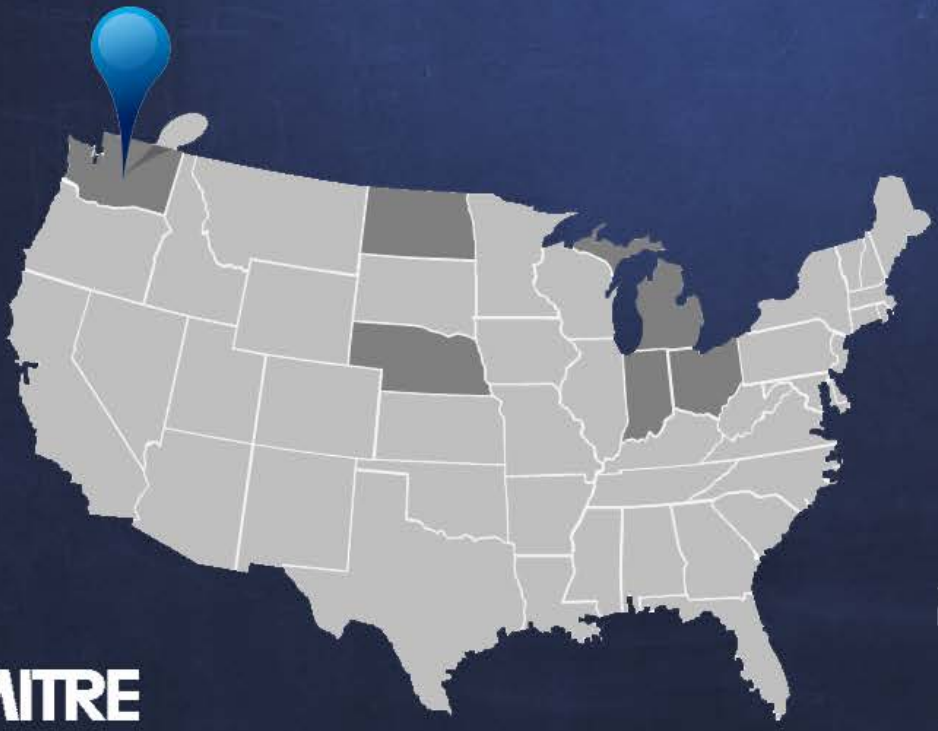
Enhancing Access to Prescription Drug Monitoring Programs Using Health Information Technology:

Linking an Opioid Treatment Program to a Prescription Drug Monitoring Program: A Pilot Study

2012



MITRE

The Office of the National Coordinator for Health Information Technology

Substance Abuse and Mental Health Services Administration SAMHSA

DEPARTMENT OF HEALTH & HUMAN SERVICES • USA

Overview

Goal

The Evergreen Treatment Services (ETS) Opioid Treatment Program (OTP) pilot demonstrated the value of health IT connectivity by:

- Improving access to PDMP data by OTP providers
- Streamlining access to the Prescription Drug Monitoring Program (PDMP) through a hyperlink in the electronic medical record (EMR) system.

This pilot configuration showcased the workflow, ease of use, and added technical value of improved access to the PDMP in the OTP clinical management system workflow.

Pilot Design

ETS is an OTP in Washington State. The ETS prescribers currently have user accounts with the state's PDMP. The pilot streamlined access to the PDMP by adding a hyperlink in the EMR that allowed physicians to directly access the state's PDMP portal without leaving the EMR. ETS already reviews patient prescription drug history as a routine part of the patient admissions and clinical management workflow. Figure 1 shows the two-way flow of information in the pilot.

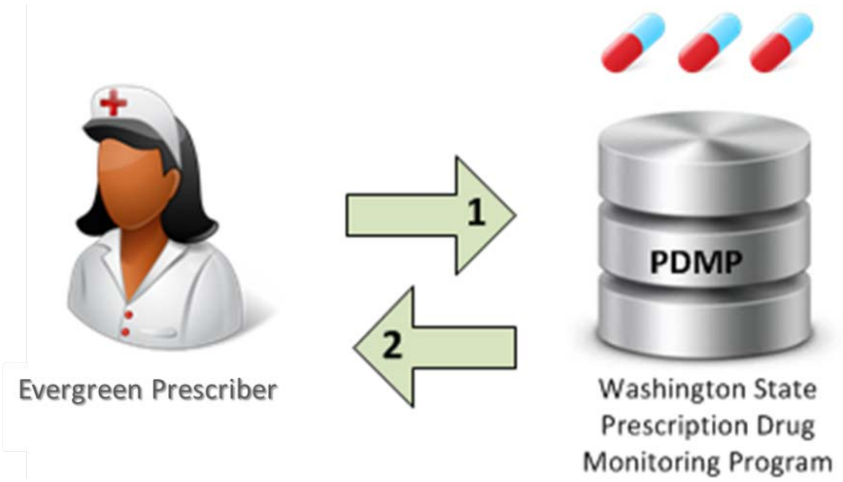


Figure 1. Pilot Workflow Diagram

ETS staff identified the patient case history as the appropriate place in their clinical workflow to access and use the PDMP data. Accordingly, the vendor updated their EMR software to add a PDMP hyperlink to the patient case history screen. The Evergreen clinic staff used their EMR system to review patient case history as part of their admissions and clinical management workflows. As shown in Figure 1, the ETS prescribers:

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1. Manually selected the PDMP hyperlink on the patient's case history screen and were presented with the Washington State PDMP system login screen. They used their existing PDMP user account to log on to the PDMP system, enter patient identification data, and review the patient's prescription data.

2. Manually recorded relevant PDMP patient prescription data in the patient case history area of the EMR system.

Appendix A describes the pilot's technical considerations, including the list of participants; Appendices B and C discuss the operational and evaluation considerations, respectively.

The Pilot Study

Pre-Pilot State

ETS provides treatment services at two fixed site facilities and three mobile units. One fixed site and the three mobile units are in Seattle, WA, serving 1,010 patients. The other fixed site clinic is in Olympia, WA, serving 364 patients. ETS elected to query the Washington PDMP for all patients as of January 4, 2012. This required developing an internal procedure that required all ETS prescribers to:

- Activate PDMP accounts
- Check the prescription drug history of all their patients.

The prescribers must check PDMP records for (1) all newly admitted patients prior to admission and (2) clinical follow-up for existing patients. Thus, all ETS prescribers regularly accessed the PDMP prior to this pilot.

In the "before state" at Evergreen:

- Clinic staff has existing PDMP user accounts.
- Operational policy requires checking the PDMP, but this check is not currently integrated with the clinic's EMR system.
- Clinic staff must remember to check the patient drug history by opening a new web browser window and entering the PDMP address to access the PDMP website.

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Hypothesis

The following hypotheses directly relate to the six areas of interest that were the basis for evaluating the pilots' effectiveness. Appendix C describes the evaluation methods in detail.

Table 1. Hypotheses and Intended Impacts

Area of Interest	Intended Impact
Ease of Use	Easier for ETS clinic staff to access the PDMP
Fit with Workflow	Improves clinic processes and is accessible at the proper place in the workflow when the prescriber is reviewing the patient's case history
Technical Impact	Does not adversely impact existing end-user technology
Clinical Impact	No clinical impacts are expected because prescribers are already required to check the PDMP system
Driver of Adoption	Easily adopted by the ETS prescribers, and the concept can be extended to other customers of the vendor's EMR system
Optimization Factors	ETS prescribers recognize the benefits of the PDMP hyperlink at the appropriate place in their workflow

Results

ETS has a staff of over 80 professionals providing addiction treatment services. ETS selected six prescribers to use the pilot for four weeks and provided feedback regarding the usability and value of the PDMP hyperlink. The overall response to the pilot was very positive, as shown in Tables 2 and 3. Table 2 shows the responses to questions about the usability and adoption of the pilot technology. Table 3 summarizes the responses to the pilot impact questions.

Table 2. Usability and Adoption Feedback Response Summary

Question	Yes	No
Did the PDMP link make it easier to access PDMP data?	66.7%	33.3%
Did you use the PDMP more because of the link?	16.7%	83.3%
Would you recommend having a PDMP link as a solution for others?	83.3%	16.7%
Do you wish to continue to use the PDMP link?	66.7%	33.3%

Table 3. Pilot Impact Feedback Response Summary

Question	Positive Impact	No Impact	Negative Impact
What was the overall impact on patient treatment based on information from the PDMP?	66.7%	33.3%	0%
Overall, did having the PDMP link make an impact?	66.7%	33.3%	0%
Overall, was the PDMP link helpful?	50.0%	33.3%	16.7%

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The feedback results indicate that the pilot had the most impact in the following areas:

- **Ease of Use**
  - A PDMP hyperlink embedded in the EMR system can have a positive impact, as shown by 83% of the responses recommending that the solution should be available for others to use.
  - An increase in the use of the PDMP because of the link was not expected because PDMP access is part of the ETS mandatory procedures. However, as shown in Table 2, there was an increase in PDMP use because the link served as a reminder to access PDMP data at the proper place in the workflow.
- **Workflow Fit**
  - Access to and use of patient prescription history data increased at the appropriate place in clinical workflow (hyperlink included on the patient case history screen).
  - A PDMP hyperlink can be integrated into the prescribers' EMR to improve workflow and serve as a reminder to check PDMP data. Even though an increased use of PDMP data was not expected, the responses indicated that some ETS prescribers accessed the PDMP more often because the link was a reminder at the appropriate place in their workflow.
- **Technical**
  - The pilot successfully established a hyperlink from the clinic EMR system to the state PDMP system.
  - The pilot successfully enabled prescribers to manually copy relevant patient prescription information from the PDMP to the clinic EMR system.
  - A PDMP hyperlink embedded in the EMR system was implemented as a low-cost solution, as shown by the contract cost in Appendix B.

Discussion

Fit with Workflow

The pilot feedback indicated a positive impact on the delivery of clinical care treatment due to a streamlined workflow using existing procedures requiring prescribers to access and use PDMP information. Although the pilot was not expected to increase the use of the PDMP, the responses did indicate an increase in use of PDMP data by some prescribers. By conveniently locating the PDMP hyperlink at the point where the information was needed in the EMR system and launching the PDMP request directly from the patient's case history screen, the pilot showed that accessing PDMP data could become easier.

There were a couple of technically savvy ETS prescribers who had previously set up their own hyperlinks to the PDMP, thus the pilot solution did not make it easier for them to access the PDMP. A follow-up question allowed respondents to provide open-ended comments about the

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PDMP link and their comments reflected this. The most significant workflow benefit was experienced by the less technically savvy prescribers.

Benefits of Technical Solution

This pilot demonstrated the value that can be achieved by implementing a simple, low-cost approach to accessing PDMP data. The addition of a PDMP hyperlink to the EMR software was technically simple and inexpensive. ETS analyzed their clinical workflow and identified the patient case history as the appropriate place to access the PDMP data using the PDMP hyperlink added by their EMR software vendor. The primary benefit of the PDMP hyperlink was the consistency and ease of access to the PDMP data where it was needed in the clinical workflow. An unexpected benefit was that the PDMP hyperlink served as a reminder to review the PDMP data while working with the patient case history.

Outcome and Next Steps

ETS has decided to continue to use the pilot software configuration because, overall, the prescribers had a positive reaction to the availability of the PDMP hyperlink at a meaningful place in their workflow.

Potential next steps for the pilot are:

- **Single Sign-On** – This pilot required ETS staff to manually log on to the PDMP using their existing user accounts. Access to the patient prescription history could be improved by direct access from the SMART EMR to the PDMP that does not require a separate logon to the PDMP.
- **Electronic Interface** – This pilot required ETS staff to manually copy patient prescription history information from the PDMP and paste it into the patient's SMART case history information. Data accuracy and a more efficient workflow could be achieved with an electronic interface for automatically copying the required data from the PDMP to the SMART case history information.
- **Making the PDMP hyperlink a standard feature of the SMART EMR** – The PDMP hyperlink could be added as a standard capability of the SMART EMR so that other users of their system could take advantage of the technology.

Other Pilots

The Enhancing Access to PDMP project conducted five additional pilots in Fiscal Year 2012 which are available for review. The pilots encompass a variety of user groups, including dispensers (pharmacists) and prescribers (ambulatory and emergency department) as well as different technological solutions. These papers can be found at the Office of the National Coordinator for Health Information Technology (ONC) PDMP website: http://healthit.hhs.gov/portal/server.pt?open =512&mode=2&objID=3870.

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Appendix A. Technical Considerations

This appendix contains a detailed description of the pilot, including a description of the pilot design, workflow, metrics, costs, and schedule.

Design

The ETS prescribers have existing PDMP user accounts, and the pilot hyperlink will facilitate a check of a patient's prescription drug record from the treatment program's EMR. Patient prescription drug history is reviewed as a routine part of the patient admissions and clinical management workflow, as shown in Figure A-1.

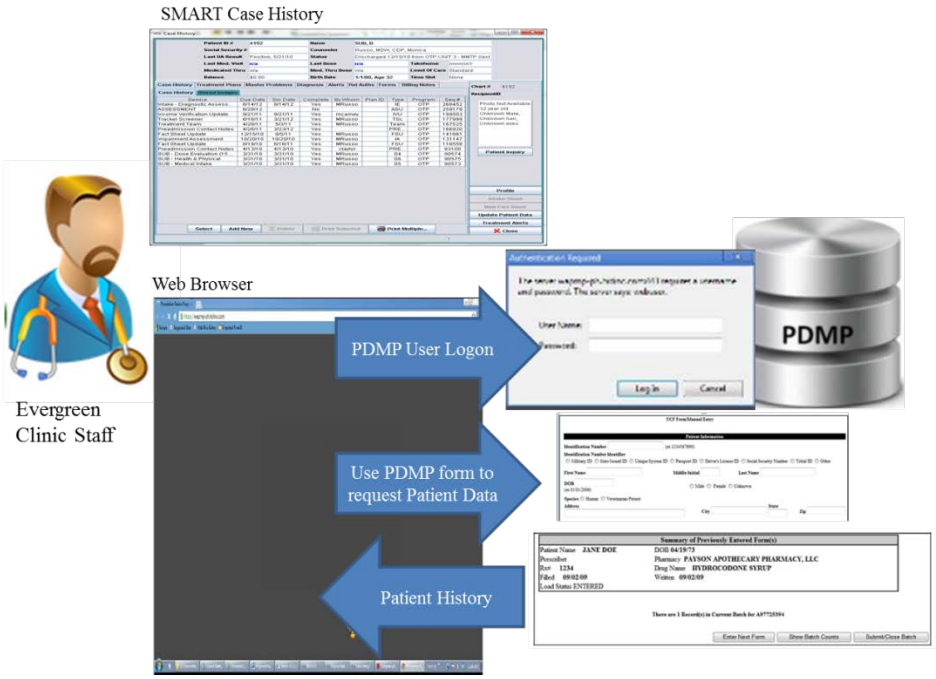

Figure A-1. Workflow before Pilot

Participants

The following parties participated in the pilot:

- Evergreen Treatment Services (ETS)
- SMART Management, Inc.

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Relevant Technologies and Tools

The primary technologies for this pilot were the existing Washington State PDMP system and the SMART Management, Inc. EMR system already in use by ETS. No new core technologies were invented to conduct the pilot.

The primary purpose of the pilot was to create a hyperlink in the EMR system that linked to the state PDMP system. This hyperlink enabled the clinic staff to directly access the PDMP system in the most appropriate place in their patient admission and clinical pain management workflows.

The following is a list of all the technologies used in the pilot:

- SMART Management, Inc. EMR
- Washington State PDMP

Testing

SMART Management, Inc. held internal quality control reviews of their analysis and the resulting code modifications from July 10–12, 2012. After release by quality control, SMART pushed the software update to the ETS development servers for beta testing. ETS conducted beta testing using their internal acceptance test procedures from July 16–20. ETS's review of the beta test results on July 20 led ETS management to approve SMART to deploy the software updates to the ETS production servers on July 23, prior to the start of business.

User Interface

Figure A-2 shows an example of the ETS case history screen for a fictitious patient. The PDMP hyperlink is located at the bottom of the screen for easy access by the prescribers. Figure A-3 shows the PDMP logon screen presented when the prescriber selects the PDMP hyperlink.

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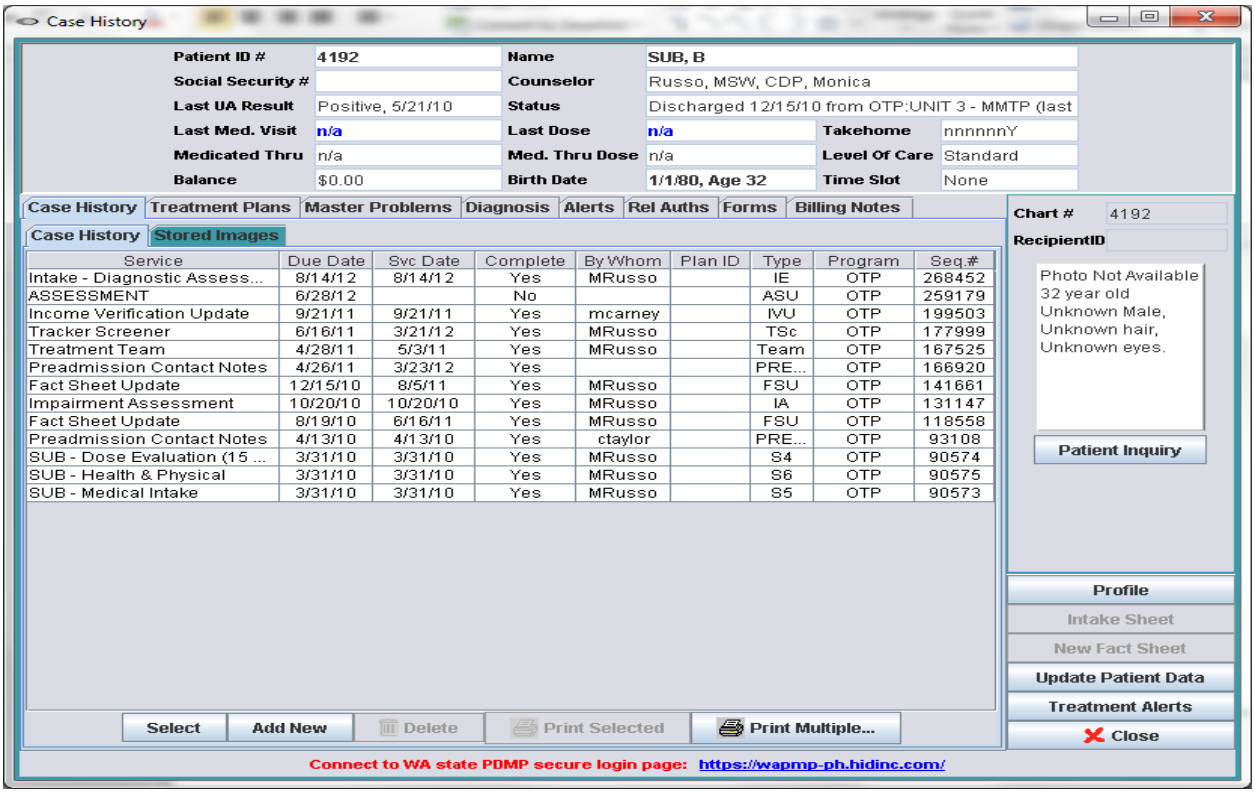

Figure A-2. EMR Case History Screen with PDMP Link

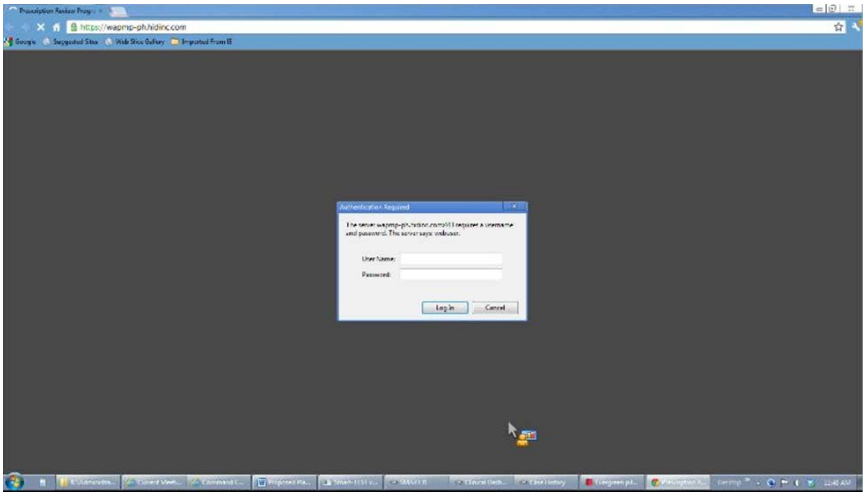

Figure A-3. PDMP Logon Screen Appearing When Case History Screen Link Was Selected

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Figure A-4 shows the pilot workflow with screen captures of the pilot software.

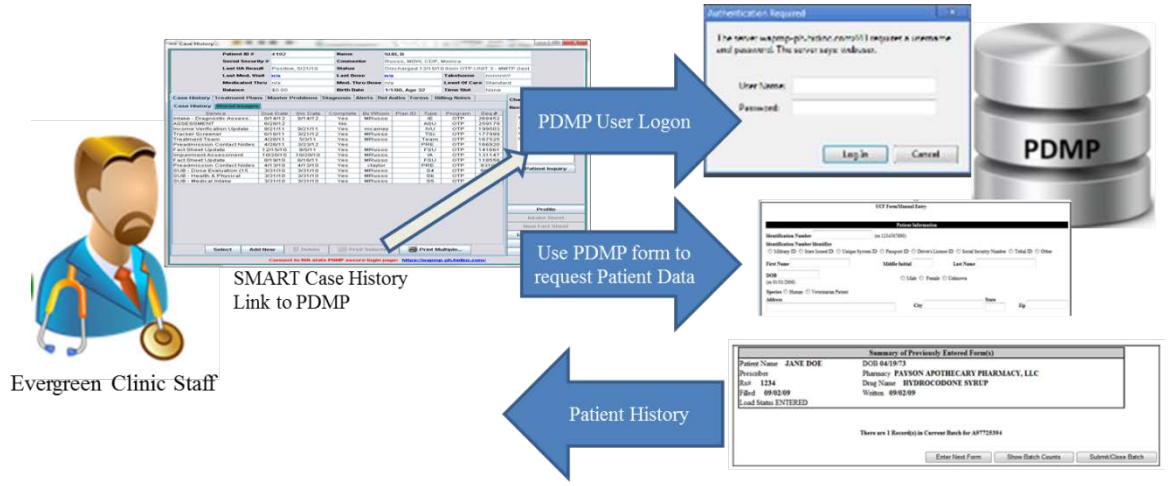

Figure A-4. Pilot Workflow Diagram

Key Operational Assumptions

The success of the pilot depended on two factors:

- The EMR vendor (SMART Management, Inc.) was willing and able to modify a version of their EMR software for use by ETS. This involved building and deploying a unique copy of the EMR software that would not be used by their other clients.
- ETS had to endorse the effort and encourage their prescribers to use the PDMP hyperlink added to the EMR patient case history capability.

Appendix B. Operational Advantages and Barriers

Advantages:

- ETS prescribers had existing PDMP user accounts and were familiar with the PDMP system.
- The clinic procedures already required that the prescriber check the PDMP for prescription history data for each admission and during clinical management functions. Therefore, it was unlikely that a metric for PDMP use would provide any value. Because the clinic already required prescribers to access the PDMP, there would not be any increased PDMP access due to the addition of a hyperlink.

Barriers:

- Given the time constraints, it was not feasible to develop the EMR hyperlink to collect usage metrics.

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- There was insufficient time to implement a single-sign-on capability from the EMR to the PDMP. The ETS prescribers had to log on to the PDMP during the pilot.

Pilot Schedule

Task Name	Start	Finish	Duration
Planning	May 15, 2012	July 6, 2012	38 days
Deployment/Training	July 9, 2012	July 22, 2012	10 days
Execution/Monitoring	July 23, 2012	August 17, 2012	28 days
Post-Pilot Analysis/Report	August 23, 2012	August 31, 2012	7 days

Pilot Costs

Vendor	Services	Cost
SMART Management, Inc.	Development	$5,000
Evergreen Treatment Services	Run pilot and conduct feedback	$1,000
	Total	**$6,000**

MITRE subcontracts are fixed price instruments. It is noted that no participants requested legal review costs for business (e.g., MITRE subcontract) and project management. Other expenses also may have been insufficiently enumerated in this list (e.g., cost of ETS testing the beta software for one week prior to accepting the software for production), and regional cost factors may likewise play a role in the quoted prices. As such, the actual cost of reproducing this pilot elsewhere may be more or less than this amount, even when attempting to exactly replicate these circumstances.

Appendix C. Evaluation Methods

Evaluation Approach – Hypotheses and Specific Methods

The Federal Government and MITRE conducted pilot studies, small-scale experiments, to test the feasibility of proposed workflows and evaluate their outcomes before investing resources in a full-scale, permanent implementation. These pilots provide valuable insights concerning time requirements, system challenges, and opportunities for process improvement—all of which can be addressed to improve final system design and performance success.

Evaluating the PDMP Pilots required a disciplined and consistent approach to examine the impact of the new or changed technical and clinical work process features toward achieving the following goals:

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- **Workflow Logistics** – Providing the correct amount of the appropriate information, in the proper condition, at the right place and time, in the necessary position/sequence
- **System Performance** – Achieving desired outcomes
- **Predicting Implementation Success** – Extrapolating the results to a larger system

MITRE's systematic analytic approach effectively consolidated these objectives into a set of three consistent evaluation themes: usability, impact, and scalability. The PDMP Pilots varied from simple to more complex health IT connectivity configurations to the PDMP, so testing afforded the opportunity to examine the different facets of performance along a continuum of technical sophistication (see Figure C-1).

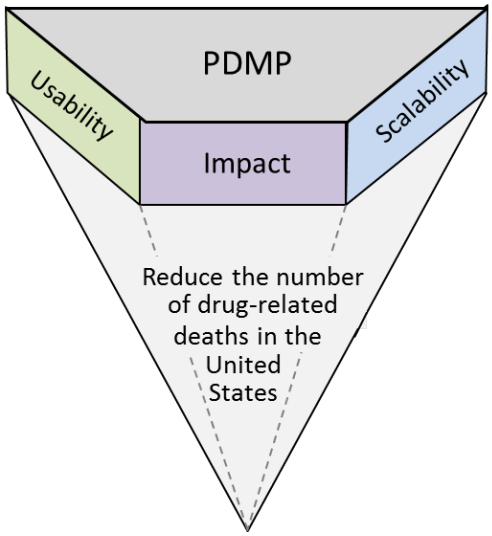

Figure C-1. Evaluation Themes

This appendix describes the three evaluation themes in detail. Each theme and its accompanying areas of interest, with associated evaluation metrics, were the basis for evaluation of the PDMP pilots.

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

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Table C-1. Usability Analysis Features

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 is meant to validate that the connectivity method to the PDMP was achieved and ultimately resulted in a positive impact to clinical care outcomes. 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 prescription drug information, readily available at the time of decision-making, that positively impacted care delivery to the patient

Table C-2. Impact Analysis Features

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 CS written or fulfilled (pilot versus prior)	Logged System Data

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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 the 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 further adoption by other sites or user groups (e.g., providers), if applicable
- **Optimization Factors** – Generated identifiable improvement opportunities to increase the usefulness and timely availability of PDMP prescription drug information

Table C-3. Scalability Analysis Features

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)

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Feedback Instrument

MITRE and ETS collaborated to collect pilot feedback. The feedback was collected through SurveyMonkey after the completion of the pilot monitoring period. Figure C-2 shows the questions used to elicit feedback.

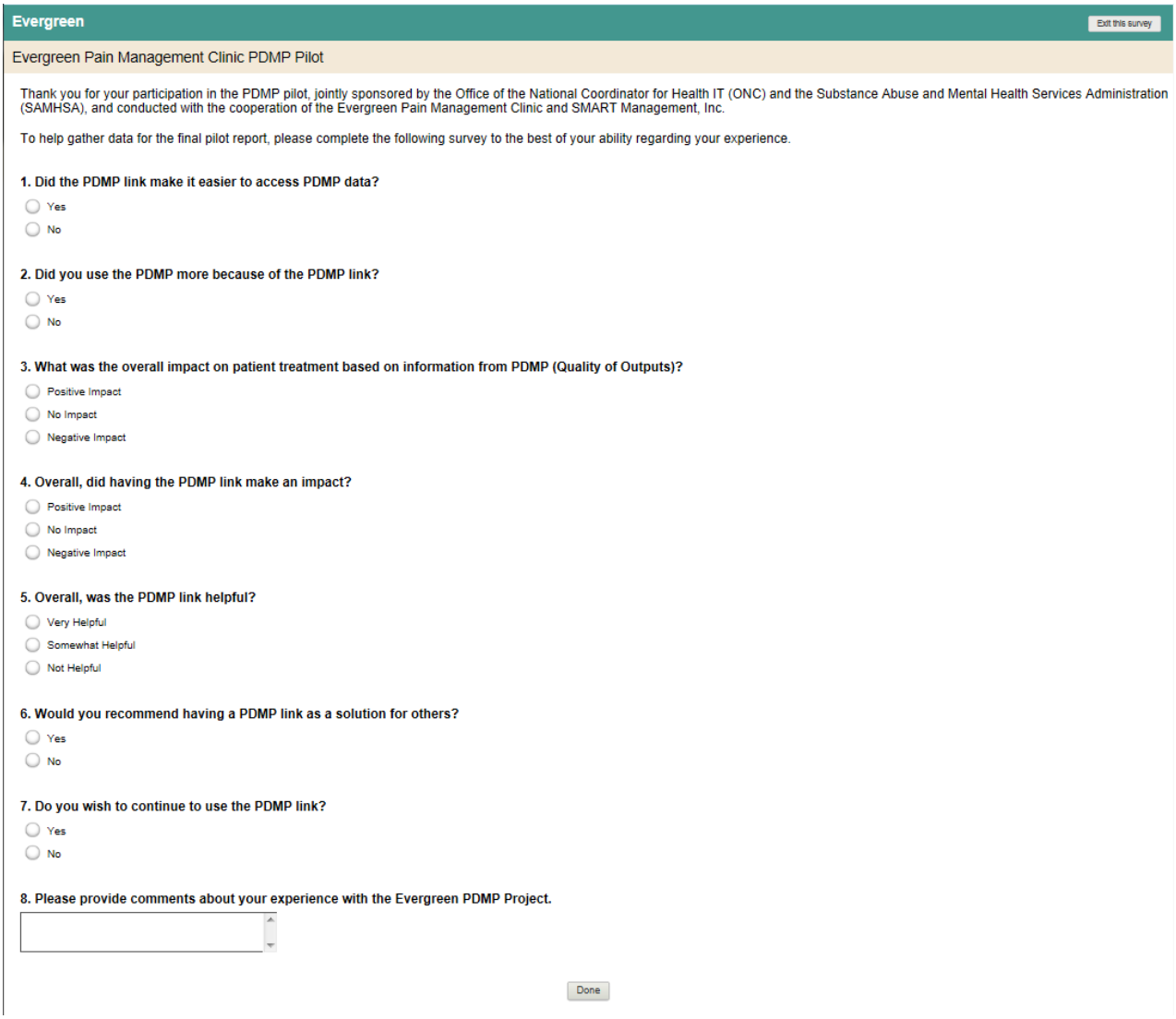

Figure C-2. Pilot Feedback

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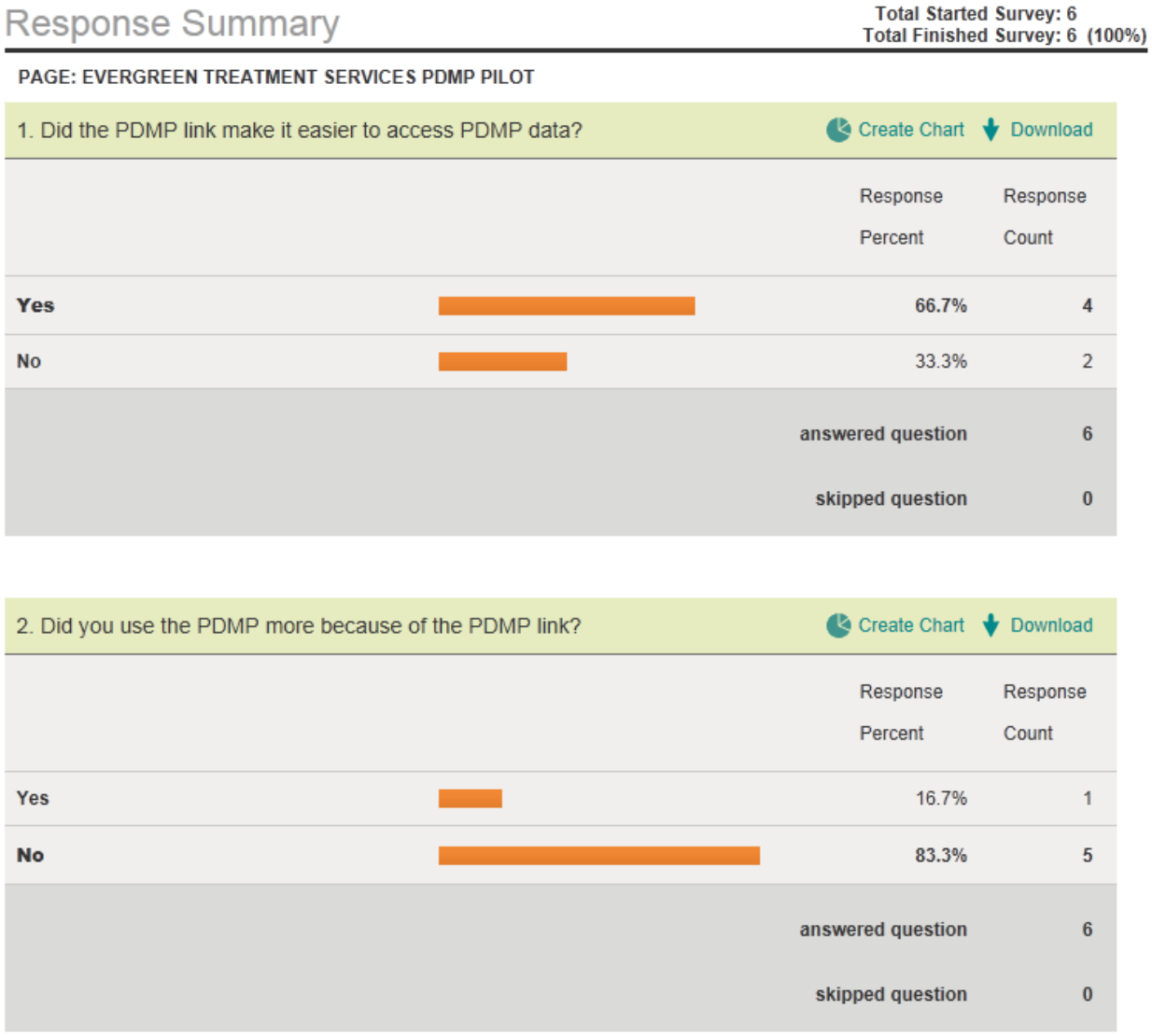
SurveyMonkey has an online analysis tool for the responses. Figure C-3 provides a series of screen shots summarizing the responses collected by SurveyMonkey.



Response Summary

Total Started Survey: 6
Total Finished Survey: 6 (100%)

PAGE: EVERGREEN TREATMENT SERVICES PDMP PILOT

1. Did the PDMP link make it easier to access PDMP data? Create Chart Download

	Response Percent	Response Count
Yes	66.7%	4
No	33.3%	2
answered question		6
skipped question		0

2. Did you use the PDMP more because of the PDMP link? Create Chart Download

	Response Percent	Response Count
Yes	16.7%	1
No	83.3%	5
answered question		6
skipped question		0

Figure C-3. Summary of Pilot Feedback Responses (Part 1 of 4)

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3. What was the overall impact on patient treatment based on information from PDMP (Quality of Outputs)?

Create Chart Download

	Response Percent	Response Count
Positive Impact	**66.7%**	**4**
No Impact	33.3%	2
Negative Impact	0.0%	0
	answered question	**6**
	skipped question	**0**

4. Overall, did having the PDMP link make an impact?

Create Chart Download

	Response Percent	Response Count
Positive Impact	**66.7%**	**4**
No Impact	33.3%	2
Negative Impact	0.0%	0
	answered question	**6**
	skipped question	**0**

Figure C-3. Summary of Pilot Feedback Responses (Part 2 of 4)

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5. Overall, was the PDMP link helpful? Create Chart Download

	Response Percent	Response Count
Very Helpful	**50.0%**	**3**
Somewhat Helpful	33.3%	2
Not Helpful	16.7%	1
	answered question	**6**
	skipped question	**0**

6. Would you recommend having a PDMP link as a solution for others? Create Chart Download

	Response Percent	Response Count
Yes	**83.3%**	**5**
No	16.7%	1
	answered question	**6**
	skipped question	**0**

7. Do you wish to continue to use the PDMP link? Create Chart Download

	Response Percent	Response Count
Yes	**66.7%**	**4**
No	33.3%	2
	answered question	**6**
	skipped question	**0**

Figure C-3. Summary of Pilot Feedback Responses (Part 3 of 4)

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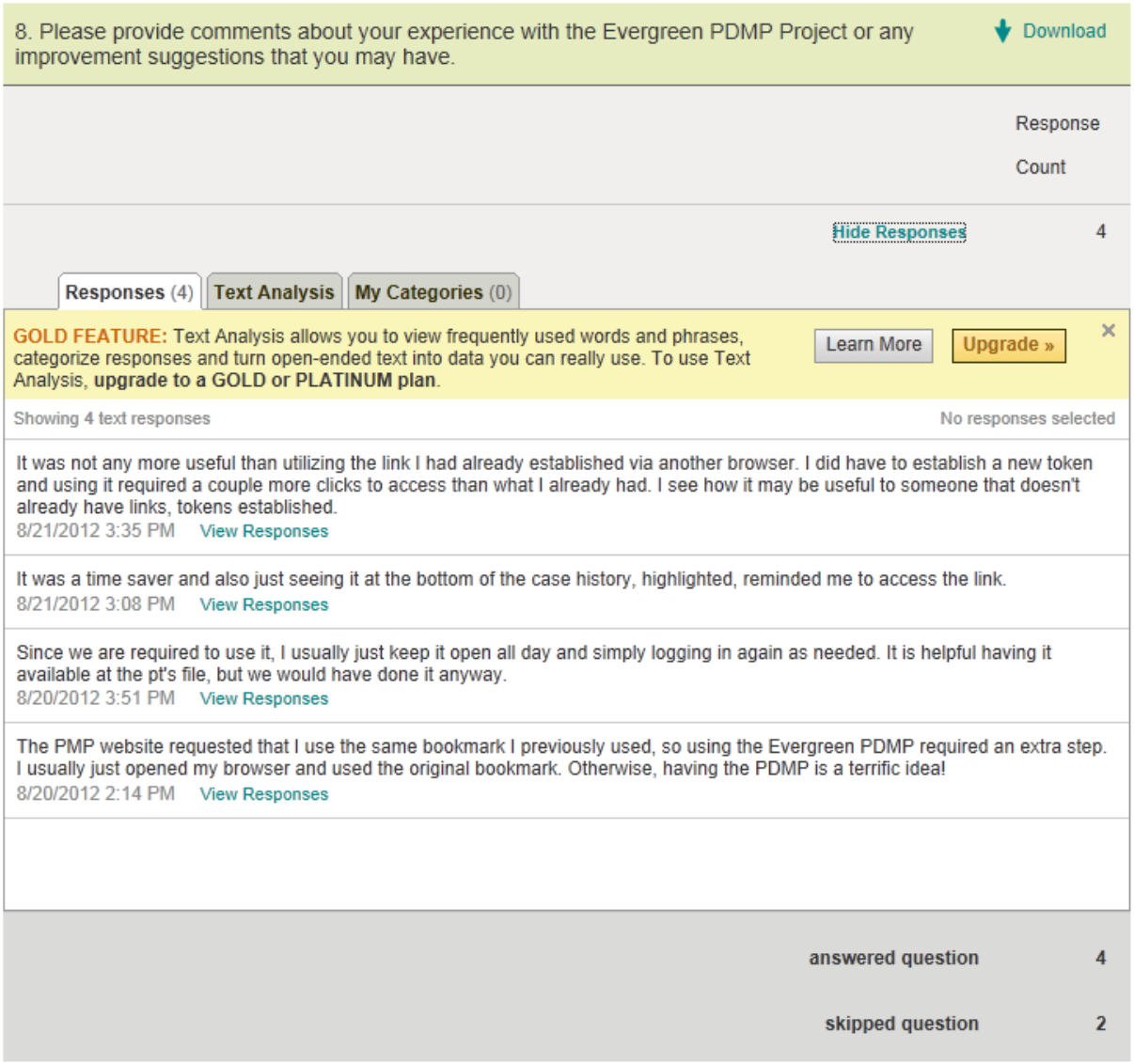

Figure C-3. Summary of Pilot Feedback Responses (Part 4 of 4)

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Acronyms

EMR Electronic Medical Record

ETS Evergreen Treatment Services

ONC Office of the National Coordinator for Health Information Technology

OTP Opioid Treatment Program

PDMP Prescription Drug Monitoring Program

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