



Supplementary Material

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Table i. Broad Injury Classification definitions.

Broad classification	Proximal humerus	Elbow	Distal radius
Category 1	Greater tuberosity	Radial head/neck	AO Type A
Category 2	2-part	Extra-articular	AO Type B
Category 3	> 2-part	Intra-articular	AO Type C

Table ii. Patient demographic and clinical injury information.

Demographic info	Value
Female, n (%)	498 (68)
Mean CCI (SD)	1.9 (1.7)
Marital status, n (%)	
Single	166 (23)
Partner/Married	365 (50)
Separated/Divorced/Widowed	203 (28)
Social status, n (%)	
Alone	153 (21)
Partner/Family/Friends	514 (70)
Part/Full-time care	67 (9)
Mean education time, yrs (SD)	13.7 (3.1)
Work status, n (%)	
Working	326 (44)
Homemaker	328 (45)
Retired	46 (6)
Unemployed/Workers Comp	34 (5)
Mean IMD (SD)	70.4 (23.6)
Location of fracture, n (%)	
Proximal humerus	173 (24)

Elbow	183 (25)
Distal radius	378 (51)
Broad Injury Classification, n (%)	
Category 1	377 (51)
Category 2	131 (18)
Category 3	226 (31)
Dominant side injured, n (%)	363 (49)
High-energy injury, n (%)	119 (16)
Neurovascular compromise, n (%)	38 (5)
Open injury, n (%)	13 (2)
Surgery, n (%)	118 (16)
Complication, n (%)	182 (25)
Prior dominant arm fracture, n (%)	137 (19)
Prior non-dominant arm fracture, n (%)	79 (11)
Antidepressant use, n (%)	174 (24)
Opioid use, n (%)	252 (34)

CCI, Charlson Comorbidity Index; IMD, Index of Multiple Deprivation.

Table iii. Descriptors of patient-reported outcome measures.

Outcome measure	Descriptor
PROMIS UE	Assess physical function of a patient's upper extremity dexterity
PROMIS PI	Assesses self-reported consequences of pain on the relevant patient-specific aspects of a patient's life
PROMIS Depression	Assesses self-reported negative mood, social support, and views of self as well as decrease in interests and purpose
PROMIS Anxiety	Assesses feelings of fear, dread, and restlessness
PROMIS ES	Assesses feelings of being cared for and being valued
PROMIS IS	Assesses a patient's perceived availability of assistance with specific material, cognitive, or task performances
PCS	Quantifies an individual's personalized pain experience, specifically their feelings and thoughts when they are in pain
PSEQ	Assesses a patient's confidence with their pain and how comfortable they feel performing tasks when in pain
TSK-11	Assesses fear of movement and re-injury after a specific injury
EQ-5D-3L	A quantitative method to measure generic health-related quality of life

EQ-5D-3L, EuroQol five-dimension three-level questionnaire; PCS, Pain Catastrophizing Scale; PROMIS ES, Patient-Reported Outcome Measurement Instrumentation System Emotional Support; PROMIS IS, PROMIS Instrumental Support; PROMIS PI, PROMIS Pain Interference; PROMIS UE, PROMIS Upper Extremity; PSEQ, Pain Self-efficacy Questionnaire; TSK-11, Tampa Scale for Kinesiophobia.

Table iv. Correlation matrix of mental health measures.

	PROMIS Depression	PROMIS Anxiety	PROMIS ES	PROMIS IS	PCS	PSEQ	TSK
PROMIS Depression	1						
PROMIS Anxiety	0.58	1					
PROMIS ES	-0.48	-0.44	1				
PROMIS IS	-0.46	-0.48	0.75	1			
PCS	0.61	0.60	-0.49	-0.47	1		
PSEQ	-0.53	-0.47	0.50	0.52	-0.22	1	
TSK	0.45	0.48	-0.47	-0.43	0.66	-0.55	1

PCS, Pain Catastrophizing Scale; PROMIS ES, Patient-Reported Outcome Measurement Instrumentation System Emotional Support; PROMIS IS, PROMIS Instrumental Support; PSEQ, Pain Self-efficacy Questionnaire; TSK-11, Tampa Scale for Kinesiophobia.

Table v. Bivariate analysis of variables with opioid use at two to four weeks.

Variable	Opioid use at two to four weeks		p-value
	Not using	Using	
Mean age, yrs (SD)	59 (22)	59 (19)	0.96*
Sex, n (%)			0.13†
Women	322 (64)	182 (36)	
Men	167 (70)	73 (30)	
Mean CCI (SD)	1.9 (1.7)	2.0 (1.8)	0.620*
Marital status, n (%)			< 0.001†
Single	92 (55)	74 (45)	
Partner/Married	275 (75)	90 (25)	
Separated	122 (57)	91 (43)	
Social support, n (%)			< 0.001†
Alone	34 (22)	123 (78)	
Full/Part-time care	56 (77)	17 (23)	
Partner/Friends/Family	399 (78)	115 (22)	
Mean education, yrs (SD)	14 (3.2)	14 (2.8)	0.390*
Work status, n (%)			< 0.001†
Working/Homemaker	248 (76)	78 (24)	
Unemployed	5 (11)	41 (89)	
Workers Comp	3 (8.8)	313 (91)	
Retired	233 (69)	105 (31)	
Mean IMD Factor (SD)	72.5 (23.0)	66.0 (24.2)	< 0.001*

Broad Injury Classification, n (%)			0.039†
Greater tuberosity	267 (70)	115 (30)	
2-part	86 (64)	48 (36)	
> 2-part	136 (60)	91 (40)	
Dominant-side injury, n (%)			0.980†
Yes	242 (66)	126 (34)	
No	247 (66)	129 (34)	
High-energy injury, n (%)			< 0.001†
Yes	45 (38)	74 (62)	
No	444 (71)	181 (29)	
Neurovascular compromise, n (%)			< 0.001†
Yes	14 (37)	24 (63)	
No	475 (67)	231 (33)	
Open injury, n (%)			0.390†
Yes	10 (77)	3 (23)	
No	479 (66)	252 (34)	
Surgery, n (%)			0.031†
Yes	68 (57)	51 (43)	
No	421 (67)	204 (33)	
Complication, n (%)			< 0.001†
Yes	47 (26)	136 (74)	
No	442 (79)	119 (21)	
Prior dominant side fracture, n (%)			0.690†

Yes	90 (64)	50 (36)	
No	399 (66)	205 (34)	
Prior non-dominant side fracture, n (%)			0.089†
Yes	47 (57)	35 (43)	
No	442 (67)	220 (33)	
Antidepressant use, n (%)			0.015†
Yes	19 (11)	160 (89)	
No	470 (83)	95 (17)	
Mean mental health measure score (SD)			< 0.001*
PROMIS Depression	49 (9.1)	58 (11)	
PROMIS Anxiety	48 (9.0)	58 (9.9)	
PROMIS Pain Interference	66 (6.4)	69 (6.6)	
PROMIS Emotional Support	57 (7.3)	44 (9.8)	
PROMIS Instrumental Support	58 (6.3)	47 (8.5)	
PCS	18 (4.5)	24 (8.1)	
PSEQ	10 (2.3)	7.1 (2.9)	
TSK-11	25 (6.5)	31 (6.3)	
Likert Pain Scale	8.4 (1.2)	9.1 (1.1)	
PROMIS UE	25 (6.2)	23 (6.2)	
EQ-5D-3L	0.33 (0.32)	0.16 (0.39)	
Patient satisfaction with providers	8.8 (1.0)	7.0 (1.9)	
Patient satisfaction with hospital services	8.3 (1.3)	5.8 (2.1)	

*Independent-samples *t*-test

†Chi-squared test

CCI, Charlson Comorbidity Index; EQ-5D-3L, EuroQol five-dimension three-level questionnaire; IMD; PCS, Pain Catastrophizing Scale; PROMIS, Patient-Reported Outcome Measurement Instrumentation System; PROMIS UE, PROMIS Upper Extremity; PSEQ, Pain Self-efficacy Questionnaire; TSK-11, Tampa Scale for Kinesiophobia.

Table vi. Bivariate analysis of variables with opioid use at six to nine months.

Variable	Opioid use at two to four weeks		p-value
	Mean (SD) for continuous vars # of patients (row %) for categorical vars		
	Not using	Using	
Mean age, yrs (SD)	59 (21)	59 (19)	0.920*
Sex, n (%)			0.180†
Women	448 (89)	56 (11)	
Men	221 (92)	19 (7.9)	
Mean CCI (SD)	1.9 (1.8)	2.2 (1.8)	0.240*
Marital status, n (%)			< 0.001†
Single	141 (85)	25 (15)	
Partner/Married	344 (94)	21 (5.8)	
Separated	184 (86)	29 (14)	
Social support, n (%)			< 0.001†
Alone	109 (69)	48 (30.6)	

Full/Part-time care	72 (99)	1 (1.4)	
Partner/Friends/Family	488 (95)	26 (5.0)	
Mean education (SD)	14 (3.1)	13 (2.5)	0.680*
Work status, n (%)			< 0.001†
Working/Homemaker	311 (95)	15 (4.6)	
Unemployed	30 (65)	16 (35)	
Workers Comp	23 (68)	11 (32)	
Retired	305 (90)	33 (10)	
Mean IMD Factor (SD)	71 (24)	64 (24)	0.0210*
Mean Broad Injury Classification (SD)			0.520*
Greater tuberosity	348 (91)	34 (9)	
2-part	118 (88)	16 (12)	
> 2-part	202 (89)	25 (11)	
Dominant-side injury, n (%)			0.230†
Yes	326 (89)	42 (11)	
No	343 (91)	33 (9)	
High-energy injury, n (%)			0.0078†
Yes	99 (83)	20 (17)	
No	570 (91)	55 (9)	
Neurovascular compromise, n (%)			0.0042†
Yes	29 (76)	9 (24)	
No	640 (91)	66 (9)	
Open injury, n (%)			0.220†

Yes	13 (100)	0 (0)	
No	656 (90)	75 (10)	
Surgery, n (%)			0.320†
Yes	104 (87)	15 (13)	
No	565 (90)	60 (10)	
Complication, n (%)			< 0.001†
Yes	135 (74)	48 (26)	
No	534 (95)	27 (5)	
Prior dominant side fracture, n (%)			0.970†
Yes	126 (90)	14 (10)	
No	543 (90)	61 (10)	
Prior non-dominant side fracture, n (%)			0.290†
Yes	71 (87)	11 (13)	
No	598 (90)	64 (10)	
Antidepressant use, n (%)			< 0.001†
Yes	119 (66)	60 (34)	
No	550 (97)	15 (3)	
Mean mental health measure scores (SD)			
PROMIS Depression	51 (10)	60 (11)	< 0.001*
PROMIS Anxiety	51 (10)	62 (9.0)	< 0.001*
PROMIS Pain Interference	67 (6.4)	70 (7.9)	< 0.001*

PROMIS Emotional Support	54 (9.8)	41 (8.6)	< 0.001*
PROMIS Instrumental Support	56 (8.3)	44 (5.1)	< 0.001*
PCS	19 (6.2)	25 (7.9)	< 0.001*
PSEQ	9.3 (2.7)	6.4 (2.8)	< 0.001*
TSK-11	26.1 (7.0)	32.8 (5.1)	< 0.001*
Likert Pain Scale	8.5 (1.2)	9.3 (1.0)	< 0.001*
PROMIS UE	24 (6.3)	22 (5.8)	0.0012*
EQ-5D-3L	0.31 (0.34)	-0.033 (0.32)	< 0.001*
Patient satisfaction with providers	8.4 (1.5)	6.5 (1.9)	< 0.001*
Patient satisfaction with hospital services	7.7 (1.9)	5.4 (2.1)	< 0.001*

*Independent-samples-tests

†Chi-squared test

CCI, Charlson Comorbidity Index; EQ-5D-3L, EuroQol five-dimension three-level questionnaire; IMD, Index of Multiple Deprivation; PCS, Pain Catastrophizing Scale; PROMIS, Patient-Reported Outcome Measurement Instrumentation System; PROMIS UE, PROMIS Upper Extremity; PSEQ, Pain Self-efficacy Questionnaire; TSK-11, Tampa Scale for Kinesiophobia.