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## Clinical Utilization of Patient Reported Outcome (PROMIS) Scores for Surgical Reconstruction of Posterior Tibialis Tendon Dysfunction

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## Clinical Utilization of Patient Reported Outcome (PROMIS) Scores for Surgical Reconstruction of Posterior Tibialis Tendon Dysfunction

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**Category:** Hindfoot

**Keywords:** Posterior Tibial Tendon, PROMIS

**Introduction/Purpose:** Previous studies have demonstrated that preoperative Patient Reported Outcome Instrumentation System (PROMIS) scores effectively predict improvement in foot and ankle surgery. Adult acquired flatfoot deformity (AAFD) and Posterior Tibialis Tendon Dysfunction (PTTD) are a common surgical problem, but it is unclear if the specific thresholds for the physical function (PF), pain interference (PI) and depression published previously for all foot and ankle surgeries apply to a specific diagnosis. Furthermore, the interplay of PROMIS scores and clinical variables has not been evaluated. The purpose of this study was: 1) to investigate the change in PROMIS scales and radiographic measurements from pre- to postoperative follow up in AAFD/PTTD patients, 2) to determine if preoperative PROMIS scales predict post-surgical improvement, 3) to determine if demographic, clinical variables combined with pre-operative PROMIS scales predict post-surgical improvement.

**Methods:** Using ICD-9/10 and CPT codes, 60 patients who underwent surgical reconstruction for AAFD/PTTD at a tertiary care center between February 2015 and November 2016 were identified. PROMIS PF, PI and Depression were assessed at initial and follow-up. A total of 35 adult patients with PROMIS scores and radiographs at baseline and greater than 3 months follow-up (mean=10.8 months) were included. For hypothesis #1, two way repeated measures ANOVAs determined pre- to post-operative change in PROMIS scales and radiographic measurements. For hypothesis #2, receiver operator curve (ROC) analysis determined the accuracy and thresholds for pre-operative decision making. For hypothesis #3, the multiple linear regression of demographic (age, gender, BMI), clinical (stage) and radiographic variables with pre-operative PROMIS scales for predicting post-operative change in PROMIS scales were evaluated (Models included: pre-operative PROMIS PF + BMI + stage AND pre-operative PROMIS PF + BMI + delta Meary's).

**Results:** PROMIS scales (PF(4.1), PI(-6.2) and Depression(-6.1)) and radiographic angles (lateral Meary's (-10.8) and A/P Talo/1st metatarsal angle (-10.9) were significantly improved ( $p < 0.01$ ). Pre-operative PROMIS PF (AUC =  $0.80 \pm 0.8$ ,  $p < 0.01$ ) and PI (AUC =  $0.81 \pm 0.07$ ,  $p < 0.01$ ) showed significant AUC for predicting Minimal Clinically Important Difference (MCID) improvement in PROMIS PI. Pre-operative PROMIS Depression showed a significant AUC ( $0.85 \pm 0.07$ ) for predicting MCID improvement in PROMIS Depression. However, pre-operative PROMIS PF was not predictive of MCID improvement in PROMIS PF (AUC =  $0.64 \pm 0.09$ ,  $p = 0.17$ ). Only pre- to post-operative change in lateral Meary's angle predicted post-operative MCID improvement for PROMIS PF (AUC of  $0.85 \pm 0.08$ ,  $p < 0.01$ ). The threshold for a 95% specificity/sensitivity for achieving MCID improvement in PROMIS PF was  $> 12.5$  degrees/ $2.5$  degrees, respectively. Models combining clinical, radiographic, and PROMIS variables achieved significance (AUC  $> 0.81$ ).

**Conclusion:** PROMIS scales and radiographic angles improve significantly following surgical reconstruction of PTTD. Unlike previous studies, PROMIS PF was not predictive of improvement in PROMIS PF. However, PROMIS PF and PI were predictive of improvement in PROMIS PI.

Radiographic improvement on lateral Meary's angle was the most strongly predictive of improvement in PROMIS PF. The strongest predictor of postoperative improvement in PROMIS PF was a combination of preoperative PROMIS PF, BMI, and stage an interplay of variables not previously evaluated. Pre-operative PROMIS thresholds are effective across diagnosis, however, diagnosis specific criteria may further enhance pre-operative decisions.

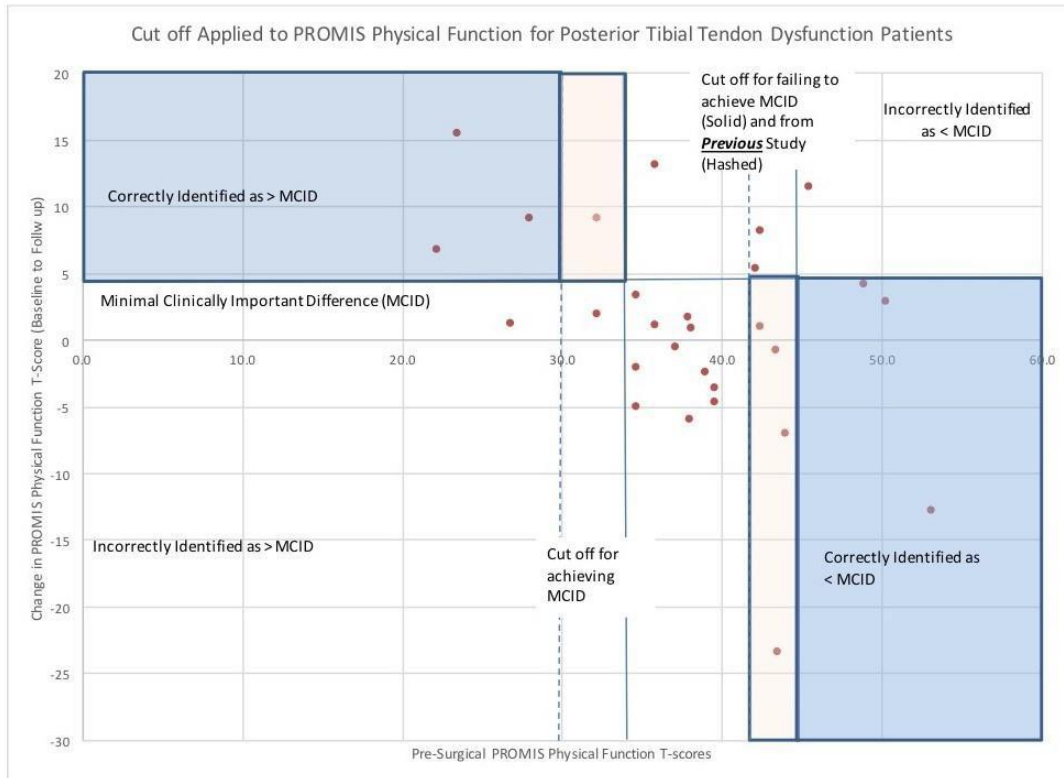


Figure 1. Cut offs from receiver operator curve analysis applied to pre-surgical PROMIS physical function scores (PF) (x axis). The change in PROMIS PF from baseline to follow up is plotted on the y axis. The cut offs from the previous study (shaded blue) are similar to the cut offs for the present data specific to posterior tibial tendon dysfunction (shaded blue and orange).