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## Utilization of Prescription Drug Monitoring Programs for Prescribing and Dispensing Decisions: Results from a Multi-Site Qualitative Study

Patricia R. Freeman, PhD, BSP Pharm<sup>\*,a</sup>, Geoffrey M. Curran, PhD<sup>b,c</sup>, Karen L. Drummond, PhD<sup>b,c</sup>, Bradley C. Martin, PharmD, PhD<sup>b,c</sup>, Benjamin S. Teeter, PhD<sup>b</sup>, Katharine Bradley, MD, MS<sup>d</sup>, Nancy Schoenberg, PhD<sup>e</sup>, and Mark Edlund, MD, PhD<sup>f</sup>

<sup>a</sup>University of Kentucky College of Pharmacy, 789 South Limestone Street, Lexington, KY 40536

<sup>b</sup>University of Arkansas for Medical Sciences, 4301 West Markham St., #522-4, Little Rock, AR 72205-7199

<sup>c</sup>Central Arkansas Veterans Healthcare System, 2200 Fort Roots Drive, North Little Rock, AR 72114

<sup>d</sup>Kaiser Permanente Washington Health Research Institute, 1730 Minor Ave, Seattle, WA 98101

<sup>e</sup>University of Kentucky College of Medicine 125 Medical Behavioral Science Office Building Lexington, KY 40536-0086

<sup>f</sup>RTI International, 3040 East Cornwallis Road, P.O. Box 12194, Research Triangle Park, NC 27709-2194

### Abstract

**Background**—Prescription drug monitoring programs (PDMPs) track the dispensing of prescription-controlled substances with the goal of mitigating misuse and diversion. Authorized users query the PDMP for controlled substance prescription histories at the point of care. Despite widespread implementation of PDMPs, there is much not known about how PDMPs influence prescribing and dispensing decisions.

**Objectives**—The objective of this study was to investigate how primary care providers (PCPs) and pharmacists utilize PDMPs when making prescribing and dispensing decisions.

**Methods**—Data from in-depth, qualitative interviews with PCPs (n=48) and community pharmacists (n=60) across four states— Arkansas, Idaho, Kentucky, and Washington were analyzed for themes around PDMP use.

\*Corresponding author. Tel +1 859-323-1381; trfree1@uky.edu.

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None

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**Results**—Both PCPs and pharmacists reported that PDMPs are key tools for aiding prescribing and dispensing decisions. PCPs reported variable use of PDMPs with most querying the PDMP when “red flags” and fewer reporting having clinic policies that direct PDMP use. Primary care providers in Kentucky reported more consistent and routine use of the PDMP as a result of a state law that mandates query prior to the initial prescribing of Schedule II controlled substances. Community pharmacists practicing in chain pharmacies reported formal policies requiring PDMP query prior to dispensing opioids, while utilization of PDMPs by pharmacists practicing in independently-owned pharmacies was more variable. Pharmacists and PCPs reported barriers to PDMP use, such as having to “log in on a separate machine” and perceived that PDMP utility could be improved by integrating it within pharmacy dispensing systems and electronic health records.

**Conclusions**—Pharmacists and PCPs reported the importance of PDMP information to aid their prescribing and dispensing decisions. Efforts to enhance state PDMP programs should consider processes that seamlessly integrate all available controlled substance prescription history for a given patient at the point of care so that PDMP utility for prescribing and dispensing decisions is maximized.

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## INTRODUCTION

Prescription opioid misuse and overdose remain a significant public health problem in the U.S. Labeled as an ‘epidemic’ in 2011 by the U.S. Centers for Disease Control and Prevention (CDC),<sup>1</sup> there is little evidence that the crisis is abating. In 2016, an estimated 11.5 million people aged 12 or older reported misuse of prescription pain relievers in the past year<sup>2</sup> and recent data show the rate of prescription opioid-related deaths increasing 4-fold between 1999 and 2016.<sup>3</sup>

Prescription drug monitoring programs (PDMPs) track the dispensing of controlled prescription drugs and have been implemented in the United States and other countries, including Canada, Australia and parts of Europe, to address the prescription opioid crisis.<sup>4-6</sup> Currently, 49 states and the District of Columbia have active PDMPs.<sup>7</sup> Prescribers and pharmacists, or their delegates, can query the PDMP at the point of care to get reports of patients’ controlled substance prescription histories to assist in making sound prescribing and dispensing decisions. In particular, PDMPs have been touted as a means of identifying patients who attempt to gain access to prescription opioids, or other controlled substances, for misuse and diversion by visiting multiple prescribers and multiple pharmacies over short periods of time, an activity commonly referred to as “doctor-shopping.”<sup>8</sup>

Historically, utilization of PDMPs has been voluntary; in recent years, however, laws mandating prescriber and pharmacist use of PDMPs under specific circumstances have been implemented by some states.<sup>9</sup> Evidence to date suggests that voluntary PDMP utilization differs significantly among providers and across states.<sup>10-15</sup> For example, pharmacist utilization of PDMPs has been shown to vary by practice environment<sup>6</sup> and by orientation (healthcare vs. law-enforcement) of the pharmacist.<sup>10</sup> Similarly, prescriber use of PDMPs has been shown to vary by specialty and clinic characteristics.<sup>11,12</sup> Prescribers and pharmacists who report using PDMPs indicate they find the information helpful in making

treatment decisions<sup>13–16</sup> yet studies report that voluntary use of PDMPs by both pharmacists and physicians remains limited.<sup>17–19</sup> However, despite widespread implementation of PDMPs across the U.S., there is much not known about how prescribers and pharmacists utilize PDMPs for prescribing and dispensing decisions. For example, what are the specific factors that prompt prescribers and pharmacists to utilize PDMPs? How do they actually use the information from PDMPs? What do they like and dislike about PDMPs? How can PDMPs be improved?

Understanding how and why prescribers and pharmacists access PDMPs and utilize the information in their prescribing and dispensing decisions is paramount to ensuring these programs are designed and implemented in ways that optimize their utility for decreasing misuse and diversion of opioids. To investigate these issues, data from qualitative interviews with 48 primary care providers (PCPs) and 60 pharmacists in four states were analyzed for themes around PDMP use. This study was part of a larger study, *Prescribers, Pharmacists, & the Opioid Dilemma: A Multi-Site Qualitative Study* (the POPs study) which used semi-structured qualitative interviews with PCPs and pharmacists to better understand decision-making processes for prescribing and dispensing of opioids for chronic non-cancer pain.

## METHODS

Interviews with pharmacists and PCPs in four states (Arkansas, Kentucky, Idaho, and Washington) were conducted. By conducting the study in multiple states, it was possible to examine opioid prescribing in both rural and urban areas with “high” rates of prescribing (Kentucky and Arkansas), in urban areas with “medium” rates of prescribing (Washington) and in rural areas with “medium” prescribing rates (Idaho).<sup>20</sup> These states also represented differences in PDMP features such as the frequency of reporting, and policies and resources surrounding opioid prescribing, such as mandates (or lack thereof) for use of PDMPs. Table 1 compares the PDMP features in the four states utilized in this study.

### Participant Recruitment

In each state, individuals involved in direct patient/consumer interactions for at least 20 hours per week and who practiced in a range of settings (e.g., chain, independent, and health system pharmacies for pharmacists; solo, group, academic, and managed care practice settings for PCPs) were recruited. A brief online screening tool was designed to record demographics and determine eligibility. The PCP and pharmacist networks of the co-investigators in the geographic locations were used initially to invite completion of the screener (by email or phone). Recruitment was also assisted by local clinical and pharmacy leaders and state professional organizations who identified potential participants, who were then emailed or called and invited to participate. A “snowball” method was also used where current participants were asked to identify potential participants in their area, who then were contacted. Recruitment goals were set *a priori* at between 12–15 for both samples within each of the four states. The study was approved by the University Institutional Review Boards in each state. Table 2 depicts the demographic details of both samples.

## Data Collection

Data were collected through the use of semi-structured interviews with each participant between June 2015 and March 2018. Most interviews took place in-person during site visits to each state, with the remaining interviews (<10%) conducted via telephone. Pharmacist and PCP interviews, for the most part, were conducted in week-long blocks during the site visits. Two rounds of site visits for each group (PCPs and Pharmacists) were conducted in Idaho, Kentucky and Washington during the first two years of the project. Interviews in Arkansas were conducted intermittently throughout final two years of the study as the lead interviewers were based in Arkansas. A dual-interviewer technique was employed, with a social scientist lead interviewer and clinician secondary interviewer present in each state. Interviews ranged from 40 up to 100 minutes in duration, depending on time needed to cover all the areas included in the interview guide. Semi-structured interview guides designed to cover a range of topics were developed *a priori* from the existing models of decision-making and literature on opioid prescribing and dispensing. The guides were revised iteratively after the first few interviews to adjust wording and delivery and revised again after approximately one-half of the interviews were completed to include emerging themes and re-prioritize topic areas. Broad topics in the interview guides included: 1) PCP and pharmacist characteristics and their experiences with and beliefs around use of opioids; 2) environmental influences such employer, state and federal policies regarding opioid prescribing dispensing; 3) patient characteristics such as medical history and if the patient is known or unknown to the practice; and 4) aspects of the patient encounter (e.g. suspicious patient behavior) that might influence prescribing and dispensing decisions. In addition to questions directly related to these *a priori* topics, the interview guides also included numerous open-ended questions designed to elicit new themes. The state PDMP was an *a priori* topic of interest that was explored in each interview of both the pharmacist and PCP samples. Copies of the interview guides are available upon request.

## Data Analysis

All interviews were digitally audio-recorded and transcribed verbatim by two independent transcription services. In the first stage of analysis, template analysis techniques developed by Nigel King<sup>21</sup> were used to develop a hybrid deductive/inductive thematic codebook. Deductive, *a priori* themes from the interview guide were used to create the first draft of the coding “template.” Transcripts were reviewed and discussed in meetings of the full research team to identify emerging inductive themes to iteratively expand the coding template. The developed template was then tested on additional transcripts to further add and refine themes until no additional themes could be identified. Moving into the second stage of analysis, two coding teams led by the primary interviewers were formed – one for the pharmacist data and one for the prescriber data – and performed top-level coding using the qualitative data analysis software package MAXQDA 12 (VERBI GmbH, Berlin, Germany). Each coding team met regularly to discuss and resolve coding discrepancies until reaching at least 80% agreement for each toplevel code, and then coded independently. For the present paper, each coding team performed a focused analysis of all data in which PDMPs were discussed, abstracting relevant text and examining data for patterns across and within states. These patterns are described below. For additional detail regarding the methodology used for the POPs study, the reader is referred to Curran et al.<sup>22</sup>

## RESULTS

### Pharmacist Results

Pharmacists were asked about use of PDMPs with the broad opening question “What are your experiences with PDMPs?” Follow up questions generally focused on specifically how and when PDMPs were used, how PDMPs affected workflow, and how the use of PDMPs could be improved. Five overall themes emerged from pharmacist responses: 1) PDMP use varies by state and practice setting; 2) PDMPs are key tools for dispensing decisions; 3) Impact of PDMPs on workflow is a significant barrier to use; 4) Increased prescriber use of PDMP would be helpful; 5) Integration of the PDMP within the pharmacy management system would increase utility.

**PDMP Use Varies**—Pharmacists reported varying frequency of use, ranging from every opioid/controlled substance patient, as reported by several pharmacists practicing in Idaho, to rarely. Daily was the most common frequency of use reported by pharmacists. Only one of the 60 pharmacists interviewed was not registered to use the state PDMP.

“I’d probably say maybe fifty at least a day. More probably than that, to be honest. . . .” - AR Pharmacist 02

“I work KASPER [KY PDMP], I use KASPER every day I work.” - KY Pharmacist 09

“We use it probably weekly. I might use it three times in a day, but I would say at an average weekly, maybe twice a month, we just wanna see especially if you get a new guy that comes in.” - ID Pharmacist 02

Reported use of the PDMP varied by practice setting with those practicing in chain pharmacies usually reporting more frequent use as a result of corporate policies that require PDMP query prior to dispensing. For example, many pharmacists working in chain pharmacies described policies requiring the use of a checklist for Schedule II opioids that included the requirement to check the PDMP. In contrast, independently practicing pharmacists usually reported less frequent use of PDMPs as a result of “knowing their patients” and having “regular customers.”

“Well, the [Big Box Store] policy is for all of the hydrocodones, oxycodones, OxyContin, mostly pretty much the opioids. The high – what do you call them – the high moving ones. We have to call, get the diagnosis, last date seen, if they’ve done a urine test, and check the monitoring program.” - ID Pharmacist 03

“Oh, yeah. I will, you know, I probably don’t run but maybe one KASPER a month. But like I said, I don’t see a lot of transient patients. It’s gut feeling and then sometimes some of my regulars that I worry about I’ll run a KASPER on occasionally, and sometimes it just confirms that everything’s like it’s supposed to be. . . .” - KY Pharmacist 08

Some independent pharmacists in Kentucky reported less frequent use of the PDMP as a result of a state law mandating prescriber query of the PDMP prior to the initial prescribing of a Schedule II controlled substance prescription. As one Kentucky pharmacist put it:

“My logic for not using KASPER every time someone comes in is because I trust the system is working the way the system’s supposed to work with the [prescriber], who has to look at KASPER in order to prescribe the prescription in the first place.” – KY Pharmacist 13

Pharmacists practicing in large health systems where pharmacists and prescribers share an electronic medical record, such as VA systems, HMOs and large academic medical centers, reported similar experiences as the independent pharmacists due to the shared EMR.

“[S]o we don’t do so much monitoring with them because we know where they’re coming from, who the doctors are, and it’s a standard script that they just sign off on. We see a lot of the same procedures and stuff like that.” –WA Pharmacist 01

Pharmacists across all states and practice settings described similar “red flags” that prompt them to check the PDMP. A non-local patient new to the pharmacy, paying cash, being overly chatty, asking for medications by brand name, prescriptions issued by out-of-state doctors were almost universally identified as red flags.

“Certainly one red flag is if they’re paying cash and not on insurance.....and the monitoring program helps us to know if they’ve gone to three or four different doctors for the same thing, then that’s a red flag too.” - ID Pharmacist 03

*“If they’re real chit-chatty, hover, you know, that’s an automatic red flag.” - AR Pharmacist 02*

“ If I have any reason to not understand or, or to not feel totally comfortable I run a KASPER and, and I also had a student in here yesterday going to pharmacy school and that’s the way I explained to him, any reason can mean anything from I don’t know them, I don’t know the doctor, they’re oddly address, like why are they here, odd actions, you know, any, anything that gives me any reason to believe something unusual, I do, yes, always.” – KY Pharmacist 15

**PDMPs are Key Tools**—Virtually all pharmacists, regardless of state and practice setting, expressed sentiment that the PDMP was a valuable tool to assist in making sound dispensing decisions. When asked about the helpfulness of the PDMP as a tool for dispensing decisions, pharmacists routinely made statements such as:

“Now that I’ve had it I would not want it taken away, I think that speaks highly for the tool.” - AR Pharmacist 01

“Yes definitely, 100%. I love it. I have it bookmarked on my computer” - WA Pharmacist 15

Pharmacists report using the PDMP to confirm their dispensing decisions. They use the information to check if patients are receiving other controlled substance prescriptions and the timing and location of their dispensing. The information garnered from the report is then used to communicate with the prescriber for further clarification or with the patient to indicate the pharmacist’s decision to not fill the prescription.

“There’ve been a couple times that they’ve been from outside prescribers,. . . especially if the insurance isn’t covering and if we pull. . . a KASPER and you can



tell they've just gone to several different prescribers, different pharmacies, that's when, . . . honestly I would turn them away and tell them that I wouldn't fill it. . .”  
– KY Pharmacist 14

“We just had an example last week with a guy that brought in something. It was dated not to fill until the 20th of September and he was in on the 19th or something like that. He goes; well, the doctor said it's okay to fill it early or blah, blah, blah. And so something just didn't seem quite right. We didn't know this guy and so we accessed the PDMP and oh my God. He's got 10 prescribers and I go; we're going to have to call the prescriber. He's like; no, no, no – don't call the prescriber because she's going to know I'm a day early. I'll just come back tomorrow. . . . Well of course we're going to call the prescriber because now I find out he's got 10 prescribers and they're all prescribing large quantities so he never came back.” - WA Pharmacist 04

**Impact on Workflow is a Barrier**—Most pharmacists interviewed described workflow challenges related to using the PDMP that were specifically related to the time needed to leave the dispensing system and log-in on a separate machine or website, enter the patient data, and then wait for the report to come back. Most pharmacists used adjectives such as “slow,” “cumbersome,” and “time-consuming” to describe the PDMPs, with the exception of two pharmacists working for one specific chain in Idaho who described having PDMP information integrated in the dispensing system.

“[B]ecause it is this external log in, this two- fact authentication getting through, it's, it's cumbersome to do it. So that's why we kind of, we don't do it for every patient just because there's just not time to necessarily do that, so that's why we kind of use that, that flag criteria.” - WA Pharmacist 10

“I would say to actually log-on on the system and then put all the information in for the patient and then wait on the system to send you the request and print it out and actually evaluate it, I would probably say, . . . I think about five to seven minutes maybe because you have to actually, like I have to flip over, I either have to write it all down from the computers, from my software system, or I just have to flip back and forth between screens and enter in all the information.” - KY Pharmacist 03

“How do I say this, its time consuming to access and utilize. . .its slow to load on that computer, and, you know, what is it, half a dozen steps to get to where you want to be, you got to put in here and here and here, it's not real user friendly.” – AR Pharmacist 04

**Increased PDMP use by Prescribers Needed**—With the exception of Kentucky pharmacists, a common theme of the pharmacist interviews was that use of the PDMP fell to the pharmacist and that prescriber use of the PDMP was lacking.

“If the doctors would check patients before they write narcotics for them. You know, they, they have access to the prescription monitoring program just as well as we do” ID Pharmacist 09

“Doctors don’t use the PMP. I don’t think they have access to it. They’ll call me to look up stuff for them, and I’m like Get an account. You need to be doing this.” WA Pharmacist 03

In 2012, Kentucky passed House Bill 1 which mandated prescriber registration and use of the PDMP prior to the initial prescribing of Schedule II opioids. As one Kentucky pharmacist put it:

“[O]ur orthopedic doctors always do a KASPER. So if I do a KAPSER they already know about it. So I’m very, I’m much more relaxed because I know they always do it.” KY Pharmacist 11

**PDMP Integration is Needed**—Almost all pharmacists expressed the desire for the PDMP to be seamlessly integrated within their dispensing systems.

“I almost wish it could be integrated with the different computers systems somehow, where we wouldn’t have to go online to hunt it down.” - ID Pharmacist 03

“It would be phenomenal if I fill a controlled substance, if the KASPER data would just pop up and go, hey, this is what this person’s getting filled nationwide, that’s what I would like. In theory, it should be possible.” - KY Pharmacist 05

“That’d be awesome. If you can, if it will just automatically download into your computer system that, hey, here’s their file from your pharmacy but here’s their PDMP file, that’s awesome.” – AR Pharmacist 03

A couple of pharmacists interviewed practiced in settings where the PDMP was integrated into the dispensing system and unanimously expressed enthusiasm for the change.

*“That, at least that pops up, every controlled substance you do that comes up which is nice. That’s probably the best thing that’s ever been developed, is, because that’s like It makes you look at it and you can check it.” – ID Pharmacist 13*

**PCP Results**—All PCPs were asked about use of PDMPs, generally with the broad opening question such as “How do you use the state prescription drug monitoring program?” with appropriate follow-up questions (e.g. “What do you do with the information?”). In their responses, PCPs generally focused on five issues: 1) whether or not they used the PDMP; 2) factors influencing their use of PDMPs; 3) how they actually accessed the PDMP; 4) what they did with information; and 5) what they liked about the PDMP or suggestions for improvement.

**Do PCPs use the PDMP?**—Almost all of the PCPs reported using the PDMP. Most reported that they accessed the database themselves, though a few used staff as delegates. A few reported that they did not use the PDMP at all or didn’t use it very frequently. One PCP in a small rural private practice told us that did not access it because of his age and lack of computer skills. Providers working in larger integrated health systems often cited their assumption that patients only filled prescriptions in system pharmacies as a reason why they



felt less need to check the PDMP. A few attributed less PDMP use to the sense of trust developed over time with their patients.

“You know, I, I never have and for me at 68, all of the computer skills necessary to do all these various and sundry things escape me.” – WA PCP 02

“. . . I’ve been in practice a long time and I’ve got a rather small practice, . . . so I, I’ve got a real tightly controlled patient population that I’ve seen for many years. And I have several patients on chronic opioids for chronic problems, . . . they sign a yearly agreement. . . I might check them once a year or so just to make sure that they’re heads up. But, you know, . . . I’ve gotten to trust these people and I really don’t think they’re screwing around in meds otherwise, so I don’t use it a whole lot.” – AR PCP 02

**When do PCPs use the PDMP and why?**—While there were many factors that influenced whether and when the PCPs used the PDMP in a clinical encounter, generally they could be classified into three broad categories. First, a large majority mentioned that they used it for a new patient, or a new opioid prescription for a known patient.

“Any new patient that’s coming to me asking for [opioids] that I don’t know, I’m looking at [the PDMP]. – ID PCP 06

“So if I’m thinking about opioids in anybody then I’ll access a PMP before starting them on opioids to see what their fill history has been like.” –WA PCP 09

Second, many PCPs said they used it when there were “red flags” that concerned them, such as requests for early refills, reports of lost or stolen medication, or asking for a particular opioid by name.

“There’s a number of red flags. Those are the kind of people I might, you know, look in the state database to see if they’re getting medications other place.” – WA PCP 03

“Aberrancies, lost medications, stolen medicines, and those sorts of things, we’ll run a board of pharmacy check on them.” – ID PCP 04

Third, some clinicians mentioned mandates to check the PDMP, whether by the clinic, managed care system, or state. PCPs in Kentucky most often referenced state-level influences (which then triggered implementation of system or clinic policies), while physicians in Washington reported clinic or health care system policies.

“So I think the policy that, once House Bill 1 kind of came through, and it, as we were anticipating that, then that’s when we officially as a clinic policy implemented that, that we’re doing the minimum, at least the minimum urine drug screening [and] KASPER. And then we do periodic clinical audits and so we try to make sure that everybody’s doing that. Sorry, three things, urine drug screen, KASPER, and drug contract.” – KY PCP 02

**How do PCPs use information from the PDMP?**—Universally, PCPs stated that if they had a concern with the information in the PDMP they would review it with the patient

personally. One PCP described the way this kind of review begins, while another noted that the objective nature of the information aids in having an honest conversation with the patient.

*“If everything is okay I don’t even mention to the patient that we pulled the information, I just go about my [usual routine]. If there are abnormalities, I talk to the patient myself. I don’t ever have my nurse talk to the patient about those abnormalities. I say ‘Hey, explain the story to me, what’s going on? Who’s this other prescriber?’ And then listen to what they have to say.” – ID PCP 04*

“I’ll just walk in and lay it down and say, ‘We got to talk.’ I believe you best be just honest with somebody. And, you know, I don’t want to be rude about it but I’ll walk in – I don’t really like to go in and say, ‘Well, have you done this,’ and then if they try to wiggle around then it almost makes them look like I’ve got them on the witness stand – I tend to walk in and say, ‘Well, I found something here that we need to talk about,’ and that takes lying off the table.” – KY PCP 10

PCPs commonly reported that if there were aberrancies (almost always getting opioids from other providers) they stopped prescribing opioids to these patients. But in some cases, there are reasonable explanations for additional prescriptions and thus the PCP feels comfortable continuing the current prescription.

“I get a [PDMP] report and it shows that they got narcotics from someone else, it is usually explainable from their surgeon, the ER, whatever, and I will give people, I’ll review the rules for opioid prescribing with them and we’ll, depending on their condition, their circumstance, we’ll keep it going.” – KY PCP 15

“Yeah, I’m just honest with the patient and tell them that any time that I’m concerned about a patient that’s on a controlled substance. . .that I run their information through the prescription monitoring program database. . . and I let them know that, ‘This is something that I found in the database, that it looks like you’ve gotten these, these prescriptions in the past from these physicians.’ I have occasionally had a patient argue with me about that. On one occasion the pharmacy was actually wrong, and we called the pharmacy and we changed, and we, they fixed how they were entering things in PDMP. – AR PCP 01

Occasionally, aberrancies lead PCPs to terminate the relationship with the patient per clinic policy or provider preference, but most reported that they stop prescribing the opioid but offer to continue caring for the patient’s other issues. Several described to us how they conduct these conversations with patients, using the PDMP results to explain why they will no longer prescribe opioids.

“We just say, ‘You’re getting your Norco through this other doctor so we’re not gonna give it to you anymore,’ that kind of thing. – IDAHO PCP 03

“And I guess I don’t usually actually fire the patient from my practice. I will usually say, ‘I’m not comfortable continuing to manage your pain. I can send you somewhere else if you want to do that. If you want to see me for other reasons, I’d still be happy to.’ But the vast majority of those, I usually don’t see again.” – ID PCP 04

“... if it’s a patient who I think has a legitimate severe chronic pain issue and they otherwise seem appropriate except their KASPER throws up red flags, then I’ll usually explain it that, [in the] primary care clinic setting, they’re in a category of risk where as a clinic we’ve decided that we can’t prescribe long-term opiates. But then I’ll usually try and facilitate referrals to a pain management clinic.” – KY PCP 01

**How could PDMPs be improved?**—Overwhelmingly, PCPs who used their state PDMP felt that this kind of database was a useful tool, describing it as “great,” or even “the best thing that’s ever happened.” One PCP in Idaho especially appreciated the expansion of their PDMP to include data on opioid dispensing from neighboring states:

“And it’s getting more robust, so we’re starting to get not just Idaho’s prescription drug monitoring, I’m starting to get people if they filled in California and Nevada, which is huge for me.” – ID PCP 01

There were few suggestions for improvement of their state PDMPs aside from PCPs in WA who found their PDMP system to be “clunky” enough to impact regular use. One PCP suggested that the PDMP be embedded in their EMR for greater ease of use:

“I don’t know how this compares to other states but it’s really clunky to log on to....And it’s really unfortunate because someone comes in, if you could just quickly, particularly with, you know, our electronic medical record, if it could be embedded and you just click and it runs a search and you figure out where they’re, it would, it would, I can’t tell you how much, we would catch, you know.” – WA PCP 14

However, more than one PCP reported a desire for a national system that would aid in identifying patients who obtain prescriptions in other states. One noted a suspected interstate “pipeline” that the current state-based tools are unable to verify:

“And the, the only things that I wish were, of course that we had a national system or at least a smoother regional system. Tracking people, from Kentucky tracking people’s controlled medications in Indiana is harder than it should be. We strongly suspect a Kentucky to Florida pipeline for narcotics and it’s impossible for us to track those people. So having a national system would be desirable.” – KY PCP 15

## DISCUSSION

Opioid misuse and overdose remain significant public health problems in the US. In efforts to mitigate these problems, states have implemented PDMPs to track the dispensing of prescription opioids and other controlled substances. At present, 49 states and the District of Columbia have active PDMPs; however, the rules governing their access and use vary<sup>5</sup>. To have maximum utility, prescribers and pharmacists must register with and access PDMPs, and utilize the information in the PDMP report for treatment decisions. In 2011, Green et al estimated that overall, less than 25% of health care providers accessed PDMPs to obtain patient reports.<sup>23</sup> Specific to PCPs, Rutkow and colleagues in 2014 surveyed a nationally

representative sample of 1000 PCPs and found that only 53% of PCPs reported using a state PDMP.<sup>24</sup>

This low utilization of PDMPs has resulted in an increasing number of states mandating registration and use of the PDMP under specific circumstances. For example, the Kentucky legislature passed House Bill 1 (HB1) in 2012, mandating prescriber and pharmacist registration with the PDMP and mandating prescriber query under specific circumstances, becoming an early adopter of mandatory query legislation along with Ohio, Tennessee and New York.<sup>25</sup> Prior to HB1, a report by Blumenschein and colleagues showed that only 16% of licensed pharmacists and 27.5% of licensed controlled substance prescribers were registered with the PDMP.<sup>26</sup> As of March 2018, all but 10 states have some degree of mandatory registration and use, with most specifically mandating prescriber query; however, 13 states have implemented rules requiring mandatory query by pharmacists under specific circumstances.<sup>27</sup>

The present study suggests that the circumstances under which PCPs and pharmacists access PDMPs varies considerably and is driven by both state influences and practice-specific policies and procedures. Specifically, implementation of the state mandate in Kentucky and “good faith” dispensing policies by some corporate chain pharmacies has resulted in more routine use of PDMP information for prescribing and dispensing decisions. Good faith dispensing policies requiring pharmacists to query the PDMP prior to dispensing Schedule II opioids have been implemented to assist pharmacists in carrying out their corresponding responsibility under 21 C.F.R. § 1306.04 to confirm the legitimacy of controlled substance prescriptions.<sup>28</sup> In most other circumstances, the use of PDMPs by both pharmacists and PCPs continues to be driven by ‘red flags’ such as when patients request medications by name, request early refills, report loss of prescriptions, etc. This finding is consistent with previous reports: one by Fleming and colleagues who found that community pharmacists in Texas reported early refill requests, paying cash and irregularities in the written prescription were events that would prompt PDMP use,<sup>29</sup> and another conducted by Green et al. suggesting pharmacists utilize PDMPs when they suspect diversion or “doctor-shopping.”<sup>30</sup> With the exception of Kentucky where a prescriber mandate exists, pharmacist participants perceive they carry the load relative to PDMP query and suggest that increased utilization by prescribers would increase PDMP effectiveness.

The data presented herein suggest that the process for PDMP access remains cumbersome and, as such, remains a significant barrier to routine use. Although most state PDMPs allow the use of prescriber delegates to access PDMP reports in hopes of streamlining workflow for prescribers, the majority of PCPs interviewed report accessing PDMPs and generating patient reports directly. Almost universally, both participant samples in this study suggested PDMPs could be improved by seamless integration within the electronic health record and dispensing systems. This finding is consistent with the focus of PDMP enhancement grants for integration funded by the Bureau of Justice Assistance. Data from the PDMP Training and Technical Assistance Center (PTTAC) indicate that efforts to integrate PDMP information within state health information exchanges, electronic health records and pharmacy dispensing systems are underway in numerous states.<sup>31</sup> Research is needed to

determine the impact of PDMP integration on PDMP use and other practice changes, such as reduced opioid prescribing and dispensing, that may occur as a result of integration.

Finally, expansion of PDMPs to include dispensing data from multiple states and/or expanding to a 'nationwide' system were cited as opportunities to improve PDMP utility. This finding is interesting in light of the fact that during our data collection period, three of the four states studied supported inter-state data sharing through the National Association of Boards of Pharmacy PMP InterConnect (Table 1). This suggests that prescribers and dispensers may lack awareness of the ability to request data from multiple states or are unfamiliar with the process by which they could do so. As of September 2017, 44 states currently support inter-state data sharing.<sup>32</sup> Education interventions designed to increase awareness of the utility of PDMPs are needed to ensure providers are utilizing features that increase effectiveness and usefulness of PDMP queries.

## LIMITATIONS

This study has limitations typical of qualitative research: sample size, representativeness of the sample and generalizability. Sample size is a common limitation of qualitative research; however, the sample size in this study (60 pharmacists and 48 PCPs) is larger than that typically found in qualitative studies and thus strengthens the results. In respect to the representativeness of the sample, the present study focused on PCPs as, overall, they issue almost one-half of opioid prescriptions in the U.S. and have reported difficulties in managing patients with CNCP as well as concerns about opioid pain medication misuse and addiction.<sup>33</sup> Due to the choice of the prescriber sample, the perspectives of pain specialists are not included in this study and the findings may not be generalizable to this group and other physician specialties whose views are not represented. Finally, qualitative studies may be limited in their generalizability as they are often conducted in a single state, or even a single community within a state. The present study tried to address this limitation and increase relative generalizability by interviewing pharmacists and prescribers from four states which were chosen based on differences in opioid prescribing rates, opioid overdose death rates and state policies aimed at mitigating opioid misuse, diversion and overdose.

## CONCLUSIONS

Pharmacists and PCPs perceive PDMPs as valuable tools when making prescribing and dispensing decisions. Efforts to enhance state PDMP programs should consider processes that seamlessly integrate all available controlled substance prescription history for a given patient at the point of care so that PDMP utility for prescribing and dispensing decisions is maximized.

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**Table 1:**

## PDMP Features in Study States

	<b>Arkansas</b>	<b>Idaho</b>	<b>Kentucky</b>	<b>Washington</b>
<b>Date users could query system</b>	2013	1999	1999	2012
<b>Reporting Frequency</b>				
At study onset	7 Days	7 Days	Daily	7 Days
Current status		Daily		Daily
<b>Schedules Monitored</b>				
	II-V	II-V	II-V	II-V
<b>Mandatory Query</b>				
At study onset	No	No	Yes	No
Current Status	Yes			
<b>PMP InterConnect Date</b>				
	2013	2014	2013	

Sources: National Alliance for Model State Drug Laws and National Association of Boards of Pharmacy.

**Table 2:**

## Sample Demographics

<b>Pharmacists</b>		<b>Arkansas n=15</b>	<b>Idaho n=15</b>	<b>Kentucky n=15</b>	<b>Washington n=15</b>
<b>Gender</b>					
	Male	9	10	9	8
	Female	6	5	6	7
<b>Years in Practice</b>					
	1–5 yrs	6	2	5	6
	6–20 yrs	7	8	4	4
	21 + yrs	2	5	6	4
<b>Practice Setting</b>					
	Chain	8	7	6	6
	Independent	7	8	7	4
	Health system*	0	0	2	5
<b>Primary Care Providers</b>					
		<b>Arkansas n=6</b>	<b>Idaho n=11</b>	<b>Kentucky n=15</b>	<b>Washington n=16</b>
<b>Gender</b>					
	Male	3	7	8	9
	Female	3	4	7	7
<b>Years in Practice</b>					
	1–5 yrs	2	1	7	4
	6–20 yrs	2	8	6	8
	21 + yrs	2	2	2	4
<b>Practice Setting</b>					
	Private Solo Practice	0	2	1	0
	Private Group Practice	0	4	3	1
	Health system**	4	3	9	13
	Community Health Centers/FQHCs	2	2	2	2

\* includes academic health systems and health maintenance organizations

\*\* includes academic health systems, VA health systems and health maintenance organizations