Paper Session 1: Working to Optimize Patient Outcomes

Implementation of Patient-Reported Outcomes Measurement Information System (PROMIS) Data Collection in a Private Orthopaedic Surgery Practice

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Introduction/Purpose: The use of computerized adaptive testing (CAT) allows measurement of patient reported outcomes (PROs) through the fewest number of questions while achieving a higher precision, diminished floor and ceiling effects, and minimal administration burden compared with traditional methods. The National Institute of Health (NIH) created the Patient-Reported Outcomes Measurement Information System (PROMIS), a series of validated item banks that measure key clinical domains. Each item bank has as few as 4 questions or up to 12 questions depending on the subject's answers. This study describes a method of administering the PROMIS CAT in a high volume Orthopedic Surgery practice, reports the administration burden and rate of patient capture, compares this population to previously reported national standards, and compares preoperative to postoperative pain item banks.

Methods: The PROMIS CAT was intended to be collected prospectively for all patients as part of a standard intake. Patients used a tablet-based program that accesses the NIH PROMIS server generating a CAT in English or Spanish. Clinical domains include physical function, pain intensity, pain interference, global physical health, and global mental health. Scores for each domain and the time required were recorded in the patient's electronic medical record (EMR) as part of their clinic visit, preserving confidentiality of the data and preventing the need for a separate database. De-identified data was retrospectively extracted from the EMR of every patient from March to December 2015. Results for each domain were compared to validated national norms using single variable t-test. Linear regression was used to assess the effect of age on outcome variables. Paired t-test was used to compare preoperative and postoperative pain intensity and pain interference when these scores were available.

Results: 1688 PROMIS CATs were administered during 5345 visits (32%), reaching 70% as logistical issues were resolved. Patient age was 53±16. Completing the CAT required 157±164 seconds, with older patients taking 10.5 more seconds per decade ($p < 0.05$). The PROMIS item banks are normalized to mean 50±10 for the US population. Our results were: pain intensity 47.8±8.6*, pain interference 57.9±8.8*, physical function 40.1±9.0*, global physical health 43.3±9.6*, and global mental health 48.4±8.9 (*$p < 0.05$). Age has a small effect on all domains ($p < 0.05$). Approximately 20 patients are required to demonstrate a 15% change for a two-tailed, paired study with α=0.05 and 80% power. 109 patients had pre and postoperative PROMIS data. Pain intensity improved from 51.8±7.8 to 44.6±8.6 ($p < 0.001$) and pain interference improved from 60.1±8.8 to 55.5±9.0 ($p < 0.001$).

Conclusion: Using tablets to access PROMIS CATs and entering the data in the patient's chart for later retrieval is an effective technique to collect PROs in a busy Orthopedic Surgery practice with limited resources and no research coordinator. The process adds 2.5 minutes to a patient's intake and does not require a complicated database or expensive equipment or licensing. Adequate number of tablets and "buy in" from staff are needed for acceptable completion rates. Demonstrating improvement in PROs after surgery holds promise for comparative studies of surgical indications and techniques and highlights the value these interventions add to patient care.