| Ease of Use | Fit with Workflow | Technical Impact | Clinical Impact | Driver Adoption | Optimization Factors |

Enhancing Access to Prescription Drug Monitoring Programs Using Health Information Technology:

Connecting Prescribers and Dispensers to PDMPs through Health IT: Six Pilot Studies and Their Impact

2012

Introduction

Prescription drug misuse and overdose is one of the fastest growing health epidemics in the United States. To address the prescription drug abuse problem, many states have established Prescription Drug Monitoring Programs (PDMPs). PDMPs collect prescription data on medications that the Federal Government classifies as controlled substances. Their purpose is to reduce prescription drug abuse and diversion.

In 2011, the Obama Administration issued an Action Plan to address the prescription drug abuse crisis. A subsequent White House Roundtable on Health Information Technology (IT) and Prescription Drug Abuse on June 3, 2011, concluded that prescription drug abuse is a preventable problem requiring immediate attention. As a result, the Office of the National Coordinator for Health IT (ONC), in partnership with the Substance Abuse and Mental Health Services Administration (SAMHSA), asked The MITRE Corporation to identify possible ways to leverage health IT to improve access to PDMPs. As part of this effort, MITRE collaborated with public and private stakeholders to conduct pilot studies enabling PDMP information to be more readily available to ambulatory and emergency department (ED) physicians (prescribers) and pharmacists (dispensers). Stakeholders helped to identify the following opportunities to leverage health IT to improve timely access to PDMP information:

- Use of secure email messages (using Direct) for sending unsolicited reports to prescribers and dispensers

- Enhancements to provider or pharmacy electronic health record (EHR) systems to automate or streamline queries to PDMPs

- Exploring opportunities to leverage intermediaries for queries to PDMPs, including Health Information Exchanges (HIE), switches, and other hubs

The Federal Government, state PDMPs, care delivery organizations, health IT businesses, and MITRE organized and configured seven PDMP Pilot Studies, or small-scale experiments (six of which are now complete). These pilot studies tested the ease and effectiveness of establishing new connections with PDMPs so that this information could be available to prescribers and dispensers at the point of care. The pilot studies explored effectiveness in multiple areas:

- At the point of decision-making (*timely*)

- Integrated naturally into existing clinical and health IT workflows (*placement*)

- Real-time data, based on the most up-to-date data in the PDMP (*currency*)

- Meaningful return of patients' prescription drug information (*essential, easily absorbed,* and *actionable*)

These pilots provided valuable insights to help identify any system challenges as well as an opportunity to assess which avenues for enhancing PDMP access show the greatest return on investment.

Pilot Studies

Table 1 outlines the six pilot studies that were completed as part of this project.

Table 1. Pilot Study Overview

State	End User	PDMP	Pilot Summary	Benefit
Indiana (IN$_1$)	Emergency Department: William N. Wishard Memorial Hospital Emergency Department	INSPECT – Indiana's Scheduled Prescription Electronic Collection & Tracking	Automated query to PDMP upon patient admission to ED; PDMP data integrated into EHR	Automated query and response, streamlined workflow for physicians
Indiana (IN$_2$)	Provider practices: • Pain Control Associates • Raj Clinics • Gastroenterology of Southern Indiana	INSPECT – Indiana's Scheduled Prescription Electronic Collection & Tracking	PDMP sends unsolicited PDMP reports for at-risk patients via Direct	Safer, more secure transmission of unsolicited reports
Michigan (MI)	Provider practice: Huron Valley Physicians Association	MAPS – Michigan Automated Prescription System	Automated query to PDMP to create integrated prescription history and alerts	Partnered with e-prescribing
North Dakota (ND)	Pharmacy: Spirit Lake Health Center Pharmacy (IHS)	ND Rx Drug Monitoring Program	Automated query to PDMP using an existing benefits management switch and rules engine	Leveraged existing benefits transmission technology
Ohio (OH)	Family medicine practice: Springfield Center for Family Medicine	OARRS – Ohio Automated Rx Reporting System	Automated query to PDMP upon: • Appointment scheduling • Patient Check-in Patient risk score and a link to PDMP details displayed in EHR	Automated query and response, streamlined workflow for physicians
Washington (WA)	Opioid Treatment Program: Evergreen Treatment Services	WA Prescription Monitoring Program (PMP)	Hyperlink to PDMP within EHR	Streamlined access to PDMP

The pilot study designs spanned different health IT models and included a range of variables:

- Participants – prescribers, dispensers, PDMPs, care delivery organizations, vendors, etc.
- Health IT systems – EHRs and pharmacy systems
- How existing health IT systems are connected to the PDMP

For more detail about the specific participants and health IT configuration of each pilot study, refer to Appendix A.

Evaluation Approach

The pilot team considered the following criteria in evaluating the pilots:

- **Usability:** Providing the correct amount of the appropriate information, in the proper condition, at the right place and time, in the necessary position/sequence (workflow logistics)
- **Impact**: Achieving desired outcomes
- **Scalability**: Predicting implementation success and the ability to extrapolate results to a larger system

The PDMP pilots varied from simple to more complex health IT connectivity configurations, so piloting afforded the opportunity to examine the different facets of performance along a continuum of technical sophistication (see Figure 1).
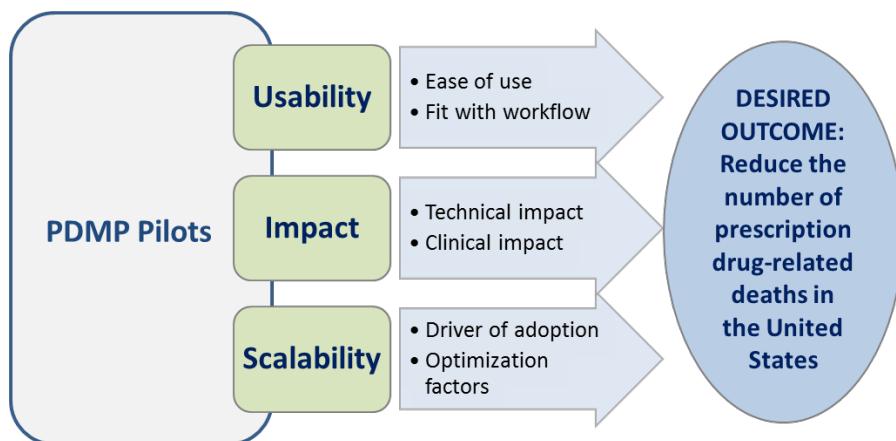

Figure 1. Evaluation Themes

The evaluation themes and their accompanying areas of interest, with associated evaluation metrics, formed the basis for evaluation of the PDMP pilots (see Appendix B).

It should be noted that the purpose of the evaluation was not necessarily to perform a comparison between the pilots to conclude which model was "better" or recommended, but rather to see what salient features were observed as favorable and could be broadly established and translated into strategies for future implementation.

Results

Each Pilot white paper discusses the specific results for each pilot, revealing the findings across the usability, impact, and scalability themes as well as more specifically within each area of interest. Each pilot summary describes in detail the pilot design, configuration, and findings.

General Findings

Although the pilot study designs spanned different health IT models and included a range of participants and workflow configurations, the following three universal findings should be highlighted:

- Once prescriber and dispenser communities were connected to the PDMP, immediate improvement to the patient care process was achieved, especially because pilot prescribers and dispensers were rarely accessing PDMP information before.

- The pilots considerably streamlined the user workflows by leveraging technology to enable PDMP query and processing tasks.

- Prescribers and dispensers were the most satisfied with their new workflows when technology automated the majority of workflow tasks.

Usability
- Ease of Use
- Fit with Workflow
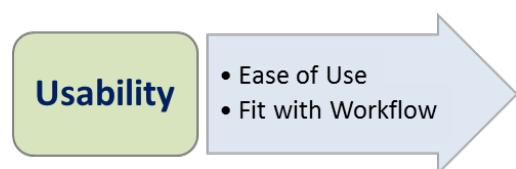
Ease of Use

The participating prescribers and dispensers who provided formal feedback overwhelmingly agreed that accessing the PDMP data with the pilot configuration was significantly easier than the following pre-pilot methods:

- Leaving the current work environment (EHR system) to separately log into the PDMP web portal and then enter patient demographic information (name, date of birth, ZIP code) to initiate a search

- Not accessing the PDMP data at all—either because inefficiencies discouraged use, users were unaware that this data source existed, or users were not registered to use the database

The pilot designs varied around technical sophistication (i.e., what tasks were automated versus manual). Specifically, these differences related to the following actions: accessing the PDMP, processing the request, generating and receiving a response from the PDMP, and documenting this information in the patient's record.

Automated Workflow Actions

Pilots in which the majority of system processing actions with the PDMP were automated (query, response) resulted in 98% to 100% of prescribers and dispensers reporting that PDMP

data was now easier to access. These participants had the following reactions when the key processes were automated:

- OH physician, *"Yes, much easier. Especially like being able to click on the report and be taken directly to the patient's report without having to enter the patient's name, date of birth, and zip code (this was very time consuming and sometimes prevented me from looking up the information in the past)."*

- IN_1 Regenstrief ED physician, *"I have to say that this is probably one of the more genius moves of the 21st century . . . having easy access to INSPECT without going to a totally different website and have it pop up instantly has taken a lot of time off of decision making for me."* Another ED physician stated, *"Do you need specific case anecdotes or just for me to say it's great! I've never used INSPECT before (0 times) because of the extra step, but I have used on many patients in just a few shifts since this change."*

Manual Workflow Actions

Pilots in which system processing still required manual actions to access the PDMP (query, response) resulted in 67% to 75% of prescribers and dispensers reporting that PDMP data was now easier to access. These participants offered the following suggestions about the manual processes:

- A WA technically savvy provider who had already implemented an equivalent technical solution commented, *"It was not any more useful than utilizing the link I had already established via another browser. I did not have to establish a new token and using it required a couple more clicks to access than what I already had. I see how it may be useful to someone that doesn't already have links, tokens established."*

- After the pilot concluded, the WA Evergreen Treatment Services providers did inquire about having a "single sign-on" capability, which would potentially improve the efficiency of their workflows.

Appendix C provides the detailed pilot results for the percent of participants who "report that accessing the PDMP data is now easier" compared to their technical configurations.

Fit with Workflow

The prescribers and dispensers uniformly agreed that the position of the new tasks in the workflow was correct. For these pilots, the PDMP query and return of information was designed to occur while the prescriber/dispenser was in the patient record at the time of decision-making. Consequently, there was little disruption to the their clinical workflows by having this valuable prescription drug information handily available at the point of care.

Impact
- Technical Impact
- Clinical Impact
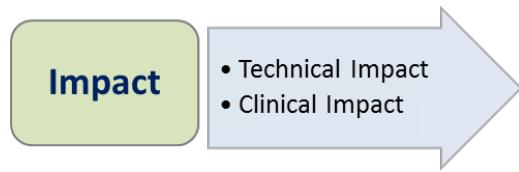
Technical Impact

All pilots successfully demonstrated the ability to connect prescribers and dispensers to the PDMP database in a relatively short amount of time, although the preparation time varied depending upon the complexity of the connectivity. Almost all pilot participants in the Pre-Pilot environment were not regularly, if at all, accessing the PDMP data due to the inconvenience of an additional step existing outside of their normal workflows. Once the new PDMP connection was made, regardless of the technical level of sophistication of that link, immediately the care delivery process was propelled forward. The WA pilot organization was the only one that had previously instituted a standard operating procedure that required providers to log into the PDMP website and query every admitted patient as part of the care treatment process.

Clinical Impact

The primary objectives of the pilots were to demonstrate connectivity and facilitate access to the PDMP data. The qualitative feedback indicated that the prescribers and dispensers felt the PDMP data was acceptable for clinical use. These users were better informed, and the availability of this information positively impacted their patient care.

An IN$_1$ physician stated, "*I have an anecdote that I think illustrates how INSPECT has a concrete impact on patient care. Let me preface this by saying that I think the primary utility of having access to INSPECT is *NOT* punitive. I see it (and use it in my practice) as providing information that could directly lead to a point of intervention in patients who may have prescription drug abuse problems. I do not use INSPECT to "catch" patients in lies (although this sometimes happens, as you know). I use it to help treat them... which in some cases is for their drug abuse/addiction, not their presenting complaint/symptom. I took care of a woman in her early 50's who presented for dental pain. She had no evidence of emergent medical issue related to her dental complaint. INSPECT report showed that she had filled 27 prescriptions for narcotics during June 2012 alone (with similar activity dating back over at least a year). I asked her about this and she ultimately admitted to having an opioid addiction, and I was able to counsel her and provide concrete outpatient drug abuse follow-up. She stated that no doctor had ever cared enough to look into her prescribing habits, and although she was tearful, she also expressed readiness to seek help for her addiction. I was able to do an INSPECT search on this patient because the ED happened to be slow at the time she came in. Most of the rest of the time (i.e., when there are multiple patients waiting to be seen), I would not have taken the time to do the search, and I would have facilitated her underlying issue by prescribing *another* course of narcotics. Having INSPECT more readily accessible (i.e., via CareWeb) would allow us to get this important information quickly so that we can use it in real-time.*"

These pilots were considerably shorter (3 to 4 weeks) than conventional clinical studies where recognized changes in practice patterns (i.e., number of prescriptions written and in treatment

to patients) are demonstrated. This may affect the scale and statistical reliability of these conclusions, but it is possible to draw meaningful conclusions on the direction of change. It is also worth noting that, for different patients, either increasing or decreasing the amount of controlled substances prescribed may be accurately described as an improvement. For example, during the IN_1 pilot over a one-month time period, physicians acknowledged the pilot's impact on the number of prescriptions they wrote:

- 58% indicated a reduction in either prescriptions written or number of pills dispensed.
- 7% indicated increase in either prescriptions written or number of pills dispensed.

Scalability • Driver of Adoption • Optimization Factors
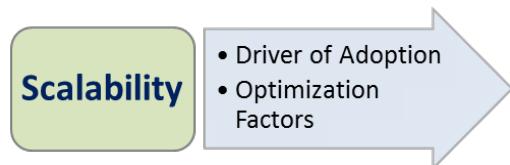
Driver of Adoption

Almost all pilot locations indicated that they will continue to use the new health IT connectivity. Although the level of technical sophistication varied across the pilots, these locations deemed value in their new connection with the PDMP database because it significantly improved efficiency and ultimately improved their care processes. However, the IN_2 pilot configuration is not likely to be used consistently because only 33% of prescribers indicated that they would like to continue to use this method for receiving alerts.

Optimization Factors

Participants identified the following opportunities for improvement regarding connectivity to the PDMP:

- Maximize automation for accessing the PDMP information to streamline the care delivery process for prescribers/dispensers. Pilot locations with the most automation were consistently more satisfied. (see Appendix D)
- Incorporate flexibility so that the ability to view detailed PDMP data beyond the initial query is available to maintain the streamlined workflow.

A notable recommendation came from the ND pilot regarding an inflexible aspect of the pilot workflow. A pharmacist stated a desire for the response process to be more conducive for conducting additional queries when the response flag is returned and more information is needed. The pilot configuration was designed only to return response flags indicating recommended courses of action. However, if the pharmacist wanted to review the prescription data in detail (medications, time-frames, etc.) behind the response code, this required the pharmacist to separately access the PDMP website, log into the PDMP, enter the patient demographic information, and search for that information:

- This ND pharmacist stated, *"Raw data should come back from the PDMP through Emdeon's switch so they [dispensers] don't have to go look it up. Data for patients at risk should automatically be displayed, and it should be available for the patients not at*

risk and for those patients when the search failed and a manual PDMP query is required – This would help us follow up on suspicious 'patients not at risk' and prevent us from needing to go to the state portal at all."

Discussion

The pilot studies successfully demonstrated the ability to enhance access to PDMP data using health IT as well as the associated benefits to care providers and dispensers. Before implementation of these pilots, most prescribers and dispensers rarely accessed the PDMP data in large part because it required them to interrupt their normal workflow. They often had to exit their EHR workspace and then log on to the PDMP website to initiate a patient search. The pilot configurations considerably streamlined this process so that querying and processing steps were automated by technology, thus no longer requiring users to employ additional manual efforts to reach this important data. Although there are multiple ways to enhance access to PDMPs, as exhibited in the pilots, prescribers'/dispensers' overall satisfaction with the new care delivery process is dependent upon the degree of automation.

In the pilot studies, enhanced access to PDMPs resulted in greater added value at the point of care. When the prescriber and dispenser communities were connected, an immediate improvement was achieved, especially because they rarely accessed the PDMP data. Steady utilization is dependent upon the level of adoption. The technical configuration allowing connectivity occurs along a sliding scale of sophistication, and the more technology is leveraged to perform work for prescribers and dispensers, the greater the level of their adoption and utilization of the PDMP.

How to Use the Pilot Documents

In addition to this Summary document, six Pilot White Papers describe individual evaluation elements for the completed pilots and provide detailed information about the pilot methods and results. These details may be useful to PDMP stakeholders who wish to recreate the pilot conditions. Figure 2 plots each pilot study according to end user and means of accessing data.
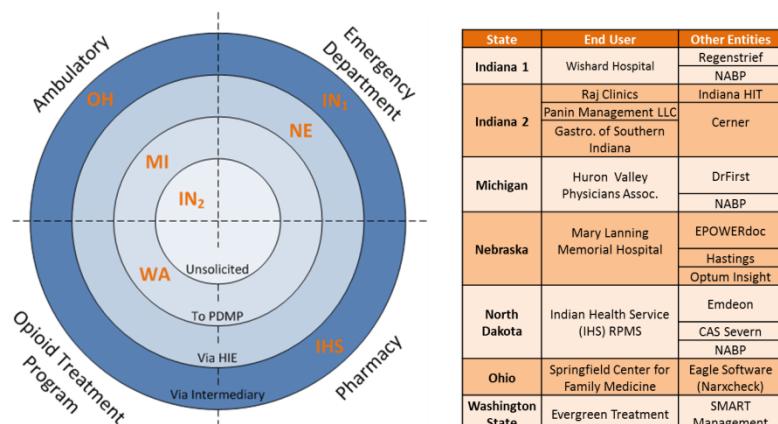

State	End User	Other Entities
Indiana 1	Wishard Hospital	Regenstrief
		NABP
Indiana 2	Raj Clinics	Indiana HIT
	Panin Management LLC	Cerner
	Gastro. of Southern Indiana	
Michigan	Huron Valley Physicians Assoc.	DrFirst
		NABP
Nebraska	Mary Lanning Memorial Hospital	EPOWERdoc
		Hastings
		Optum Insight
North Dakota	Indian Health Service (IHS) RPMS	Emdeon
		CAS Severn
		NABP
Ohio	Springfield Center for Family Medicine	Eagle Software (Narxcheck)
Washington State	Evergreen Treatment	SMART Management

Figure 2. PDMP Pilot Studies

Appendix A. Pilot Study Participants and Components

This appendix outlines the seven pilot studies, categorizing which participants and components were involved in each pilot. The column heading row lists the pilots by state abbreviation; for example, ND represents the North Dakota pilot.

PDMP Pilot Studies

Pilot Configuration	IN$_1$	IN$_2$	MI	ND	OH	WA	NE
Participants							
Prescriber in Ambulatory Setting		✔*	✔		✔	■	
Prescriber in Emergency Department	✔						✔
Dispenser				✔			
Health IT Systems							
EHR (EMR, Pharmacy and Rx systems)	✔		✔	✔	✔	✔	✔
Switch (e.g. benefits switch)			✔	✔			
Health Internet Service Provider (HISP)		✔*					
Health Information Exchange (HIE)					✔		✔
Health IT software (systems/networks)	✔				✔		
PMPi (interstate hub)	✔		✔	✔			
PDMP	✔	✔*	✔	✔	✔	✔	✔
Workflow (features of process that enable connection to the PDMP)							
Accessing the PDMP							
• Manual	✔	•		✔		✔	✔
• Automated		✔*	✔		✔		
Processing the PDMP Request							
• Manual		•				✔	
• Automated	✔	✔*	✔	✔	✔		✔
PDMP Response Format							
• Directly logged into the PDMP		•				✔	✔
• PDMP report returned to EHR	✔		✔				
• Customized PDMP report returned to EHR			✔	✔	✔		
Documentation into EMR/EHR							
• Manual		•				✔	✔
• Automated	✔		✔	✔	✔		

✔* Automatic unsolicited reporting from PDMP (no PDMP prescription detailed in Direct Message).

• Prescriber must manually access PDMP to research prescription data details (follow up from Direct Message).

■ The providers at Evergreen Treatment Services are not prescribers for their patients.

Six of the pilots were conducted from February through September 2012. The Nebraska pilot, the last column shaded in Table 1, was initiated in fiscal year 2012 (FY12) and is expected to conclude during the first quarter of FY13.

Appendix B. Evaluation Criteria

This appendix outlines the evaluation themes and their accompanying areas of interest, along with associated evaluation metrics.

Usability

The primary focus of the usability theme is the user's perspective. The following areas of interest concern the optimization of the care delivery experience and the efficiency in performing work processes by leveraging and maximizing technical integration:

- **Ease of Use** – Promoting easier and more efficient ways to access to the PDMP prescription drug data than the previous method for prescribers and dispensers
- **Fit with Workflow** – Natural integration into existing clinical and health IT workflows for prescribers and dispensers

Area of Interest	Evaluation Metrics	Data Source
Ease of Use	% reporting PDMP data provided was of acceptable quality for use	Participant Feedback (Solicited Response, Interview)
	% reporting PDMP data now easier to access (pilot versus prior methods)	Participant Feedback (Solicited Response, Interview)
	Distribution of previous methods used to access data	Identification of Methods / Logged System Data
Fit with Workflow	% indicating proper integration with position in workflow	Participant Feedback (Solicited Response, Interview)
	% indicating access to PDMP data was better than alternative option	Participant Feedback (Solicited Response, Interview)

Impact

The impact theme was meant to validate that the connectivity method to the PDMP was achieved and ultimately resulted in positive clinical care. The following areas of interest assess the technical and clinical impact:

- **Technical Impact** – Resulted in maximizing connections to existing technologies and increased queries to the PDMP data
- **Clinical Impact** – Resulted in timely and meaningful PDMP information, readily available at the time of decision-making, that positively impacted care delivery to the patient

Area of Interest	Evaluation Metrics	Data Source
Technical Impact	% change in PDMP queries (pilot versus prior)	Logged System Data
	Distribution of patients at threshold condition (at risk versus not at risk)	Logged System Data
Clinical Impact	% satisfied with data provided in pilot configuration for clinical use	Participant Feedback (Solicited Response, Interview)
	% reporting change in treatment as result of better PDMP access	Participant Feedback (Solicited Response, Interview)
	% change in prescriptions for controlled substances written or fulfilled (pilot versus prior)	Logged System Data

Scalability

The scalability theme assessed the capability of the new work processes to be widely applied and accommodate growth in the existing system of prescribers and dispensers. The following areas of interest assessed how well participants adopted the new process and the degree to which it improved the existing workflow:

- **Driver of Adoption** – Accepted by the participants so that the pilot drove adoption by other sites or user groups (e.g., prescribers), if applicable

- **Optimization Factors** – Generated identifiable improvement opportunities to increase the usefulness and timely availability of PDMP prescription drug information

Area of Interest	Evaluation Metrics	Data Source
Driver of Adoption	% wishing to continue to use the new process	Participant Feedback (Solicited Response, Interview)
	% willing to recommend the new process to their peers or colleagues	Participant Feedback (Solicited Response, Interview)
Optimization Factors	% able to identify specific, actionable steps to further refine process	Participant Feedback (Solicited Response, Interview)
	Distribution of specific suggestions for improvement	Participant Feedback (Solicited Response, Interview)

The pilot studies used these evaluation guidelines for establishing their data collection plans. In some circumstances where the recommended data capture method was not feasible, the pilot participants adapted their plans to include customized data-gathering methods or proxy measurements.

Appendix C. Ease of Accessing PDMP Data

This table presents results for each pilot study for the category "Percent Reporting that PDMP Data Was Now Easier to Access" (based on those participants who formally provided feedback).

Pilot Study	PDMP Access and Processing Triggers	% Reporting PDMP Data Now Easier to Access
IN$_2$	**Access PDMP** • Manual Trigger – If physician is inclined to review the detailed PDMP data after receiving an automated PDMP alert secure message, the physician accesses the PDMP via the website. **Process PDMP Request** • Manual Trigger – Prescriber enters the patient's demographic information to launch the search.	67% (n=3)
WA	**Access PDMP** • Manual Trigger – Provider presses a hyperlink in EHR in Patient Record to directly take Prescriber to PDMP Log-In Portal. **Process PDMP Request** • Manual Trigger – Provider enters the patient's demographic information to launch the search.	67% (n=6)
ND	**Access PDMP** • Manual Trigger – Dispenser initiates the E1* message to access the PDMP data for the patient, and it is facilitated through a single sign-on. **Process PDMP Request** • Automatic Trigger – Patient's demographic information is automatically passed to the PDMP search.	75% (n=4)
MI	**Access PDMP** • Automatic Trigger – Request is initiated when the prescription is being processed, before final authorization. **Process PDMP Request** • Automatic Trigger – Patient's demographic information is automatically passed to the PDMP search. **PDMP Response (*enhanced feature*)** • Automatic Trigger – A formatted PDMP report is automatically integrated into Prescription History. • Automatic Trigger – PDMP data is included in proactive clinical alerts for duplicate prescription therapy.	not reported

Pilot Study	PDMP Access and Processing Triggers	% Reporting PDMP Data Now Easier to Access
OH	**Access PDMP** • Automatic Trigger – Request is initiated when a patient schedules an appointment and is updated when the patient arrives for the appointment. **Process PDMP Request** • Automatic Trigger – Patient's demographic information is automatically passed to the PDMP search. **PDMP Response (*enhanced feature*)** • Automatic Trigger – PDMP data is automatically integrated into the patient's record and available for review when the prescriber is already there.	100% (n=6)
IN$_1$	**Access PDMP** • Automatic Trigger – Request is initiated when the patient is admitted to the Emergency Department. **Process PDMP Request** • Automatic Trigger – Patient's demographic information is automatically passed to the PDMP search. **PDMP Response (*enhanced feature*)** • Automatic Trigger – PDMP data report is automatically integrated into the patient's prescription drug history section,	98% (n=243)

Appendix D. Pilot Technical Configurations

This figure illustrates pilot configurations across technical levels of sophistication (automated and manual process triggers).