The Use of the Patient-Reported Outcomes Measurement Information System (PROMIS) to Evaluate Nerve-Related Pain

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Background

- Peripheral nerve-related pain due to compression, acute stretch, trauma, and neurotomy is a significant cause of morbidity and disability.
- The absence of a validated, patient-friendly, and physician-friendly instrument for the preoperative and postoperative evaluation of pain prevents clinical decision-making based on consistent objective data
- This study employed the Patient-Reported Outcomes Measurement Information System (PROMIS) as a novel, objective, thorough, and improved tool to assess pre- and post-operative pain in patients with well-localized nerve pain.

Methods

- All patients who underwent clinical evaluation for well-localized nerve pain between 2010-2013 by the primary author were included in the study.
- Patients completed the PROMIS pain-related behavior and interference surveys pre- and post-operatively as part of routine clinical assessment.
- PROMIS uses a computerized iterative algorithm of questions to assess the impact of chronic conditions, including pain, on patient health-related quality of life.
- Additionally, they completed a 10-point pain intensity scale as a legacy measure.
- Patient-specific PROMIS data were compared to the national average (50) calculated from a large database of the general U.S. population.

Figure 1: Patient Flow Chart

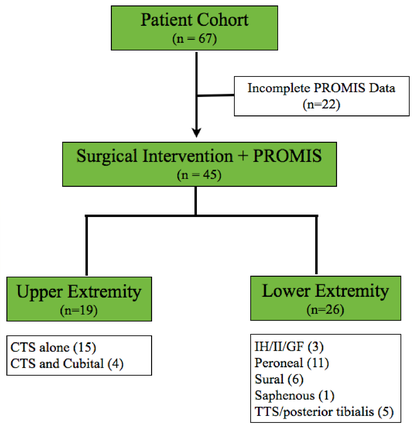


Table: Patient Characteristics, Demographics, and Procedures

		UE	LE	All Patients
Number		42.2% (n=19)	57.7% (n=26)	n=45
Gender	Male	47.4% (n=9)	46.2% (n=12)	46.7% (n=21)
	Female	52.6% (n=10)	53.8% (n=14)	53.3% (n=24)
Age		55.47 (SD 13.95)	46.62 (SD 14.54)	50.36 (SD 14.8)
BMI		29.19 (SD 6.07)	27.47 (SD 4.47)	28.1 (SD 5.1)
Smoking	Nonsmoker	89.5% (n=17)	69.2% (n=18)	77.8% (n=35)
	Current Smoker	10.5% (n=2)	26.9% (n=7)	20.0% (n=9)
	Not Available	(n=0)	3.8% (n=1)	2.2% (n=1)
# Comorbidities		3.0 (SD 3.14)	2.0 (SD 1.138)	2.44 (SD 2.26)
Diabetes	Yes	21.1% (n=4)	11.5% (n=3)	15.5% (n=7)
	No	78.9% (n=15)	76.9% (n=20)	77.8% (n=35)
	Not Available	(n=0)	11.5% (n=3)	6.7% (n=3)
Surgical Intervention	Decompression: Open	n=3	n=10	n=13
	Decompression: Endoscopic	n=16	n=0	n=16
	Traction neurectomy, intramuscular burial	n=0	n=6	n=6
	Neuroma / Nerve excision	n=0	n=9	n=9
	Direct Repair	n=0	n=1	n=1
Average Time from Preoperative Survey to Surgery		1.95 weeks (SD 13.0)	5.93 weeks (SD 5.03)	4.25 weeks (SD 9.35)
Average Time from Surgery to Postoperative Survey		7.56 weeks (SD 13.33)	20.28 weeks (SD 26.24)	14.91weeks (SD 22.46)

LE, lower extremity; UE, upper extremity; SD, standard deviation

Figure 2: Preoperative vs Postoperative PROMIS scores for UE cohort

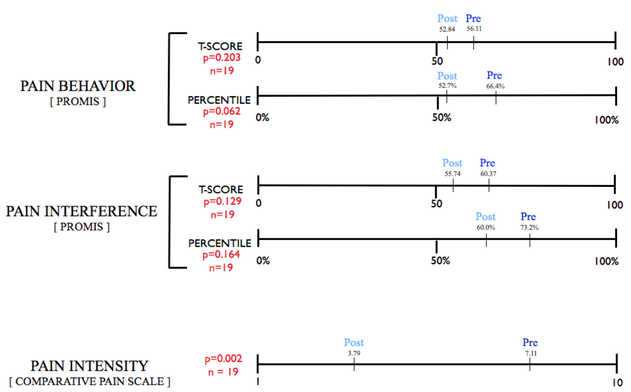
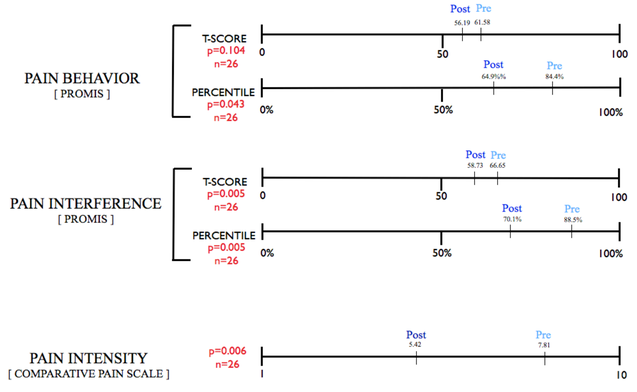


Figure 3: Preoperative vs Postoperative PROMIS scores for LE cohort



Results

- **Figure 1:** Complete PROMIS data were available for 45 patients who underwent peripheral nerve surgery: 19 (42.2%) for carpal tunnel syndrome with or without cubital tunnel syndrome and 26 (57.8%) for lower extremity (LE) pain.
- **Table:** This table gives the patient characteristics and intervention types for all study participants
- **Figures 2-3:** Patients who underwent surgery for UE nerve pathology demonstrated improvement in pain intensity, but not in the PROMIS measures of behavior and interference. LE pain significantly improved on pain intensity and PROMIS behavior and interference measures. The MCID (mean clinically important difference) was met for both pain behavior and pain interference (change in T-score of 5 or more).
- The upper extremity cohort had a shorter average follow up which, along with differences in nerve pathology, may explain the lack of improvement in PROMIS measures.

Conclusions

- The results of this study showed that, overall, patients who were evaluated for nerve-related pain experienced more pain than the general population, based on the PROMIS pain behavior and interference scales.
- Using PROMIS as an objective outcome measure, patients with LE peripheral nerve pain presented with greater preoperative pain and demonstrated significant post-surgical improvement, in contrast to patients with UE nerve pathology.
- PROMIS may be a useful clinical tool to objectively assess pain manifested in behavior and interference among patients with well-localized nerve pain, and to identify specific patient groups who may benefit from surgical intervention.