BACKGROUND: Pre-operative quadriceps strength may have a positive influence on post-operative function and outcomes at time of return to sport. Little consideration has been given to quadriceps strength during the early post-operative timeframes. Twelve-week post-operative anterior cruciate ligament reconstruction (ACL-R) is considered a critical time point for progression in the rehabilitation process. There is currently limited research looking at the relationship between clinical measurements pre-operatively and at 12-weeks following ACL-R.

PURPOSE/HYPOTHESIS: The primary purpose of this study was to examine the differences between Y-Balance Test Lower Quarter (YBT-LQ) and isokinetic quadriceps strength tested pre-operatively and post-operatively following ACL-R (12-weeks).

STUDY DESIGN: Within subject, repeated measures

METHODS: Thirty-nine participants (15.6±1.5 y/o) were diagnosed with an ACL tear and were undergoing rehabilitation to return to a sport requiring cutting and pivoting were included. YBT-LQ and isokinetic quadriceps strength were assessed pre-operatively and at 12-weeks after ACL-R. YBT-LQ composite scores were calculated bilaterally and isokinetic quadriceps strength was tested using the Biodex Multi-Joint Testing and Rehabilitation System. Paired T-tests were used to determine mean group differences between YBT-LQ and isokinetic quadriceps strength scores pre-operatively and at 12-weeks post-operative. A Pearson Correlation was performed to determine relationships between variables at both time points.

RESULTS: There was a significant improvement in YBT-LQ composite scores from pre-operative to 12-weeks post-operative on both the involved (Pre-operative: 89.0 ± 7.7; 12-weeks: 94.1 ± 7.1, p<0.001) and uninvolved (Pre-operative: 92.6 ± 6.2; 12-weeks: 97.6 ± 6.8, p<0.001) limbs. Quadriceps strength decreased significantly from pre-operative to 12-weeks on the involved limb (Pre-operative: 82.3 ftlbs ± 38.6; 12-weeks: 67.9 ftlbs ± 27.4, p<0.01), but no differences were found on the uninvolved limb (Pre-operative: 117.3ftlbs ± 42.0; 12-weeks: 121.7ftlbs ± 41.5, p = 0.226).

CONCLUSIONS: Involved limb quadriceps strength decreases from time of pre-operative to 12-weeks following ACL-R.

LEVEL OF EVIDENCE: 3

KEY WORDS: Anterior cruciate ligament reconstruction, pre-operative, quadriceps strength, Y-balance test