“What Patient Reported Outcome Should I Use?”

The Utility of Patient-Reported Outcome Measures in Orthopaedic Trauma Research

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Background:

Patient reported outcome score measures (PROs) are the new standard for measuring treatment success¹. The introduction of PROs prompted a transition from radiographic and clinical outcome measures to the patients' perceptions of their outcomes. The information garnered through PROs are self-reported opinions from patients without influence or interpretation by members of the care team. Patient reported outcome instruments measure a patient's perception of symptoms, functional status and overall health related quality of life. The inception, development and use of PROs allows patients, surgeons and the medical community to compare clinical outcomes.

Commonly used PROs are validated instruments for specific patient populations, anatomic locations, injuries or surgical indications. Despite the significance of using the correct PROs, there is little consensus within the orthopaedic trauma community as to which PROs should be used. We reviewed five years of publications from five major orthopaedic journals to characterize the use of PROs in trauma related publications.

Materials/Methods:

- All articles published in the *Journal of Orthopaedic Trauma*, *Journal of Bone and Joint Surgery (US)*, *Clinical Orthopaedics and Related Research*, *Journal of Hand Surgery* and *Journal of Shoulder and Elbow Surgery* from 2011-2015 were reviewed.
- Publications pertaining to outcomes after traumatic injuries were included.
- Publication year, number of patient reported outcomes used, and the specific patient reported outcomes published per study were recorded and analyzed.

Results:

- 6269 articles reviewed.
- 1929 (31%) articles pertained to trauma.
- 27% of orthopaedic trauma articles utilized PROs.
- An average of 107 trauma studies with PROs were published per year across included journals.
- An average of 2 PROs were reported per publication.
- The percentage of trauma studies which included PROs varied by journal. 40% of trauma articles published in JSES included PRO, 35% in JHS and JOT, 30% in CORR and 29% published in JBJS.
- The most commonly used PROs included: VAS (n=164), Disabilities of the Arm and Hand Score (n=161) Constant Score (n=76), Short Form Survey-36 (n=58), American Shoulder and Elbow Surgeons Standardized Shoulder Assessment (n=45).

Figure 1a: Number of trauma related articles which utilized PRO per year

Figure 1b: Number of Trauma Related Publications with PRO by Journal 2011-2015

Patient Reported Outcome Instrument	Frequency of Publication (n=)
Visual Analog Scale (VAS)	164
Disabilities of the Arm, Shoulder, and Hand (DASH) score	161
Constant-Murley Score	76
Item Short Form Survey – 36 (SF-36)	58
American Shoulder and Elbow Surgeons Standardized Shoulder Assessment form (ASES)	45
Mayo Elbow Performance Index (MEPI)	42
Quick-DASH (qDASH)	40
Short Form Musculoskeletal Assessment (SFMA)	34
The American Orthopedic Foot and Ankle Score (AOFAS)	25
EQ-5D™ index score	25
Unique study created (Non-validated)	23
Harris Hip score	22
Simple Shoulder Test (SST)	19
Patient reported Wrist/Hand Evaluation (PRWHE)	18
UCLA Shoulder Score	16
Michigan Hand Outcomes Questionnaire (MHQ)	14
Short Form – 12 (SF-12)	14
Olerud and Molander Ankle Score	12
Oxford Elbow Score	10
Lower Extremity Function Scale (LEFS)	10

Table 1: Top 20 PROs published across CORR, JBJS, JHS, JOT, JSES, from 2011-2015

Conclusions:

- The use of PRO in orthopaedic trauma studies represented a minority of publications across five major journals between 2011-2015.
- Standardization is lacking, making comparison between studies challenging.
- The VAS and DASH score were the most frequently PROs reported followed by additional PROs for the upper extremity.
- Characterizing PROs use directs future investigators toward selecting valid and applicable PROs to evaluate patient outcomes following orthopaedic trauma.

	Frequency of Publication (n=)
Journal of Orthopaedic Trauma (JOT)	
Visual Analog Scale (VAS)	56
Disabilities of the Arm, Shoulder, and Hand (DASH) score	30
Item Short Form-36 (SF-36)	31
Short Musculoskeletal Functional Assessment (SMFA)	27
Constant-Murley Score	19
Journal of Shoulder and Elbow Surgery (JSES)	
Constant-Murley Score	37
Disabilities of the Arm, Shoulder, and Hand (DASH) score	37
Visual Analog Scale (VAS)	35
Mayo Elbow Performance Score (MEPI)	30
American Shoulder Elbow Surgeons Score (ASES)	24
Journal of Hand Surgery (JHS)	
Disabilities of the Arm, Shoulder, and Hand (DASH) score	54
Visual Analog Scale (VAS)	40
quick-DASH	18
Michigan Hand Outcomes Questionnaire (MHQ)	14
Patient reported Wrist/Hand Evaluation (PRWHE)	14
Journal of Bone and Joint Surgery (JBJS)	
Disabilities of the Arm, Shoulder, and Hand (DASH) score	33
Visual Analog Scale	25
Item Short Form -36 (SF-36)	19
Constant-Murley Score	15
Study Specific (Non-validated Satisfaction Survey)	14
EQ-5D™ index score	10
Clinical Orthopaedics and Related Research (CORR)	
Visual Analog Scale (VAS)	8
Disabilities of the Arm, Shoulder, and Hand (DASH) score	7
Constant-Murley Score	5
Harris Hip score	5
Item Short Form-36 (SF-36)	3

TABLE 2: Top 5 published PROs by Journal.

1. Gagnier JJ. Patient reported outcomes in orthopaedics. *J Orthop Res*. 2017;35(10):2098-2108. doi:10.1002/jor.23604.