Using PROsetta Stone to Translate PROMIS Depression Scores for Meaningful Use in Orthopaedic Trauma

Amanda Spraggs-Hughes, BS, MA[1]*; William M. Ricci, MD*[1]*; Michael Gardner, MD*[2]*; Christopher McAndrew, MD, MSc*[1]
[1]*Washington University in St. Louis, St. Louis, Missouri, USA;*
[2]*Stanford University Department of Orthopaedic Surgery, Redwood City, California, USA*

Background/Purpose: PROMIS (Patient Reported Outcomes Measurement Information System) assessments provide clinicians with valid and reliable outcome instruments with low patient burden. Due to the novelty of administering the assessments in clinical populations, many of the PROMIS domains have not yet been interpreted for meaningful use in directing clinical care. The PROsetta Stone project is an NIH (National Institutes of Health)-funded initiative tasked with developing "cross-walks" to translate PROMIS scores into comparable scores from commonly used legacy instruments. The primary aim of this study was to translate PROMIS Depression scores collected in an orthopaedic trauma outpatient clinic to Patient Health Questionnaire-9 (PHQ-9) depression severity levels utilizing the PROsetta Stone. The secondary aim was to examine the translated scores in a diverse orthopaedic trauma population to develop future treatment strategies for depression after orthopaedic trauma.

Methods: In 2015, the orthopaedic surgery department of a Level I trauma center implemented a new check-in process for patients that included the collection of the PROMIS CAT (Computer Adaptive Test) Depression assessments. IRB approval was obtained after a pilot period to retrospectively collect the PROMIS Depression scores along with basic patient demographic data. The PROsetta Stone cross-walk was utilized to stratify the PROMIS scores by PHQ-9 depression severity levels (Table 1). Descriptive statistics were used to analyze and report on the PROMIS Depression scores and translated PHQ-9 severity levels.

Results: PROMIS Depression scores were collected for 810 insured patient visits to the orthopaedic trauma faculty during an 11-week pilot period. The mean age was 54 years and 53.5% of the sample was male. The mean PROMIS Depression score was 48.5, which is just below the population mean of 50. Figure 1 demonstrates the breakdown of translated PROMIS Depression to PHQ-9 severity levels for this sample. The PHQ-9 proposed treatment actions recommend initiating depression treatment for PROMIS Depression scores of ≥59.9 including immediate initiation of pharmacotherapy intervention for PROMIS ≥65.8. Based on these guidelines, 9.5% of patients presenting to an outpatient orthopaedic trauma clinic should be treated for depression and 4.2% meet criteria for immediate initiation of pharmacotherapy.

Conclusion: Translation of PROMIS Depression scores into the depression severity levels of the PHQ-9 allowed determination of patients in need of further evaluation and treatment for depressive symptoms. While the overall mean PROMIS score of this cohort was near the population mean, nearly 14% of our patients met PHQ-9 criteria for initiation of depression treatment or beginning pharmacotherapy. By utilizing the severity strati-

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fication of the commonly used PHQ-9, PROMIS Depression scores can be interpreted for appropriate and timely treatment of depression in orthopaedic trauma patients. Future directions could include the creation of Collaborative Care Models to aid in the treatment of depression in orthopaedic trauma patients.

Table 1. PROsetta Stone translation of PROMIS Depression t-scores to PHQ-9 depression severity levels

PROMIS Depression t-score	PHQ-9 Score	PHQ-9 Depression Severity	PHQ-9 Proposed Treatment Actions*
0 – 52.4	1 to 4	None	None
52.5 – 59.8	5 to 9	Mild	Monitor and repeat PHQ-9 at next appointment
59.9 – 65.7	10 to 14	Moderate	Initiate treatment planning
65.8 – 71.4	15 to 19	Moderately Severe	Immediate pharmacotherapy
71.5 +	20 to 27	Severe	Immediate pharmacotherapy plus expedited referral

*Adapted from Kroenke, K. & Spitzer, RL. (2002). The PHQ-9: A new depression and diagnostic severity measure. *Psychiatric Annals,* 32, 509-521.

Figure 1. The sample distribution of translated PROMIS Depression to PHQ-9 severity levels. For each category the PHQ-9 severity is provided with the associated PROMIS Depression scores in parentheses.