

## When are the Patients Satisfied with Their Outcome? Correlation of PROMIS Values with Patient Acceptable Symptom State (PASS) Scores in Foot and Ankle Patients

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**Introduction/Purpose:** PROMIS values are being adopted due to ease of use and influence on clinical decision making. Studies support the use of PROMIS physical function (PF), pain interference (PI), and Depression (D) for pre-surgical decision making. Patient Acceptable Symptom State (PASS) is a validated outcome measure commonly used in other areas of medicine and surgery that captures when patient's symptoms reach a daily acceptable level. Knowing what PROMIS scores are associated with a patient's PASS(Yes)/(No) rating would further enhance the use of PROMIS scales. The purpose of this study: 1) association of PROMIS scales with a PASS rating, 2) threshold values of PROMIS PF, PI, D associated with PASS rating, and 3) whether PROMIS, and patient demographics are predictive of a PASS rating.

**Methods:** 464 consecutive foot and ankle patients (variety of foot and ankle conditions) over a 4 week interval prospectively completed PROMIS PF, PI and D as well as the PASS question: "Taking into account all of the activities that you do during your daily life, your level of pain, and also your function, do you consider that the current state of your foot and ankle is satisfactory?" PROMIS assessments are used as the standard of care however, the point patients feel they have improved to an acceptable degree (PASS) is not known. The analysis included 1) a two-way ANOVA to compare PROMIS scores (PF, PI, D) between patients grouped as PASS(Yes) and PASS(No); 2) ROC analysis to determine AUC, cut offs, and 95% sensitivity/specificity for PASS(Yes), PASS Ambiguous, and PASS(No); 3) Logistic regression analysis with PROMIS scales, age, gender, and visit type as predictors and PASS(Yes)/(No).

**Results:** PROMIS PF was lower ( $p<0.01$ ) and PI higher ( $p<0.01$ ), however, PROMIS D ( $p=0.26$ ) was similar between PASS(Yes/No) groups. The AUC for PROMIS PF( $p<0.01$ ) and PI( $p<0.01$ ) were significant but not PROMIS D ( $p=0.21$ ). The cut offs for PASS(Yes) with 95% specificity were 52.0 and 50.7 for PF and PI, respectively. The cut offs for PASS(No) with 95% sensitivity were 23.6 and 69.6 for PF and PI, respectively. PROMIS values between 23.6 and 52 for PF and between 50.7 and 69.6 for PI were PASS ambiguous. Regression analysis showed that gender, visit type, and PROMIS (PI/PF) significantly predicted PASS(Yes)/(No) (75% accuracy).

**Conclusion:** PROMIS t-scores of near 50 (average of US population) correspond to PASS(Yes) cut offs for both PF and PI. When feasible a benchmark of 50 on PROMIS T-scores may be a reasonable goal for patient outcome after foot and ankle treatments. For patients that are PASS ambiguous, other factors such as preoperative PROMIS scores (PF and PI), gender, and visit type (new or follow up) may motivate discussions with patients about their expectations of treatment. Longer term follow-up, may result in a higher percentage of PASS YES patients and alter cut off scores.

**Table 1.** The results of the receiver operator curve analysis and two way ANOVA pairwise comparisons for 464 foot and ankle patients (PASS Yes = 118)

Receiver Operator Curve Analysis			
	Area Under the Curve	p-value	95% Confidence Interval
<sup>1</sup> PROMIS Scale			
Physical Function	0.60	<0.01	0.54-0.66
Pain Interference	0.66	<0.01	0.61-0.72
Depression	0.54	0.21	0.48-0.60
Cut offs			
	*PASS NO	*PASS Ambiguous	*PASS YES
Physical Function	<23.6	23.6-52.0	>52.0
Pain Interference	>69.6	50.7-69.6	<50.7
Depression	>63.9	42.5-63.9	<42.5
Two Way ANOVA (Pairwise comparisons)			
	Mean Difference (PASS Yes/NO)	P- value	95% Confidence Interval
Physical Function	3.0	<0.01	1.0 - 4.9
Pain Interference	-3.9	<0.01	-2.5-5.3
Depression	-0.9	0.26	0.7-2.5

<sup>1</sup>PROMIS = Patient Reported Outcome Instrumentation System

\*PASS=Patient Acceptable Symptom State