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Orthopaedic Surgery

Title

A Comparison of Prognostic Models to Facilitate Surgical Decision Making for Patients with Spinal Metastatic Disease

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A standardized protocol reduces opioid use and facilitates opioid cessation following anterior cervical spine surgery

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Introduction

- Opioids are abundantly prescribed following anterior cervical spine (ACS) surgery
- At UCD significant variability in prescribing practices between providers
- Orthopaedic surgeons are third highest prescribers of opioids
- Goal:
 - Reduce variability in prescribing and decrease serious consequences associated with opioid over-prescription

Design/Sample

- Prospective and retrospective study
- Patients who underwent ACS surgery between 2015-2022 were compared
 - Patients from 2015-2021 (pre-protocol) and 2022 patients (post-protocol)
- Opioid Protocol
 - Discharged w/ 5-10 mg oxycodone (or equivalent) q4-6 hours with a maximum of 50 mg morphine equivalents (MME) per day for 2 weeks, with one refill at 2 weeks postoperatively if needed

Analysis

- Pre- and post-protocol groups compared on basis of opioid type, dosing, frequency, duration, and number of refills prior to first visit
- Categorical variables were compared with chi-squared test, and continuous variables were compared using t-tests. All statistical analyses were two-sided and conducted using SAS® Studio software (SAS Institute Inc., Cary, NC), with level of significance set at p<0.05.

Results

Table 1: Patient population summary.

	Group		P-value
	Pre-Protocol (N = 315)	Post-Protocol (N = 83)	
Age (mean ± std dev)	57.1±12	55.4±13	0.21
Levels (mean ± std dev)	2.02±0.78	2.64±0.76	<0.001*
Length of Stay (LOS) (mean ± std dev)	2.3±3.1	2.3±1.7	0.87
Discharge Disposition			
Home	296 (93.97%)	76 (91.57%)	0.43
Not-Home	19 (6.03%)	7 (8.43%)	
Opioid Prescriber			
Attending	0 (0%)	1 (1.22%)	<0.001*
Resident	93 (31%)	4 (4.88%)	
Midlevel	207 (69%)	75 (91.46%)	

Asterisks (*) indicates statistical significance with p-value < 0.05.

Table 2: Opioids Prescribed.

	Group		Total
	Pre-Protocol	Post-Protocol	
Opioid Prescribed			
Codeine	3 (1%)	1 (1.25%)	4 (1.05%)
Hydrocodone	50 (16.67%)	12 (15%)	62 (16.32%)
Hydromorphone	6 (2%)	3 (3.75%)	9 (2.37%)
Oxycodone	214 (71.33%)	64 (80%)	278 (73.16%)
Oxycontin	4 (1.33%)	0 (0%)	4 (1.05%)
Roxicodone	20 (6.67%)	0 (0%)	20 (5.26%)
Tramadol	3 (1%)	0 (0%)	3 (0.79%)
Total	300 (78.95%)	80 (21.05%)	380 (100%)

Missing prescriptions include 18.

Table 3: Opioid Morphine Milligram Equivalents (MME) details.

	Group		p-value
	Pre-Protocol	Post-Protocol	
Opioid Dose Prescribed (mg) (mean ± std dev)	6.3 ± 5	5.6 ± 3.3	0.22
MME Prescribed			
Daily MME (mean ± std dev)	117.4 ± 63.6	42 ± 20	<0.001*
Total MME (mean ± std dev)	715.7 ± 522.2	330 ± 239.6	<0.001*
Refilled Medication Prior to Initial Follow-Up			
Yes	62 (20.33%)	21 (26.25%)	0.25
No	243 (79.67%)	59 (73.75%)	
Still on Opioids after 12 Weeks Post-Op			
Yes	64 (20.71%)	8 (10.39%)	0.03*
No	245 (79.29%)	69 (89.61%)	

Missing prescriptions include 21.

Asterisks (*) indicates statistical significance with p-value < 0.05.

Summary

Our study examined the effect of developing a reliable protocol for prescribing opioids for postoperative pain following ACS surgery. Our goal was to progress toward completion of an effective, research-based, and consistent opioid prescription protocol. This protocol proved to effectively reduce total MME administration.

Long-term, we hope this study may assist in the development of opioid prescribing protocols for other orthopaedic procedures at UC Davis Medical Center

Conclusions/Further Study

- Implementation of a standardized protocol for post-operative opioid prescription following ACS surgery reduced daily and total MME prescribed, with fewer patients remaining on opioids at three months follow-up. Future studies may be warranted to verify any changes in pain scores.

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