

2015

## Health Information Exchange to Support a Prescription Drug Monitoring Program

Gary L. Cochran

Donald G. Klepser

Marsha Morien

Lina Lander

Follow this and additional works at: <http://pubs.lib.umn.edu/innovations>

### Recommended Citation

Cochran GL, Klepser DG, Morien M, et al. Health Information Exchange to Support a Prescription Drug Monitoring Program. *Inov Pharm*. 2015;6(1): Article 188. <http://pubs.lib.umn.edu/innovations/vol6/iss1/4>

*INNOVATIONS in pharmacy* is published by the University of Minnesota Libraries Publishing.

## Health Information Exchange to Support a Prescription Drug Monitoring Program

Gary L. Cochran PharmD, SM<sup>1</sup>; Donald G. Klepser PhD, MBA<sup>1</sup>; Marsha Morien MSBA, FHFMA, FACHE<sup>2</sup>; and Lina Lander ScD<sup>3</sup>

<sup>1</sup> Department of Pharmacy Practice, College of Pharmacy, University of Nebraska Medical Center, Omaha, Nebraska, USA

<sup>2</sup> Department of Health Services Research and Administration, College of Public Health, University of Nebraska Medical Center, Omaha, Nebraska, USA

<sup>3</sup> Department of Epidemiology, College of Public Health, University of Nebraska Medical Center, Omaha, Nebraska, USA

**Acknowledgments:** The authors would like to acknowledge Daniel Lomelin and Jaclyn Smith for their assistance with survey management and data collection. We appreciate the assistance of Anne Byers, Nebraska Information Technology Commission and Deb Bass, NEHII, Inc.

**Competing Interest:** None of the authors have any competing interests to disclose.

**Funding:** This project was part of the Nebraska Health Information Exchange Evaluation and was supported by a contract from the Nebraska Information Technology Commission with funding from the US Department of Health and Human Services Office of the National Coordinator.

**Key Words:** Health Information Exchange, Prescription Drug Monitoring Program

### Abstract

**Objective:** To describe barriers to the utilization of a query based Health Information Exchange (HIE) that supports a statewide Prescription Drug Monitoring Program (PDMP). **Methods:** Emergency room (ER) prescribers were surveyed bi-weekly and at the end of a four-month study to estimate HIE/PDMP utilization and identify barriers to utilization. **Results:** Self-reported utilization from seventeen providers in three emergency rooms was very low. Providers estimated that prescription history was rarely available when queried. Problem lists and laboratory reports were estimated to be available 60% of the time. **Discussion:** Barriers to HIE utilization for PDMP purposes included prescribers not finding the information they queried and lack of integration into clinical workflow. Low perceived need for PDMP and prescriber preparedness to manage abusers may also have reduced utilization. **Recommendation:** Financial and human resources must be available for training and integration of a HIE based PDMP into the ER's clinical workflow. Minimizing information gaps is also necessary to increase utilization.

### Background

The prevalence of prescription drug abuse continues to increase in the United States.(1-5) Opioid pain relievers (OPRs) were responsible for 14,800 of the 20,044 (73.8%) prescription drug overdose deaths in 2008.(6) The number of OPR deaths continued to increase to 16,651 in 2010.(7) The rate for OPR deaths was four times the rate for cocaine and heroin deaths combined.(7) According to the Centers for Disease Control and Prevention (CDC) report, "enough opioid pain relievers were sold to medicate every adult in the United States with the equivalent of a typical dose of 5mg of hydrocodone every 4 hours for 1 month".(7)

Prescription Drug Monitoring Programs (PDMP) have become important tools in the effort to reduce OPR abuse and diversion. A PDMP is a "statewide electronic database, which collects designated data on substances dispensed in the state".(8) A PDMP's primary objectives are to support access to the legitimate use of controlled substances while deterring or preventing drug abuse and diversion.(8) Although the effectiveness of different PDMP designs is still unclear, there is some evidence to support their effectiveness in changing prescribing and dispensing behavior.(9-12) One challenge of developing a PDMP is creating a program that works in a variety of care settings.

Emergency rooms provide care for many OPR overdoses, but they are also the source of many opiate prescriptions.(4,5,11,12) A recent analysis of data from the National Hospital Ambulatory Medical Care Survey reported that 51% of all ER visits involved a painful condition and that opioid analgesics were prescribed for 31% of all visits.(13) ER physicians need to quickly and accurately discern a patient's

**Correspondence:** Gary L. Cochran, PharmD, SM  
Assistant Professor, Department of Pharmacy Practice  
College of Pharmacy, University of Nebraska Medical Center  
986045 Nebraska Medical Center, Omaha, NE 68198-6045  
P: 402-559-4329; Email: [gcochran@unmc.edu](mailto:gcochran@unmc.edu)

need for controlled substances. Access to a complete, continuously updated prescription history could allow ER physicians to identify patients who have recently received controlled substances from other providers. Access to clinic and hospital notes would also provide the ER physician with information regarding acute and chronic diseases that are being treated by other providers. A query based Health Information Exchange (HIE) is one technology that can provide access to the types of information needed for a PDMP.

“Electronic health information exchange allows doctors, nurses, pharmacists, other health care providers and patients to appropriately access and securely share a patient’s vital medical information electronically, improving the speed, quality, safety and cost of patient care”.(14) A significant focus of The Health Information Technology for Economic and Clinical Health Act (HITECH), signed into law in 2009 as part of the American Recovery and Reinvestment act, is to fund and develop statewide HIEs. A planned national network of such exchanges has potential to improve the nation’s overall health.[4]

Three dominant types of HIEs exist. (14) A directed or point-to-point exchange allows standards-based health information to be securely transmitted directly between two providers. The exchanged information may include continuity of care documents, referrals, and other clinical documents to support clinical care. Query-based exchanges allow a provider to search for health information from a large network of participating healthcare organizations and providers. Consumers-mediated exchanges allow patients to share their aggregated personal health information with the providers of their choice.

The Nebraska Health Information Initiative (NeHII), part of the planned national network, is a statewide, internet-based health information exchange sponsored by Nebraska health care providers and health insurers who share and use information for both treatment and payment purposes.[15] NeHII, a query-based HIE, allows participating providers to access more complete Electronic Health Records (EHR) by acting as a transfer source for medical records. A statewide network of providers is able to query information from other participating providers in near real time and securely transfer patient information among each other as necessary. In addition to accessing other EHRs, NeHII can query pharmacy, laboratory and insurer data, allowing prescribers to view patient laboratory results, medication histories, and formulary information from multiple sources. NeHII also supports Direct exchange between providers. More than 45 million laboratory results, 8.6 million radiology reports, and

24.4 million transcription reports are available via NeHII. (15) Prescription histories are provided by a data feed from SureScripts (Surescripts, LLC, Arlington, VA).

Because of this functionality, NeHII was chosen as Nebraska’s PDMP in 2011. Nebraska was the first state to use a HIE as the data source for its PDMP.(16) We conducted an early evaluation of ER prescriber utilization and satisfaction with the Nebraska PDMP. Prescriber utilization throughout the study was very low. This manuscript briefly describes the information most often queried by ER prescribers in the emergency room, but more importantly presents barriers to utilization of the HIE that were identified during the course of the evaluation.

### Methods

Seventeen emergency room prescribers (physicians, physician assistants, and nurse practitioners) from 3 Nebraska hospitals who had no experience using the NeHII system agreed to participate in this case study. NeHII staff conducted training for prescribers between August and November 2013. Training consisted of a 1-hour introduction to the NeHII Virtual Health Record (VHR) and included system access, patient identification, and basic queries for medication histories, clinic or hospital notes, and laboratory data. The VHR is a stand-alone, web-based application that provides secure access to the NeHII system. The VHR is not integrated into the hospital’s electronic health record and requires a separate sign-on. Following training, participating prescribers were given four months of free access to the NeHII VHR.

Participants were e-mailed a 3-question survey every two weeks during the four-month study period and a final survey that could be completed in less than 10 minutes. The purpose of bi-weekly surveys was to estimate the number of times an ER prescriber looked for and found PDMP related information using the NeHII VHR. The final survey focused on provider satisfaction, usefulness of NeHII for PDMP purposes, and barriers to utilization. Surveys were generated and responses were collected using Qualtrics software, Version 54548 of the Qualtrics Research Suite. (Qualtrics, Provo, UT).

### Results

#### *Bi-weekly Survey*

Providers estimated that they accessed NeHII for 65 of the 347 (19%) ER patients cared for during the survey period. Prescription history was the information most frequently sought by providers; however, they reported that the information was rarely available (2 of 65 queries; 3%). One provider queried information from problem lists, clinic or hospital notes and laboratory, with information being available 60% of the time.

Because of the low response rate, investigators questioned whether providers were regular users of the HIE, but were unable or unwilling to respond to the surveys. In order to check whether NeHII utilization was higher than indicated by our response rate, NeHII provided de-identified access data for the 17 participants. Seven of the 17 participants accessed NeHII a total of 18 times over the 4-month study period. Ten participants (59%) never logged into the system during the study period.

#### *Final Survey*

Five participants (2 physician's assistants, 2 nurse practitioners, 1 unknown) responded to the final survey. Respondents on average reported 18 years of practice experience. Two respondents reported that NeHII was "somewhat easy" to navigate and 2 providers rated navigation as either "somewhat difficult" or "very difficult". Participants responded that access to the HIE should be available for prescribers, nurses and pharmacists, but not receptionists or other administrative personnel. None of the five respondents indicated that using NeHII for PDMP purposes helped them identify or avoid an inappropriate prescription for a controlled substance during the study period. Three respondents reported that the HIE was "a little useful" but none planned to continue using the HIE's virtual health record beyond the study period.

#### **Discussion**

The low utilization of the HIE for PDMP purposes amongst study participants was surprising given the national magnitude of opiate prescription abuse and the testimonials from ER physicians who have used NeHII to identify those at high risk for abuse in the past.(16) There are several barriers that may explain the low utilization observed in our project that may serve as useful lessons for policy makers and others implementing query-based HIE into a clinical environment.

*Information Gaps:* Utilization of any health information system will not occur if the system lacks the information being sought by users. Several studies have identified missing information as a significant barrier to HIE utilization.(17-19) In our project, participants reported that they rarely found the prescription information they queried.

Prescription history is provided to the HIE through a Surescripts (Surescripts, LLC, Arlington, VA) feed that is updated in near real time. Surescripts captures prescription information from two sources. Prescriptions are captured when a pharmacy submits a prescription claim to an insurer (or pharmacy benefits manager). Some pharmacies submit dispensed prescriptions directly to Surescripts. At the time of the study, six pharmacy chains within the state submit all

prescriptions dispensed directly to Surescripts. With the exception of prescriptions from those pharmacy chains, cash paying customers, Medicaid recipients, and those who have chosen to opt out of the HIE do not have prescription history available through the HIE. It is likely that some abusers of controlled substances have opted out of the HIE to make identification more difficult. More work needs to be done to identify the prevalence of patients admitted to emergency rooms with a chief complaint of pain and do not have prescription histories in the HIE. In order to ensure universal availability of prescription histories for the State's PDMP, pharmacies will either need to increase voluntary reporting, or the state may need to require reporting of all prescriptions for controlled substances from either prescribers or pharmacies.

*Workflow:* Integration of the HIE technology into an ER's workflow was not an objective of the training provided. Training focused on access, functionality, and navigation of the system. Respondents identified lack of workflow integration as a barrier to utilization. Organizations should address the following questions to enhance effective utilization of the technology.

- Which patients will be regularly queried?
- Who will conduct the queries and at what point during the patient encounter?
- What information will be conveyed to the prescriber and in what format?
- How will relevant information be incorporated into the patient's medical record?

Only emergency room prescribers were provided access to the HIE in this study. Emergency room nurses or pharmacists may be better positioned to gather a patient's prescription history. Respondents to this survey supported providing access to both nurses and pharmacists. Lack of a single sign-on can also affect workflow and has been recognized by others as a barrier to utilization.(19-21) In our study, participants needed to log in to NeHII separately from their EHR. The need to remember separate login credentials and change workflow was identified as barriers to utilization. Additionally, all participants in the study were new users of the HIE and the four month period may not have provided an adequate opportunity to integrate the system into their workflow.

HIEs with medication query functionality can identify patients who have information from other providers available. (21) Query based HIE's also have the potential to scan prescription history and identify patients who have exceeded a predefined threshold of prescriptions,

prescribers, and/or pharmacies in a given time period. These automatic notifications would be more efficient than querying every patient with a complaint of pain. Automatic notification of HIE data availability combined with single sign-on may significantly reduce current barriers to utilization.(21)

*Prevalence/Perceived Need:* Nebraska's 2008 overdose death rate was the lowest in the nation (5.5/100,000). (6) No large-scale statewide public health campaigns directed at the general population or healthcare providers have focused on the prevention of opiate prescription abuse. These factors may have created the perception that opiate prescription abuse is not a significant problem, leading to low HIE utilization. In addition, not every ER admission complaining of pain is at high risk of prescription opiate abuse – it is not necessary to query the HIE for every ER admission. A study conducted in 2008 reported that users accessed the HIE for only 6.9% of all emergency department encounters.(22) There are currently no estimates of the number of ER admissions that would be categorized as potential abusers within the state. This information would be helpful in assessing whether HIE queries for PDMP purposes were at or below expected utilization.

*Prescriber Preparedness to Manage Potential Abusers:* One issue that has not been widely discussed in the literature involves whether ER physicians are adequately prepared to manage a suspected opiate abuser. Prescribers have several options if a potential abuser is identified. They can decide to provide non-opioid pain relievers or a very limited supply of a controlled substance. In addition they could contact the patient's primary care provider, law enforcement officers, or coordinate referral to local treatment centers. Identification of an appropriate strategy in an emergency room setting may be time consuming, and contact information for appropriate referral may not be readily available – particularly at night and during weekends. In addition, some prescribers may be uncomfortable initiating a confrontation that could escalate. Thorn et al. recently described several justifications provided by physicians for not using HIE. Some physicians reported that "they were doing fine" or they "think they do not need" HIE. One respondent said physicians "get bogged down and just want to see patients".(19) In our study, 2 respondents to the final survey either did not want to be notified if a suspected abuser was identified by the HIE or stated that no referral or contact information was needed for those determined to be abusing opioids. It is difficult to measure the significance of this issue in practice, but the potential impact on utilization should not be underestimated.

Despite the barriers to utilization, query based HIEs still have the potential to be a significant part of an effective PDMP

program. Availability of complete prescription histories for all patients would certainly increase the value of the HIE and should be a goal. Issues surrounding workflow, perceived need, and appropriate treatment of those suspected to be opiate abusers may be addressed through the development of a comprehensive, hands-on, use-case based training program.

While HIE training programs can borrow heavily from electronic health record (EHR) training strategies, there are important differences between HIE and EHR adoption that must be considered. The decision to implement an EHR is made at the organizational level. Vendors discuss known barriers to utilization and customize implementation and training to address these issues. Institutions devote significant financial and human resources to implementation. In contrast, HIEs are developed for a state or large geographic region. Few, if any resources are provided by the adopting institution to customize workflow and support training. Significant resources are unlikely to be available from the HIEs. Many HIEs are struggling with sustainability and have small staffs that focus on system functionality and software installation. Additional resources will be required to support effective training and workflow integration.

### Recommendations

This was the first evaluation of a query based HIE being used to support a statewide PDMP. Providing free HIE access and training did not lead to regular utilization by emergency room providers. This is important because many recognized barriers to HIE adoption focus on cost to participate and network level issues such as interoperability and information security. We recommend that organizations implementing HIE services plan workflow integration carefully. It was clear from our case study that providing access and demonstrating software functionality was not sufficient. Adopting facilities must understand that additional financial and human resources will likely be required to support training and effectively integrate HIE based PDMP programs into the emergency room setting. Regular prescriber use of the HIE is also predicated on information being readily available in the HIE. Minimizing information gaps will encourage utilization. Additional research is needed to determine whether prescribers are adequately prepared to manage a patient identified as a potential abuser of controlled substances in the ER setting.

**References**

- (1) Hall AJ, Logan JE, Toblin RL, Kaplan JA, Kraner JC, Bixler D, et al. Patterns of abuse among unintentional pharmaceutical overdose fatalities. *JAMA* 2008 Dec 10;300(22):2613-2620.
- (2) Paulozzi LJ, Ballesteros MF, Stevens JA. Recent trends in mortality from unintentional injury in the United States. *J Safety Res* 2006;37(3):277-283.
- (3) Paulozzi LJ, Budnitz DS, Xi Y. Increasing deaths from opioid analgesics in the United States. *Pharmacoepidemiol Drug Saf* 2006 Sep;15(9):618-627.
- (4) Centers for Disease Control and Prevention (CDC). Emergency department visits involving nonmedical use of selected prescription drugs - United States, 2004-2008. *MMWR Morb Mortal Wkly Rep* 2010 Jun 18;59(23):705-709.
- (5) Wisniewski AM, Purdy CH, Blondell RD. The epidemiologic association between opioid prescribing, non-medical use, and emergency department visits. *J Addict Dis* 2008;27(1):1-11.
- (6) Centers for Disease Control and Prevention (CDC). Vital signs: overdoses of prescription opioid pain relievers---United States, 1999--2008. *MMWR Morb Mortal Wkly Rep* 2011 Nov 4;60(43):1487-1492.
- (7) Centers for Disease Control and Prevention (CDC). Vital signs: overdoses of prescription opioid pain relievers and other drugs among women--United States, 1999-2010. *MMWR Morb Mortal Wkly Rep* 2013 Jul 5;62(26):537-542.
- (8) Questions & Answers. State Prescription Drug Monitoring Programs. [http://www.deadiversion.usdoj.gov/faq/rx\\_monitor.htm](http://www.deadiversion.usdoj.gov/faq/rx_monitor.htm) Accessed March 2015.
- (9) Simeone R, Holland L. An Evaluation of Prescription Drug Monitoring Programs. Albany, New York: Simeone Associates, Inc. 2006; Available at: <http://simeoneassociates.com/simeone3.pdf> Accessed March 2015.
- (10) Green TC, Mann MR, Bowman SE, Zaller N, Soto X, Gadea J, et al. How does use of a prescription monitoring program change pharmacy practice? *J Am Pharm Assoc* (2003) 2013 May-Jun;53(3):273-281.
- (11) Baehren DF, Marco CA, Droz DE, Sinha S, Callan EM, Akpunonu P. A statewide prescription monitoring program affects emergency department prescribing behaviors. *Ann Emerg Med* 2010 Jul;56(1):19-23.e1-3.
- (12) Weiner SG, Griggs CA, Mitchell PM, Langlois BK, Friedman FD, Moore RL, et al. Clinician impression versus prescription drug monitoring program criteria in the assessment of drug-seeking behavior in the emergency department. *Ann Emerg Med* 2013 Oct;62(4):281-289.
- (13) Mazer-Amirshahi M, Mullins PM, Rasooly I, van den Anker J, Pines JM. Rising Opioid Prescribing in Adult U.S. Emergency Department Visits: 2001-2010. *Acad Emerg Med* 2014 Mar;21(3):236-243.
- (14) Compatibility & Information Exchange: Health Information Exchange. <http://healthit.gov/providers-professionals/health-information-exchange/what-hie> Accessed March 2015.
- (15) Nebraska Health Information Initiative. <http://nehii.org> Accessed March 2015.
- (16) Community Betterment through HIE. "Engaging Community Stakeholders to Create a Sustainable , Large-Scale HIE. Prescription Drug Monitoring Program. 2006; Available at: <http://nehii.org/images/stories/videos/docs/nehiiPdmp.pdf> Accessed March 2015.
- (17) Hincapie AL, Warholak TL, Murcko AC, Slack M, Malone DC. Physicians' opinions of a health information exchange. *J Am Med Inform Assoc* 2011 Jan-Feb;18(1):60-65.
- (18) Rudin R, Volk L, Simon S, Bates D. What Affects Clinicians' Usage of Health Information Exchange? *Appl Clin Inform* 2011 Jan 1;2(3):250-262.
- (19) Thorn SA, Carter MA, Bailey JE. Emergency physicians' perspectives on their use of health information exchange. *Ann Emerg Med* 2014 Mar;63(3):329-337.
- (20) Vest JR, Zhao H, Jasperson J, Gamm LD, Ohsfeldt RL. Factors motivating and affecting health information exchange usage. *J Am Med Inform Assoc* 2011 Mar-Apr;18(2):143-149.
- (21) Genes N, Shapiro J, Vaidya S, Kuperman G. Adoption of health information exchange by emergency physicians at three urban academic medical centers. *Appl Clin Inform* 2011 Jul 13;2(3):263-269.
- (22) Johnson KB, Unertl KM, Chen Q, Lorenzi NM, Nian H, Bailey J, et al. Health information exchange usage in emergency departments and clinics: the who, what, and why. *J Am Med Inform Assoc* 2011 Sep-Oct;18(5):690-697.