard to sport-specific tasks and injury potential.

**Category:** Knee - ACL Post-Surgery

**Return to Sport and Psychological Readiness to Return to Sport in Individuals who Have Undergone Bilateral vs Unilateral ACL Surgeries**

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**Summary:**
Our study shows no significant differences in return to sport and psychological readiness to return to sport between individuals who underwent bilateral vs unilateral ACL surgeries.

*Data:* Purpose: To compare psychological readiness to return to sport (RTS) and RTS rates between patients undergoing bilateral versus unilateral anterior cruciate ligament reconstruction (ACLR). Methods: A retrospective review of patients who underwent ACLR with a minimum 2-year follow-up was conducted. Bilateral ACLR were matched 1:3 to unilateral reconstructions based on age, sex, and body mass index (BMI). Psychological readiness to RTS was assessed using the validated ACL Return to Sport after Injury Scale (ACL-RSI). This along with time and level of RTS were compared between the two cohorts. Statistical analysis was conducted with chi-square for categorical variables and two-sided t-test for continuous variables. Results: One hundred seventy patients, 44 who underwent bilateral ACLR and 132 who underwent unilateral ACLR were included. At the time of first surgery, patients were 28.8 ± 9.4 years old in the unilateral cohort and 25.7 ± 9.8 years old in the bilateral cohort (p = 0.06). Patients were equally comprised of males and females (50%). There was no difference in psychological readiness to RTS (bilateral: 50.5 vs unilateral: 48.1, p = 0.46), RTS rates (unilateral: 78.0% vs bilateral: 65.9%, p = 0.16), percentage of return to preinjury sport level (unilateral: 61.2% vs bilateral: 69.0%, p = 0.21) or time to return to preinjury sport level (unilateral: 41.2 ± 29.3 weeks vs bilateral: 35.2 ± 23.7 weeks, p = 0.31) between the two cohorts. Differences existed among patients within the bilateral ACLR cohort that were not found in the unilateral ACLR cohort: patients aged 30 and older had significantly lower ACL-RSI scores (age <30: 59.0 vs >30: 39.5, p = 0.01), as did females (male: 60.2 vs female: 42.1, p = 0.02). Conclusion: Compared to patients who undergo unilateral ACL reconstructions, patients who undergo bilateral ACL reconstructions are equally as psychologically ready to return to sport, demonstrating equal rates of return to sport, time to return, and level of return.