Preoperative NarxCare Narcotics, Sedatives, and Stimulants Scores of >100: Worse PROMs and Dissatisfaction After Primary TKA

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INTRODUCTION:

The NarxCare platform analyzes real-time controlled substance data from prescription drug monitoring programs. Every Narx Report includes patient-specific scores for narcotics, sedatives, and stimulants. These scores are based on a complex algorithm, ranging from 000 to 999, with higher scores equating to higher numbers of prescribers, MME, pharmacies, and overlapping prescriptions. While the overdose risk score (ORS, another score provided by NarxCare which combines these three subtypes) has previously been studied and a preoperative ORS of ≥300 has been linked with increased healthcare utilization following total hip arthroplasty (TKA), there is minimal understanding of the impact of each of the NarxCare score subtypes. This study aimed to evaluate the association preoperative Narcotic, Sedative, and Stimulant score on PROMs and satisfaction at 1-year post-TKA.

METHODS:

All patients who underwent primary TKA at a USA tertiary healthcare system from November 2018-December 2022 were eligible. Patients with incomplete PROMs or missing Narx score at any time point were excluded. This led to 3,445 patients being enrolled in this study. Multivariable linear regression models were used to assess the relationship between baseline Narx scores and 1-year PROMs. The PROMs evaluated included the Knee Disability and Osteoarthritis Outcome Score (KOOS) Pain, Physical Function Shortform (PS), Joint Replacement (JR), and Veteran RAND-12 mental component score (VR-12MCS). Clinically relevant improvements were determined by the minimal clinically important difference (MCID) and Patient Acceptable Symptom State (PASS) thresholds. All models were controlled for pre-specified demographics and surgical confounding variables. RESULTS:

Results

A preoperative Narcotics score of 100-199 has higher odds of failure to achieve MCID in HOOS PS (p<0.049), while the ORS has to increase to 200-299 before it becomes associated with failure to achieve MCID in HOOS Pain (p=0.004) and JR (p=0.001). Preoperative Narcotics of 100-199 is associated with failure to reach PASS threshold in HOOS Pain (p=0.028) (Table 1). Patients with preoperative narcotics score of 100-199 are 31% more likely to be dissatisfied at 1-year (p=0.02).

A preoperative sedatives score of 100-199 has higher odds of failure to achieve MCID in HOOS Pain (p<0.002), HOOS JR (p=0.02) and PS (p=0.104). Preoperative sedatives score of 1-99 is associated with failure to reach PASS threshold in HOOS PS (p=0.014) (**Table 2**). Patients with preoperative sedatives score of 100-199 are 49% more likely to be dissatisfied at 1-year (p=0.002).

A preoperative stimulant score greater than 0 has higher odds of failure to achieve PASS threshold in HOOS JR (p=0.015), but no association with HOOS Pain or PS. Preoperative stimulant score had no significant association with failing to achieve MCID in any HOOS domain **(Table 3)**. Patients with preoperative stimulant score of >0 are 57% more likely to be dissatisfied at 1-year (p=0.024).

DISCUSSION AND CONCLUSION:

Preoperative Narcotics and Sedatives score, a measure of prescription opioid and sedative use, of just 1-99 may significantly decrease the chances of meaningful improvements in knee pain and function, as well as satisfaction at 1-year. A preoperative stimulant score greater than 0 is associated with lower improvement in hip function. A multidisciplinary approach is warranted to nullify the detrimental effects of opioids, sedatives and stimulant drug use to improve patient perceived outcomes.

Table 1 - Multivariable logistic regression model, using failure to reach MCID and attainment of PASS Threshold in KOOS Pain, PS, and JR as outcomes for <u>Narcotics</u>

	MCTD KOO	C Dain	MCTD VOC	NO DO	MCID KO	NO TO	FASS THREShold In K	00
	OR (05% CT) R		SICID KOC	OP (05% CD P		Jojk		Γ
	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P		1
Baseline Nacotics Score (1-99 v 0)	2.10 (1.34 - 3.29)	0.076	0.96 (0.70 - 1.30)	0.780	1.37 (0.92 - 2.04)	0.122	Baseline Stimulant	t
Baseline Nacotics Score (100-199 v 0)	2.03 (1.19 - 3.47)	0.009	1.71 (1.22 - 2.39)	0.002	1.62 (1.02 - 2.57)	0.042	Score (>=0 V 0)	ť
Baseline Nacotica Score (200-299 v 0)	2.22 (1.11-4.42)	0.024	1.51 (0.94-2.41)	0.086	2.18 (1.22 - 3.93)	0.009	Baseline Stimulant Score (>=0 v 0)	Ϊ,
Baseline Nacotica Score (300-399 v 0)	2.27 (1.00 - 5.15)	0.049	2.62 (1.58 - 4.34)	<0.001	2.70 (1.41 - 5.18)	0.003	This model was adjust Anesthesia, PROM Ph	enc
Baseline Nacotica Score (400-499 v 0)	2.96 (1.07 - 8.15)	0.036	1.56 (0.69 - 3.54)	0.288	1.90 (0.70 - 5.17)	0.208		
Baseline Nacotics Score (>=500 v 0)	4.02 (1.10 - 14.66)	0.035	2.03 (0.64 - 6.46)	0.232	1.57 (0.35 - 7.13)	0.560		
	KOOS Pain	PASS	KOOS PS I	PASS	KOOS JR	PASS		
Baseline Nacotica Score (1-99 v 0)	1.51 (1.23 - 1.85)	0.23	1.41 (1.13 - 1.76)	0.36	1.29 (1.06 - 1.57)	0.59		
Baseline Nacotica Score (100-199 v 0)	1.80 (1.42 - 2.28)	<0.001	1.70 (1.31 - 2.19)	<0.001	1.58 (1.25 - 1.99)	<0.001		
Baseline <u>Nacotica</u> Score (200-299 v 0)	1.50 (1.11 - 2.02)	0.008	1.61 (1.17 - 2.22)	0.003	1.47 (1.09 - 1.99)	0.011		
Baseline <u>Nacotica</u> Score (300-399 v 0)	2.41 (1.71 - 3.41)	<0.001	2.63 (1.84 - 3.76)	<0.001	2.01 (1.42 - 2.85)	<0.001		
Baseline Nacotica Score (400-499 v 0)	2.20 (1.33 - 3.62)	0.002	2.65 (1.59 - 4.41)	<0.001	2.37 (1.41 - 3.97)	0.001		
Baseline Nacotics	4.02	<0.001	3.15	0.002	3.97	0.001		

	MCID KOO	S Pain	MCID KOO	OS PS	MCID KOOS JR		
	OR (95% CI)	Р	OR (95% CI)	Р	OR (95% CI)	Р	
Baseline Stimulant Score (>=0 v 0)	1.10 (0.43 - 2.83)	0.836	1.82 (1.04 - 3.19)	0.037	1.43 (0.66 - 3.11)	0.362	
	KOOS Pain	PASS	KOOS PS I	PASS	KOOS JR I	PASS	
Baseline Stimulant	1.10	0.631	1.35	0.160	0.94 (0.62 - 1.43)	0.780	

	MCID KOOS Pain MCID KOOS PS		MCID KOOS IB			MCID KOOS Pain		MCID KOOS PS		MCID KOOS JR			
	MCID KOO	5 ram	MCID KOC	515	SICID KOC) 3 JK		OR (95% CI)	Р	OR (95% CI)	Р	OR (95% CI)	P
Baseline Stimulant	1.10	P 0.836	1.82	P 0.037	1.43	0.362	Basseline Sedative Score (1-99 v 0)	1.97 (1.28 - 3.04)	0.002	1.12 (0.84 - 1.48)	0.436	1.40 (0.96 - 2.04)	0.078
Score (>=0 v 0)	(0.43 - 2.83) KOOS Pain	PASS	(1.04 – 3.19) KOOS PS I	PASS	(0.66 - 3.11) KOOS JR I	PASS	Baseline Sedative Score (100-199 v 0)	1.94 (1.07 – 3.52)	0.028	1.37 (0.93 - 2.02)	0.112	1.81 (1.10 – 2.97)	0.020
Baseline Stimulant Score (>=0 v 0)	1.10 (0.74 - 1.66)	0.631	1.35 (0.89 - 2.06)	0.160	0.94	0.780	Baseline Sedative Score (200-299 v 0)	2.14 (0.92 - 4.96)	0.078	1.93 (1.15 – 3.26)	0.014	1.71 (0.81 – 3.59)	0.159
his model was adjuste nesthesia, PROM Ph	ed for Age, Sex, Bl motype	MI, Race,	Education, Smok	ing, ADI,	CCI, Insurance, I) Diagnosis,	Baseline Sedative Score (300-399 v 0)	4.87 (2.38 – 9.98)	<0.001	2.85 (1.62 - 5.02)	<0.001	3.32 (1.69 - 6.53)	0.001
							Baseline Sedative Score (400-499 v 0)	1.96 (0.57 - 6.79)	0.288	1.95 (0.89 - 4.29)	0.096	1.58 (0.53 - 4.72)	0.416
							Baseline Sedative Score (>=500 v 0)	6.49 (1.74 - 24.29)	0.005	2.50 (0.75 - 8.36)	0.136	3.69 (0.98 - 13.89)	0.053
								KOOS Pain PASS		ASS KOOS PS PASS		KOOS JR PASS	
							Baseline Sedative Score (1-99 v 0)	1.57 (1.30 – 1.89)	<0.001	1.42 (1.16 – 1.75)	0.001	1.33 (1.11 – 1.60)	0.002
							Baseline Sedative Score (100-199 v 0)	1.71 (1.34 – 2.20)	<0.001	1.82 (1.39 – 2.37)	<0.001	1.60 (1.25 – 2.04)	<0.001
							Baseline Sedative Score (200-299 v 0)	1.62 (1.12 - 2.36)	0.011	2.21 (1.51 - 3.24)	<0.001	1.75 (1.21 – 2.53)	0.003
							Baseline Sedative Score (300-399 v 0)	2.25 (1.48 - 3.40)	<0.001	1.95 (1.24 - 3.07)	0.004	1.68 (1.10 – 2.58)	0.017
							Baseline Sedative	3.02	<0.001	3.50	-0.001	3.23	<0.001
							Score (400-499 v 0)	(1.80 - 5.07)		(2.05 - 5.95)	<0.001	(1.86 - 5.61)	