

Editorial Commentary: Patient-Reported Outcomes Measurement Information System (PROMIS) Has Decreased Disease-Specific Responsiveness More Than Legacy Outcome Measures, But PROMIS and Legacy Measures Do Correlate: You Can't Have Your Cake and Eat It Too



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Abstract: A better understanding of hip-preservation patients lies in our ability to analyze and collect data. Collecting the appropriate outcome measures is required to improve treatments, personalize health care, and drive policy. Current research suggests legacy measures and Patient-Reported Outcomes Measurement Information System (PROMIS) measures can be used in data collection, but which measures are best? PROMIS computer-adaptive tests are an attractive outcome measure source because they allow for low-burden data capture with reduced completion times and limited floor and ceiling effects. PROMIS provides numerous reliable, sensitive, and domain-specific measurements capturing a patient's health outcomes. PROMIS has been shown to correlate with hip and other legacy outcome measures, but because PROMIS is more general than some legacy measures, it may be less responsive. PROMIS measures are applicable across a wide spectrum of health measures for our patients, including hip femoroacetabular impingement, but should not replace the legacy measure of the International Hip Outcome Tool 12. However, PROMIS should still be measured because it may allow greater comparison to studies of other conditions resulting in diminished reporting bias.

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Low-burden data capture that is adaptive and responsive to patients' physical, social, and mental function is of paramount importance in today's health care landscape. Legacy hip measures have all shown to be responsive to nonarthritic hip conditions, but they have limitations in their applicability to a patient's global health across many disease spectrums.¹⁻⁴ Hip-preservation patients, as all, are complicated and represent more than a single measure. Patient-Reported Outcomes Measurement Information System (PROMIS) computer-adaptive tests (CATs) are an attractive outcome measure source because they allow for low-burden data capture with reduced completion

times and limited floor and ceiling effects.⁵ PROMIS provides numerous reliable, sensitive, and domain-specific measurements capturing a patient's health outcomes.⁶

Over the past several years, PROMIS measures have been heavily studied in the hip-preservation world. Multiple authors have shown moderately strong to strong correlations of PROMIS measures to legacy hip scores.⁷⁻⁹ PROMIS, specifically PROMIS Physical Function (PF), has previously been shown to strongly correlate to legacy measures.^{7,8} With correlation, we must ask ourselves, Is the correlation meaningful? This brings us to the current research: How responsive is PROMIS PF to a specific disease, femoroacetabular impingement syndrome (FAIS)?

Nwachukwu, Rasio, Beck, Okoroha, Sullivan, Makhni, and Nho¹⁰ have authored "Patient-Reported Outcomes Measurement Information System Physical Function Has a Lower Effect Size and Is Less Responsive Than Legacy Hip Specific Patient Reported Outcome

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Measures Following Arthroscopic Hip Surgery.” They took on an in-depth psychometric analysis of PROMIS measures versus legacy measures in FAIS patients at 6 months after arthroscopy. They concluded a moderately strong correlation of PROMIS PF to the International Hip Outcome Tool 12 (iHOT-12) and a strong correlation to the Hip Outcome Score—Sports Subscale (HOS-SS). In item responsiveness analysis, neither PROMIS PF nor HOS-SS was as responsive in the short-term follow-up as the iHOT-12 in patients treated for FAIS. The authors considered that PROMIS measures are applicable across a wide spectrum of health measures for our patients but should not replace the legacy measure of the iHOT-12.

The study by Nwachukwu et al.¹⁰ was well performed and thoughtful, and it leads me to a further question: Does decreased responsiveness with correlation make PROMIS an inferior collection measure for hip preservation? As the authors concluded—and in my opinion—the answer is no. I believe PROMIS is the future of data collection. There are many PROMIS measures that can open a wide array of patient-centered care data. Specifically, PROMIS PF was not designed for FAIS and the iHOT-12 was; thus, it is not surprising that the iHOT-12 is more responsive for the specific disease for which it was designed. One could think that, more impressively, a PROMIS CAT general physical function measure, PROMIS PF, showed a good correlation to the iHOT-12 at 6 months. The current study highlights the void of knowledge on the applicability of available PROMIS measures for hip preservation.

As new information is uncovered, controversy is created, and this study stirs the pot. The moderately strong correlation at 6 months after surgery reported by Nwachukwu et al.¹⁰ is slightly different, given that prior studies have shown a strong correlation of PROMIS PF to the iHOT-12, including the current authors’ prior research.⁷⁻⁹ In my opinion, all these studies confirm what multiple authors have concluded: PROMIS PF, which is a general measure of physical function, correlates to legacy hip measures. Nwachukwu et al. chose to compare the relative efficiency (RE) of one measure with that of another. Simply, RE is a comparison between 2 patient-reported outcome measures to find which measure has the highest power for a fixed sample size. The higher the RE, the smaller the sample size needed to detect a change. An RE greater than 1 means that an instrument is efficient at detecting change when compared with another instrument.¹¹ In the current study, the iHOT-12 was the most responsive measure versus all studied measures.¹⁰ The HOS-SS and PROMIS PF fared the same versus the iHOT-12, both with an RE lower than 1. This finding does not mean the PROMIS PF or HOS-SS measure is not useful

but leads to more questions. There are published reports on joint-specific PROMIS lower-extremity (LE) measures, but measures specifically for the hip have not been validated.^{12,13} The PROMIS LE CAT is not readily available, but with continued work, a PROMIS LE test highly responsive to the hip is possible. Griffin et al.² initially educated us on the value of the iHOT-12, but we all should be aware that our patients are much more than a hip condition.

The continued evaluation of PROMIS will lead to global collections of outcome measures across all facets of patient care in the future. Specifically, for hip preservation, we continue to evolve our knowledge about the applicability of these measures. As my hip-preservation fellowship director, Steven Olson, instilled in me years ago, “PROMIS is the future and we need to better understand it.” With the attractiveness of the low data burden and strong correlation to legacy hip measures, PROMIS scores, in my opinion, are important to continue to collect. Our current multicenter young adult hip registry consists of many PROMIS CAT measures (including PROMIS PF), the iHOT-12, and the Oswestry Disability Index. Forming a comprehensive registry that will allow low-burden and highly responsive data collection is the future. At present, it seems that neither a single PROMIS PF nor iHOT-12 score will allow us to eat our cake and have it too!

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