

Administration and Prescription of Opioids in Emergency Departments: A Retrospective Study

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ABSTRACT

Introduction. Opioid overdose caused 47,600 deaths in 2017 in the United States. Emergency departments (EDs) are one source of opioids that could be abused or diverted for non-medical use. Bills to reduce opioid use in EDs have been passed in multiple states; however, Kansas does not have a bill regulating opioid administration. This study sought to identify characteristics that influence opioid administration and prescription at EDs in Wichita, Kansas.

Methods. This was a retrospective chart review analyzing patient encounters from EDs of three hospitals in Wichita, Kansas during May 2018. Information collected from charts included demographic and insurance information, as well as pain evaluation, diagnosis, disposition, provider education, and provider documentation of efforts to limit opioid abuse.

Results. Of the 1,444 encounters included in the analysis, providers administered opioids in the ED during 17.4% of visits and prescribed opioids for outpatient treatment for 10.6% of ED patient encounters. Subjective pain rating and provider credentials were associated significantly with opioid prescription.

Conclusion. The prevalence of opioid administration and prescription in participating emergency departments is roughly equivalent to current best-practice data from hospitals utilizing strong opioid-reduction protocols. *Kans J Med* 2021;14:1-4

INTRODUCTION

In the U.S., opioid overdose was a cause of 42,249 deaths in 2016 (13.3 deaths per 100,000) and contributed to 67.8% of all drug overdose deaths in 2017.^{1,2} The rate of drug overdose resulting in death in Kansas in 2016 was 11.8 per 100,000 (333 total drug overdose deaths).² In 2010, 31% of emergency department (ED) visits nationally resulted in an opioid prescription.³ With more than one-third of visits involving opioids, EDs often are evaluated for opioid prescription abuse. However, little research has been conducted on the opioid administration of Kansas EDs.

The number of opioid prescriptions from an ED varies greatly, even for a single medical indication. For example, states varied from 40% to 2.8% of patients being prescribed an opioid medication from the ED for ankle sprains among opioid-naïve patients treated from 2011 to 2015.⁴ In Kansas, 35.7% of ankle sprain patients received an opioid prescription from an ED.

Guidelines for acute pain, including the Alternatives To Opioids protocol (ALTO)⁵ and the U.S. Centers for Disease Control and Prevention's Chronic Pain Guidelines (CDC-CPG)⁶ are available to guide opioid medication decisions. The ALTO protocol can be used to guide administration and prescription of analgesics for indications that include headache/migraine, musculoskeletal pain, renal colic, abdominal pain, bone fracture, and joint dislocation. The protocol encourages the use of analgesics, such as acetaminophen, ibuprofen, and ketorolac, prior to opioid administration.⁵ The CDC-CPG guides the provider into setting goals for pain control, discussing appropriate risks and benefits with the patients, and setting criteria for minimizing long-term opioid use,⁶ but defers to the American College of Emergency Physician's (ACEP) 2012 clinical policy guideline for opioid management of chronic pain in the ED. The ACEP recommends against prescribing opioids for acute exacerbation of chronic pain in the ED [Level C recommendation].⁷

Adopting opioid prescribing guidelines has reduced opioid prescribing rates drastically in some locations.⁸ For example, a study performed in both a community and an academic medical center tested the implementation of a prescribing guideline that resulted in a decline of opioid prescriptions from 52.7% to 29.8% of patient visits. Even in a hospital with less frequent opioid prescribing practices, adopting guidelines has reduced opioid administration in the ED from 22.5% to 17.7%.⁹ In 2017, 17 states had bills including opioid prescription guidelines,¹⁰ however, Kansas was not one of those states. As of 2020, Kansas did not have a bill regarding opioid prescription. Additionally, Kansas had little published research on opioid prescription practices. The purpose of this study was to identify what patient and provider characteristics were associated with opioid administration and prescription in EDs in Wichita, Kansas.

METHODS

Procedures. This study was approved by the Human Subjects Committee at the University of Kansas School of Medicine-Wichita and the Institutional Review Board of hospitals participating in this study. ED medical records were collected for the month of May 2018 from three hospitals in Wichita, Kansas: a large, urban, Level I trauma and tertiary referral center, a large community hospital, and a suburban community hospital.

More than 8,000 charts from all ED visits to each of the hospitals were abstracted and de-identified. Data abstraction was initiated with 246 charts completed (in chronological order from two of three hospitals). Upon further evaluation, the study team decided to reduce the total number of charts reviewed to preserve time and effort. The remaining charts were randomized, and a total of 1,500 charts (500 per hospital) fitting inclusion criteria were selected for data abstraction, including the initial 246 charts.

Participants. All patients presenting to these EDs were eligible for study selection. Inclusion criteria included patients aged 13 years or older (patients known to be at greatest risk for abusing opioids).^{3,11} Exclusion criteria included trauma and hospice patients and those with an active diagnosis of cancer, as determined by ICD-10 codes.

Instrument. Demographic and insurance information was abstracted from hospital-collected data in the electronic health record (EHR). Subjective pain measurements, using a numerical scale from 0 - 10 with faces,¹² were garnered from nurse-recorded vital signs, with the maximum reported pain recorded during each encounter. All other information, including diagnoses, medications, disposition, and provider credentials were obtained from emergency providers' (physicians and/or mid-levels) clinical notes. Visits in which the patient was prescribed an opioid pain medication for outpatient therapy were evaluated for documentation of efforts to minimize opioid use. Such efforts could include documentation that the patient was asked screening questions regarding drug abuse, following guidelines of the ALTO protocol⁵ or CDC-CPG⁶, attempting use of non-opioid analgesia prior to opioid administration, and/or prescribing a small number of short-acting opioids.

Statistical Analysis. Of the 1,500 EMRs of patient encounters selected for this study, 56 encounters were excluded. This resulted in 1,444 records that were included in the analysis. All statistical analyses were performed in SAS software (Version 9.4, SAS Institute, Inc., Cary, NC). Summary statistics were generated and a multiple multinomial logistic regression model with generalized logit link function was utilized to analyze the effects of predictor variables (all of which were treated as discrete variables) against two response variables: 1) opioid administered in the ED (yes/no), and 2) opioid prescribed for outpatient therapy (yes/no/not applicable). Upon identifying significant predictor variables, odds-ratio estimates of each predictor variable level were estimated against a reference predictor variable level. In the case of insurance status, each predictor variable level was utilized as a reference level in a sub-model to investigate differences between all possible insurance status effects. Additionally, the frequency of opioid administration in our chronologic 246 charts were compared against the randomly selected remainder of charts to investigate their potential difference. Finally, demographics and pain variables were analyzed to elucidate possible differences in the makeup of populations, utilizing each hospital, as they varied among the hospitals.

RESULTS

Most patients (71.6%, n = 1,034) self-reported being Caucasian, and 57.6% (n = 831) of patients were female (Table 1). The most frequent age range of patients in the ED were those in their 30s, constituting 18.7% of all ED visits. More than one-third (35.9%, n = 519) of patients utilized private insurance, 25.0% (n = 361) used Medicare, 18.4% (n = 265) used Medicaid, and 0.7% (n = 299) of patients were uninsured.

Nearly half (45.6%, n = 658) of patients reported 'severe' (7 - 10) pain, and a report of "10/10" was the single most reported pain value (15.3%, n = 220). Seventeen percent (17.4%, n = 243) of patients were administered an opioid analgesic while in the ED. The frequency of

Table 1. Patient demographics.

	Frequency	Percent
Self-Reported Race and Ethnicity		
Caucasian	1,034	71.6%
African American	205	14.2%
Hispanic	154	10.6%
Other/Not reported	52	3.6%
Gender		
Female	831	57.6%
Male	613	42.5%
Age (years)		
13-19	132	9.1%
20-29	238	16.5%
30-39	270	18.7%
40-49	226	15.7%
50-59	197	13.6%
60-69	165	11.4%
70-79	103	7.1%
80-89	86	6.0%
90 or older	27	1.9%
Insurance Status		
Private insurance	519	35.9%
Medicare	361	25.0%
Uninsured	299	20.7%
Medicaid	265	18.4%

opioid administrations among the first 246 EMRs abstracted was not significantly different than the randomized 1,198 EMRs (p = 0.933). Among those patients who were administered an opioid analgesic, 45.3% (n = 110) were given a non-opioid medication trial prior to opioid administration.

Opioids were prescribed for 12.8% (n = 153) of ED discharges. Hydrocodone was the opioid medication most prescribed, resulting in 56.8% of all opioid prescriptions (n = 88; Figure 1). Oxycodone was the second most frequent, representing 29.7% of opioid prescriptions (n = 46). The mean number of opioid tablets prescribed was 13.3. Most (84.8%, n = 128) opioid prescriptions were for fewer than 20 tablets, and one prescription was written for more than 24 tablets.

Multinomial logistic regression identified two variables that were associated with opioid administration in the ED: the patient's subjective pain rating (p < 0.0001) and the credentials of the prescriber (p < 0.0241). Patients reporting a pain rating of 3 or 5 of 10 (not 4 of 10) were more likely to have opioids administered in the ED than those rating no pain (p < 0.0076 for all individual ratings). Medical doctors were more likely to administer opioids in the ED than nurse practitioners (NPs; p < 0.0055).

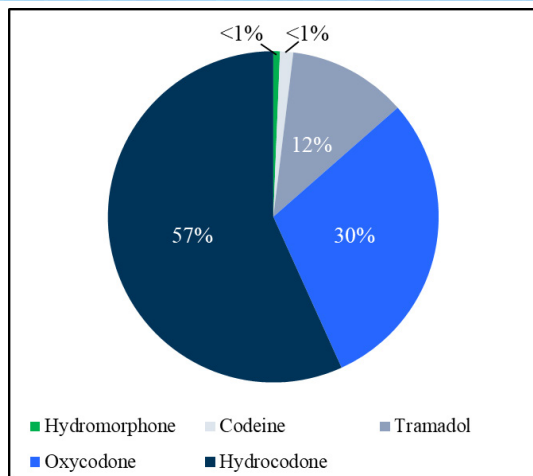


Figure 1. Percentage of outpatient opioid medications prescribed.

Four variables were associated with opioid prescriptions upon discharge: the patient's subjective pain rating ($p < 0.0005$), prescriber credentials ($p < 0.0001$), hospital ($p < 0.0001$), and insurance status ($p < 0.0040$). Patients with a pain rating of 5 of 10 were more likely to be prescribed opioids than those rating no pain ($p < 0.05$ for all ratings).

Both MDs (OR = 0.421, 95% CI: 0.311-0.570) and DOs (OR = 0.459, 95% CI: 0.317-0.663) were less likely to prescribe opioids than NPs ($p < 0.0001$). Physician assistants (PAs) were 1.605 (95% CI: 1.063-2.422) times more likely to prescribe opioids than NPs ($p < 0.0244$; Figure 2).

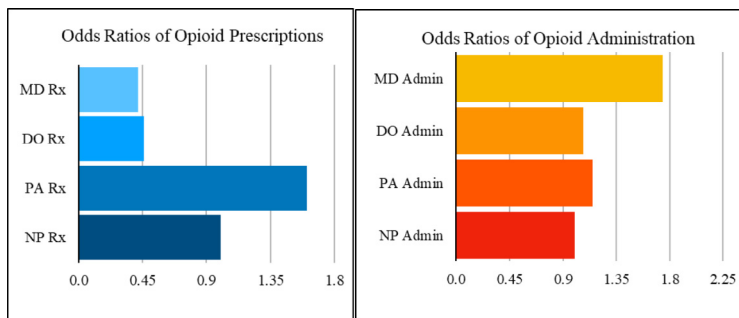


Figure 2. Odds ratios of likelihood of various ED healthcare professionals prescribing or administering opioids.

Patients presenting to one ED (hospital 3) were 3.423 (95% CI: 2.481-4.725) times more likely to be prescribed an opioid than the least frequent prescribing ED. The lowest frequency prescribing ED (hospital 1) was not significantly different than hospital 2. The hospitals varied significantly among multiple demographic variables, including age, race, gender, insurance status, and subjective pain ($p < 0.01$ in all cases). Of note, hospital 3 (highest opioid prescribing) had the highest proportion of Caucasian patients and privately insured patients, the lowest proportion of uninsured patients, and the lowest overall subjective pain ratings ($p < 0.0010$). Hospital 3 also had the fewest ED visits over the study month, with 1,010 ED visits; hospital 2 had 3,167 ED visits, and hospital 1 had 4,053 ED visits.

Medicare recipients were 0.537 (95% CI: 0.338-0.852) times less

likely than Medicaid beneficiaries ($p < 0.0083$), 0.57 (95% CI: 0.362-0.898) times less likely than uninsured patients ($p < 0.0153$), and 0.48 (95% CI: 0.321-0.712) times less likely than those with private insurance ($p < 0.0003$) to receive an opioid prescription for outpatient therapy.

DISCUSSION

The patient demographics of this sample were similar to the population demographics of the 2010 Census.¹³ This patient population was likely representative of the community, though the current study had slightly more uninsured and women patients than the population of Wichita, KS in the 2010 U.S. Census.

In the current study, an opioid was administered during 17.4% of patient encounters in the ED. This value is consistent with a study of an academic medical center after the establishment of the ALTO protocol, in which 17.7% of visits resulted in opioid administration.⁹

Moreover, opioids were prescribed for 12.8% of ED discharges. This frequency of opioid prescribing was substantially lower than a study from 2013 through 2015, in which 24.3% of ED discharges resulted in an opioid prescription nationally.¹⁴ In light of these comparisons, prescribers from the current study prescribed opioids less than might be expected for community hospitals in a state which lacks strong state regulations for opioid prescribing in the ED.

Increased patient-reported pain was associated with opioid administration and prescription. Though effective pain control can be achieved with opioid medications, it was noteworthy that non-opioid pain medications were trialed in 48.9% of patients who eventually received an opioid. This was especially significant considering a study of a large, academic medical center ED following the ALTO protocol resulted in non-opioid medications being utilized for 19.3% of visits.⁹

The prescriber's credentials were associated with opioid administration and prescribing in an incongruent way. MD physicians (but not DO physicians) were more likely to administer opioid medication than NPs. However, MD and DO providers were both associated with fewer visits resulting in an opioid prescription than NPs, and PAs were more likely to prescribe opioids than any other group. Since patient encounters, not providers themselves, were the focus of this study, this incongruity in administration may be attributed to the limited number of providers included in this study. Additionally, other unmeasured factors could differ between and amongst physicians and mid-level practitioners, reflecting these inconsistencies. Yang et al.¹⁴ suggested that among medical indications, mid-level practitioners and physicians differed significantly in the frequency of opioid prescriptions (e.g., physicians were more likely to prescribe opioids for abdominal pain, whereas mid-level prescribers were more likely to prescribe opioids for dental pain).

As one of the hospitals included in this study prescribed more opioids than the other two, it is useful to consider what factors may contribute to this difference. The hospital with the highest proportion of patients receiving an opioid prescription in this study had the smallest ED census during the study month, with less than one-third of the ED visits of either of the other hospitals. Furthermore, it was the smallest and only suburban hospital in this study; the other two were urban. Demographically, the highest prescribing hospital

patient population had a greater proportion of Caucasian patients and those with private insurance, but slightly lower subjective pain scores than other patient populations. Given that the same staffing company provides physicians and mid-levels for all the hospitals studied, prescribers were not necessarily unique to any one study location. This finding may indicate that, even among a stable set of providers, hospital location, demographic factors, or ED census may affect opioid prescribing rates.

Insurance status was a significant predictor of opioid prescriptions. Medicare beneficiaries were less likely to be prescribed opioids than Medicaid recipients, the uninsured, and privately insured patients. This finding may be attributed to the advanced ages of Medicare beneficiaries, as it is recommended that opioid medication is limited for use in geriatric populations who are at risk for falls or fractures.¹⁵ Another possible explanation to this outcome could be that Medicaid recipients and the uninsured population are visiting the ED at a more advanced stage in their disease conditions. This population is also more susceptible to injury due to their living and working conditions.

Limitations. There are a few limitations to our study that may interfere with its generalizability. The study was completed over a limited period of time. It was conducted during the month of May, a month during which our population may have participated in more outdoor activities, leading to more minor injuries and ED visits. In addition, the study was completed in one city setting and included a 71.6% majority Caucasian population. Furthermore, only three EDs were included in our study, in a city that has additional hospitals and freestanding ED facilities.

Our study aimed to abstract data based on each individual ED visit and did not take into consideration repeated visits of the same patients. This procedure could have led to one or more patients being included in our study multiple times and may have overestimated the prevalence of opioid use in the hospital if opioids were utilized for these patients on more than one visit. Additionally, since the extension diagnoses of each patient were not accounted for, the differences between ongoing chronic pain management and acute pain management could not be determined. This means that our results could be altered by providers filling opioid prescriptions that a patient entered the ED on. Further studies need to consider diagnoses and previous medications to elucidate further the relationship between opioid administration and EDs.

CONCLUSIONS

In this study, opioids were used commonly in a variety of ED settings. In the hospitals examined, almost half of the patients reported severe pain during their ED encounter. Providers attempted to treat patients initially with non-opioid medications in 48.9% of cases. Efforts should be taken to highlight pertinent guidelines and put more definite criteria for administering and prescribing opioid medications for this population.

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