Suboptimal Opioid Prescribing: A Practice Change Project

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ABSTRACT

In the U.S. in 2015, the proportion of people dependent on opioids approached one percent, and opioid overdose rivaled auto accidents as the leading cause of accidental death. The literature suggests a credible link between increased opioid prescribing and increased opioid addiction. Accordingly, some have suggested that limiting the number of opioid prescriptions (and the number of doses per prescription) might be effective in reducing the number of opioid-related deaths. Toward this end, we designed and piloted an evidence-based quality-improvement project in four urgent care clinics. Results of the intervention were monitored with data from a state-sponsored prescription drug-monitoring program (PDMP) by comparing opioid prescribing before and after adoption of the guideline, and in this manner, a statistically significant ($P < 0.05$) decline in the rate of opioid prescribing was revealed. On average, 2.43 fewer opioid prescriptions were written, per provider, per week, in weeks five through eight after promulgation (5.21, SD =4.37) than in the eight weeks before promulgation (7.64, SD =7.73). Our results suggest that implementing a simple opioid-prescribing guideline, with monitoring, can reduce sub-optimal opioid prescribing, and therefore the volume of opioids available in the community for diversion, abuse, and addiction.

KEYWORDS: opioid prescription, opioid epidemic, urgent care, prescribing guidelines, practice change

INTRODUCTION

In the U.S. in 2015, the proportion of people dependent on opioids approached one percent (809 per 100,000),[1] and the mortality rate from opioid overdose exceeded 10 per 100,000. In the same year, the number of opioid deaths (33,091) in the U.S. approached the number of traffic fatalities (35,092), rivaling the latter for the most important cause of accidental death in the nation.[2]

Opioid prescribing, which began increasing in the U.S. in the early 1990s, has been linked to increasing numbers of people addicted to opioids, and, in turn, increasing numbers of opioid overdose incidents and deaths.[3] In Rhode Island, the opioid "epidemic" (of overdose incidents and deaths) has been especially problematic. For example, in 2015, Rhode Island's age-adjusted death rate from "drug-induced causes" was 28.9 per 100,000, 68 percent higher than the overall U.S. rate (17.2 per 100,000), and 5th highest among the 50 states and the District of Columbia. Furthermore, Rhode Island's current standing represents a significant deterioration over the past decade and a half. In fact, since 1999, the state's age-adjusted drug-induced death rate has doubled twice. At that time, Rhode Island's rate was 5.8 per 100,000, 15 percent *lower* than the overall U.S. rate (6.8), and 24th highest among the 50 states and the District of Columbia. Rhode Island's death rate from drug-induced causes has been especially high in the past several years.

On the basis of the *prima facie* correlation between trends in opioid prescribing and trends in opioid addiction, opioid overdose incidents, and opioid-induced deaths, some have suggested that by reversing the trend in opioid prescribing, one might reverse the trends in untoward outcomes, as well. Recent literature indicates that prescribing guidelines, combined with prescription monitoring, may be used to help health prescribers make more informed choices in the use of analgesics.[4,5] Accordingly, we designed and piloted a practical, evidence-based quality-improvement project to limit opioid prescribing in urgent care settings, focusing on the treatment of acute pain.

SETTING

The pilot was implemented in four privately owned urgent care centers ("the centers") under common management in the State of Rhode Island, staffed by 14 physicians and mid-level practitioners. The centers care for the usual mix of urgent care complaints, which include acute pain associated with minor injuries, infections, and inflammations, for which opioids may be prescribed. The combined average number of patients seen in the clinics is 2.75 patients per provider per hour. The patients seen through the clinics are pediatric through geriatric, with 95% being adult and the majority of the children being in the adolescent age group. All forms of medical insurance including all major insurances, state health coverage and self-pay are accepted at OSUC clinics. Prior to the pilot, the centers had adopted an electronic medical record system in which the default maximum for opioid prescribing is 15 doses, which amounts to

3–5 days' use at one dose every four to six hours. Prescribers may exceed the default, but it serves as a reminder of current guidelines from the Centers for Disease Control and Prevention ("CDC"):

> "Patients who are prescribed opioids for acute pain are more likely to use opioids long-term, and a greater amount of early opioid exposure (taking opioids for a longer time or at higher doses) is associated with greater risk for long-term use. Physical dependence on opioids is a physiologic response in patients exposed to opioids for more than a few days. Several previous guidelines on opioid prescribing for acute pain from emergency departments and other settings have recommended prescribing <3 days of opioids in most cases, whereas others have recommended <7 days or <14 days. The Guideline recommends that if opioids are needed in cases of acute pain (not related to major surgery or trauma, such as acute back pain, sprained ankle), ≤3 days will often be sufficient – unless circumstances clearly warrant additional opioid therapy – and that more than 7 days will rarely be needed. If pain continues longer than expected, providers should re-evaluate the patient to make sure nothing was missed."[6]

An examination of the prescribing behavior of the centers' 14 providers in the eight weeks prior to implementation of the pilot (based on prescriber-specific reports generated by Rhode Island's Prescription Drug Monitoring Program – PDMP"), demonstrated restraint in the use of opioids. On average, most prescriptions were written for 2–5 *doses*, equivalent to 1–2 days' treatment. Only one prescriber differed substantially from this profile, with an average of 30 doses per prescription, equivalent to 5–7 days' treatment. Given this laudable starting point, the pilot focused primarily on *whether or not* to prescribe opioids – as opposed to non-opioid analgesics – for treatment of acute pain.

INTERVENTION

The intervention was composed of three elements: provider education, guidelines for opioid prescribing, and monitoring of prescribing behavior.

Provider Education

A PowerPoint presentation with supplemental hand-outs was developed from the "CDC Guideline for Prescribing Opioids for Chronic Pain – United States"7 (and key references therein), and presented to all prescribers in each of the four centers. The CDC's "Guideline" contains a wealth of information on opioid use and misuse, including an assessment of the relation between short-term use of opioids for *acute* pain and long-term use of opioids for *chronic* pain.

Guidelines

The following guidelines were adopted:

1) Before prescribing opioids, assess the patient's prescription history, by generating a patient-specific report from Rhode Island's Prescription Drug Monitoring Program database ("PDMP"). Assess patterns of opioid use, and look for other prescriptions which may cause adverse reactions in combination with opioids, such as benzodiazepine.

2) Limit all opioid prescribing to a 7 days' supply.

Monitoring of Prescribing Behavior

Opioid prescribing was monitored before and after adoption of the guidelines, to assess the effect of the pilot. Provider-specific prescribing profiles generated by Rhode Island's PDMP were used for this purpose.

ASSESSMENT OF THE INTERVENTION

Using PDMP profiles, we compared opioid prescribing in the eight weeks before adoption of the guideline, t(0), in weeks 1–4 post-adoption, t(1), and in weeks 5–8 post-adoption, t(2). The data from pre- and post-intervention PDMP reports were compared in EXCEL spreadsheets. We summarized opioid prescribing using means, standard deviations, standard errors, and upper and lower 95% confidence intervals. (**See Tables 1 and 2**.) Paired t-tests were conducted to assess the statistical significance of changes in opioid prescribing, using $P < 0.05$ as a cut-off for tests of statistical significance.

RESULTS

The summary statistics in **Table 1** demonstrate a decline in the average number of opioid prescriptions written per provider per week over the course of the pilot. The decline was immediate. On average, 1.89 fewer opioid prescriptions were written per provider per week in the four weeks post-intervention, t(1), as compared with the eight weeks pre-intervention, t(0). Over 14 providers, this amounts to 106 fewer opioid prescriptions written, or about 577 doses dispensed. The decline was sustained in weeks 5–8 post-intervention,

Table 1. Mean number of opioid prescriptions per provider per week across four urgent care settings, as measured in three time periods:

t(0): weeks minus 8 through minus 1 before adoption of new prescribing guidelines
t(1): weeks plus 1 through plus 4 after adoption of new prescribing guidelines
t(2): weeks plus 5 through plus 8 after adoption of new prescribing guidelines

Period	Mean	Std. Deviation	Std. Error Mean
t(0) Average of 8 weeks before Intervention t(0) N=14	7.64	7.53	2.01
Average of weeks 1-4 after Intervention t(1) N=14	5.75	7.38	1.97
Average of weeks 5-8 after Intervention t(2) N=14	5.21	4.47	1.16

but with less variation in the number of opioid prescriptions written per provider, i.e., with *more uniformity of prescribing across providers*, as revealed by the standard deviations calculated for t(0), t(1), and t(2): 7.53, 7.38, and 4.77, respectively.

Turning to **Table 2**, the decline in opioid prescribing between t(0) and t(2) was found to be statistically significant ($P < 0.05$), on the basis of the paired t-test. Other declines, i.e., between t(0) and t(1) and between t(1) and t(2), did not achieve statistical significance, primarily because of the rather large standard deviations computed for paired comparisons in t(0) and t(1).

Table 2. Differences in the mean number of opioid prescriptions per provider per week across four urgent care settings, as measured in three time periods:

t(0): weeks minus 8 through minus 1 before adoption of new prescribing guidelines
t(1): weeks plus 1 through plus 4 after adoption of new prescribing guidelines
t(2): weeks plus 5 through plus 8 after adoption of new prescribing guidelines

	Paired Differences					t	df	Sig. (1-tail)
	Mean	Standard Deviation	Standard Error	95% Confidence interval of the difference				
				Lower	Upper			
t(0) vs. t(1) (N=14)	1.07	1.76	3.08	-3.02	3.14	0.61	13	p=0.27
t(1) vs. t(2) (N=14)	-3.50	2.12	4.51	-6.15	3.87	-1.64	13	P=.060
t(0) vs. t(2) (N=14)	-2.43	1.23	1.51	-4.39	-0.47	1.97	13	p=0.035

DISCUSSION

Although reducing the number of people addicted to opioids is the goal of our intervention and others like it, the effects of such interventions will, unfortunately, not be seen immediately, so obstinate is the problem. Nevertheless, what *can* happen immediately is a reduction in the number of opioid doses available for diversion in the community. Our results suggest that a simple opioid prescribing intervention, combining provider education, a simple prescribing guideline, and prescription monitoring, can decrease the number of opioid prescriptions written by urgent care providers. Ostensibly, the patients who *might* have been treated with opioids were treated with alternative medications or therapies, thereby reducing the number of *unnecessary* opioid doses available for diversion.

Can similar results be obtained in other settings? Quite possibly. Certainly, the simplicity of our intervention lends itself to a wide variety of settings, as *"initial"* opioid prescribing for *acute* pain occurs in virtually all settings in which opioids are prescribed. In continuity-of-care settings, of course, it is also desirable to institute parallel guidelines for the use of opioids in the treatment of *chronic* pain.

In any setting, however, we believe that *monitoring*—with the use of PDMP reports – is key. Fortunately, PDMP systems have become more common – and accessible – across the United States, which should facilitate the use of PDMP reports in interventions such as the one we piloted.

Finally, we offer a related – and of late, crucial – caveat: In today's opioid-saturated world, providers – in all healthcare settings—*must* be equipped to assess and to refer those patients whom they suspect to be developing or to have developed a dependency on these medications. Simply limiting the number of doses prescribed, without additional support, such as may be effected by means of an appropriate referral to a center specializing in the treatment of chronic pain or of opioid addiction, *may* encourage some patients to seek an illicit source of prescription opioids or of heroin – or so it would seem, despite a scarcity of studies on this very issue.[8] Certainly, there is a connection between the use of prescribed opioids and heroin use among "recent users of heroin,"[9] and this, in and of itself, calls for prudence, not only in prescribing, but in the evaluation of patients and the potential need for referral to pain or addiction specialists. Again, provider awareness and *education* is key, not to mention some form of goal-setting and monitoring (of assessment and referral practices). In this vein, the Rhode Island Department of Health, among many other public health agencies, recommends adoption of a protocol called "Screening Brief Intervention and Referral to Treatment" or simply "SBIRT."

Screening Brief Intervention and Referral to Treatment (SBIRT): Consider screening all patients annually or upon entry to your practice to assess potential risk for substance abuse. Tools such as the Opioid Risk Tool (ORT) as well as DAST 10 (Drug and Alcohol Screening Tools 10) and several more tools available from Substance Abuse and Mental Health Services Administration (SAMHSA). [10] [For additional information on SBIRT from SAMHSA, see: https://www.samhsa.gov/sbirt]

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