

Opioid prescribing trends in a Veterans Affairs emergency department and dental clinic before and after implementation of opioid-prescribing guidelines

Rebecca Lavasani, PharmD¹; Michelle Chung, PharmD²; Allison Beatty, PharmD, BCPP³; Phillip Lawrence, PharmD⁴; Elizabeth Unni, PhD, MBA, BPharm⁵

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Abstract

Introduction: Opioid overdose is highly prevalent among veterans. The Opioid Safety Initiative (OSI) and Centers for Disease Control and Prevention (CDC) issued prescribing guidelines for managing chronic pain. The purpose of this study was to investigate the impact of the 2013 OSI and 2016 CDC guidelines on opioid-prescribing trends in the emergency department and dental clinic within the Veterans Affairs Salt Lake City Health Care System.

Methods: In this retrospective, cohort study, opioid prescriptions were queried from January 1, 2013, through March 31, 2017, and separated into 3 groups: pre-OSI, post-OSI, and post-CDC. The primary outcome was to determine a decrease in opioid prescribing. Secondary outcomes included changes in concurrent benzodiazepine and naloxone prescriptions and prescriber status. Analysis of variance was used to determine a difference between study periods.

Results: There were 7339 opioid prescriptions identified. A statistically significant difference was found between the 3 groups in average number of opioids prescribed, morphine milligram equivalents per prescription, days' supplied, and medication quantity per prescription ($P < .01$). There was no significant difference between the 3 groups regarding morphine milligram equivalents per day ($P = .24$). Benzodiazepine prescribing remained the same. Concurrent naloxone prescriptions increased.

Discussion: The results demonstrate that days' supply, quantity, and morphine milligram equivalent per day in the post-CDC group were consistent with guideline recommendations. Concurrent naloxone prescribing increased throughout all time periods. Implementation of guidelines impacted opioid-prescribing trends, ultimately lessening potential for misuse and abuse. However, there is still need for improvement with reducing concurrent benzodiazepine prescriptions.

Keywords: opioids, overdose, pain, chronic pain, pain management, veterans, OSI, CDC, Utah

¹ (Corresponding author) Clinical Pharmacist, Veterans Affairs Sierra Nevada Health Care System, Reno, Nevada, relavasani@gmail.com, ORCID: <https://orcid.org/0000-0003-4507-6810>; ² Postgraduate Year 1 Pharmacy Resident, Kadlec Regional Medical Center, Richland, Washington, ORCID: <https://orcid.org/0000-0002-8209-421X>; ³ Clinical Pharmacist Specialist, Mental Health Assistant Professor of Pharmacy Practice, Roseman University of Health Sciences College of Pharmacy, Veterans Affairs Salt Lake City Health Care System, Salt Lake City, Utah, ORCID: <https://orcid.org/0000-0003-3275-0132>; ⁴ Director for Experiential Education, Assistant Professor of Pharmacy Practice, Roseman University of Health Sciences, South Jordan, Utah, ORCID: <https://orcid.org/0000-0002-8869-913X>; ⁵ Chair and Associate Professor, Touro College of

Pharmacy, New York, New York, ORCID: <https://orcid.org/0000-0001-9968-4366>

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Introduction

Opioids have been utilized for many years to relieve pain and are often viewed as the most effective analgesic medications.¹ However, management of chronic pain with

opioids has become a controversial issue due to concerns with addiction and safety.¹ Opioid misuse and abuse is a growing epidemic, which has led to increased addiction and death nationwide.² A 2017 Centers for Disease Control and Prevention (CDC) report estimated 47 600 opioid overdoses in the United States with approximately 36% due to prescription opioids.³

Opioid prescribing has been associated with an increased risk of addiction and opioid-related deaths.² Opioids are commonly prescribed in emergency departments (EDs) and dental clinics for the treatment of acute pain.^{4,5} One study⁵ showed that opioid-naïve patients who received and filled a new opioid prescription from the ED are at an increased risk of recurrent use at 1 year compared to those without opioid receipt at discharge. In addition, 12% of the immediate-release opioid prescriptions in the United States come from dental clinics.⁴ Although it is a national problem, Utah in particular is substantially impacted, ranking fourth in the nation for opioid misuse and leading the nation in veteran overdose deaths.^{6,7} Veterans Affairs (VA) health care providers are responsible for a vast proportion of the opioids that are being prescribed to veterans.⁸ According to the Opioid Safety Initiative (OSI), veterans are twice as likely to die from accidental overdose compared to nonveterans.⁹

In response to this epidemic, the CDC and Veterans Health Administration created guidelines to help reduce the high rates of opioid prescribing. Veterans Health Administration introduced the OSI in October 2013 to provide guidance for opioid prescribing and alternative recommendations to combat chronic pain.¹⁰ Subsequently, in March 2016, the CDC also released guidelines¹¹ for pain management with the intent to improve safety of pain treatment and reduce the risks of opioid-related deaths. The CDC guidelines¹¹ specifically recommend reevaluating risks and benefits when increasing to greater than 50 morphine milligram equivalents (MME) per day and not to exceed 90 MME per day. The guideline¹¹ also suggests that acute pain can be frequently treated within 3 to 7 days. Additionally, naloxone coprescribing is recommended to mitigate risk of fatal overdose, especially in patients with a history of overdose, substance use disorder, opioid doses of ≥ 50 MME/d, and concurrent benzodiazepine use.¹¹ Similar to OSI, CDC guidelines¹¹ also recommend use of nonpharmacologic and nonopioid alternative therapies for initial treatment in pain. If opioid use is warranted, both guidelines^{9,11} recommend initiating with the lowest effective dose. Additionally, both strongly advise against the use of concurrent benzodiazepines and opioids due to increased risk of abuse, misuse, and overdose.^{9,11}

This study aimed to investigate the impact of the OSI and CDC guidelines on opioid prescribing trends in the emergency and dental clinic within the VA Salt Lake City Health Care System (VA-SLC). It is necessary to understand the impact of these guidelines to determine whether further provider education may be required with opioid prescribing to reduce misuse, abuse, and accidental overdose.

Methods

The institutional review boards of the University of Utah and Department of Veterans Affairs Salt Lake City Health Care System approved this retrospective analysis and archived electronic medical record review. This investigation was a retrospective cohort study of all patients who received opioids as part of their treatment from the emergency department or dental clinic within the VA-SLC from January 1, 2013, through March 31, 2017. Prescription information was queried from the VA Corporate Data Warehouse (Salt Lake City, UT), which included all opioid prescriptions (except buprenorphine) prescribed from the VA-SLC emergency department or dental clinic. The following groups were established according to the timeline: (1) pre-OSI—opioid prescriptions written prior to OSI and CDC guidelines (January 1 to December 31, 2013; a total of 364 days), (2) post-OSI—opioid prescriptions written between the OSI and the CDC guidelines (January 1, 2014, to June 1, 2016; 882 days), and (3) post-CDC—opioid prescriptions written after the CDC guidelines (June 2, 2016, to March 31, 2017; 302 days). Although OSI was introduced in October 2013, this study considered pre-OSI time up to December 2013 to account for the time it takes for a new initiative to get implemented. Similarly, although the CDC guidelines were introduced in March 2016, the post-CDC timeline was delayed until June 2016. Because the timing of the release of the guidelines and the start of the study resulted in unequal time intervals between the groups, the data was normalized to account for the unequal time intervals by dividing the outcome measure counts by the total number of observation days. All prescription doses were manually calculated to MMEs using the GlobalRPH Opioid Analgesic Converter (Detroit, MI) and reviewed by 2 individuals (R.L. and M.C.) to minimize the chance of error. The primary outcomes included the number of opioid prescriptions, average overall dose, average written quantity, and average days' supply in all 3 study periods. Secondary outcomes included rates of concurrent opioid and benzodiazepine prescriptions, opioid and naloxone prescriptions (prescribed within 30 days of one another), and prescriber location (ED or dental clinics). Analysis of variance with α set to 0.05 was used for statistical analysis to determine a statistical difference between the 3 study periods for the primary outcomes. Microsoft Office Excel® Analysis

TABLE: Changes in opioid prescribing from January 2013 to March 2017

Study Outcomes	Pre-OSI	OSI	CDC	P Value
Average written days' supply	9.6	8.9	6.5	<.01
Average written quantity	34.6	27.8	23.7	<.01
Average morphine milligram equivalent per prescription	268.9	253.7	192.0	<.01
Average morphine milligram equivalent prescribed per day	29.7	31.1	30.5	.235
Average number of opioid prescriptions per month per time period	145	155	107	
No. of concurrent benzodiazepine prescriptions per opioid prescription	0.22	0.20	0.20	
No. of concurrent naloxone prescriptions per opioid prescription	0	0.02	0.12	

CDC = Centers for Disease Control and Prevention; OSI = Opioid Safety Initiative.

ToolPak (Redmond, WA) was used to conduct all the statistical analyses.

Results

There were a total of 7342 opioid prescriptions identified; of those, 3 prescriptions prescribed for buprenorphine-naloxone were excluded from the study, resulting in 7339 prescriptions for analysis. The Table describes the changes in opioid-prescribing trends between January 2013 and March 2017. A statistically significant difference was found between the 3 study periods in the average number of opioids prescribed per month, MMEs per prescription, days' supplied, and quantity supplied ($P < .01$). The average number of opioid prescriptions per month decreased from 145 to 107 between the pre-OSI and post-CDC timeline (Figure 1). Both days' supplied and quantity supplied decreased significantly from the pre-OSI through post-CDC time period. No significant difference was observed between the 3 groups regarding MMEs per day. ED physicians were responsible for 76% of opioid prescriptions, followed by physician's assistants at 13%, dentists at 10%, and nurse practitioners with 1% (Figure 2). There was no significant difference found between concurrent benzodiazepine and opioid prescribing across the 3 time intervals. However, the number of naloxone prescriptions per opioid prescription increased (Table).

Discussion

Our study demonstrated that, after implementation of the 2 guidelines, the average days' supply per opioid prescription from the ED and dental clinic decreased to align with current recommendations. The CDC guidelines¹¹ recommend the written days' supply and dose for each opioid prescription to be sufficient for the duration of expected pain. According to these guidelines,¹¹ acute pain can typically be treated with a 3-day supply of opioid therapy; however, some cases may require longer durations up to 7 days. Although the number of days' supplied in this study decreased from 9.6 to 6.5, it is still on the higher end of the various guideline recommendations. Further measures need to be taken to ensure that physicians are aware and educated about the 3 days' supply recommended by the CDC. Additionally, the MME/d did not exceed 50 MME during any of the time intervals of this study. This indicates that our site was prescribing below the recommended MME prior to the implementation of guidelines.

Both OSI and CDC guidelines^{9,11} recommend prescribing nonopioid alternatives for pain or multimodal pain management in addition to nonopioids for acute pain. If patients are unresponsive to nonopioid treatment interventions, opioid therapy may be considered when benefits outweigh the risks of misuse and abuse.^{9,11} This study demonstrates a significant decrease in the average number

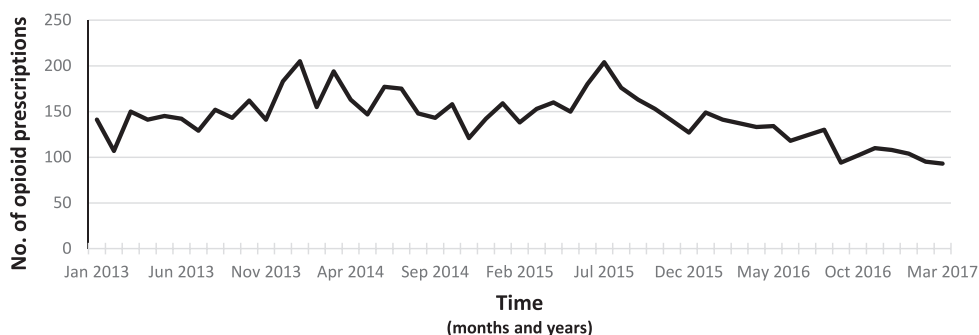


FIGURE 1: Trend of number of opioid prescriptions per month from January 2013 to March 2017

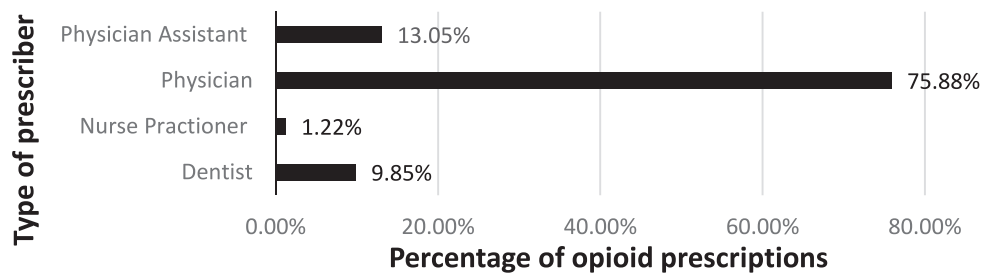


FIGURE 2: Percentage of opioid prescriptions from prescriber types across the study period

of opioids prescribed per month, perhaps suggesting use of alternative treatments. Additionally, both guidelines strongly recommend against the concurrent use of benzodiazepines and opioids due to the increased risk of central nervous system depression, leading to a potentially fatal overdose. However, there was no difference observed in concurrent benzodiazepine prescribing throughout this study. These findings suggest that further interventions to reduce benzodiazepine coprescribing may be warranted. The CDC guidelines¹¹ recommend that clinicians involve pharmacists and pain specialists when opioids are coprescribed with other central nervous system depressants. Pharmacists can play a key role in deprescribing concurrent benzodiazepine prescriptions and recommending naloxone when appropriate. Pharmacists can make an impact by recognizing high-risk patients for opioid abuse and misuse while also ensuring provider education on current guidelines for opioid prescribing.

Our study indicated 76% of opioid prescriptions were written by ED physicians, followed by physician's assistants at 13% and dentists at 10%. Naloxone and opioid coprescribing are highly encouraged as a preventative measure for patients at a higher risk for opioid-related harm.^{10,11} In our study, naloxone prescribing significantly increased after the implementation of the guidelines. Whereas there were only 2 naloxone prescriptions for every 100 opioid prescriptions in the OSI group, there were 12 naloxone prescriptions for every 100 opioid prescriptions in the CDC group. These numbers are greater than the most recent national average in 2018, which showed approximately 1 naloxone prescription for every 69 opioid prescriptions (1.4 for every 100).

This study is not without limitations. The OSI and CDC recommendations^{9,11} were published approximately 30 months apart. When the data was initially extracted, it had not yet been 30 months since the CDC recommendations had been published; therefore, our observation time periods were not equivalent. Although the analysis was adjusted for unequal time intervals, future studies may need to consider an equal time period approach. Additionally, because this study only examined the opioid-prescribing trends in the ED and dental clinic, further studies are needed to examine the impact of the

guidelines in other VA departments where opioids are commonly prescribed. Although education was provided from the Veterans Health Administration facility to health care providers regarding the OSI guidelines, it is uncertain whether training was delivered following publication of CDC guidelines. These educational opportunities in addition to new guidelines may have impacted the opioid-prescribing patterns. Also, the percentage of opioid prescriptions by provider type was a descriptive analysis. The number of patients seen by provider type was not assessed, and the data was not normalized to report number of opioid prescriptions per provider. So, although ED physicians wrote 76% of opioid prescriptions, this may not fully indicate increased prescribing rates compared to other provider types. Further studies are needed to determine the extent of knowledge and awareness of ED physicians and dentists regarding opioid and naloxone prescribing and the conscious efforts needed to prescribe opioids as per the guidelines. Although there was a decrease in the number of opioid prescriptions per month, this study did not specifically track any nonopioid interventions. Future studies may also investigate whether proper nonopioid multimodal pain management is concurrently being utilized and the patient's satisfaction with the pain management.

In conclusion, the average number of opioid prescriptions, days' supply, and quantity has significantly decreased from January 2013 through March 2017 at the VA-SLC ED and dental clinic after the implementation of OSI and CDC guidelines. Concurrent naloxone prescribing has also increased, now exceeding the national average. However, additional interventions may be necessary to deter concurrent benzodiazepine and opioid prescribing. Although future studies are still warranted to investigate the effects of the guidelines within the other VA departments, these study results demonstrate a positive impact of the implementation of the OSI and CDC guidelines on opioid-prescribing trends in the ED and dental clinics within the Salt Lake City VA health system.

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