Trends in PROMIS Scores in the Early Post-Operative Period Following Various Lateral Ankle Ligament Reconstructive Techniques

Ashlee MacDonald MD; Jeff Houck PT, PhD; John Ketz MD; Judith F Baumhauer MD, MPH; Irvin Oh MD; A. Samuel Flemister MD
University of Rochester Medical Center, Rochester, NY

Presented by: Allison W. McIntyre, MPH

The Ankle Sprain

- Lateral ankle ligament injuries account for 25% of musculoskeletal injuries

- Non-surgical treatments first

- Approximately 15% develop chronic instability necessitating surgery

Lateral Ankle Ligament Reconstruction Outcomes

- Long-term studies on surgical treatments and satisfaction show 90% good to excellent outcomes

- Current scoring systems for evaluating outcomes and monitoring progression of foot and ankle conditions have deficiencies.
  - Functional evaluations limited by time of healing

  - Satisfaction evaluated only after months of recovery

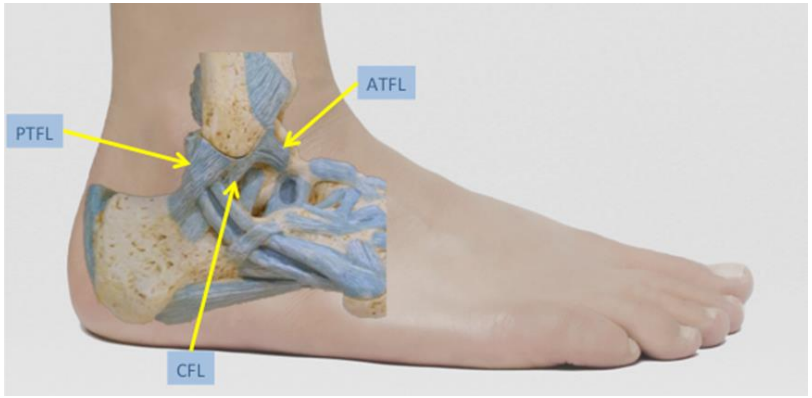
PROMIS

PROMIS instruments are reliable, valid and responsive and can be collected efficiently and quickly in a clinic setting.
PROMIS scores provide the opportunity to monitor progress from the patient's perspective over the course of treatment.

- URMC Orthopaedics:
  - Collects PROMIS on every patient at every visit
  - PROMIS CAT instruments: Physical Function, Pain Interference, Depression
  - Scores available immediately in electronic medical record for provider to discuss with patient
  - Database of scores available to researchers

Purpose

- To evaluate the trends in post-operative PROMIS physical function (PF), pain interference (PI), and depression scores in patients undergoing lateral ankle ligament reconstruction.



- Intended to be an illustration of how PROMIS scores can be used in a clinical setting
- No attempt to show one procedure superior to another

What can the scores tell us?

Methods

- Reviewed PROMIS scores prospectively obtained from all patients evaluated in our foot and ankle clinic between February 2015 and October 2016.

- 111 patients identified who underwent lateral ankle ligament reconstruction using ICD-9/10 and CPT codes

Exclusion Criteria:

1. Less than three-month follow-up
2. Incomplete PROMIS scores
3. Other documented surgeries unrelated to lateral ankle instability occurring during the follow-up period

Total 55* patients met inclusion criteria

*2 patients had other types of reconstruction and were not included in this analysis

Surgical Treatments

- Provider preference
- Patient Characteristics
  - Ligament laxity
  - Activity level

- BG = modified Broström-Gould.
  - Stretched ligaments are divided and tightened “tummy tuck”
- BG+FT = modified Broström-Gould augmented with suture anchors
  - BG plus fiber tape to secure “tummy tuck with backup”
- Allograft
  - Cadaver tendon woven to recreate stretched tendons

Demographics and Clinical Characteristics			
	Allograft (n=17)	BG (n=21)	BG+FT (n=15)
Age	37.22 ± 10.94	40 ± 14.52	40.9 ± 15.0
Gender	5 M 17 F	4 M 24 F	6 M 11 F
BMI	31.22 + 8.04	30.46 + 14.52	33.76 + 8.66
Pre-op PF	41.98 ± 7.19	38.78 ± 7.43	41.41 ± 4.73
Pre-op PI	57.77 ± 6.65	62.06 ± 6.59	60.97 ± 5.44
Pre-op D	47.27 ± 9.98	51.39 ± 9.69	50.71 ± 8.58
Follow-up (weeks)	31.86 ± 14.08	28.15 ± 13.90	28.68 ± 16.02
Cavovarus Reconstruction	4 (23.5%)	3 (14.3%)	3 (20.0%)
OCD procedures	5 (29.4%)	6 (28.6%)	2 (13.3%)

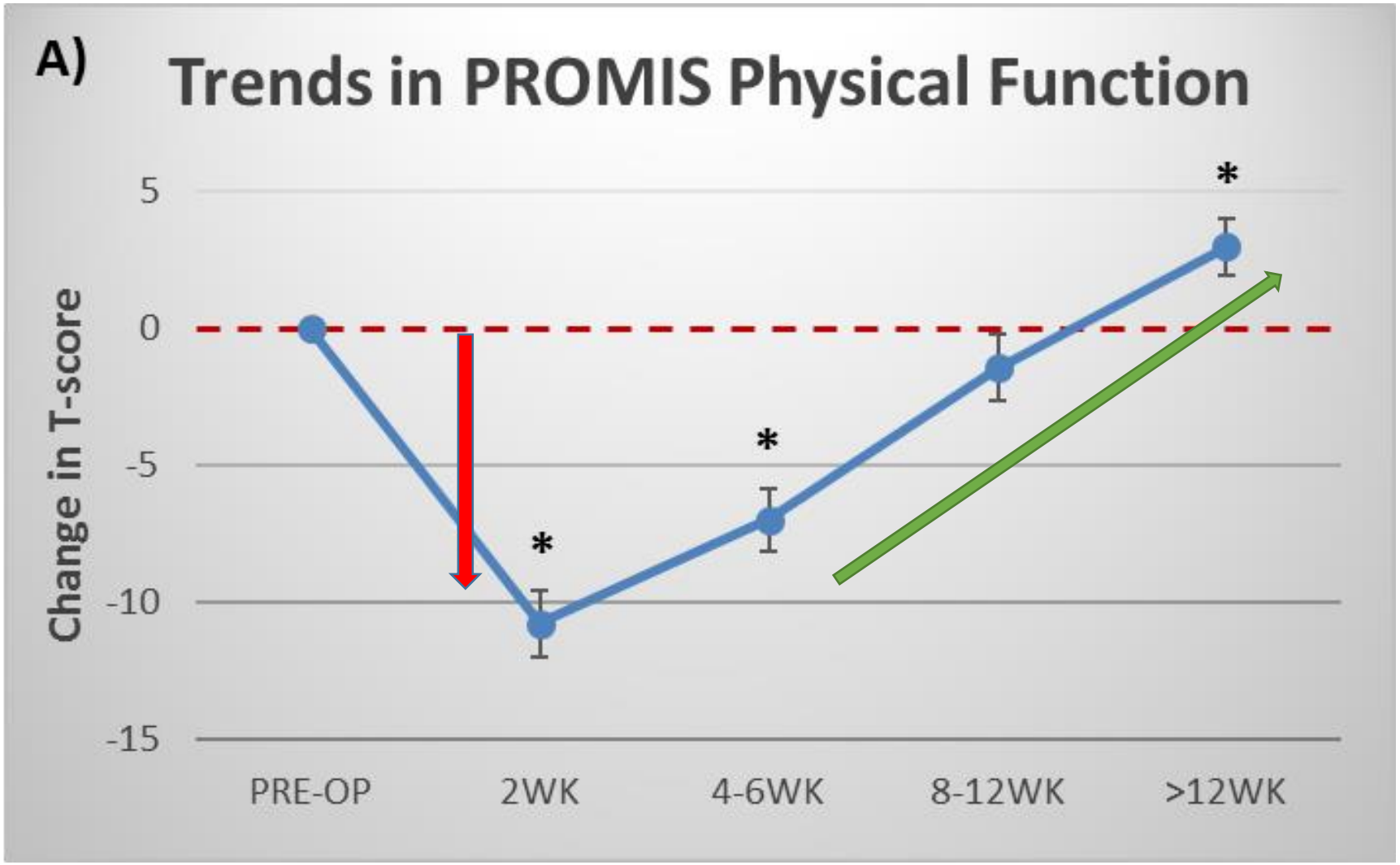
We are operating on the RIGHT people!

Data Analysis

- PROMIS PF, PI, and depression scores were evaluated at each post-operative visit.
  - Scores grouped for purposes of analysis

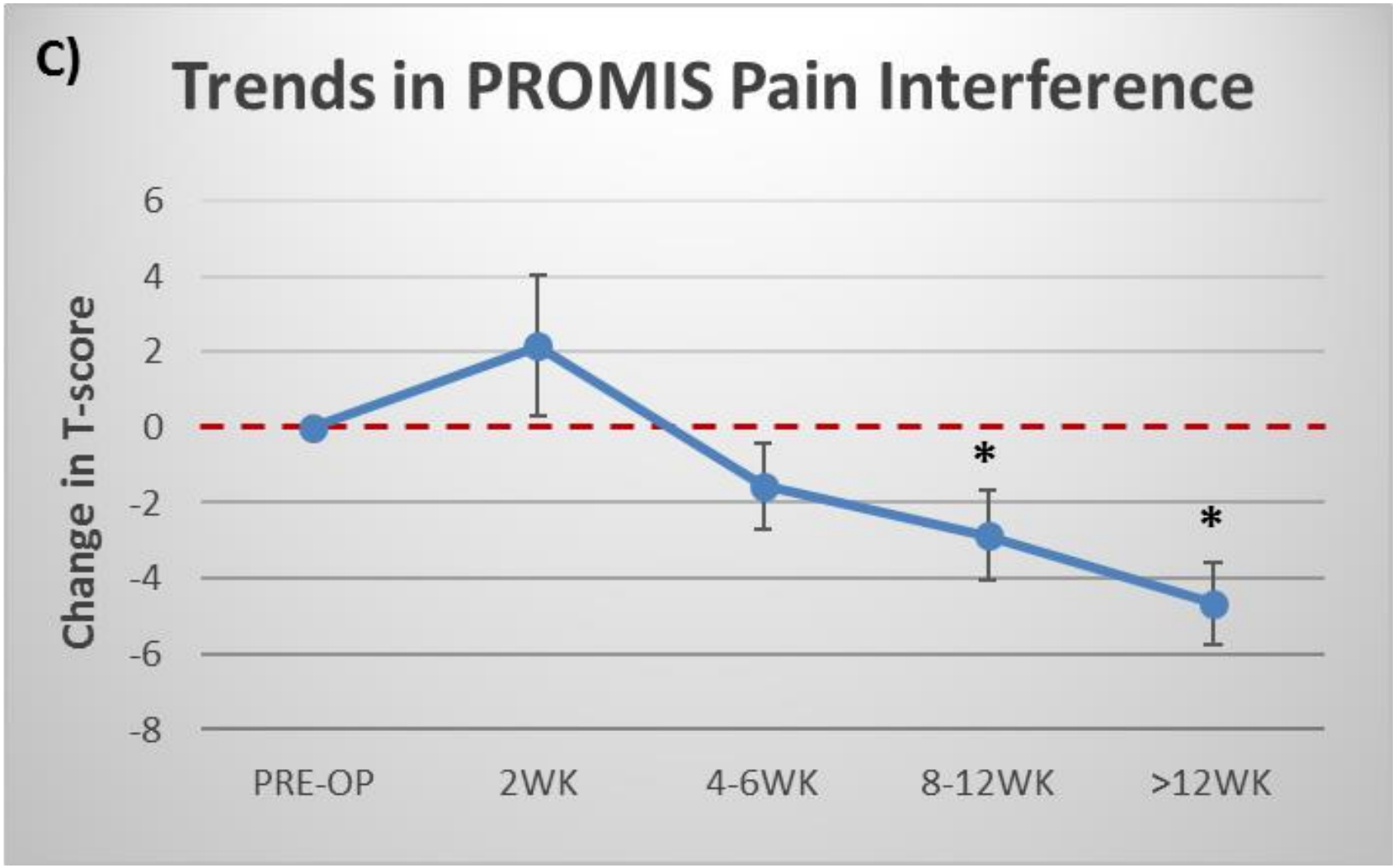
- Changes in scores were calculated as compared to baseline pre-operative scores and compared at each follow-up time point using two-way ANOVA.

- Differences in reconstruction type in patients undergoing allograft, modified Broström -Gould (BG), or modified Broström-Gould augmented with fibertape (BG+FT) were also evaluated.



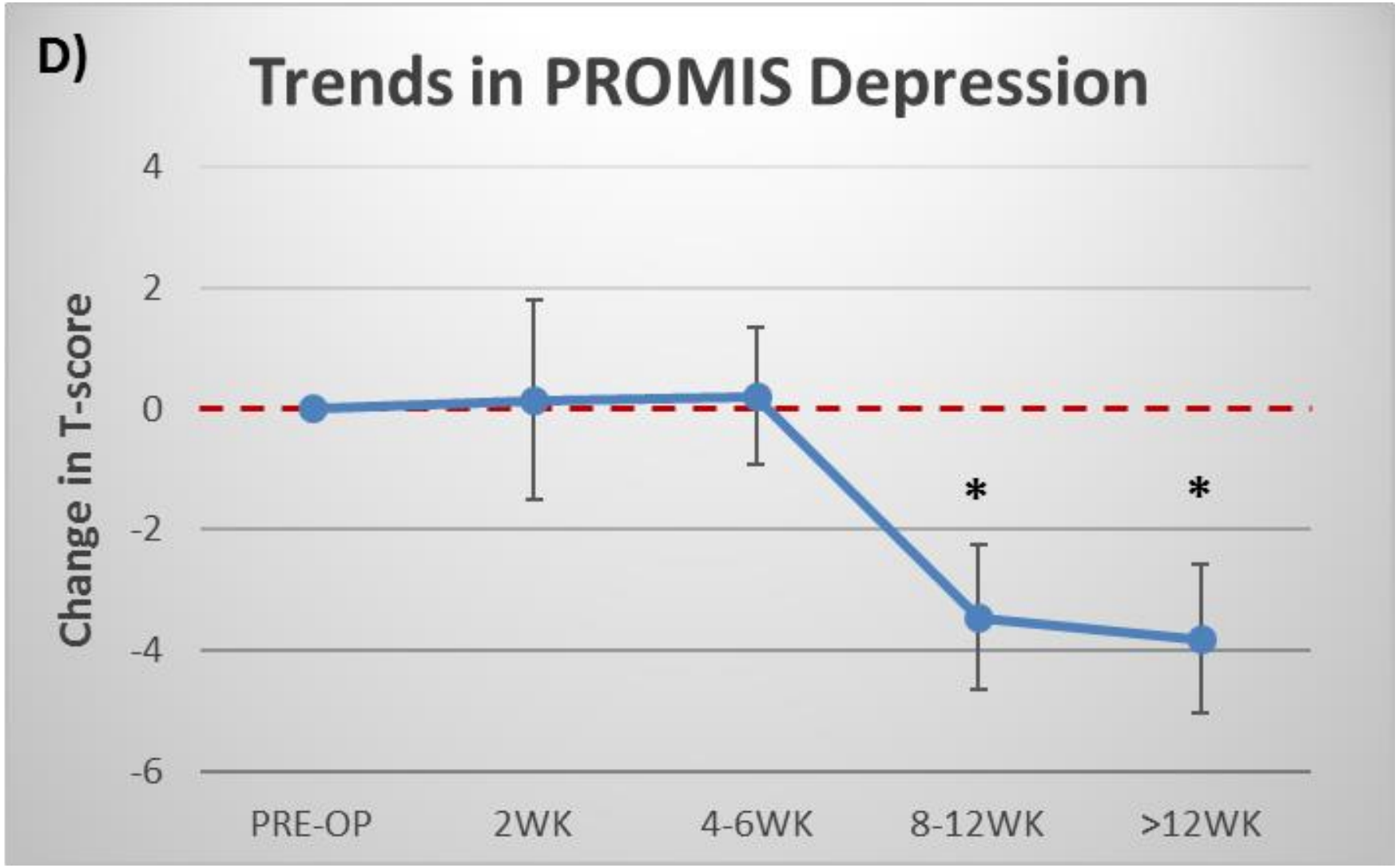
PF was significantly worse at 2 and 4-6 week follow-up ($p<0.05$) and significantly better at >12 weeks follow-up ($p<0.01$).

Overall trend demonstrates a return to baseline at 8-12 week follow-up and continued improvement at >12 weeks post-op

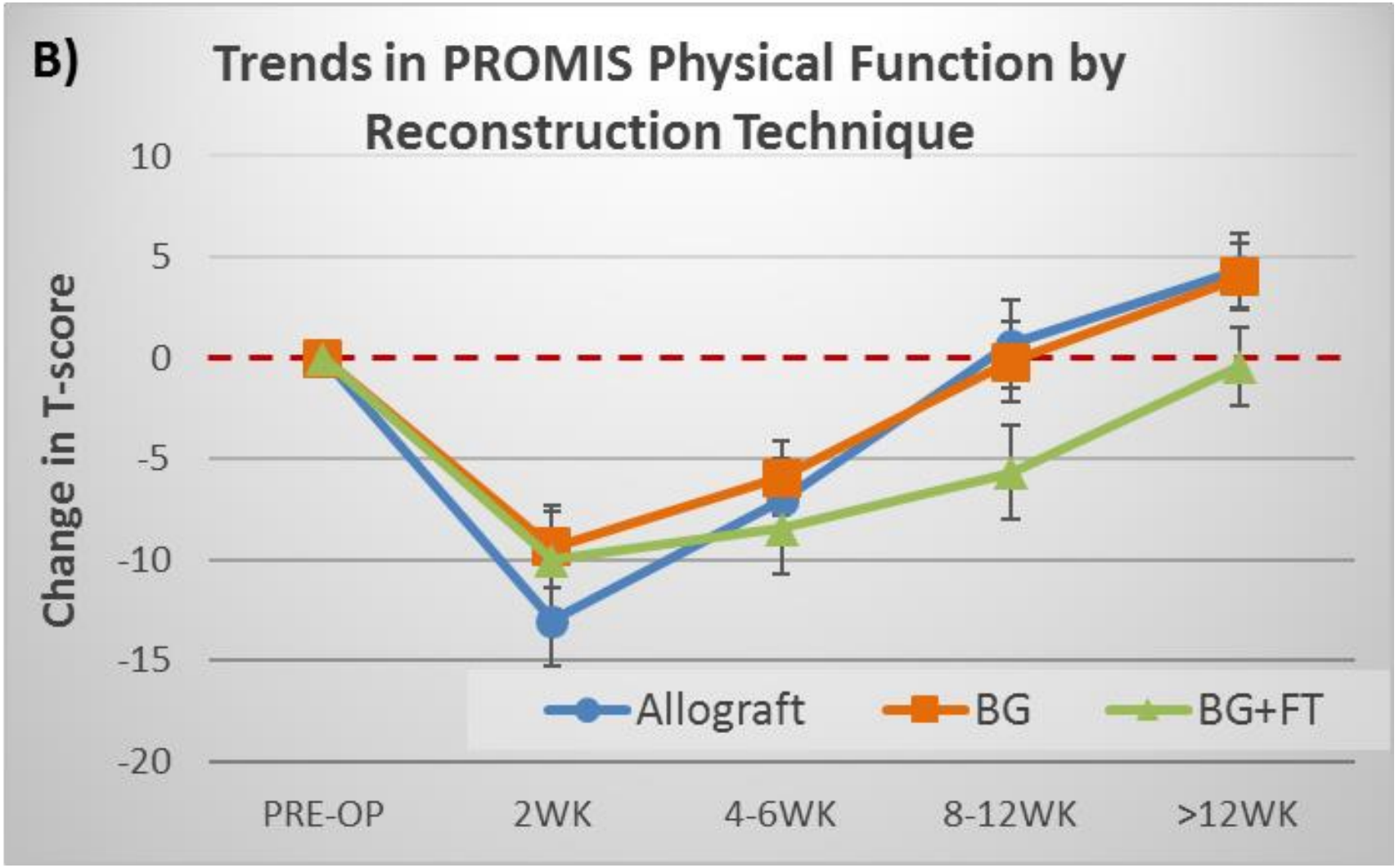


- PI significantly improved from baseline beginning at 8-12 week follow-up (p=0.02).
- >12 week follow-up ½ SD improvement suggests meaningful clinical improvement

*unless otherwise noted p < 0.05



- Important to acknowledge the role mental health plays in treatment outcomes.
- Depression was unchanged from baseline at 2 weeks and 4-6 week follow-up, then significantly improved thereafter ($p<0.01$).
- Better functioning and decreased pain results in improved mood!



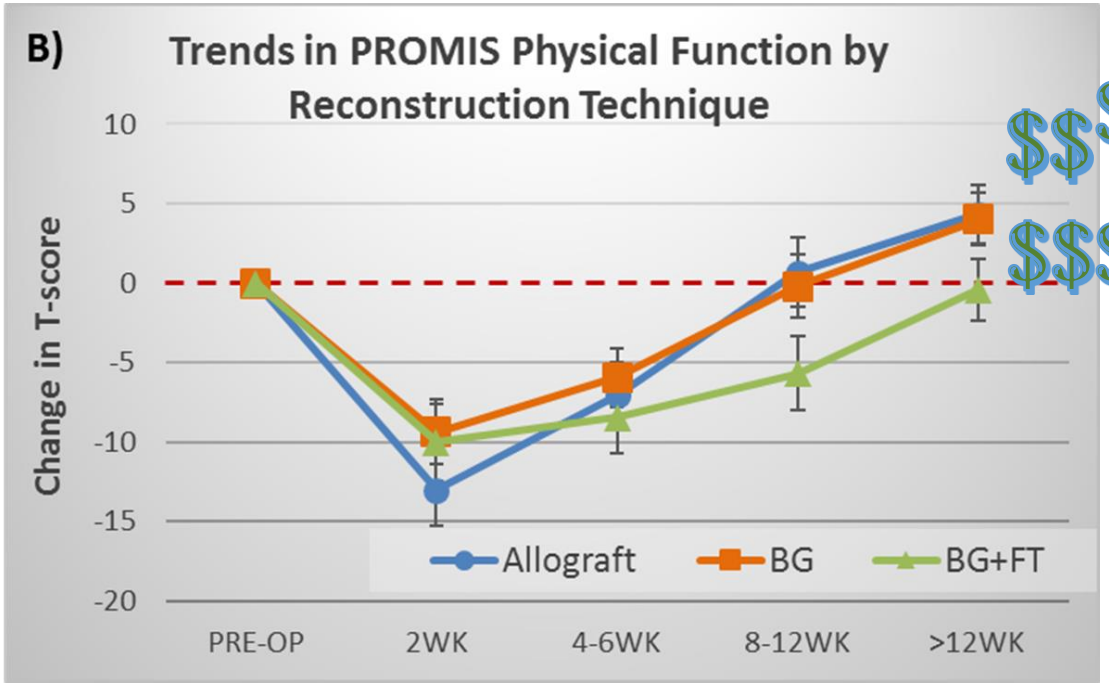
- Delay in PF recovery in ▲ group starting at 8-12 weeks
- At >12 weeks we see nearly significant <u>slower improvement</u> in PF with ▲ compared to ● ($p = 0.07$) and ■ ($p = 0.051$)
- Important to investigate further with more data to determine if these trends persist because they may have clinical significance

What do the PROMIS scores tell us?

- Clinical expectations are reflected in PROMIS scores
- Surgery in patients with baseline scores ≥ 1 SD away from mean can improve function and decrease pain
- Improving physical function and pain can affect mood
- There are definite trends in recovery that can be used for pre-operative counseling and to guide patient expectations after surgery

What else can we learn?

- How much does mental health status affect physical function and pain interference? What can we do about it?
- Is the delay in recovery seen in the BG+FT group typical?
  - If yes, helps to set expectations for patients who need this type of surgery



$$$$$

$$$$$$$

The PROMIS data may provide additional insight into which procedure might work best in a value-based care model

More data will help provide answers – benefit of PROMIS - URMC and other Institutions

Questions?