Best Practices for Prescription Drug Monitoring Programs in the Emergency Department Setting: Results of an Expert Panel

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Prescription drug monitoring programs are generally underused in emergency departments (ED) and nationwide enrollment is low among emergency physicians. We aimed to develop consensus recommendations for prescription drug monitoring program policy and design to optimize their functionality and use in the ED. We assembled a technical expert panel with key stakeholders in emergency medicine, public health, and public policy. The panel included academic and community-based emergency physicians, a pediatric fellowship–trained emergency physician, a medical toxicologist, a public health expert, a patient advocate, a legal expert, and two state prescription drug monitoring program administrators. We compiled prescription drug monitoring program policies and characteristics and organized them into domains based on user–prescription drug monitoring program interaction. The panel convened for 3 rounds in which the policies and characteristics were introduced, discussed, and modified in an iterative fashion to achieve consensus. The process yielded policy recommendations and design features, with majority agreement. The panel made 18 policy recommendations within these main themes: enrollment should be mandatory, with an automatic process to mitigate the workload; registration should be open to all prescribers; delegates should have access to prescription drug monitoring program to alleviate work flow burdens; prescription drug monitoring program data should be pushed into hospital electronic health records; prescription drug monitoring program review should be mandatory for patients receiving opioid prescriptions and based on objective criteria; the prescription drug monitoring program content should be standardized and updated in a timely manner; and states should encourage interstate data sharing. An expert panel identified 18 recommendations that can be used by states and policymakers to improve prescription drug monitoring program design to increase use in the ED setting. [Ann Emerg Med. 2016;67:755-764.]

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INTRODUCTION

Background

The United States is currently facing an epidemic of opioid analgesic–related addiction, overdose, and death.[1] Opioid prescriptions quadrupled between 1999 and 2013, with overdose deaths increasing in parallel.[2,3] Painful conditions are the leading chief complaints for emergency department (ED) visits,[4-6] and emergency providers frequently prescribe analgesics,[7] with one recent multicenter study showing that 17% of ED visitors were prescribed an opioid at discharge.[8] A specific challenge to emergency physicians when prescribing is the lack of continuity of care and knowledge about the medical history of the patients under their care. One tool available to assist in clinical decisionmaking is a state-based prescription drug monitoring program.[9] These programs are electronic databases that collect data from pharmacies about dispensed controlled substances.

Importance

Although there is evidence to suggest that prescription drug monitoring programs are a useful tool in reducing opioid-related addiction, diversion, and overdose,[10,11] at present the programs are underused by emergency physicians because of regulatory limitations and program design that are at odds with efficient patient care in the ED.[12,13] The literature supporting prescription drug monitoring program efficacy is based on observational studies,[10,14] with several studies before 2008 demonstrating that prescription drug monitoring program implementation alone is insufficient to affect opioid prescribing and recommend improving program policy and design.[15,16] In their current format, prescription drug monitoring programs have several limitations, such as complex procedures for enrollment, delayed reporting, and stand-alone Web sites that require burdensome log-in procedures. Because each state has developed prescription drug monitoring programs independently, they are not standardized and have not been optimized for best practices.[17] Some of these limitations are more pronounced in the ED setting.[13] For example, accessing the database for patient care can require several minutes, which is problematic for emergency physicians who face the constant tension to

rapidly evaluate and manage patients or risk having potentially ill patients wait untreated. Recently proposed guidelines for improved prescribing in the ED include routine use of the prescription drug monitoring program,[18,19] with the Centers for Disease Control and Prevention, the Food and Drug Administration, and the White House Office of National Drug Control Policy all supporting their expansion.[20]

Goals of This Investigation

To our knowledge, to date there is no policy analysis of the integration of public health, state policy, and emergency medicine for the purpose of prescription drug monitoring program optimization. Although there are several publications recommending best practices for prescription drug monitoring program development and use,[21,22] they have not specifically evaluated state prescription drug monitoring program policy and design in the context of the practice of emergency medicine. The aim of this project was to review the existing recommendations on prescription drug monitoring program design and to convene an expert panel to review current program policy and characteristics to yield design features and policy recommendations that would support best practice in the ED setting.

MATERIALS AND METHODS

Study Design and Setting

We convened a technical expert panel and used nominal group technique to iteratively review prescription drug monitoring program policies and make best practice recommendations for program design and policy in the ED environment. We performed a literature review to identify general prescription drug monitoring program design features and potential best practices, and a policy review to identify detailed program characteristics and policies. The expert panel was convened in 3 rounds of calls and voting, with resultant design features and policy recommendations.

Literature and Policy Review

One author (M.B.G.-E.) performed a systematic literature review to generate the framework for discussion and identification of best practices for prescription drug monitoring program design, and a policy review to identify state policies and regulations of such programs. Targeted search terms (Appendix E1, available online at http://www.annemergmed.com) were used in PubMed after consultation with a medical librarian; a gray literature search was performed with Google, state Web sites, and online data repositories of legislation[23-25] to identify government policies and regulations. M.B.G.-E. reviewed abstracts and full articles for relevancy to the project aim and reviewed legislative databases to identify relevant state policy. The summary of the review was evaluated by 2 content experts (L.S.N. and J.D.S.), and a detailed list of prescription drug monitoring program characteristics and state policies were compiled from relevant publications for review by the expert panel (Appendix E2, available online at http://www.annemergmed.com).

Prescription drug monitoring programs were created out of state policy to solve a public health problem, often without significant input from clinical practitioners. We aimed to incorporate the perspectives of public health, state policy, and emergency medicine in our project and selected 3 core publications from each of these fields as background reading for our expert panel. These were the 2011 White House Office of National Drug Control Policy's prescription drug abuse prevention plan,[20] the assessment of the evidence for best practices[21] from the PDMP Center of Excellence, and the American College of Emergency Physicians' clinical policy on pain management.[26]

Selection of Participants

Between August and September 2014, we assembled the expert panel with key stakeholders in medicine, public health, and public policy to participate in a nominal group technique consensus panel (Table 1). We aimed for a panel composed of content experts and physician stakeholders and sought to fill the following positions: 2 community emergency physicians, an academic emergency physician, a

Table 1. Panelist by title and expertise.

No.	Expert Panel Member	Expertise	Practice Setting
1	Academic physician, facilitator and cochair	Emergency medicine and toxicology	Academic university
2	Academic physician, cochair	Emergency medicine and health policy	Academic university
3	Community physician	Emergency medicine, emergency medicine operations	Community practice
4	Community physician	Emergency medicine, emergency medicine operations	Community practice
5	State PDMP administrator	Public policy	Government
6	State PDMP administrator	Public policy	Government
7	Patient advocate	Patient advocacy	Community and academic
8	PDMP content expert	Public health	Academic university
9	Public health expert	Public health law	Academic university
10	Pediatric emergency medicine–trained physician	Pediatric emergency medicine	Community and academic

PDMP, Prescription drug monitoring program.

content expert on prescription drug monitoring program design and policy, a pediatric emergency physician, a patient advocate, a public health law expert, a government expert on prescription drug monitoring programs, and 2 state prescription drug monitoring program administrators. Participants had to commit to attend each session, and we sought geographic variation in the physician and administrator panelists. To recruit our community physician and pediatric emergency medicine–trained physician panelists, we solicited a call for panelists through the American College of Emergency Physicians' Quality and Performance Committee, Quality Improvement Patient Safety Section, and Pediatric Emergency Medicine Section. We identified our content expert, public health law expert, and government-based prescription drug monitoring program expert, who served as a consultant and attended all calls, through our literature review. We contacted several state prescription drug monitoring program administrators from states known to have highly functioning prescription drug monitoring programs and selected 2 according to their geographic variation and ability to attend all sessions. The expert panel was cochaired by an academic emergency physician-toxicologist who served as the facilitator (L.S.N.) and an academic emergency physician–health policy researcher (J.D.S.). Overall, 2 panelists were responsible for prescription drug monitoring programs as part of their job, 2 panelists and our consultant had specific academic interest in prescription drug monitoring programs, and 6 panelists had no previous active engagement in prescription drug monitoring programs.

Methods for Consensus

We used the nominal group technique as our method for achieving consensus.[27] This method entailed rounds composed of structured conference calls, with a slide presentation headed by the cochairs in which information was gathered from the experts, with postcall voting and subsequent modification of themes. The expert panel had 3 conference calls with 2 voting opportunities and a comment period. Items were modified iteratively according to the previous round's discussion and voting. Terms specific to prescription drug monitoring programs were defined for the panel (Table 2).

Table 2. Definitions.

Term	Definition
Nonphysician license	Issued to nonphysician practitioners, which encompasses physician assistants and advanced practice registered nurses in the United States
Limited license	Issued to physicians enrolled in postgraduate medical education, which encompasses resident physicians in the United States
EHR	Electronic health record
Push system	In push-based health information exchange, the data are actively pushed from a network (in this case, PDMP database) to EHR.
Pull system	In pull-based health information exchange, the provider can query the network (in this case, PDMP database) to access the data.
Delegates	Clinical trainees or nonclinical staff. Given authorization to access state PDMP on behalf of the prescriber.
Registration	Referring to legislation and policy around provider's ability to sign up for the database
Enrollment	The process by which the provider gains the right to access to the database

EHR, Electronic health record.

Process and Outcomes

The expert panelists were sent the core publications and a preliminary list of prescription drug monitoring program characteristics and state policy before calls for review. In round 1, the panelists reviewed the preliminary list of prescription drug monitoring program characteristics and state policy, which totaled 42 items within 5 domains (Appendix E2, available online at http://www.annemergmed.com) and reviewed the core literature. Each domain and item was openly reviewed by all panelists under the guidance of the facilitator. The voting sheet was introduced for postcall voting. Voting instructions were to review and rank each item as 1 to 5 on a Likert scale, with a score of 1 indicating minimal utility of the prescription drug monitoring program in the ED setting and a score of 5 indicating maximal utility. High utility or beneficial policies were defined as those that reduce harm to the individual patient and improve the public health more than any offsetting harm to ED work flow. Panelists were asked to identify items in which tensions between public health, patient care, and ED operations existed. Panelists were also asked to identify items that appeared to be beyond the scope of an ED-focused guideline. Voting results were distributed to the group before round 2.

In round 2, the panelists were presented with voting results organized in a table for review. For each item, the following were reported: median Likert score, number of panelists who identified an item as beyond the scope of the ED setting, and the number of panelists who identified an item as having tension between public health, patient health, and ED operations. The goals of round 2 were to eliminate topics out of scope and to begin generation of the 2 products of the expert panel: design features and policy recommendations. Each of these products contains prescription drug monitoring program design and policy recommendations. Design features describe inherent

characteristics of prescription drug monitoring programs such as how they are accessed, details of their data management, and their technical design. Items were categorized into those that maximized or inhibited utility of prescription drug monitoring program use in the ED setting and then organized into a table. Policy recommendations were consensus statements based on the expert panel discussion. After the call, the research team generated policy recommendations to be reviewed during round 3.

The goals of round 3 were to review design features before final voting and discuss policy recommendations individually, allowing each panelist an opportunity to comment, with the goal of gaining consensus on the wording of each statement. The panelists were introduced to voting for round 3 at the end of the call, with instructions to review each policy recommendation and select statements that best represented their views and to confirm their agreement with the design features. The compiled results of the round 3 voting sheets were deidentified and returned to the panelists for review for a final comment period. In this last phase, panelists were asked to review the 2 products (design features and policy recommendations) for final approval.

RESULTS

The initial list of prescription drug monitoring program charcteristics and policies (Appendix E2, available online at http://www.annemergmed.com) was introduced, modified, and voted on. All panelists voted in each round. The 8 items under "Enrollment" and "Registration" required clarifiation of language, but all of the items were retained. The category "Access" was subdivided into its individual subcategories, with all the items under "Log-on process" retained, and the category title "Access to Authorized Providers" was changed to "Delegates," with retention of the items. The 9 items under "Standardization of Content" were combined and reduced to 2. The items under the categories "Reports," "Mandatory Reporting," and "Confidentiality and Security" were determined beyond the project scope and removed. All of the "Updates" and "Interstate Accessibility" items were retained. Finally, several items from each category and all items under "Use Mandate" and "Exemption Mandate" categories were identifed as too complex to be categorized under design features, with plans to explore these further in policy recommendations. A pictoral description of this process is outlined in the Figure.

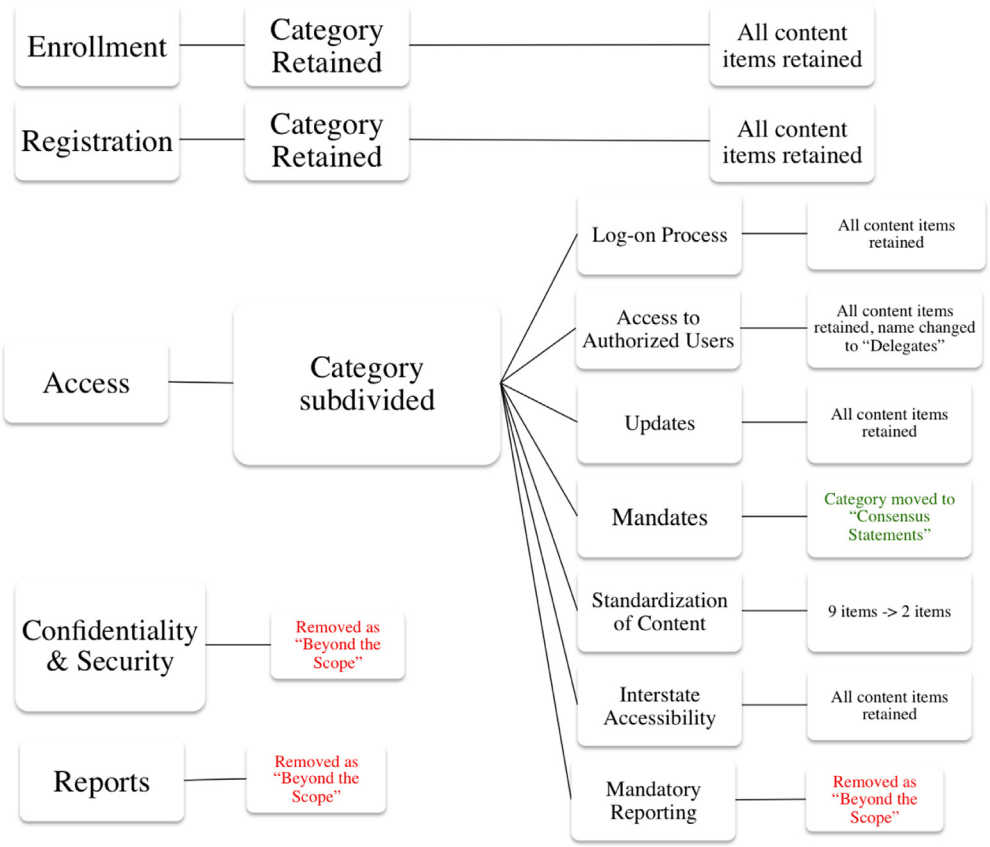

Figure. Modification of domains.

Design features were reviewed and scored by the expert panel, with 10 items categorized as maximizing utility, two as having acceptable utility, and eight as inhibiting utility (Table 3). The expert panel had majority agreement for all these categorizations. All design features received unanimous support, with the exception of 1 panelist, who abstained on notarization, given that that panelist's state policy currently supports this standard. The research group complied policy recommendations from the expert panel discussion. The expert panel reviewed and scored the policy recommendations, with detailed results displayed in Table E1 (available online at http://www.annemergmed.com). Subsequent review during round 3 and the comment period resulted in 18 final policy recommendations (Table 4). There was unanimous support, with 1 exception: 1 panelist disagreed with the mandate statement's narrow focus on objective criteria alone, pointing to the lack of evidence to support objective or subjective criteria as accurate in detecting at-risk patients and preventing overdose or abuse.

LIMITATIONS

There are several limitations to our study. The majority of physicians in our expert panel are currently affiliated with an academic institution. Given that the majority of emergency physicians practice in community-based setting, our expert panel may not be a representative sample. However, several of the panelists from academic settings have previously worked in a community-based practice and many of the flow and operational issues are similar. Therefore, our recommendations should be applicable to either setting. Second, our expert panel composition was broad but includes only representative views. Specifically, we did not include an ED nurse or physician assistant or nurse practitioner. Because nurses (apart from nurse practitioners) do not prescribe controlled substances, we do not think they are key stakeholders in the prescription drug monitoring program prescribing process, although they would become significant stakeholders if they become routinely designated delegates. Additionally, we did not include an information technology specialist, which may have allowed more detailed discussion about technical aspects of prescription drug monitoring program design. However, limiting the expert panel size improved the ability of the participants to contribute and encouraged discussion. Third, given that all panelists had a specific interest in opioid overdose and misuse, the research group

Table 3. Design features.*

Maximize Utility	Acceptable Utility	Inhibit Utility
Enrollment		
Mandatory enrollment		Voluntary enrollment
Automatic process		Automatic or active enrollment process
Automatic enrollment process		Active enrollment process
		Notary required for enrollment
Registration		
Registration open to full licenses and partial licenses (midlevel providers, resident providers)		Registration restricted to fully licensed physicians
Log-on process		
Push system: integrated into EHR	Pull system: integrated into EHR	Stand-alone Web site: not integrated into EHR
Delegates		
Delegates are linked to ED/hospital		Delegates are linked to individual physician
Nonclinical staff can serve as delegates (eg, clerical staff)		
Standardization of content		
Minimum information:		Monitoring fewer than schedule II–IV
Patient name/date of birth/address		
Medication name/dose/number dispensed		
Date dispensed and prescribed		
Prescriber name/address		
Monitoring of schedule II–IV		
Updates		
Update PDMP 48 h from time of dispensing	Update PDMP within 1 wk	Update PDMP longer than 1 wk
Interstate accessibility		
Log onto other state's PDMP through pull or push system through home state PDMP		Log onto other state's PDMP by accessing that state's PDMP directly

EHR, Electronic health record.

*Maximize utility: Reduces harm to individual patient, improves public health, and improves ED work flow. Acceptable utility: Improves emergency physician's ability to use PDMPs but preferable design/policy exists. Inhibits utility: Inhibits routine use of PDMP by emergency physicians and inhibits ED work flow. Potential harms to individual patient and public health by inhibiting use in the ED.

Table 4. Policy recommendations by domain.

Domain	Policy Recommendations
Enrollment	We recommend that PDMP enrollment be mandatory rather than voluntary, with an automatic enrollment process to mitigate extra work. For states that prefer voluntary enrollment, we recommend automatic an enrollment process to encourage participation.
	We recommend that PDMP enrollment be an automatic process and recommend against an active enrollment process to minimize workload to providers and to improve rates of enrollment.
	We recommend against use of notarization procedures for any type of enrollment.
Registration	We recommend that registration be open to all providers who prescribe, thus allowing PDMP use for those with partial licenses, limited licenses, and full licenses, in addition to designated delegates.
	We recommend against limiting registration to only fully licensed providers.
Log-on	We recommend that state policy allow PDMP integration of log-on into electronic health records as a push rather than a pull system. We prefer push but find pull acceptable.
Delegates	We recommend that delegates be allowed to access PDMPs in EDs to alleviate work flow burdens of PDMP access.
	We suggest that, in states in which the PDMP's design is not compatible with EHR integration, delegates are important to alleviate work flow burden.
	We recommend that, in states that lack access for partial/limited providers, delegates be permitted because they are important to alleviate work flow burden.
	We recommend that delegates' access be linked to an institutional account (eg, hospital) rather than to individual physicians' accounts.
Mandates	We recommend mandatory lookup for select patients to whom a controlled substance is to be prescribed according to objective criteria (eg, plan to prescribe a certain number or days of pills, validated screening tool, or morphine milligram equivalents).
Standardization	We recommend that the PDMP report at least the following to the ED provider: date dispensed, date prescribed, patient name/DOB/address, name/dose/number of medication prescribed, and prescriber name/address.
	We recommend that the PDMP include at least schedule II–IV medications.
	We recommend that PDMPs report a minimum of 12 mo of patient prescription history.
Updates	We recommend that PDMPs be updated within 48 h of dispensing. We prefer 48 h but find 1 wk acceptable.
	We recommend against updates longer than 1 wk after dispensing.
Interstate accessibility	For states that allow interstate sharing, we recommend access to other states' PDMP through a pull system to reduce work flow burden.
	We support legislation to enable sharing between all PDMPs.

was initially concerned that panelists would weigh the public health aspects of prescription drug monitoring program use more heavily than the ED work flow concerns. However, there was strong representation of emergency physicians on the expert panel, and ED operations and work flow were strongly considered and discussed. Finally, these recommendations are based on current literature and expert opinion. At present, there is insufficient published evidence to conclusively support all of our panelist recommendations, and expert opinion can be biased. It was noted during peer review that the recommendations seemed to emphasize mandating changes for physician behavior and more moderated language for systems and institutional changes. This may reflect panelists' biases and perceptions that we are more able to control individual physician actions, rather than those of organizations or systems. Ironically, system-based changes lead to more effective changes than individual mandates.

DISCUSSION

The United States faces a prescription medication overdose epidemic, and ED providers are in need of tools to improve their ability to detect patients at risk for overdose and death. One such tool is the prescription drug monitoring program, yet in many EDs, it is not routinely used because it does not fit seamlessly into the crowded ED work flow. To our knowledge, to date there are not recommendations for prescription drug monitoring program design that take into account the perspective of emergency care providers. To address this lack of recommendations for prescription drug monitoring program design and use in the ED, we convened an interdisciplinary expert panel to make policy recommendations. Our panel identified several challenges that must be considered if prescription drug monitoring programs are to be routinely used and produced consensus recommendations about prescription drug monitoring program design and policy to improve use in the ED setting. These are focused on the user–prescription drug monitoring program interaction and are described by category below.

Enrollment

One significant challenge facing prescription drug monitoring programs has been limited enrollment by prescribers, with rates of enrollment well below 50% in most states and a median registration rate of 35%.[21,28] As an attempt to encourage use of prescription drug

monitoring programs, more than 20 states now mandate that prescribers enroll in their state prescription drug monitoring program.[29] Supporting these legislative efforts are several observational studies that associate prescription drug monitoring program use with decreased rates of opioid abuse.[11] Given this, we recommend that states adopt mandatory enrollment in their prescription drug monitoring programs and support this with automatic enrollment mechanisms. For example, Massachusetts mandates prescription drug monitoring program enrollment and recently facilitated this by automatically enrolling providers when they renew their state controlled substance license.[30] Some states continue to require notarization of prescribers' applications for prescription drug monitoring program accounts to validate an applicant's identity. However, notarization presents an obstacle to enrollment for busy practitioners, and we recommend against its use, instead proposing the solution of linking prescription drug monitoring program registration to state controlled substance licensure or medical licensure to allay identity concerns.

Registration

There has been a substantial increase in use of physician assistants and nurse practitioners in the last decade; they now treat approximately 15% of all ED patients.[31] Both physician assistants and nurse practitioners have the ability to prescribe in all 50 states, but the need for physician supervision and stipulations about controlled substance prescribing vary by state. In the majority of states, these providers are eligible for licensure by the state to prescribe controlled substances.[32] However, a review of current legislation shows that a minority of states permit prescription drug monitoring program registration by physician assistant and nurse practitioners, with even fewer permitting registration by resident physicians.[33] Because physician assistants, nurse practitioners, and resident physicians perform a significant and increasing percentage of care during ED visits, prescription drug monitoring program access should be extended to them. Additionally, not affording resident providers with prescription drug monitoring program access is a missed educational opportunity. We recommend that prescription drug monitoring program access be granted to all prescribers.

Log-on

For prescription drug monitoring program content to be helpful, it must be easily accessible. Providers report difficulty with navigation of the Web portal and forgotten passwords as common reasons for not using the program.[12] Integration of prescription drug monitoring program content into health information exchanges and electronic health records with single sign-on capabilities will remove these major barriers to routine use. Recently, the Office of the National Coordinator for Health Information Technology completed several pilot projects in Ohio and Indiana involving integrating prescription drug monitoring program data into electronic health records for use of ED providers.[34] Several states (Nebraska, California, Oregon, and Washington) are now moving toward integrating their prescription drug monitoring program data directly into their health information exchanges and electronic health records. There are 2 methods by which such data can be integrated: push and pull. Both types allow secure data transfer, with push resulting in data's being electronically deposited into the recipient's system and pull requiring a query by the recipient, with subsequent aggregation and delivery of data by the sending system. The push method is preferred because it reduces the risk of error that can occur when physicians base their use of the prescription drug monitoring program on personal judgment, which is imperfect for predicting diversionary and abusive behavior.[35,36] Our expert panel thought that integration of prescription drug monitoring program data into existing health information exchanges and electronic health records was critical to routine use and recommended a push system as being preferable to a pull system. Practically, it is challenging for states to legislate requirements for use of a push system because they would need statewide participation of all health care systems to integrate it into their electronic health record functionality. Washington State has implemented such a program in collaboration with the state medical association and a third-party vendor.[37]

Delegates

It is common for providers to delegate aspects of documentation and data collection to nonprovider staff. Given that one of the primary reasons stated by emergency physicians for not using the prescription drug monitoring programs is time constraints,[12] nonprovider delegates who can access the prescription drug monitoring program data for the provider can remove work flow burden as a barrier to program use. This is especially true in states that have stand-alone Web sites in which the prescription drug monitoring program data are not integrated into the electronic health record and in states in which only fully licensed physicians are granted access to the program. For example, registration staff at some EDs access the prescription drug monitoring program and print it as part of the ED record of every patient. At present, the majority of states have legislation in place to support delegates;

however, some states allow only 1 physician to designate 1 delegate. Although this practice may work in an office-based setting, it is ineffective for EDs, given that many delegates are needed to provide prescription drug monitoring program data 24 hours a day for multiple providers and large patient volumes. Our expert panel recommends policies that allow hospital or department-wide designation of delegates.

Mandates

Although our expert panel recommends automatic enrollment in prescription drug monitoring programs, some literature suggests that such enrollment does not always result in its use.[38] To this end, some states have moved toward mandated prescription drug monitoring program use. These states have experienced increases in database queries and reductions in opioid prescribing.[14,39,40] However, mandates face prescriber opposition,[14] and although well-framed mandates may improve outcomes, others may have unintended consequences such as inadequate pain control and inappropriate requirements to access the prescription drug monitoring program when not clinically indicated.[40]

There are patient safety and public health benefits to evaluation of a patient's controlled substance prescription history before prescribing of an opioid analgesic. Although there are no data to suggest that objective criteria for prescription drug monitoring program review before prescribing is superior to subjective criteria, there is evidence that providers are poor at detecting patients at risk for opioid abuse or overdose.[35,36] Given this, our expert panel recommends mandatory lookup for patients for whom a controlled substance is to be prescribed, according to objective criteria such as the intention of prescribing a predetermined number of days, pills, or morphine milligram equivalents, or according to a validated screening tool. Such polices can set a reasonable minimum amount for which prescription drug monitoring program lookup would not be mandatory to balance the work of reviewing prescription drug monitoring programs with ED work flow concerns. For example, in Massachusetts, review of the prescription drug monitoring program is mandatory, but there is an exemption for ED providers when they prescribe for fewer than 5 days.[41] This will not prevent the prescriber from using the prescription drug monitoring program at his or her own discretion for other patients.

Standardization

In the early days of prescription drug monitoring program development, the Alliance of States with Prescription Monitoring Programs recognized a need for standardization in electronic data collection. Thus, the American Society for Automation in Pharmacy guidelines created a prescription drug monitoring program data reporting standard in 1995 and have been updated regularly, with the most current version published in 2010. Currently, all operational prescription drug monitoring programs use the society's format for data transmission and collection. However, not all states use the most recent version, which limits interoperability, interstate data sharing, and comprehensive data analysis.

The level of detail in data collection recommended by our expert panel is thorough and in alignment with the most up-to-date American Society for Automation in Pharmacy standards. By adopting the society's most recent version, states optimize their ability to report prescription history data and facilitate cross-state sharing and collaboration with Medicaid, the Department of Defense, the Indian Health Service, and the US Department of Veterans Affairs. With respect to drug schedule reporting, more than half the states monitor Drug Enforcement Administration schedule II (eg, oxycodone), III (eg, buprenorphine), IV (eg, benzodiazepine), and V (eg, low dose codeine in cough suppressants) drugs, which is in alignment with our expert panel's recommendation of reporting a minimum of schedule II to IV.

Updates

For ED providers, accurate and timely updating of prescription drug monitoring programs is critical to their use as a tool to detect at-risk patients for addiction, overdose, diversion, and abuse. The first step of timely reporting occurs when dispensers (pharmacies) update their dispensing information promptly. In many states, the time requirement for reporting prescription data from the pharmacy to the prescription drug monitoring program is determined by statute and varies from 48 hours to months. Given that the use of stand-alone Web portals lacks integration into pharmacy work flow, this is an obvious barrier to rapid updating of prescription drug monitoring program databases and prevents reporting at dispensing. However, technological improvements of linking prescription drug monitoring programs and pharmacy systems, along with stronger legislation, will allow more timely reporting. Given the current level of technology, our expert panel recommends that states be required to provide updates within 48 hours and discourages updates longer than 1 week.

Interstate Accessibility and Federal Involvement

Interstate sharing improves a provider's ability to detect patients who are at risk for abuse and overdose, particularly in areas close to state borders.[42] There is an ongoing effort

to improve information sharing using a prescription monitoring information exchange program under the guidance of the Alliance of States With Prescription Monitoring Programs.[43] More than half the states now participate in this exchange, although some do not have measures in place to allow interstate sharing. Recently, the US Department of Health and Human Services submitted a report to Congress on prescription drug monitoring program interoperability standards, encouraging use of prescription monitoring information exchange architecture for all state prescription drug monitoring programs.[44]

Although state prescription drug monitoring programs have largely been funded by state efforts, the federal government is increasing funding by 2 grant programs aimed at supporting these programs: the Harold Rogers prescription drug monitoring program grant, administered by the Department of Justice, and the National All Schedules Prescription Electronic Reporting Act of 2005 grant, administered by the US Department of Health and Human Services. Although the National All Schedules Prescription Electronic Reporting Act initially went unfunded, it received appropriations of $2.0 million 2010, and the Harold Rogers prescription drug monitoring program received $7.0 million in 2014. With increased funding, states may be able to tackle several of the policy issues discussed in this article: updating to the most recent American Society for Automation in Pharmacy standard, health information exchange integration for both providers and pharmacies, and improved interstate sharing.

In summary, the United States faces an opioid epidemic, and there is significant support and interest for policy changes to improve opioid prescribing in the ED. Improving prescription drug monitoring program design for use in the ED setting is an important place to start. These expert panel recommendations identify feasible methods to improve access to the prescription drug monitoring program and ease of use. We encourage policymakers to apply these recommendations to their state prescription drug monitoring program policies. They should feel confident that such policy changes are supported by key stakeholders. If implemented, these recommendations could help improve enrollment and encourage routine use of prescription drug monitoring programs, decreasing the harm associated with opioid prescribing.

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APPENDIX E1

Search terms

Capitalized terms are Medical Subject Headings terms; uncapitalized are free texted.

Search terms and strings for prescription drug monitoring program guidelines:

- Outpatients/ or Emergency Service, Hospital/ or Ambulatory Care (and) prescription drug monitoring program (or) PDMP
- Guidelines/ or Emergency Service, Hospital/ or Ambulatory Care (and) prescription drug monitoring program (or) PDMP

Search terms and strings for Opioid Analgesic-related use, abuse and overdose:

prescription drug/ td [Trends]
prescription drug/ ep [Epidemiology]
opioid analgesic/ td [Trends]
opioid analgesic/ ep [Epidemiology]
Outpatients/ or Emergency Service, Hospital/ or Ambulatory Care (and) opioid analgesic (or) prescription drug

APPENDIX E2

Preliminary list of PDMP characteristics and state policy

Enrollment
Automatic enrollment
Required enrollment, automated
Required enrollment, not automated
Voluntary enrollment, automated
Voluntary enrollment, not automated

Registration
Registration requires notarization
Registration restricted to fully licensed physicians
Registration open to full licenses and partial licenses (midlevel providers, resident providers)

Access
Log-on Process
Log-on is conducted on a separate Web site
Log-on is integrated into EHR
Access to Authorized Providers
Delegates are linked to individual physician
Delegates are linked to ED/hospital
Use Mandates
Mandatory patient lookup before prescribing a controlled substance to a patient
Mandatory patient lookup before prescribing any controlled substance to a patient determined to be at risk for drug diversion or abuse
Mandatory documentation of review of patient information in PDMP in chart
Mandatory review of adjoining state PDMP if patient lives near state border
Mandatory training for users
Optional training for users
Exemption Mandates
Specific provision that providers not have to look at PDMP before prescribing a controlled substance
Exemption of ED provider from mandatory lookup of new patient
Standardization of Content
Reporting of date dispensed
Reporting of date prescribed
Reporting of patient by name and DOB
Reporting of patient by address
Monitoring of schedule II only
Monitoring of schedule II–IV
Monitoring of schedule II–V
Name, dose, and number dispensed
Prescriber name and address
Updates
Update PDMP at dispensing
Update PDMP within 1 wk of dispensing
Update PDMP within 1 mo of dispensing
Interstate Accessibility
Providers in one state can access other states' PDMPs
PDMP in one state contains neighboring state's data
Mandatory Reporting
Report methadone clinic data to PDMP
Report VA data to PDMP

Confidentiality and security
Designation of PDMP data as confidential
State requires security measures to allow interstate sharing
Permits public health research

Reports
Reporting and feedback
Unsolicited reports about patients, to providers
Unsolicited reports for providers, about their prescribing patterns

Initial policy recommendations: round 2 voting document

Table E1. Master voting document.

	Panelists										
Policy Recommendation Items	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
Enrollment											
"We recommend that PDMP enrollment be…" (pick one)	1	1	1	1	2	1	1	1	1	1	2
Mandatory rather than voluntary. For states that prefer voluntary enrollment, we recommend that the process for enrollment minimize work through an automatic enrollment process.											
Mandatory and recommend against voluntary enrollment.											
"We recommend that PDMP enrollment be…" (pick one)	2	2	2	2	2	2	2	1	1	1	2
Automatic process rather than an active process, to minimize workload on the providers.											
Automatic process and recommend against an active enrollment process to minimize workload to provider and to improve rates of enrollment.											
"Agree, disagree, neutral"	a	a	a	a	a	a	a	a	a	n	a
We recommend against the use of notarization procedures for any type of enrollment.											
Registration											
"Agree, disagree, neutral"	a	a	a	a	a	a	a	a	a	a	a
Registration should be open to all providers who prescribe, thus allowing PDMP use for those with partial licenses (emergency medicine residents), limited licenses (physician assistant, nurse practitioner), and full licenses.											
Limiting registration to only fully licensed providers	d	d	d	d	d	d	d	d	d	d	d
Log-on											
"We recommend that state policy require PDMPs' design to allow integration of log-on into electronic health records as…"	1	1	2	1	2	1	1	1	1	1	1
A push or pull system											
A push rather than pull system											
Delegates											
"Agree, disagree, neutral"	a	a	a	a	n	a	a	a	a	a	a
Delegates should be allowed to access PDMPs in all EDs to alleviate work flow burdens of PDMP access.											
In states in which the PDMP's design is not compatible with EHR integration, delegates are important to alleviate work flow burden.	a	a	a	a	n	a	a	a	a	a	a
In states that lack access for partial/limited providers, delegates are important to alleviate work flow burden.	a	a	a	a	a	a	a	a	n	a	a
We recommend that delegates' access be linked to an institutional account (eg, hospital) rather than to individual physicians' accounts.	a	n	a	a	a	a	a	a	a	a	a
Mandates											
"We recommend…" (pick one)	3	2	1	3	3	3	3	3	3	3	3
Against mandatory lookup requirements											
Mandatory lookup for any ED patient to whom a controlled substance is to be prescribed											
Mandatory lookup for select patients to whom a controlled substance is to be prescribed according to objective criteria (eg, plan to prescribe a certain number or days of pills, validated screening tool, or morphine milligram equivalents)											
Mandatory lookup for select patients to whom a controlled substance is to be prescribed according to subjective criteria (ex, clinical judgment)											
"Agree, disagree, neutral"	a	d	a	a	a	a	a	a	n	a	a
State lookup mandates should be based on objective rather than subjective criteria.											
States that mandate review of a neighboring state's PDMP should participate in an interstate sharing system that allows push/pull access into neighboring states' PDMP.	a	a	a	a	a	a	a	a	a	a	a
Against universal exemption for emergency medicine providers	a	a	a	a	a	a	n	a	a	a	a

Table E1. Continued.

Policy Recommendation Items	Panelists										
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
Standardization of content											
"Agree, disagree, neutral"	a	a	a	a	a	a	a	a	a	a	a
We recommend that the PDMP report at least the following to the ED provider: date dispensed, date prescribed, patient name/DOB/address, name/dose/number of medication prescribed, and prescriber name/address.											
We recommend PDMP include schedule II–V medications	a	a	a	a	a	a	a	a	a	a	a
We recommend PDMPs report a minimum of 6 mo of patient prescription history.	d	d	n	d	d	d	n	a	d	d	d
We recommend PDMPs report a minimum of 12 mo of patient prescription history.	a	a	a	a	a	a	a	a	a	a	a
Updates											
"Agree, disagree, neutral"	a	a	a	a	a	a	a	a	a	a	a
We recommend that PDMPs be updated within 48 h of dispensing.											
We recommend that PDMPs be updated within 1 wk of dispensing.	a	n	n	a	n	n	a	a	a	a	d
We recommend against updates longer than 1 wk after dispensing.	a	a	a	a	a	a	a	a	a	a	a
Interstate accessibility											
"Agree, disagree, neutral"	a	a	a	a	a	a	a	a	a	a	a
For states that allow interstate sharing, we recommend access to other states' PDMP through a pull system to reduce work flow burden.											
We support legislation funding a national system that allows sharing between all PDMPs.	a	a	a	a	a	a	a	a	a	a	a