



Utilization and Outcomes of a Transitional Pain Service in High-Risk Surgical Veterans



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Introduction: The postoperative transition from acute to ongoing care may be high-risk for patients with psychiatric or substance use disorders who are prone to prolonged pain and opioid use. Transitional Pain Services (TPSs) support pain control, tapering, and recovery, but predictors of high utilization are unclear.

Materials and Methods: We conducted a retrospective cohort study of surgical patients managed by a TPS at a Veterans Affairs medical center from February 2024–February 2025. Outcomes included total postoperative opioid use, morphine milligram equivalents (MME), TPS duration (days), and provider contacts, analyzed using multivariable linear and logistic regression. Predictors included in the models were demographics, pain catastrophizing, psychiatric issues, substance use history, and preoperative opioid use.

Results: Among 345 consecutive patients, 94% had chronic pain, 26% used opioids preoperatively, 69% had psychiatric diagnosis, and 79% had a substance use history. Of the preoperative opioid users (n=88), 5.7% were discharged on opioid doses higher than baseline, but 28% were tapered to lower doses. Of the opioid naïve patients, 2.3% were discharged prior to full opioid taper. Median postoperative use was 218 MME (IQR 165–428), TPS management duration 31 days (IQR 12–36), and provider contacts 5 (IQR 3–6). Pain catastrophizing was the strongest overall predictor: each point increase associated with 31 MME higher opioid use (p=0.023), 3.9 additional TPS days (p<0.001), and increased contacts (p=0.015). Active nicotine use (p=0.005) and preoperative opioid ≥50 MME/day (p=0.006) also predicted higher opioid consumption.

Conclusions: In this high-risk Veteran cohort, the involvement of a Transitional Pain Service was associated with low rates of prolonged opioid use. Pain catastrophizing as well as opioid and nicotine use were strong predictors of utilization, underscoring the value of early psychosocial screening.

Variable	Definition	Rationale
Demographic Factors		
Age	Continuous, years at surgery	Age-related changes in opioid metabolism and pain perception
Sex (Male)	Binary (male vs. female)	Sex differences in opioid response and postoperative pain trajectories
Psychosocial Factors		
Brief Pain Catastrophizing Scale (BPCS)	Continuous score (0-16)	Strong predictor of prolonged opioid use and poor surgical outcomes
Alcohol (AUDIT-C)	Continuous score (0-12)	Alcohol use disorders associated with persistent postoperative opioid use
Substance Use Indicators		
Active Nicotine Use	Binary (yes/no)	Smoking predicts higher opioid requirements and prolonged use
Current Cannabis Use	Binary (yes/no)	Emerging evidence of altered opioid requirements in cannabis users
Any History of SUD	Binary (yes/no)	Prior substance use increases risk of aberrant opioid behaviors
Clinical Factors		
Psychiatric Diagnosis	Binary (depression, anxiety, or PTSD)	Mental health conditions are risk factors for chronic opioid use, particularly in veterans
Current Depression	Binary (yes/no)	Active depression associated with poor pain outcomes
Preoperative Opioid ≥50 MME/day	Binary (yes/no)	Prior opioid exposure strongest predictor of persistent use; 50 MME threshold per CDC guidelines
Non-opioid Analgesic Use	Binary (NSAIDs, acetaminophen, or topical)	Marker of baseline pain complexity and multimodal engagement

Table 1. Predictor Variable Definitions and Rationales for Inclusion in Analytic Models. Summary of 11 predictor variables included in regression models for postoperative opioid use and transitional pain service utilization. Variables were selected based on established associations with persistent opioid use, clinical relevance to veterans, and database availability. Variables represent demographic, psychosocial, substance use, and clinical domains.

Characteristic	Value ¹
Demographics	
Age, years	63 (56-74)
Male sex	309 (90%)
Surgical Characteristics	
Orthopedic surgery	227 (66%)
Neurosurgery	40 (12%)
Podiatry	53 (15%)
Other surgeries	25 (7%)
Outpatient procedure	130 (38%)
Psychosocial Factors	
Pain catastrophizing score (BPCS)	7.7 (4.0-12.0)
AUDIT-C score	1.7 (0-3.0)
Psychiatric Comorbidities	
Any psychiatric diagnosis ²	237 (69%)
Depression	153 (44%)
PTSD	155 (45%)
Anxiety	92 (27%)
Substance Use	
Any SUD history ³	273 (79%)
Current nicotine use	50 (14%)
Current cannabis use	88 (26%)
Baseline Pain Management	
Chronic pain diagnosis	326 (94%)
Preoperative opioid use	88 (26%)
Preop MME/day (among users)	22.5 (10-60)
Preop opioid ≥50 MME/day	26 (30% of users)
Anticoagulant use	37 (11%)
TPS Outcomes	
Duration of care, days	31 (12-36)
Total provider contacts	5 (3-6)
Postoperative opioid use, total MME	218 (165-428)
Postoperative MME/day	17.5 (7.5-21.4)
Discharged on higher dose than baseline	11 (3.2%)

Table 2. ¹Values are n (%) or median (IQR) ²Depression, anxiety, or PTSD ³Any history of alcohol, opioid, stimulant, or other substance use disorder

Predictors	Postoperative Opioid Use (MME)			TPS Duration (Days)			Provider Contacts (Number)		
	β	95% CI	p	β	95% CI	p	β	95% CI	p
Age	-11.7	-39.6 - 16.2	0.41	0.5	-1.6 - 2.6	0.63	-0.11	-0.32 - 0.11	0.32
Male Sex	-38.8	-126.1 - 48.4	0.38	-3.4	-9.9 - 3.0	0.30	-0.47	-1.13 - 0.19	0.17
Pain Catastrophizing (BPCS)	30.7	4.2 - 57.1	0.023	3.9	1.9 - 5.9	<0.001	0.25	0.05 - 0.45	0.015
Alcohol Use (AUDIT-C)	-30.7	-57.2 - -4.1	0.024	0.7	-1.2 - 2.7	0.47	-0.07	-0.27 - 0.13	0.47
Psychiatric Diagnosis	-11.7	-72.3 - 48.8	0.70	0.3	-4.2 - 4.8	0.90	-0.16	-0.61 - 0.30	0.50
Current Depression	50.1	-18.6 - 118.8	0.15	1.3	-3.8 - 6.4	0.61	0.16	-0.36 - 0.68	0.54
Any SUD History	-74.2	-229.7 - 81.3	0.35	7.2	-4.3 - 18.7	0.22	0.09	-1.09 - 1.27	0.88
Active Nicotine Use	108.8	33.0 - 184.6	0.005	-1.6	-7.2 - 4.0	0.57	-0.2	-0.77 - 0.38	0.50
Current Cannabis Use	-10.1	-68.9 - 48.6	0.73	-0.9	-5.3 - 3.4	0.68	0.35	-0.10 - 0.79	0.13
Preop Opioid ≥50 MME/day	169.1	49.7 - 288.5	0.006	3.5	-5.4 - 12.3	0.44	0.54	-0.36 - 1.44	0.24
Anticoagulant Use	98.1	13.5 - 182.8	0.023	6.2	-0.1 - 12.4	0.053	0.92	0.28 - 1.56	0.005
Preop Non-opioid Analgesics	-34.7	-97.0 - 27.5	0.27	1.2	-3.4 - 5.8	0.61	0.39	-0.09 - 0.86	0.11
Model R ²	0.082			0.039			0.047		

Table 3. Multivariable Linear Regression Models for Primary Outcomes. Linear regression analyses examining predictors of continuous outcomes among 345 patients managed by the Veterans Affairs Transitional Pain Service. All outcomes were capped at the 90th percentile to minimize outlier influence (863 MME for opioid use, 64 days for TPS duration, 8 for provider contacts). Values shown are β coefficients with 95% confidence intervals. Bold indicates p<0.05. Model performance assessed by adjusted R².

Predictors	High Opioid Use (>428 MME)			Extended Duration (>36 Days)			High Contacts (>6)		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Age	0.97	0.73-1.30	0.85	1.09	0.83-1.45	0.53	1.06	0.81-1.38	0.69
Male Sex	0.69	0.31-1.59	0.37	0.7	0.32-1.61	0.39	0.6	0.28-1.30	0.18
Pain Catastrophizing (BPCS)	1.39	1.07-1.81	0.015	1.6	1.22-2.10	0.001	1.18	0.93-1.50	0.18
Alcohol Use (AUDIT-C)	0.71	0.51-0.95	0.027	1.13	0.87-1.46	0.35	0.88	0.68-1.14	0.34
Psychiatric Diagnosis	0.78	0.42-1.45	0.43	1.28	0.71-2.37	0.42	0.85	0.49-1.50	0.58
Current Depression	1.43	0.73-2.76	0.3	1.06	0.55-2.02	0.86	1.49	0.80-2.76	0.21
Any SUD History	0.54	0.14-2.38	0.39	NA*	NA	0.98	1.23	0.31-6.17	0.78
Active Nicotine Use	2.25	1.10-4.57	0.025	1.07	0.50-2.16	0.86	1.4	0.70-2.77	0.34
Current Cannabis Use	0.91	0.49-1.63	0.76	0.93	0.52-1.63	0.8	1.54	0.91-2.60	0.11
Preop Opioid ≥50 MME/day	2.16	0.84-5.49	0.11	0.51	0.13-1.52	0.26	0.54	0.18-1.42	0.23
Anticoagulant Use	2.2	1.00-4.72	0.045	1.65	0.75-3.53	0.2	2.6	1.25-5.42	0.01
Preop Non-opioid Analgesics	0.83	0.44-1.59	0.56	1.12	0.61-2.10	0.73	1.72	0.94-3.25	0.09
Model Tjur R ²	0.091			0.062			0.068		

Table 4. Multivariable Logistic Regression Models for High Utilization (>75th Percentile). Logistic regression analyses identifying predictors of patients in the highest quartile (>75th percentile) of utilization. High utilization defined as: >428 MME for postoperative opioid use, >36 days for TPS duration, and >6 for provider contacts. Values shown are odds ratios with 95% confidence intervals. Bold indicates p<0.05. Model performance assessed by Tjur R². *Model convergence failure.