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# Predictors of Functional Disability in Patients Undergoing Anterior Cruciate Ligament Reconstruction

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# Predictors of Functional Disability in Patients Undergoing Anterior Cruciate Ligament Reconstruction

Michael Korn MD, Caleb Gullledge BS, Chaoyang Chen MD, Vasilios Moutzouros MD, Eric Makhni MD



all for you

# ACL Reconstruction

- Primary restraint to anterior tibial translation
- >175,000 ACL reconstructions annually
- \$1 billion annual costs
- Variable postoperative function and return to sport
- Options for reconstruction
  - Bone-tendon-bone, hamstrings, quad tendon autograft
  - Tendon allograft



# Patient Reported Outcome Measures

- PROMIS
  - 2004 NIH initiative
  - Item banks organized by health domains (physical, mental health, etc)
  - Computer Adaptive Testing
  - Quick, efficient, validated
- MCID
  - What is a meaningful benefit to the patient?
  - Smallest change in outcomes score necessary to be considered meaningful improvement

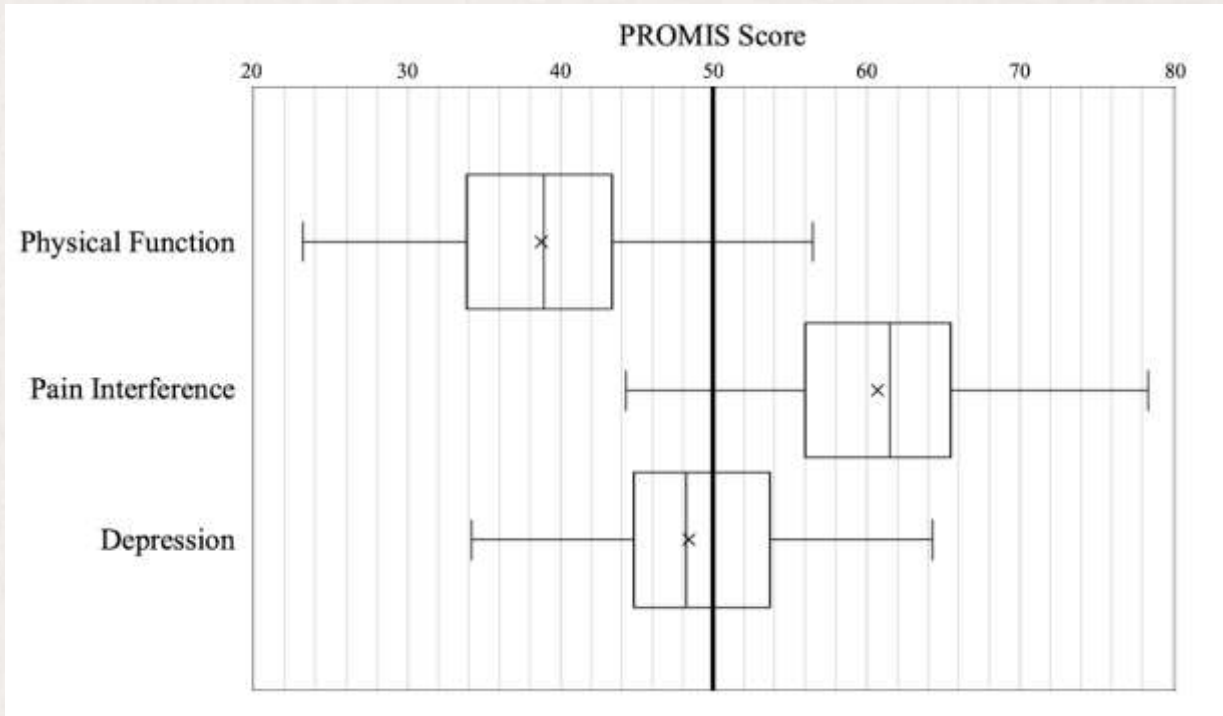


# Study Design

- Purpose: What patient factors are associated with poor preoperative function?
  - Which patients can be optimized?
  - Which patients are unlikely to benefit?
- Retrospective analysis of 145 patients undergoing ACL reconstruction
  - PROMIS Physical Function, Pain, and Depression domains
  - Patient demographics, radiographic findings, and injury history were analyzed

# Results

- Wide variability in preoperative PROMIS scores
- PROMIS Physical Function negatively correlated with BMI, Pain, and Depression



Variable	R value	P value	Correlation Strength
Age	-0.005	0.477	Weak
MHI	0.015	0.429	Weak
BMI	-0.167	<b>0.048</b>	Weak
PI	-0.707	<b>0.000</b>	High
D	-0.354	<b>0.000</b>	Moderate-weak

# Results

- Meniscus tears associated with lower Physical Function
- Physical therapy associated with higher Physical Function
- Meniscus tears associated with higher pain

**Table 3.** Impact of Patient Demographics on PROMIS scores

	PROMIS-PF	PROMIS-PI	PROMIS-D
Mean (SD)	38.7 (7.4)	60.7 (7.2)	48.4 (8.5)
Range	23.2 – 61.7	38.7 – 78.4	34.2 – 78.1
<b>Sex</b>			
Male	38.5	60.5	<b>47.2</b>
Female	39.2	61.1	<b>50.4</b>
<b>Race</b>			
White	38.6	59.9	48.1
Black	37.8	63.9	52.3
Asian	36.9	62.3	45.7
Other	40.5	59.8	46.6
<b>Tobacco Use</b>			
Current	37.9	63.5	50.0
Former	41.3	60.5	49.7
Never	38.6	60.4	48.1
<b>Tear thickness</b>			
Full	38.7	60.8	48.3
Partial	40.0	59.5	50.0
<b>Meniscus Pathology</b>			
Yes	<b>37.9</b>	<b>61.7</b>	48.1
No	<b>40.5</b>	<b>58.5</b>	48.8
<b>Physical Therapy</b>			
Yes	<b>40.2</b>	59.5	48.3
No	<b>37.7</b>	61.5	48.4
<b>Revision Surgery</b>			
Yes	38.8	60.4	47.9
No	38.7	60.7	48.4

# Conclusions

1. Wide range in PROMIS scores in patients undergoing ACL reconstruction
2. Physical therapy and low BMI associated with better preoperative function
3. Worse preoperative function in patients with depressive symptoms
4. Some patients undergoing ACL reconstruction may be unlikely to benefit from surgery



# Future Directions

- Can we use preoperative PROMIS scores to predict which patients are likely or unlikely to benefit from surgery?

PROMIS Domain	Post-op Visit	<i>P</i>	Percent Probability of Achieving MCID <sup>a</sup>				
			Likely to Achieve MCID			Unlikely to Achieve MCID	
			95%	75%	50%	25%	5%
Physical Function	3 months	<b>0.003</b>	≤36.4	39.8	41.8	43.8	≥47.1
	6 months	<b>&lt;0.001</b>	≤38.2	44.1	47.6	51.1	≥57.0

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# Thank you



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