Preoperative Performance of PROMIS in Patients with Articular Cartilage Defects of the Knee

Alan Shamrock MD, Brian Wolf MD MS, Shannon Ortiz MPH, Kyle Duchman MD, Matthew Bollier MD, Jacqueline Baron BA, and Robert Westermann MD
• The authors have no disclosures.
Background

• Cartilage defects of the knee are common and challenging to treat\textsuperscript{1,2}.
  – Limited ability of articular cartilage to heal

• Area of intensive basic science and clinical research

• Patient reported outcomes (PROs) utilized to assess preoperative disability and postoperative improvement
Background

• Patient-Reported Outcomes Measurement Information System (PROMIS) developed by the National Institutes of Health (NIH) in 2004\(^3\)

• Database of questions administered using item response theory
  – Answer to a question is scored and next most informative question is given\(^4\)
Background

• PROMIS Physical Function (PF) available in electronic form
  – Computer Adaptive Test (CAT)

• Previous studies demonstrated that a reduction in question burden and electronic administration improves PRO completion rates\(^5-9\)
Purpose

• To validate the PROMIS PF CAT instrument as a tool to quantify preoperative disability in patients undergoing surgery for articular cartilage injury in the knee
  – Chondroplasty
  – Microfracture
  – Osteochondral autograft/allograft transfer (OATs)
  – Autogolous chondrocyte implantation (ACI)
  – Cartilage resurfacing
Methods

• Prospectively enrolled patients completed PROMIS PF CAT, Knee Injury and Osteoarthritis Outcome Score (KOOS), Short Form-36 Health Survey (SF-36), and EuroQol-5 Dimension (EQ-5D) questionnaires at their preoperative visit

• Spearman correlation coefficient used to compare instruments

• Instrument correlations were defined as excellent (>0.7), excellent-good (0.61-0.69), good (0.4 to 0.6), and poor (<0.39)\textsuperscript{10}
Results

- 293 knees in 275 subjects (54.5% male)
- mean age was 34.0 ± 14.7 years (range: 12-70) and mean BMI was 30.0 ± 6.9 kg/m²
Results

- The PROMIS PF CAT had an excellent correlation with the SF-36 PF ($r=0.819$, $p<0.001$), SF-36 PCS ($r=0.766$, $p<0.001$), KOOS ADL ($r=0.733$, $p<0.001$), KOOS Sport ($r=0.709$, $p<0.001$), and EQ-5D ($r=0.752$, $p<0.001$) instruments; an excellent-good correlation with the KOOS pain ($r=0.662$, $p<0.001$), and KOOS QOL ($r=0.640$, $p<0.001$) scores; and a good correlation with the KOOS symptoms ($r=0.519$, $p<0.001$) scale

- Fewest number of questions (4.17 + 0.93)

- No ceiling or floor effects
Conclusion

• PROMIS PF CAT is an effective tool for preoperative outcome assessment in patients with isolated cartilage defects of the knee.

• Correlates strongly with legacy PRO measures with no ceiling and floor effects and a minimal time burden for completion.
References