



# Examining Patient Goal Quality, Patient Activation, and Patient Reported Outcome Measures in an Orthopaedic Surgical Population

Paul M. Werth, MS; Sean Liu, BA; Clifford A. Reilly, MPH; Kevin J. McGuire, MD

## Introduction

Musculoskeletal procedures are prevalent in the United States and are expected to increase in demand multiple-fold as the population ages.<sup>1</sup> Despite the increasing frequency of such procedures, patients continue to report high levels of dissatisfaction.<sup>2</sup> Goal setting and achievement provides many benefits to patients and may improve patient outcomes.<sup>3,4</sup> However, few studies have investigated the effect of goal quality on patient outcomes. SMART criteria, which are already used in some aspects of rehabilitation, may provide a means of assessing goal quality.<sup>5</sup> Higher quality goals may improve patient outcomes and satisfaction due to their personalized and calibrated nature, which may manage expectations and identify targeted actions most appropriate for achieving the identified goal. The aims of this study are to: 1) investigate pre-operative patient goal quality, clarity, and specificity, 2) determine the association between goal quality and patient activation, and 3) determine the correlation between goal quality and scoring on patient reported outcome measures.

## Methods

- Retrospective observational study of 600 randomly selected patient goals from surgical patients across many orthopaedic subspecialties
- Chi-square or one-way ANOVA used to analyze relationship between patient characteristics and SMART criteria
- Binary logistic regression for each of the SMART criteria and patient activation
- Ordinal logistic regression for aggregated SMART criteria score and patient activation
- Mixed effects model for patient demography or SMART criteria and PROM score in THA and TKA

## Hypotheses

- H1:** ≥50% of goals will meet the specific, measurable, relevant, or time-bound SMART criteria
- H2:** <25% of goals will meet the specific, measurable, relevant, and time-bound SMART criteria
- H3:** Baseline demographic data will not significantly differ across goal quality
- H4:** The relationship between each applicable SMART criteria and patient activation will be significant and positive
- H5:** The relationship between each applicable SMART criteria and patient reported outcome measure will be significant and positive

## Results

### Preoperative Goal Quality and Relation to Patient Demographics

	0	1	2	3	4	p
<b>Total n</b>	74	195	258	68	5	
<b>BMI Category (%)</b>						<b>0.036</b>
Underweight (<18.5)	1 (1.6)	1 (0.6)	0 (0.0)	1 (1.6)	0 (0.0)	
Normal Weight (18.5-24.9)	7 (11.1)	24 (13.9)	35 (14.7)	12 (18.8)	0 (0.0)	
Overweight (25.0-29.9)	34 (54.0)	53 (30.6)	81 (34.0)	20 (31.2)	3 (60.0)	
Class I Obesity (30.0-34.9)	7 (11.1)	51 (29.5)	60 (25.2)	21 (32.8)	2 (40.0)	
Class II Obesity (35.0-39.9)	13 (20.6)	24 (13.9)	39 (16.4)	5 (7.8)	0 (0.0)	
Class III Obesity (≥40.0)	1 (1.6)	20 (11.6)	23 (9.7)	5 (7.8)	0 (0.0)	
<b>Employment Status (%)</b>						<b>0.006</b>
Employed	4 (19.0)	20 (29.0)	34 (41.5)	12 (66.7)	0 (0.0)	
Unemployed	2 (9.5)	6 (8.7)	8 (9.8)	1 (5.6)	2 (100.0)	
Retired	13 (61.9)	36 (52.2)	35 (42.7)	4 (22.2)	0 (0.0)	
Student	0 (0.0)	0 (0.0)	1 (1.2)	0 (0.0)	0 (0.0)	
Other	2 (9.5)	7 (10.1)	4 (4.9)	1 (5.6)	0 (0.0)	

Figure 1: Percentage of patient goals meeting SMART Criteria.

Figure 2: Patient Demographics Stratified by Number of SMART Criteria Satisfied in Goal. Age, gender, BMI, race, education, and sub-specialty not significant.

### Goal Quality and Relation to Patient Activation

	Intercept	PAM Level	SE	95% CI	p
<b>Specific</b>	1.49	<b>1.00</b>	0.01	0.98 – 1.01	<b>.78</b>
<b>Measurable</b>	11.40	<b>.99</b>	0.01	0.97 – 1.01	<b>.33</b>
<b>Relevant</b>	0.15	<b>1.00</b>	0.01	0.97 – 1.02	<b>.77</b>
<b>Time-bound</b>	0.07	<b>.99</b>	0.02	0.96 – 1.03	<b>.74</b>

Figure 3: Binary Logistic Regression with SMART criteria as Outcome.

- Patient activation did not predict goal specificity, measurability, relevance, or timing
- Patient activation was not a significant predictor of overall goal quality

## Results (Cont.)

### Goal Quality and Relation to Patient Reported Outcome Measures

PROM	# SMART Criteria Met	Estimates	CI	p
KOOS-PS	1	-2.73	-10.96 – 5.50	0.516
	2	-0.02	-7.74 – 7.71	0.997
	3	-1.96	-11.51 – 7.59	0.687
PROMIS-GPH	1	-2.20	-6.58 – 2.19	0.326
	2	-0.06	-4.18 – 4.05	0.976
	3	-3.61	-8.69 – 1.47	0.164

Figure 4. Random Intercepts and Slopes Mixed Effects Model Predicting PROM Outcomes Overtime for TKA

PROM	# SMART Criteria Met	Estimates	CI	p
HOOS-PS	1	2.69	-7.06 – 12.43	0.589
	2	4.43	-5.00 – 13.86	0.357
	3	7.46	-4.32 – 19.24	0.214
PROMIS-GPH	1	2.30	-1.69 – 6.30	0.258
	2	2.00	-1.89 – 5.90	0.313
	3	4.90	0.06 – 9.74	<b>0.047</b>

Figure 5. Random Intercepts and Slopes Mixed Effects Model Predicting PROM Outcomes Overtime for THA

## Conclusions

- Intervention is needed to define goal relevance to the patient's quality of life and time period in which expected to be met
- Patient activation is not related to goal quality, further study is needed
- PROM scores are not related to goal quality, except for PROMIS-GPH in THA patients, further study is needed

## References

- Kurtz S., Ong, K., Lau, E., Mowat, F., & Halpern, M. (2007). Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. *Journal of Bone and Joint Surgery - Series A*, 89(4), 780–785. <https://doi.org/10.2106/JBJS.F.00222>
- Jones, C. A., Beaupre, L. A., Johnston, D. W. C., & Suarez-Almazor, M. E. (2005). Total joint arthroplasties: Current concepts of patient outcomes after surgery. *In Clinics in Geriatric Medicine* (Vol. 21, Issue 3 SPEC. ISS., pp. 527–541). W.B. Saunders. <https://doi.org/10.1016/j.cger.2005.02.005>
- Brock K, Black S, Cotton S, Kennedy G, Wilson S, Sutton E. Goal achievement in the six months after inpatient rehabilitation for stroke. *Disabil Rehabil*. 2009;31(11):880-6. doi:10.1080/09638280802356179, 10.1080/09638280802356179
- Fisher K, Hardie RJ. Goal attainment scaling in evaluating a multidisciplinary pain management programme. *Clin Rehabil*. 2002;16(8):871-7. doi:10.1191/0269215502cr5540a
- Krasny-Pacini A, Evans J, Sohlberg MM, Chevignard M. Proposed Criteria for Appraising Goal Attainment Scales Used as Outcome Measures in Rehabilitation Research. *Arch Phys Med Rehabil*. 2016;97(1):157-70. doi:10.1016/j.apmr.2015.08.424, 10.1016/j.apmr.2015.08.424