

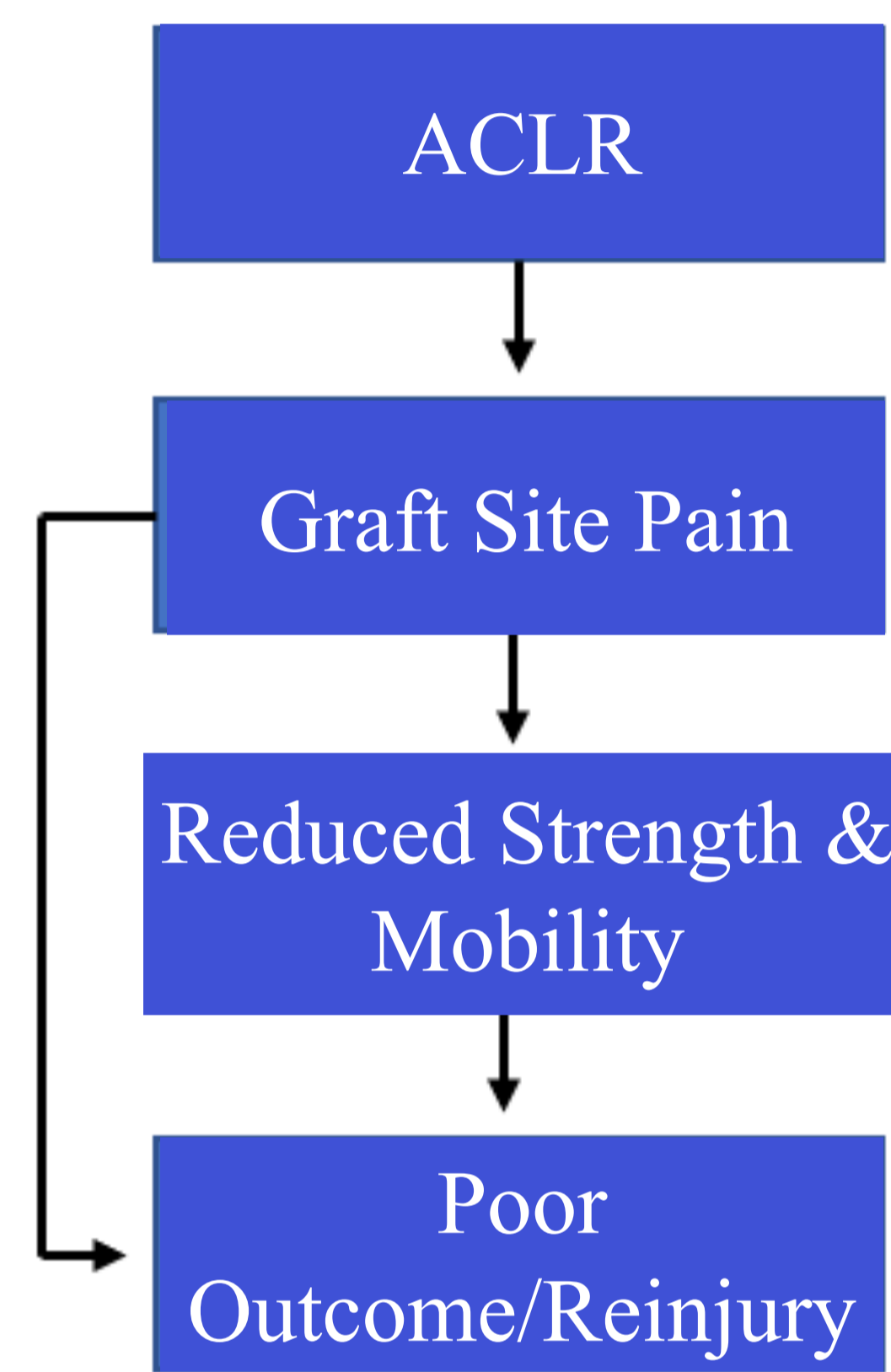
# Correlation Between Graft Site Healing and Self-Reported Knee Function 6 months After Anterior Cruciate Ligament Reconstruction

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## BACKGROUND

•Graft site pain is common in patients after anterior cruciate ligament reconstruction (ACLR), especially with a patellar tendon autograft. Patients with graft site pain report the following<sup>1</sup>:



- Less joint mobility
- Greater muscle weakness

These limitations are linked to decreased knee function and greater risk of reinjury.

Patients who experience graft site pain display aberrant gait biomechanics and reduced confidence in their abilities compared to those who are pain free.

However, it is unclear if improved graft site healing during the first 6 months of rehabilitation following ACLR mitigates poor patient reported outcomes<sup>2</sup>. It is important for patient reported outcomes to be positive because it correlates with better post-ACLR knee function, return to sport success, and reduced reinjury.<sup>3</sup>

## PURPOSE

- To identify associations between graft site cross-sectional area and self-reported knee function in those 6 months post-ACLR.

## SUBJECTS & STUDY DESIGN

- This data comes from a randomized controlled trial evaluating the effects of vibration on outcomes linked to PTOA development
- Ultrasound imaging and self-reported knee function were assessed in one session 6 months after ACLR.
  - Subjects were 17 individuals with unilateral ACLR (59% male, 22.3 ± 5.32 years old, 28.66 ± 6.60 BMI)



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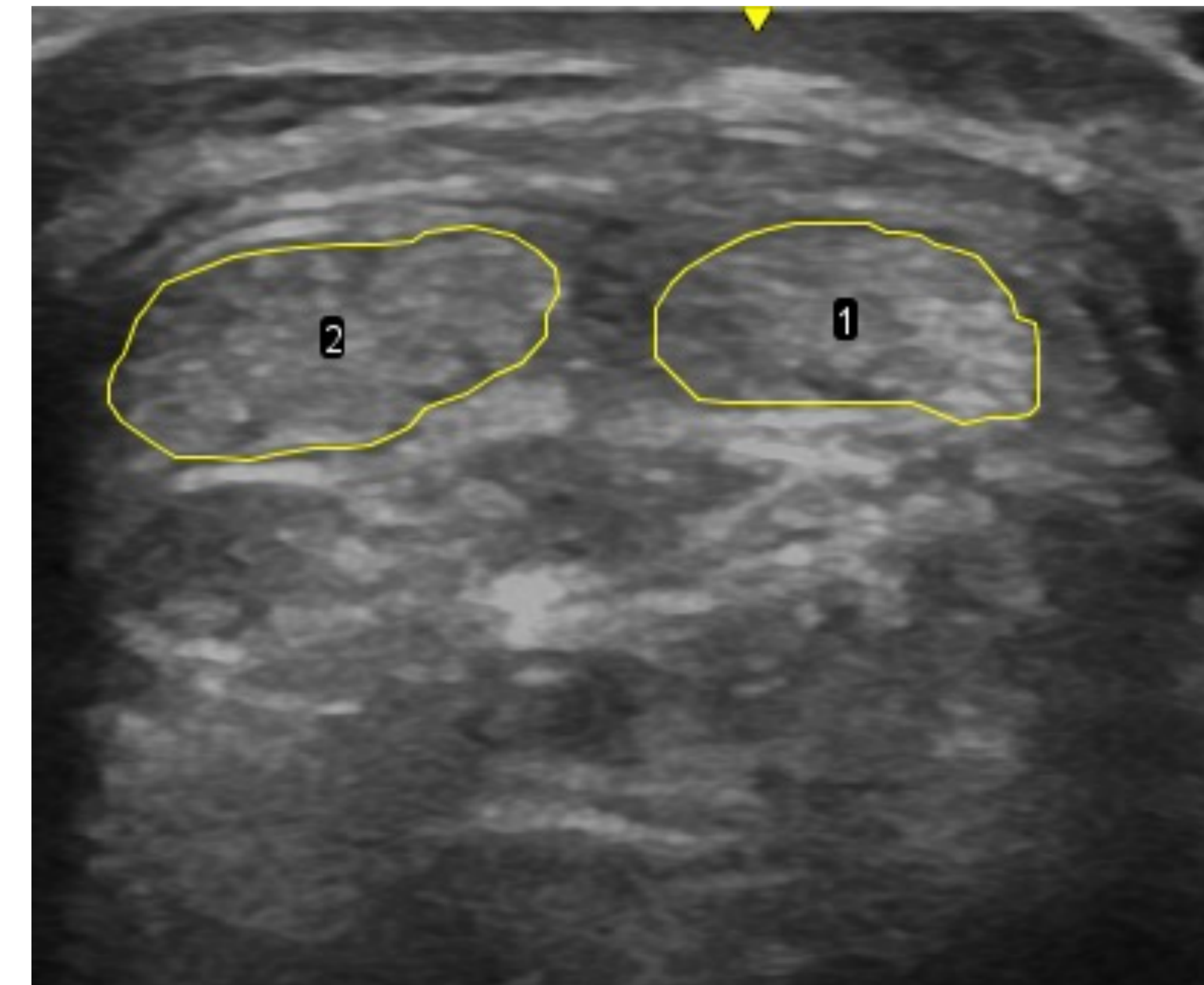
Our Mission is to Explore, Educate & Engage in MUSCULOSKELETAL INJURY PREVENTION

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## METHODS

### Ultrasound Area Assessment

- Ultrasound images of both limbs were taken at the subjects' 6 month visit
- Patellar tendon cross-sectional area (CSA) was determined by selecting the area of interest using ImageJ software
    - Cross-sectional area (cm<sup>2</sup>)
    - Mean
    - Standard Deviation
  - Graft site healing was defined as the percentage of the ACLR limb CSA divided by the contralateral limb CSA



### Quadriceps Strength Assessment

Subjects performed open chain knee extension to test quadriceps strength, power, and endurance. An isokinetic machine was used to measure the subjects' strength, and the raw data was processed to compare ACLR limb strength to contralateral limb strength. Quadriceps strength was defined as the percentage of the ACLR limb strength divided by the contralateral limb strength.

### International Knee Documentation Committee (IKDC)

Subjects completed a subjective scale that provides information regarding overall knee function. The questionnaire focuses on three categories: symptoms, sports activity and knee function.

### Knee Injury and Osteoarthritis Outcome Score (KOOS)

Subjects completed a questionnaire related to overall knee function and pain. The sections of the questionnaire include: pain, symptoms, sport, quality of life, and daily living

### Statistical Analysis

Pearson product-moment correlations (r) were used to determine the strength of association between the following variables:

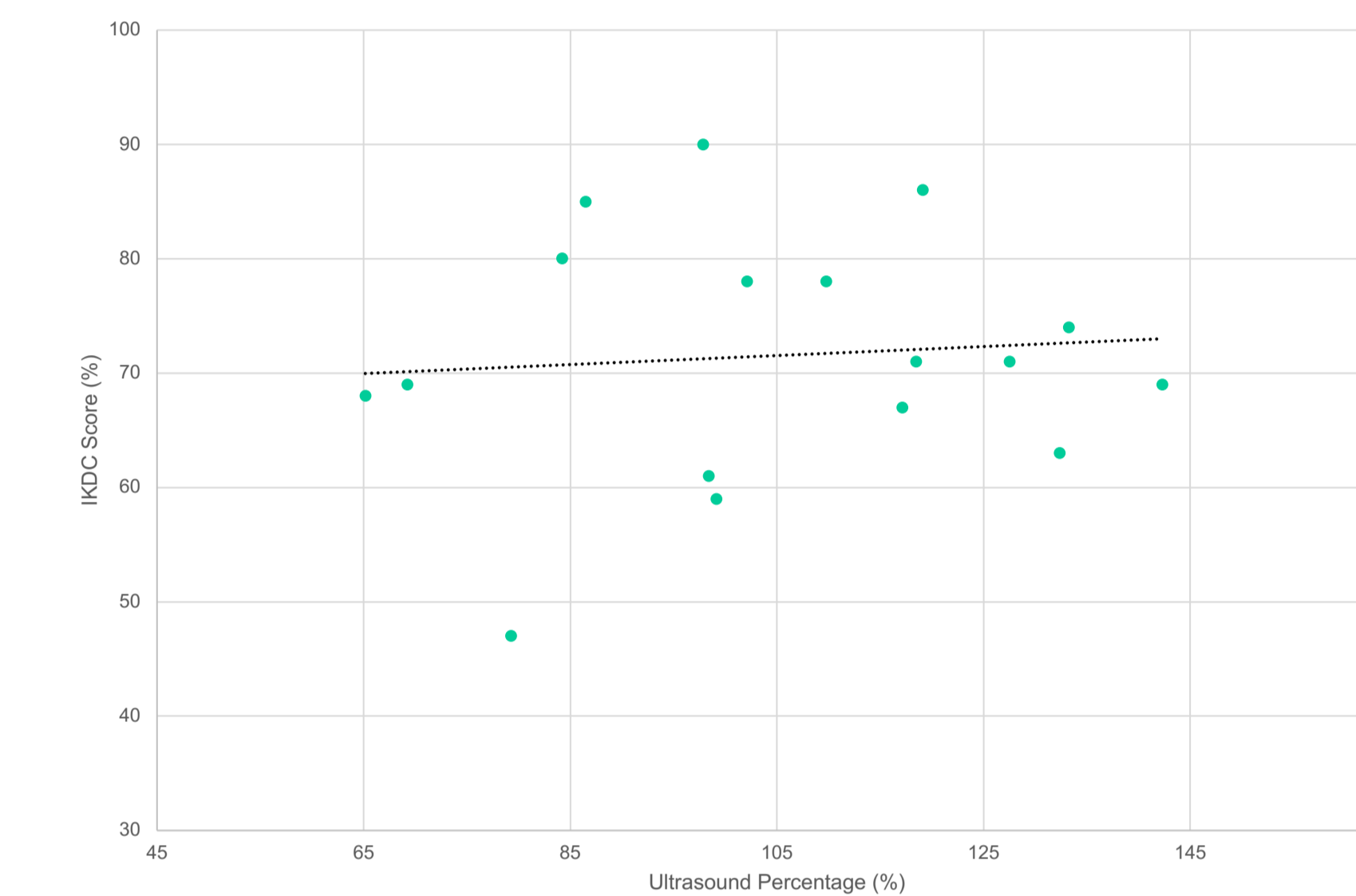
Cross-sectional Area Percentage, IKDC score, KOOS score

## Results

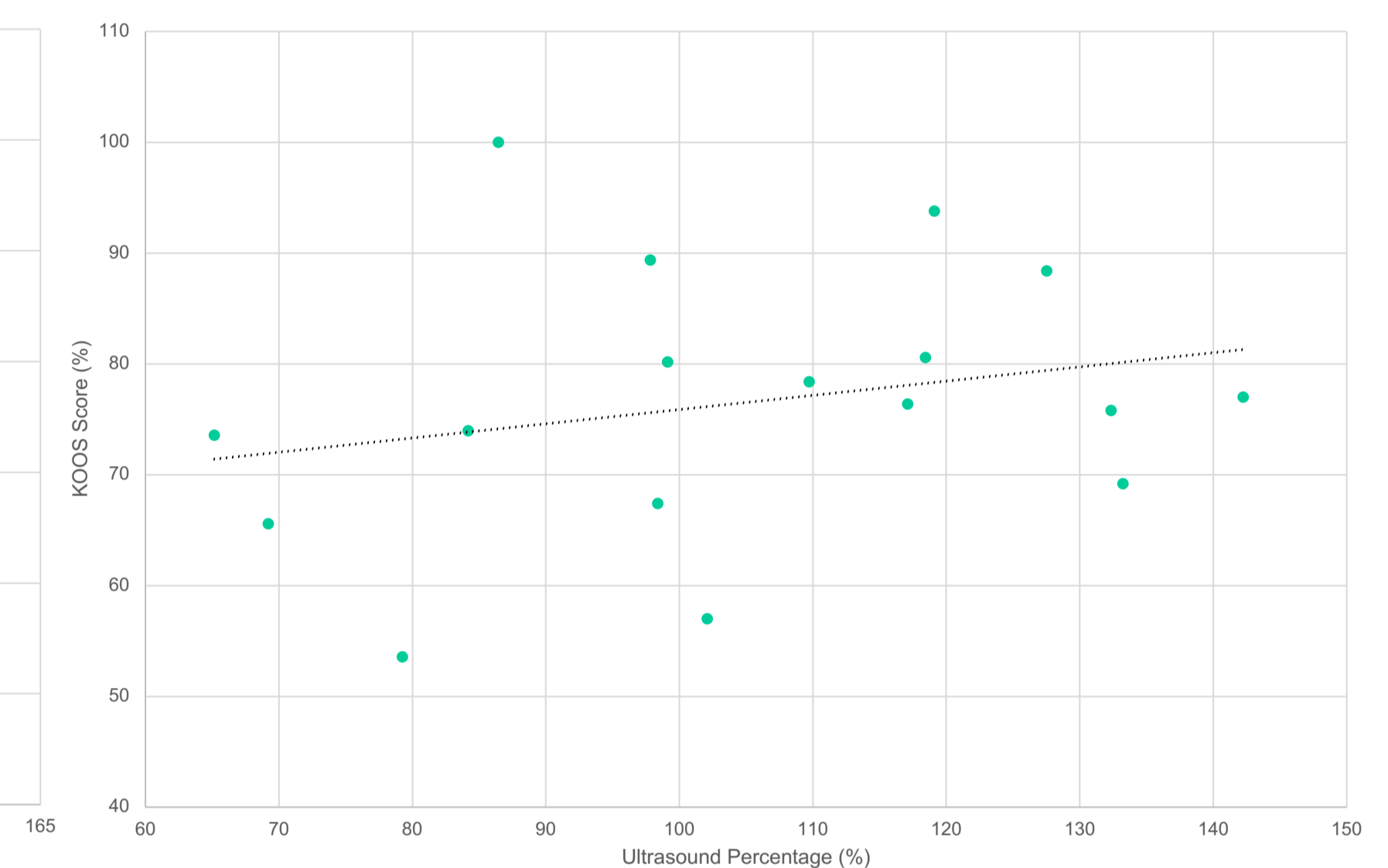
Only quadriceps strength associations yielded significant results (P < 0.05)

	Graft Site Healing vs IKDC Score	Graft Site Healing vs KOOS Score	Graft Site Healing vs Quadriceps Strength
p value	0.0833	0.242	0.0328
r <sup>2</sup> value	0.0069	0.0587	0.0004

Correlation Between IKDC Score and Graft Site Healing 6 Months Post ACL Reconstruction



Correlation Between KOOS Score and Graft Site Healing 6 Months Post ACL Reconstruction



## Discussion

No associations were found between graft site healing and self reported knee function 6 months after ACLR. There were weak positive correlations between graft site healing and self reported knee function but no significant results. Future research should include data on muscle strength, bilateral force exertion, and further imaging to assess any relationship between knee function and graft site healing. Obtaining a larger sample size (N > 17) and examining progress across multiple stages (1, 9, 12, and 18 months) could provide more insight into preventing reinjury. These findings suggest that other factors beyond graft site healing (e.g. muscle weakness, joint swelling and inflammation, etc.) likely influence changes in self reported outcomes over the first 6 months post-ACLR.

### Limitations

- Small sample size (N=17)
- High variance in subject performance at 6 months post ACLR

## References

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