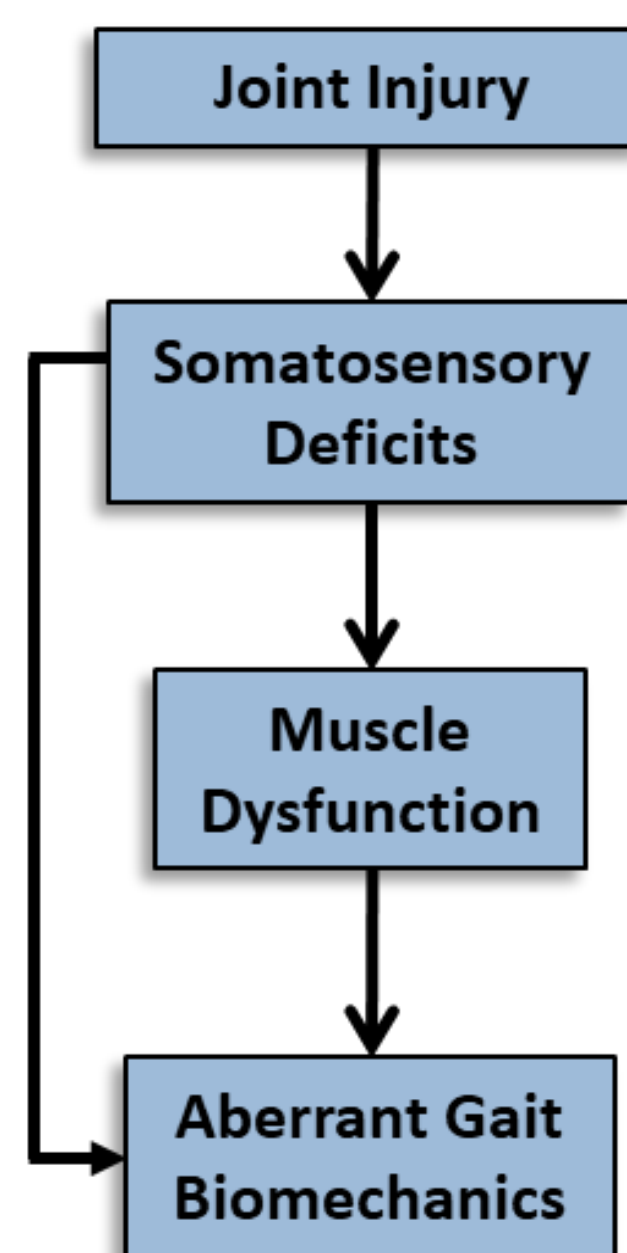


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BACKGROUND

- Anterior cruciate ligament reconstruction (ACLR) induces a strong decrease in the ability of the individual to develop force in the injured knee post-surgical repair



- RSI (Reactive Strength Index) decreases post-ACLR
 - Calculated as the distance traveled divided by the duration of ground contact time and after a single-leg hop
 - Indicator of the strength or force that the repaired knee can generate during a functional task
 - Higher values linked to improved ability to return to physical activity after ACLR

- ACL injury rates are notably higher in women than in men
- Return-to-physical activity typically occurs 6-9 months post-ACLR
- It is unclear how RSI changes over this time interval and whether this recovery differs across sex
- These questions are critical to determine if RSI is an indicator of recovery following ACLR

PURPOSE

- To compare changes in RSI during a single-leg hop from 6 and 9 months post-ACLR between men and women

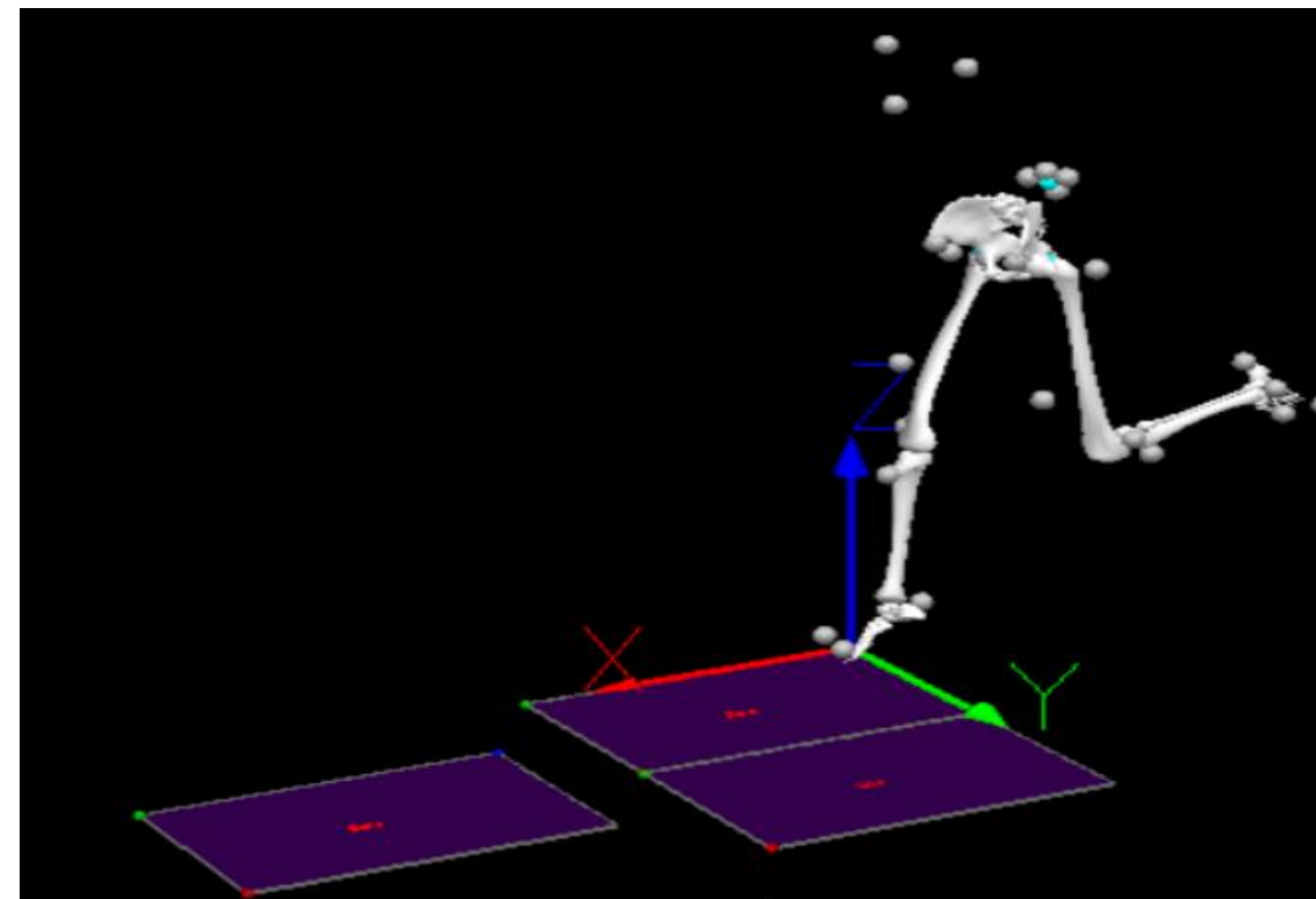
SUBJECTS & STUDY DESIGN

- 17 volunteer subjects (47% men, 53% women) with ACLR completed testing sessions at 6 and 9 months post-ACLR via a repeated-measures design
- Landing biomechanics and knee function were assessed in each session

METHODS

Warm-up/Prep Procedure

- Subjects were asked to warm-up and prepare their legs for movement in whichever method they choose
- Once prepped, subjects were asked to stand in standard anatomical position on a box positioned 6 inches from a force plate



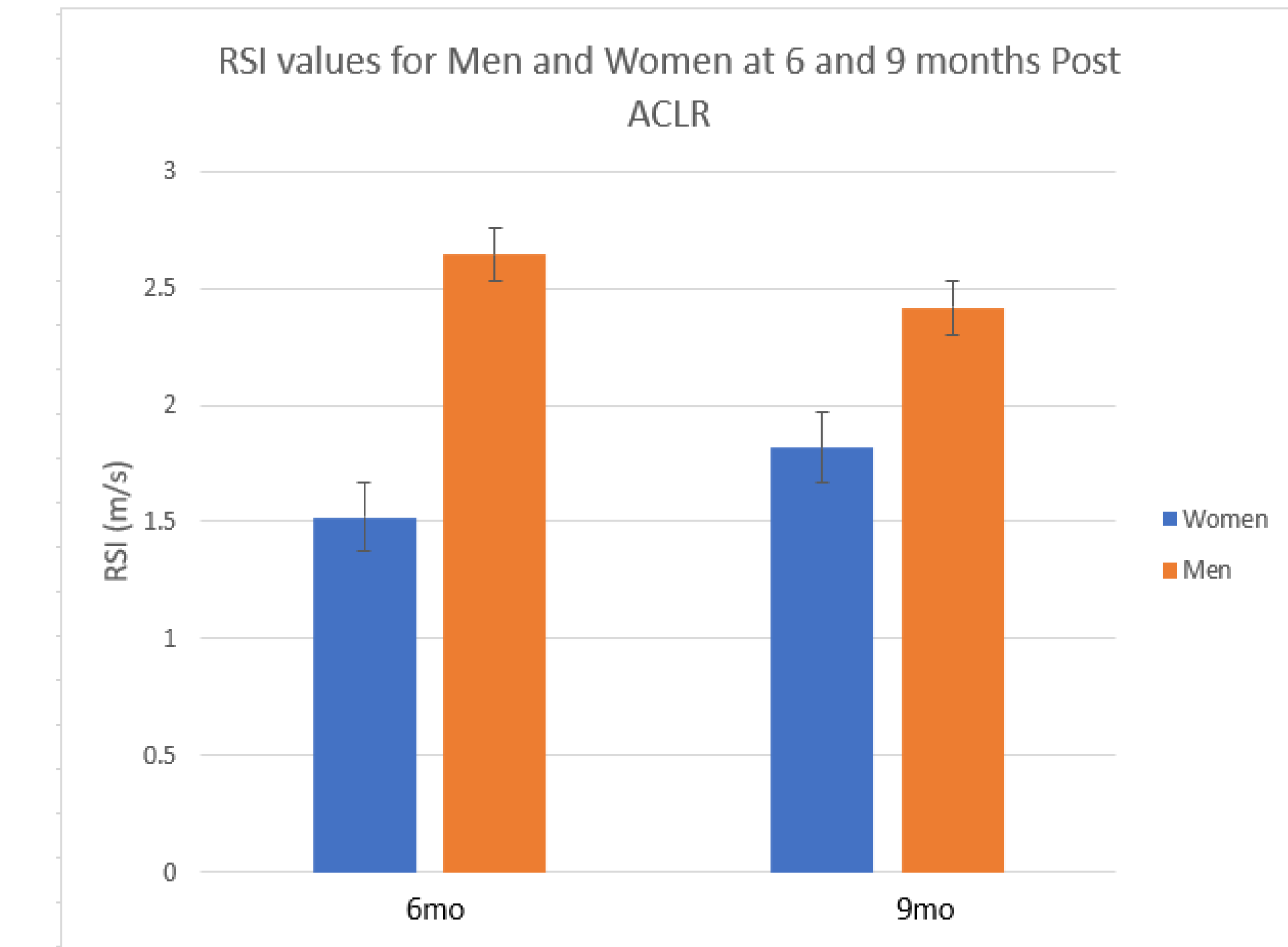
3D skeletal model of subject performing single leg hop

Experimental Procedure

- RSI was assessed by measuring ground contact time and distance traveled during a function task
 - Subjects jumped off the box with both legs and landed on the force plate only on ACLR limb
 - Immediately after landing, subjects pushed off the ACLR leg to attempt to jump as far as possible at a 45° angle opposite of their ACLR leg
 - ex. A individual with ACLR in the right leg jumped left 45° to achieve maximum distance
 - The RSI was then calculated as the distance hopped divided by the ground contact time derived from the force plate

RESULTS

- There was not a significant difference between RSI at 6 months and 9 months post-ACLR ($p > 0.05$)
- RSI was significantly greater in males than females at 6 months post-ACLR ($p = 0.008$)
- RSI did not differ across sex at 9 months post-ACLR ($p > 0.05$)



DISCUSSION

- The extended recovery time of 9 months vs. 6 months did not yield a statistical improvement in RSI for the sexes combined
 - RSI values are not exclusively indicative of recovery progress
 - RSI may not be sensitive to other factors that define recovery and the ability to return to physical activity between 6 and 9 months post-ACLR
- Women displayed poorer RSI compared to men at 6 months post-ACLR but not at 9 months
 - May indicate a greater rate of recovery in males over the first 6 months post-ACLR but a greater rate in females from 6 to 9 months
 - RSI values are not completely indicative of recovery progress
- Increased recovery time post-ACLR decreases chance of a recurring injury
 - Future research is necessary to determine whether improving RSI values between 6 and 9 months post-ACLR reduces the risk of re-injury