

Who Uses a Prescription Drug Monitoring Program and How? Insights From a Statewide Survey of Oregon Clinicians

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Abstract: Prescription drug monitoring programs (PDMPs) are relatively new but potentially useful tools to enhance prudent prescribing of controlled substances. However, little is known about the types of clinicians who make the most use of PDMPs, how these programs are incorporated into clinicians' work flow, or how clinicians and patients respond to the information. We therefore surveyed a random sample of Oregon providers, with 1,065 respondents. Clinicians in emergency medicine, primary care, and pain and addiction specialties were the largest number of registrants, but many frequent prescribers of controlled substances were not registered to use the PDMP. Among users, 95% reported accessing the PDMP when they suspected a patient of abuse or diversion, but fewer than half would check it for every new patient or every time they prescribe a controlled drug. Nearly all PDMP users reported that they discuss worrisome PDMP data with patients; 54% reported making mental health or substance abuse referrals, and 36% reported sometimes discharging patients from the practice. Clinicians reported frequent patient denial or anger and only occasional requests for help with drug dependence. More research is needed to optimize how clinicians use PDMPs across settings and how clinicians and patients respond to the data.

Perspective: This study examined differences between PDMP users and nonusers and how clinicians in various specialties use PDMPs in practice. A better understanding of effective PDMP use will facilitate access to treatment for patients with pain while curbing the prescription drug epidemic and may ultimately reduce abuse, misuse, and overdose death.

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Prescription drug abuse and overdose have reached epidemic status in the United States, and prescription drug monitoring programs (PDMPs) have been implemented in nearly every state to combat the epidemic. The Office of National Drug Control Policy and the Centers for Disease Control and Prevention, among other federal agencies, have endorsed PDMPs as a way to reduce doctor and pharmacy shopping. Such shopping (visiting multiple prescribers or pharmacies to obtain prescription drugs) is associated with increased risk of drug-related overdose and death.^{12,13}

PDMPs originated from law enforcement and have only recently received attention as health care tools with potential benefits for patient care. PDMPs appear to influence clinicians' decisions about whether to prescribe controlled substances.^{2,8,10} Given the potential of

PDMPs to reduce doctor shopping, misuse, abuse, diversion of prescription medications, and ultimately overdose, optimizing their use is important. This requires a better understanding of which clinicians use these systems and how they are using them. Little is known about the characteristics of clinicians who register and use PDMPs and those who choose not to register, and even less is known about how clinicians integrate PDMPs into clinical practice.

Despite potential advantages, clinicians have been slow to adopt the use of PDMPs. On average, 53% of physicians within a state are registered to use the program,⁹ and many use it infrequently.^{8,10} Few studies have explored the clinical and demographic characteristics of clinicians who choose not to register for their state's PDMP or who are unaware of the PDMP. Such information might facilitate increasing adoption rates and use of the system.

Prescribing patterns for controlled substances vary as a function of clinician specialty and patient age, among other things.¹⁶ Thus, PDMPs may be more useful among some specialties and practice settings than others. For example, in an academic setting, emergency medicine physicians were more aware of the PDMP and used it more frequently than pediatricians.⁷ Wider knowledge of PDMP adoption rates among clinicians from various specialties and settings would help target further adoption and education efforts.

A small number of studies have addressed factors that lead prescribers to access the PDMP or have addressed how prescribers respond to suspicious PDMP findings. However, these have been limited by small size, poor response rates, or focus on academic physicians.^{8,10} More research is needed to understand the practice settings in which PDMP data are most useful, to generate insights into how clinicians integrate the PDMP into clinical practice, and to learn how they respond to the information. Therefore, a statewide survey was conducted to address the following aims:

- 1) Compare the demographic and clinical characteristics of high users, low users, and nonusers of the PDMP
- 2) Among clinicians who use the PDMP, identify when they access PDMP, what actions they take as the result of a worrisome report, and perceptions about how patients respond when they discuss the PDMP information

Methods

The study was approved by the institutional review boards at both Oregon Health and Science University and the Oregon Health Authority's Public Health Division (PHD). Clinicians gave their consent to participate in the study by completing and returning the survey.

Oregon PDMP

Oregon's PDMP is primarily intended as a tool for clinicians and pharmacists to help improve patient health, not as a regulatory tool for health care boards or law enforcement. Law enforcement can only obtain PDMP

information with a valid court order based on probable cause, and health care regulatory boards can only request information on licensees under an active investigation. In functionality, Oregon's PDMP is similar to many others. Pharmacies are required to upload Schedules II through IV controlled substances data at least weekly and clinicians are able to access information at any time via the Internet. Unlike some state programs, worrisome patient profiles do not generate automatic proactive alerts.

Sampling

The intended sampling frame was all Oregon clinicians with a current Drug Enforcement Administration license. First, a master database, totaling 22,078 clinicians, was developed using state board registries, including the Medical Board and boards of Nursing, Dentistry, Naturopathic Physicians and Optometry. This was matched with the Drug Enforcement Administration list, and clinicians without a license were removed so that only clinicians eligible to register for the PDMP were included. The PHD then matched the master database with the PDMP to identify registered and non-registered clinicians.

The PDMP registry was used to define high- and low-frequency-user groups. We chose the break between high- and low-frequency users based on actual usage observed in the PDMP over a 3-month period between December 1, 2012, and February 28, 2013. Of 4,345 registered users at the time, only 955 had queried 5 or more times in that interval. We opted for a break at 4 times or more to ensure an adequate pool for our sample goal of 650 high-frequency users. The list of high-frequency users of the PDMP was crossed with the board registry lists, so individuals (such as pharmacists) who were not listed in one of the registries were removed. Inadvertently, the list of low-frequency users of the PDMP was not crossed with the board registries as intended. As a result, a small number of pharmacists were included in the low-frequency-user sample ($n = 127$) but excluded from this analysis.

Finally, the PHD pulled a random sample of clinicians from each of the 3 user groups to participate in this study: 650 high-frequency users, 650 low-frequency users, as well as 2,000 nonusers. Nonusers were over-sampled in anticipation of a lower response rate. Only the PHD had access to identifying information.

Survey Development

Three survey versions were developed, 1 for each user group. The high- and low-user surveys differed only on the first question regarding how often a clinician used the PDMP each month. Low users had the option of indicating that they had "not yet accessed the PDMP." The high- and low-user surveys asked clinicians about using the PDMP in practice ([Supplementary Fig 1](#)), whereas the nonuser survey asked clinicians about barriers to registration ([Supplementary Fig 2](#)). The survey content was developed based on current gaps in the literature, input from state program experts, clinical experts, an

earlier and smaller state survey,⁵ and focus groups with clinicians from 9 other states who were active users of their states' PDMPs. The surveys required 7 to 14 minutes to complete, depending on the version and how much the clinician wrote in response to open-ended questions. Respondents were invited to participate in a follow-up telephone interview, and a small number of interviews have been completed.

Survey Mailing

Acumentra Health prepared survey mailing packets without names or addresses. Each packet contained a cover letter, a survey, and a metered return envelope. A \$2.00 bill was included as a novel incentive. Materials were all printed with unique identification numbers. The PHD hand-placed the corresponding address labels on the envelopes and mailed the packets in April 2013.

By using the PHD as the return address and applying mailing labels after the packets were fully assembled, the clinicians' identities were protected from anyone outside the PHD. However, clinicians had the option of self-identifying at the end of the survey in order to participate in a later, voluntary telephone interview. At the top of each survey was a URL and password for respondents to complete the survey online if they chose to do so. The web surveys were a duplicate of the paper surveys. A follow-up survey packet was sent to nonrespondents 3 weeks after the initial mailing.

Data Entry/Storage

The anonymous paper and web survey data were saved on Acumentra Health's secure servers. Randomly selected surveys (10%) were validated with double-entry. A total of 106 surveys were verified, and 9 (8.5%) required correction on 1 item per survey—a data entry error rate of .4% per item entered.

The response rate was stratified by survey type and calculated as the number of returned surveys divided by the number of distributed surveys, less those returned for bad addresses. The inadvertently sampled pharmacists among the low-frequency users were removed from the numerator and denominator in calculating response rates.

Web and paper survey responses were exported into 3 databases, 1 for each version of the survey. Data quality checks ensured that there were no duplicate entries and that all fields were populated with values allowed by the data dictionary.¹⁴ Twenty respondents who identified themselves as registered PDMP users on the nonuser survey were removed from the nonuser group. We presume that these individuals registered for the PDMP after our sampling was complete. Twelve of these requested a registered user survey; 5 surveys were returned and included in the low-frequency-user group. Nine respondents who were retired were removed from the "non-user" group. An additional 4 surveys were not entered because of other reasons, such as practicing outside the state of Oregon. Where appropriate, chi-square tests were used to determine statistical differences.

Results

Survey Sample

There were 358 respondents in the high-PDMP-user group out of 612 valid requests, after removing bad addresses and a duplicate survey, for a 58.5% response rate. Among low-PDMP users, there were 261 responses out of 503 valid requests, after removing bad addresses and 127 pharmacists inadvertently included in the sample, for a 51.9% response rate. Among unregistered clinicians, we received 439 responses from 1,789 valid requests, for a 24.5% response rate.

The age and gender mix of physician respondents closely matched those of the medical board registry, which suggested that they were representative demographically. This was also true for dentists with regard to age. Other boards did not record these demographic data. The demographic and credential features of the high- and low-PDMP users were similar, so they were combined as registered "users" for descriptive purposes (Table 1).

Comparison of Registered Users Versus Nonusers

Comparisons were made between high users, low users, and nonusers of the PDMP, and we present the results with the most notable differences. Where there were no statistically significant differences between high and low users, we collapsed these groups into "registered users." At times, we combined the high- and low-user groups because the clinical interpretation was more relevant to compare users to nonusers. Questions regarding use of PDMP in clinical practice were asked only of high and low registered users.

Demographics, Setting, Credential, and Specialty

Nonusers tended to be older than users, with 25.4% over age 60 compared with 15.6% of users ($P < .01$, Table 1). Compared to nonusers, a larger proportion of PDMP users practiced in safety net clinics (9.6 vs 3.8%, $P < .01$) and emergency departments (15.7 vs .7%, $P < .01$). Relatively few respondents from inpatient hospital settings were registered to use the PDMP. Credentialed physicians and physician assistants were heavily represented in the user group in our survey sample, as were those practicing in emergency medicine, pain and addiction, and primary care arenas. In contrast, nurse practitioners, surgeons, dentists, and psychiatrists were more heavily represented in the nonuser group in our survey sample. There were 205 (46.7%) nonusers who were not aware that they could register as a user of the PDMP.

Prescribing Habits

Registered users of the PDMP reported prescribing all classes of controlled substances more often than nonregistrants (Table 2). However, many nonregistrants also reported frequent prescribing of controlled substances. Among the 439 nonusers who returned a survey, 62.8%

Table 1. Demographic and Practice Characteristics of Survey Respondents According to PDMP User Status*

	PDMP REGISTERED USERS, N (%)	NONUSERS, N (%)
Total, n	619	439
Age category (y)		
<30	13 (2.1)	4 (.9)
30–39	161 (26.0)	98 (22.8)
40–49	185 (29.9)	105 (24.4)
50–59	157 (25.4)	114 (26.5)
≥60	95 (15.3)	109 (25.4)
Gender		
Male	327 (53.7)	214 (50.1)
Ethnicity		
Hispanic or Latino	21 (3.6)	10 (2.4)
Race		
American Indian/Alaska Native	5 (.8)	2 (.5)
Asian	44 (7.1)	43 (9.8)
Native Hawaiian or Other Pacific Islander	5 (.8)	0 (.0)
Black or African American	1 (.2)	2 (.5)
White	534 (86.3)	366 (83.4)
Practice setting		
Large private office (>5 practitioners)	141 (23.2)	90 (21.1)
Small private office (≤5 practitioners)	182 (30.0)	152 (35.7)
Academic practice	30 (4.9)	33 (7.8)
Resident	9 (1.5)	1 (.2)
Safety net clinic (eg, health department or FQHC)	58 (9.6)	16 (3.8)
Hospital-based clinic	31 (5.1)	31 (7.3)
Hospital: inpatient primarily	8 (1.3)	28 (6.6)
Emergency department	95 (15.7)	3 (.7)
Other	53 (8.7)	72 (16.9)
Credential		
Physician (MD or DO)	394 (65.0)	196 (45.6)
Nurse practitioner	99 (16.3)	107 (24.9)
Dentist	40 (6.6)	91 (21.2)
Physician assistant	59 (9.7)	23 (5.4)
Naturopathic physician	11 (1.8)	0 (.0)
Other	3 (.5)	13 (3.0)
What is your specialty (if applicable)?		
Emergency medicine	95 (17.2)	4 (1.1)
Internal medicine specialties	17 (3.1)	38 (10.8)
Other specialties	44 (8.0)	97 (27.5)
Pain/addiction specialties	36 (6.5)	5 (1.4)
Pediatrics	1 (.2)	38 (10.8)
Primary care	312 (56.4)	57 (16.1)
Psychiatry	28 (5.1)	41 (11.6)
Surgical specialties	20 (3.6)	73 (20.7)

Abbreviations: FQHC, federally qualified health center; MD, doctor of medicine; DO, doctor of osteopathic medicine.

*Numbers within categories do not add to the total number of respondents due to missing values or not applicable categories (eg, specialty for nonphysicians).

reported occasionally (1–5 times per week) or frequently (5 or more times per week) prescribing any class of controlled substance. Seventy-five percent of surgeon respondents prescribed opioids at least once a week, though only 26.1% of these regular prescribers were registered to use the PDMP. Four in 5 psychiatrist respon-

dents prescribed benzodiazepines at least once a week, but only 39.3% of these regular prescribers were registered to use the PDMP. Psychiatrists were also regular prescribers of amphetamine drugs (79.7%), but just 43.6% of these prescribers were registered. Of the 70.3% dentist respondents who prescribed opioids at least weekly, only 38.9% were registered to use the PDMP.

Clinical Practice Characteristics

Roughly three-quarters of registered users reported having moderate to expert levels of training regarding treatment of chronic pain, identifying substance abuse and addiction, and identifying mental health conditions. Fewer nonusers (roughly two-thirds) reported similar levels of training in these areas (Table 2). In contrast, only 36.6% of users and 28.2% of nonusers had received training in treating substance abuse and addiction ($P < .01$). A majority of both users and nonusers reported that they follow practice guidelines concerning opioid prescribing, pain management, and substance abuse. However, significantly more high users than low users reported using such practice guidelines. Similar proportions of high and low users reported using depression screenings, and both were significantly more likely to do so than nonusers of the PDMP. Similarly, significantly more low users than nonusers reported following guidelines for opioid prescribing. Registered users were significantly more likely than nonusers to employ other prescription monitoring methods, including urine toxicology screening, pain contracts, and random pill counting.

Use of PDMP in Clinical Practice

When Clinicians Access the PDMP

Approximately half of PDMP high users accessed it 10 or more times per month compared with just 9.8% of low users. High and low users reported various triggers for checking the PDMP (Table 3). Among registered PDMP users, 95.5% said they access the PDMP when they suspect diversion, addiction, or abuse, and 73.4% said they access it when a patient requests an early refill of a controlled medication. Forty-eight percent said they check the PDMP for every new patient and 36.3% whenever considering a prescription for a controlled substance. Only 4.0% of clinicians reported using the PDMP with every patient, although this figure was 22.2% among pain and addiction specialists. Pain and addiction specialists appeared to use the PDMP more routinely than other specialties across all clinical situations probed (Table 3).

Clinician Responses to PDMP Data

A worrisome PDMP report is one that suggests potential diversion, misuse, or abuse. Upon finding a worrisome PDMP report, clinicians reported a variety of responses (Table 4). Ninety percent reported they would discuss the concern with the patient, 75.1% would prescribe a noncontrolled drug alternative, and 54.2% would refer patients to a relevant specialist

Table 2. Clinical Characteristics of Survey Respondents According to PDMP User Status

	PDMP REGISTERED USERS, N (%)	NONUSERS, N (%)	P VALUE
Prescribing habits			
Prescribe opioids at least weekly	544 (88.7)	206 (48.4)	<.001
Prescribe benzodiazepines at least weekly	388 (63.1)	138 (32.8)	<.001
Prescribe amphetamine-like drugs at least weekly	183 (30.0)	79 (19.2)	<.001
Prescribe sleep medications at least weekly	337 (55.0)	106 (25.4)	<.001
Moderate to expert education/training			
Identifying mental health conditions	482 (79.5)	273 (64.5)	<.001
Identifying substance abuse/addiction	437 (71.9)	288 (68.4)	.231
Treating chronic pain	471 (77.3)	286 (67.8)	.001
Treating substance abuse/addiction	222 (36.6)	119 (28.2)	.005
Monitoring patients on controlled substances			
Use urine toxicology screening	440 (71.1)	106 (24.2)	<.001
Use pain contracts	430 (69.5)	130 (29.6)	<.001
Use random pill counting	171 (27.6)	50 (11.4)	<.001

USE OF PRACTICE GUIDELINES	HIGH USERS, N (%)	HIGH VS LOW USERS P VALUE	LOW USERS, N (%)	LOW VS NONUSERS P VALUE	NONUSERS, N (%)
Follow opioid prescribing practice guideline	314 (90.8)	.009	204 (83.6)	<.002	279 (72.7)
Follow pain management practice guideline	297 (87.4)	.027	196 (80.7)	.219	303 (76.5)
Follow depression screening practice guideline	282 (83.2)	.102	189 (77.8)	<.001	236 (60.1)
Follow substance abuse practice guideline	271 (80.4)	.002	165 (69.3)	.721	263 (68.0)

(eg, substance abuse or mental health clinician). More than one-third (35.8%) of clinicians said they sometimes discharge patients from their practice; this was most often true among pain and addiction specialists (52.8%). Primary care and pain and addiction doctors were more likely than other specialists to refer a patient to a mental health or addiction specialist because of a worrisome PDMP report (61.2% for primary care and pain specialists vs 42.4% among other specialties, $P < .01$). Many clinicians reported that they prescribe a noncontrolled drug alternative in the event of a worrisome report, but emergency medicine physicians were most likely to do so (80.0%). Sixty-four percent of psychiatrists and approximately 40% of pain/addiction and primary care doctors required patients to enter into a medication contract because of a worrisome report.

Few respondents reported that they consulted a pharmacist in response to a worrisome PDMP report, but pain/addiction specialists and internal medicine physicians were more likely than other specialists to do so ($P < .001$; see Table 4).

If clinicians had at least moderate levels of training in treating chronic pain, they were more likely to refer the patient to a specialist when the PDMP report suggested diversion or misuse compared to those with less training (57.1 vs 38.4%, $P < .01$). Perhaps paradoxically, clinicians with more training in the treatment of chronic pain, identifying substance abuse, treating substance abuse, or identifying mental health conditions were more likely than those with less training to report discharging a patient from their practices if a PDMP report suggested potential diversion or misuse.

Table 3. Situations in Which Registered Users (High + Low) Access the PDMP, According to Clinician Specialty

SPECIALTY	TOTAL, N	USUALLY, I ACCESS THE PDMP WHEN...				
		... I SEE A NEW PATIENT FOR THE FIRST TIME	... I SUSPECT DIVERSION, ADDICTION, OR ABUSE	... WITH EVERY PATIENT	... A PATIENT REQUESTS AN EARLY REFILL OF A CONTROLLED MEDICATION	... WHENEVER I CONSIDER PRESCRIBING CONTROLLED SUBSTANCES
Emergency medicine	95	21 (22.1)	93 (97.9)	3 (3.2)	70 (73.7)	27 (28.4)
Internal medicine specialties	17	8 (47.1)	13 (76.5)	1 (5.9)	9 (52.9)	6 (35.3)
Other specialties	44	16 (36.4)	41 (93.2)	0 (.0)	32 (72.7)	14 (31.8)
Pain/addiction specialties	36	25 (69.4)	35 (97.2)	8 (22.2)	30 (83.3)	23 (63.9)
Pediatrics	1	0 (.0)	1 (100.0)	0 (.0)	1 (100.0)	0 (.0)
Primary care	312	187 (59.9)	301 (96.5)	9 (2.9)	231 (74.0)	123 (39.4)
Psychiatry	28	6 (21.4)	24 (85.7)	1 (3.6)	19 (67.9)	6 (21.4)
Surgical specialties	20	4 (20.0)	20 (100.0)	0 (.0)	14 (70.0)	2 (10.0)
Total	553	267 (48.3)	528 (95.5)	22 (4.0)	406 (73.4)	201 (36.3)

NOTE. Values are n (%) unless otherwise indicated.

Table 4. Clinician Responses to PDMP Report by Specialty

If a PDMP Report Suggests Potential Diversion or Misuse, I Sometimes...

SPECIALTY	TOTAL, N	... DISCUSS THE CONCERN WITH THE PATIENT	...PRESCRIBE NONCONTROLLED DRUG ALTERNATIVE	...REFER THE PATIENT TO A SPECIALIST	...DISCHARGE MY PATIENT FROM MY PRACTICE	...REQUIRE PATIENT TO ENTER INTO A MEDICATION CONTRACT	...CONSULT A PHARMACIST
Emergency medicine	95	87 (91.6)	76 (80.0)	44 (46.3)	5 (2.2)	5 (5.3)	4 (4.2)
Internal medicine	17	13 (76.5)	9 (52.9)	9 (52.9)	8 (47.1)	4 (23.5)	4 (23.5)
Pain/addiction	36	34 (94.4)	26 (72.2)	23 (63.9)	19 (52.8)	15 (41.7)	9 (25.0)
Primary care	312	279 (89.4)	238 (76.3)	190 (60.9)	134 (43.0)	127 (40.7)	40 (12.8)
Psychiatry	28	24 (85.7)	21 (75.0)	7 (25.0)	10 (35.7)	18 (64.3)	5 (17.9)
Surgical	20	20 (100.0)	14 (70.0)	8 (40.0)	6 (30.0)	8 (40.0)	2 (10.0)
Other	44	43 (97.7)	31 (70.5)	19 (43.2)	16 (36.4)	12 (27.3)	3 (6.8)
Total	553	500 (90.4)	415 (75.1)	300 (54.3)	198 (35.8)	189 (34.2)	67 (12.1)

NOTE. Values are n (row % by specialty) unless otherwise indicated. Pediatricians were excluded because of small sample size (n < 5).

Patient Responses to PDMP Data

Clinicians reported a variety of patient behaviors when discussing a worrisome PDMP report, most commonly anger or denial (87.7% reported patients respond this way at least “sometimes”). Nearly three-quarters (73.4%) of clinicians reported that patients sometimes did not return, and only 22.9% reported that their patients sometimes requested help for drug addiction or dependence.

Training to Make PDMP More Useful in Clinical Practice

Registered users were asked what would make the PDMP more useful in clinical practice (Fig 1). At least 60% of clinicians thought training in the following areas would be “somewhat” or “very useful”: how to respond to information in a PDMP report, detecting substance abuse, treatment alternatives to controlled medications, nonconfrontational communication with patients, and chronic pain management. In contrast, considerably fewer users endorsed training in data interpretation.

Discussion

Among survey respondents, the PDMP appeared to be widely used by clinicians from many disciplines, especially among emergency medicine, primary care, and pain and addiction specialties. In our sample, the largest proportion of registrants included physicians and physician assistants, compared with other credentialed clinicians. Respondents who were registered users of the PDMP were more frequent prescribers of controlled substances than nonusers. However, there remained substantial gaps in enrollment among those who reported that they regularly prescribe controlled substances, especially among clinicians in psychiatry, dentistry, and surgical specialties. In addition, 47% of nonusers reported that they were not aware they could register for the PDMP. Most clinicians accessed the PDMP when they suspected diversion but fewer appeared to routinely check the PDMP in other clinical situations (eg, new patient). When a patient had a worrisome PDMP report, nearly all clinicians engaged in a discussion with the patient, but other responses (eg, referral, discharge) were more variable, based somewhat on specialty.

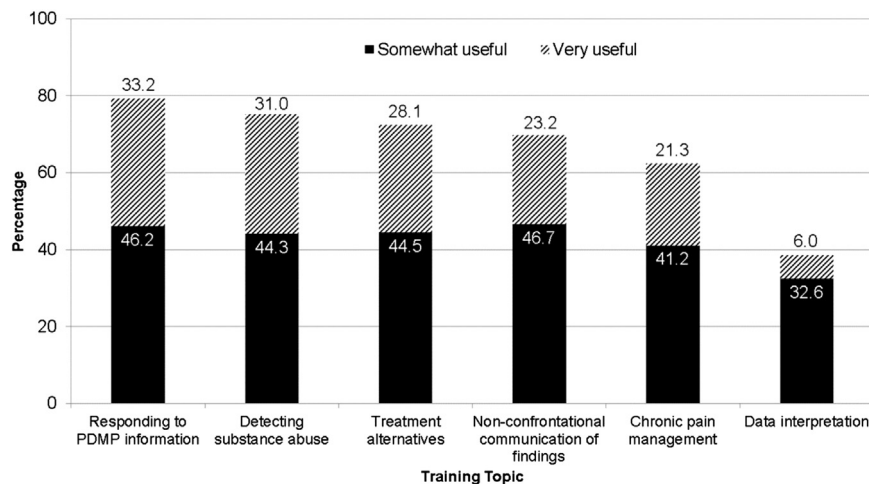


Figure 1. Percentage of registered users (high + low) who reported that training on various topics would make the PDMP somewhat or very useful in clinical practice.

The fact that nearly half of PDMP nonusers were not aware they could register for the program indicates a need to increase education and enrollment in the clinician community. In Oregon, during 2013, a majority (78%) of prescriptions were written by 26% of active prescribers ($n = 4,000$). Through outreach efforts, nearly 60% of these frequent prescribers are now registered. However, efforts to reach the remaining frequent prescribers of controlled substances must continue.

Emergency department doctors are among the top prescribers of opioids,¹⁶ and several studies have confirmed the usefulness of PDMPs in the emergency setting.² Baehren et al observed that emergency physicians changed their treatment strategy after reviewing PDMP data, sometimes decreasing and sometimes increasing controlled prescriptions. Although some specialties clearly benefit from routine use of the PDMP (eg, pain specialists and emergency physicians), what constitutes appropriate use in other specialties and settings is less clear.

In national studies, primary care physicians accounted for nearly 28.8% of all opioid prescriptions,¹⁶ and they treated a significant portion of chronic pain patients on an ongoing basis (52.0%).³ However, primary care physicians were much less likely than pain physicians, chiropractors, and acupuncturists to feel confident in their ability to manage specific pain conditions.³ Internists, dentists, and orthopedic surgeons accounted for 14.6, 8, and 7.7% of opioid prescriptions in 2009, respectively,¹⁶ and dentists were the largest prescriber of opioids for patients between 10 and 19 years of age. The specialty of a clinician likely determines the frequency and quantity of controlled prescriptions written (ie, prescribing patterns), which influences the patient's risk of overdose and diversion. For example, most dentists and surgeons may only prescribe short-term opioids after a procedure, unlike clinicians who treat chronic low back pain. It will be important to explore how PDMPs can best be used across various settings and subspecialties.

From survey responses among high users of the PDMP, the majority of clinicians did not appear to have routine policies regarding when to access the PDMP. Such policies might include checking the PDMP, for example, with all new patients or whenever considering prescription of a controlled substance. Pain and addiction specialists appeared to access the PDMP more routinely than other specialists across clinical situations.

Clinical impressions about which patients are drug seeking often differ from the information obtained from PDMP reports.¹⁷ Thus, it may be useful for clinicians to adopt routine practices for deciding when to check the PDMP. Our study indicated that only 4.0% of clinicians check the PDMP with every patient, and only 36.3% checked whenever they considered prescribing a controlled substance. The Federation of State Medical Boards recently released policy guidelines on treating chronic pain with opioid analgesics, suggesting that clinicians should access the PDMP whenever evaluating patients for treatment.⁶

Among clinicians who provide only episodic care or prescribe controlled substances for limited periods

(such as surgeons or dentists), the appropriate roles and responsibilities in preventing, detecting, and addressing prescription drug abuse remain unclear.

Although survey respondents reported that they nearly always discuss a worrisome PDMP report with a patient, they also indicated that patients often do not return or that they discharge patients from practice. Ninety percent of respondents indicated that patients at least sometimes express anger or denial when a clinician discusses a worrisome PDMP report. These findings suggest that the conversations between clinicians and patients regarding PDMP information may not promote optimal care, particularly for drug dependence or abuse. Further investigation into how clinicians discuss PDMP with patients; the actions they take in response to suspected abuse, misuse, or diversion; and the subsequent patient responses and outcomes is needed to identify promising practices.

It is important to consider the potential negative unintended consequences of PDMPs. For example, some clinicians may avoid prescribing altogether (ie, the chilling effect), may discharge patients from practice, or may confront patients in such a way that they choose not to return. One study suggests that clinicians have a range of strategies for approaching patients about PDMP data, and some strategies may be more effective than others.¹¹ More research and education on optimal communication strategies is needed.

Research on the use of the Screening, Brief Intervention, and Referral to Treatment protocol for alcohol suggests that there are feasible interventions that can address abuse, addiction, or dependence.¹⁵ However, there is little research on the effectiveness of Screening, Brief Intervention, and Referral to Treatment with patients abusing prescription drugs. Interestingly, clinicians with more training in identifying and treating chronic pain, substance abuse, and mental health disorders were more likely to report that they would discharge patients from practice than clinicians with less training. Such patients may end up in the care of less experienced or less well trained clinicians, thus repeating the cycle of doctor shopping, misuse, or untreated pain or mental health conditions. In follow-up telephone interviews with providers who responded to this survey, we ask about pain contracts and reasons for discharging patients from practice. Clinician responses to broken contracts seem to vary. Some clinicians do consider a broken contract a reason to discharge, whereas others state that they would discontinue controlled substances but continue seeing the patient, offering treatment alternatives. Still others have reported that the only reason they discharge patients is due to unsafe or abusive behavior toward clinic staff.

Clinicians who used the PDMP indicated that training related to improving communications and responding to PDMP reports would be useful, suggesting that clinicians are open to improving skills in these areas. Simply providing clinicians with access to data within the PDMP may not be enough to change their behavior or patient behavior. More research is needed to learn how clinicians can best intervene with patients who exhibit

signs of abuse, misuse, diversion, or risky use of prescription drugs. Ultimately, it is important to assess whether clinician use of PDMP results in better patient outcomes.

Important strengths of the study include its size, statewide sampling, inclusion of PDMP nonusers, and identification of respondents' specialties. The survey included nonphysician users of the PDMP. Previous surveys of PDMP use have typically included small samples and have been limited to single specialties or to academic settings. Few have addressed nonusers of the PDMP, and few have itemized responses by clinician specialty. Additional studies including these elements are needed to better assess PDMP use and the effectiveness of these systems for improving patient care.

Several limitations of the study were identified. Survey response rates were suboptimal, but for users of the PDMP, they were comparable to other surveys of medical providers.^{1,4} However, clinicians not registered to use the PDMP responded at a much lower rate (25%) than registered users. Low response rates can introduce potential bias as respondents may systematically differ from nonrespondents in their clinical characteristics, reasons for not registering, or perceived barriers. A worrisome PDMP report and the terms *potential misuse* and *diversion* were not defined for survey participants, thus introducing another potential source of variability and bias. The survey included a random sample of clinicians in Oregon and may not be generalizable to clinician populations in other states. Some specialties contained small sample sizes, making specialty comparisons difficult. The survey questions were developed by the authors. Though based on other

surveys and focus groups, they have not been independently validated. As in any survey, social desirability may bias some results, although this bias was reduced by providing anonymity to the respondents.

Future research should focus on identifying optimal strategies for accessing and discussing the PDMP in diverse settings and help establish routines and guidelines for each. Further study is needed to optimize the approaches clinicians take when discussing PDMP reports and to identify which strategies lead to better patient outcomes. Identifying effective approaches to "problem patients" may help to reduce the likelihood that these patients end up on the street or in another clinician's office. Now that PDMPs are widely available, more attention is needed to maximize their clinical utility if they are to achieve their potential for reducing drug misuse and abuse and increasing patient safety.

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Supplementary Data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jpain.2014.04.003>.

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