# PROMIS PF and SMFA Crosswalk: Accuracy Varies by Domain

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## BACKGROUND

As part of the NIH Roadmap initiative, PROMIS (Patient Reported Outcomes Measurement Information System) has developed item banks, short forms and computer-adaptive tests (CATs) in order to standardize measurement for many health-related quality of life domains. The PROMIS Physical Function (PF) domain consists of a 121-item bank, and is increasingly being used by the orthopaedic research community.

One of the most widely used measures of function in this setting is the 46-item Short Musculoskeletal Functional Assessment (SMFA), which assesses dysfunction, mobility, bother, and emotion. A critical tool for researchers transitioning from legacy measures to PROMIS is the availability of linking (also known as crosswalk) tables. While most of the PROMIS measures have published linking tables for many legacy measures, there is no crosswalk available for the PROMIS PF and the SMFA.

## MATERIALS AND METHODS

The study, conducted at 43 Level 1 trauma centers, enrolled 1000 patients participating in longitudinal trials, and collected 733 SMFA and PROMIS PF assessments at either 6 or 12-months post injury. Linking functions between SMFA domains and PROMIS PF were developed following equipercentile matching methodology.

All PROMIS measures are based on population norms and designed to measure a construct on a scale of 0 to 100, with a mean of 50 and a standard deviation of 10.

A Minimally Important Clinical Difference (MCID) for the SMFA of 7 was used based on prior literature. In order to evaluate the construct of function using the same scale direction (higher SMFA represents worse function, higher PROMIS represents better function), SMFA measures were transposed after score calculations.
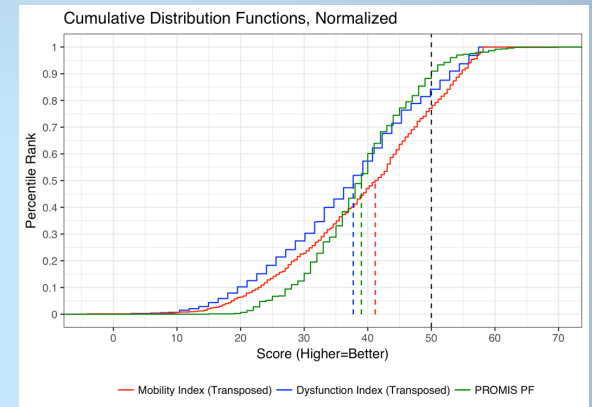
## RESULTS

Overall, there was a high correlation between the PROMIS PF CAT and SMFA mobility and dysfunction domains: 0.79 and 0.81, respectively. As expected, our patient population reflected poorer function than the general population, with dysfunction, mobility and PF scales approximately 1 standard deviation below the population mean.
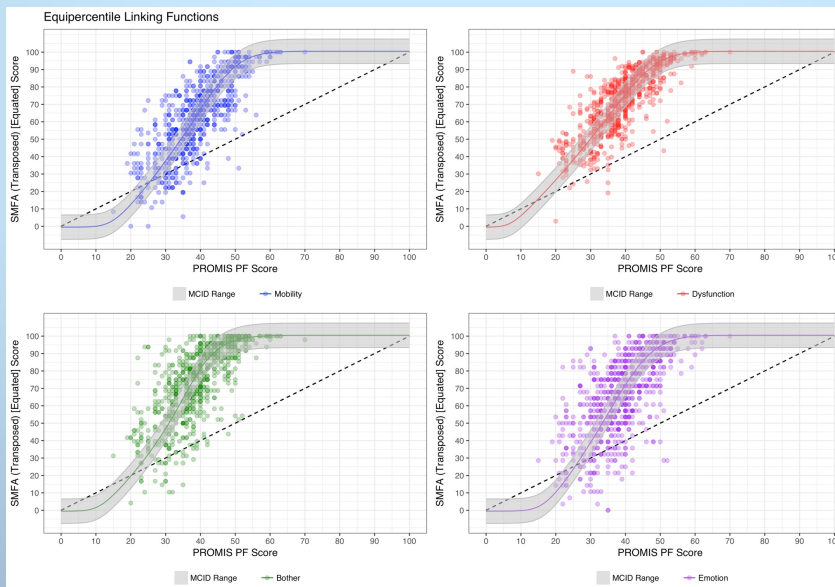
## CORRELATION OF SCALES



## LINKING FUNCTIONS WITH MCID RANGES



Equipercentile Linking Functions
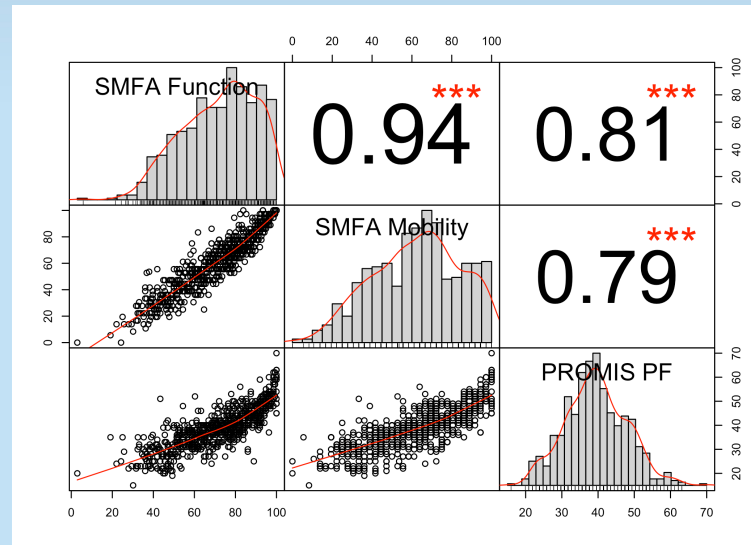
## COMPARING DISTRIBUTIONS



Cumulative Distribution Functions, Normalized

Interestingly, the accuracy of the observed vs PF-predicted SMFA scores was poor. Only 55% and 44% of the predicted SMFA dysfunction and mobility scores, respectively, were within one MCID of the observed scores. While a ceiling effect was observable for the SMFA, this was not the main cause of the discrepancies between the instruments. As expected, accuracy was even lower for other SMFA domains not focused on physical function.

## CONCLUSIONS

SMFA vs. PROMIS PF linking functions can be used to compare across studies and normative sets. However, the accuracy of the crosswalks suggests that the PROMIS PF is not a perfect match for any of the SMFA domains, and that the predicted values should be used with significant caution. Additional PROMIS domains may be required to replace the SMFA, as reliable linking in several domains is not currently available.

## DISCLOSURES