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Key Words: Electronic medical record (EMR); electronic health record (EHR); health information technology (HIT); patient centered medical home (PCMH); patient portal; secure messaging; smoking cessation.

Abstract

Pharmacists are providing clinical services in nontraditional practice settings including the patient-centered medical home (PCMH). PCMHs strive to improve patient outcomes in a number of ways, including through innovative use of health information technology (HIT) and by encouraging patients to take an active role in their health care. This paper describes a pharmacist-directed smoking cessation program at a PCMH that utilizes HIT to engage patients in the smoking cessation process and lessons learned from implementation of the program to guide other pharmacists considering implementing a similar program. Secure messaging through the patient portal of the electronic medical record (EMR) can be an effective way to deliver a smoking cessation program for appropriately selected patients and aligns with PCMH standards as the program uses HIT to engage patients in self-management.

Health care continues to evolve in an effort to reduce cost and improve patient outcomes. Pharmacists are adapting to these changes by providing clinical pharmacy services in a variety of nontraditional practice settings, including the patient-centered medical home (PCMH).[1] The PCMH is a promising primary care model for cost-effective and quality care that uses teamwork and innovative health information technology (HIT) to improve patient outcomes and encourage patients to take an active role in their health care.[2,3] Medical homes are assessed on the quality of the care they provide, and one of the organizations that performs this quality assessment is the National Committee for Quality Assurance (NCQA). Many insurers will pay higher reimbursement to practices that have NCQA PCMH recognition, but in order to be granted this designation, practices must meet a number of defined standards related to enhanced access, active support of patient self-management, and meaningful utilization of HIT.[2,3]

Effective use of technology is a mainstay of the PCMH model, and several NCQA measures assess how well the practice incorporates HIT into patient care. For example, PCMHs are assessed on whether they provide patients the opportunity to have a secure, two-way electronic communication with the practice.[4] Secure messaging has been increasingly utilized in outpatient health care across a variety of specialties such as internal medicine, surgery, and obstetrics/gynecology, and pharmacists have used secure, online messaging to help patients with hypertension improve blood pressure control.[5,6] This model of patient-provider communication through an online patient portal may be an untapped opportunity for pharmacists within a PCMH to effectively provide other health care services as well.

A health care focus that is greatly needed at this time is smoking cessation. According to the Surgeon General's 2014 report on tobacco use, smoking continues to be the leading cause of preventable death in America, with over 40 million Americans dependent on tobacco.[7] In addition to the significant impact smoking has on health and well-being, it is also associated with a heavy financial burden in the United States, with adult smoking-related direct medical costs alone estimated to be over $130 billion annually.[7] Pharmacists have been called upon by the former acting U.S. Deputy Surgeon General Rear Admiral Scott Giberson to exercise their professional training in tobacco control efforts as they have proven to be accessible and effective resources for patients who are interested in smoking cessation.[8-10] Secure, online messaging could be an innovative new way for pharmacists to deliver smoking cessation counseling within the PCMH, as this delivery model would allow pharmacists to manage at-risk populations and contribute to innovative use of HIT, both of which are measures assessed by NCQA.[4]

We investigated whether pharmacists have attempted to use the patient portal of the electronic medical record (EMR) to provide a tobacco cessation service and found no studies that examine this unique delivery model for smoking cessation. Some of the ways HIT has been utilized in smoking cessation

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efforts include emailing between patients and health care providers to provide smoking cessation counseling and e-referral systems for providers to connect patients to online smoking interventions during routine clinical care.[11-13] One study showed that for greater patient engagement, an online smoking cessation program should clearly advise smokers to quit smoking and how to achieve this goal, provide content in a specific order, and send reminder emails.[14] The most successful internet-based interventions for smoking cessation are interactive and individualized to meet the patient's needs.[15]

In an effort to improve smoking cessation success within PCMHs in a way that would contribute to measures assessed by NCQA, we designed a pharmacist-directed smoking cessation program delivered through the secure, online patient portal of the EMR. We believe that this two-way patient portal communication between the patient and pharmacist is an innovative way to facilitate smoking cessation counseling in a convenient and personalized manner where pharmacists can provide the pharmacologic and behavior-related resources patients need to stop smoking and stay smoke-free. In addition, this model aligns with the goals of an NCQA-recognized PCMH as it utilizes the EMR to provide a patient care service and actively involves patients in managing their own health. This article describes the design of the smoking cessation program and the lessons learned through implementation of the program.

Program Design

The pharmacist-delivered patient portal smoking cessation program received institutional review board approval to be piloted at two Tier 3 NCQA-accredited PCMHs associated with a large, academic medical center in Ohio. A list of patients documented in the EMR as current smokers was generated. The patients were telephoned by a pharmacist and asked about their willingness to quit smoking. Patients interested in quitting smoking were invited to participate in the smoking cessation program at the PCMH. They were scheduled for a pharmacist visit to enroll in the program and to start the quitting process (see Figure 1 for program outline).

Pharmacist visit: During this visit, the pharmacist enrolled the patient in the online patient portal through the EMR (if not previously enrolled) and provided a brief tutorial on how to use the patient portal for secure messaging. The patient received a printed booklet that contained instructions for using the patient portal for reference and educational tools that corresponded with each step of the three-step smoking cessation program. The patient completed "Step 1" of the program during their visit with the pharmacist, which included a series of questionnaires that helped the patient determine their reasons for smoking and motivations for quitting. They chose a quit date that fell within the next month and a nicotine replacement product or prescription cessation aid was suggested to their physician for approval based on the patient's health status, current smoking habits, and detailed smoking history. Patients were then instructed to follow-up with the pharmacist via the patient portal for the remainder of the program.

First patient portal correspondence: One week after the initial patient visit, the pharmacist messaged the patient through the patient portal and asked him/her to complete "Step 2" of the smoking cessation program booklet, which included handouts that provided recommendations for behavioral techniques to curb temptations after quit date. The pharmacist asked that the patient reply with his/her coping plans for the three most difficult scenarios for which the patient would have to give up cigarettes. If the patient did not respond in one week, the pharmacist sent a reminder message.

Second patient portal correspondence: On the patient's quit date, the pharmacist messaged the patient to see if an attempt to quit was made and how the patient was coping with the change. If the patient did not respond in one week, the pharmacist sent a reminder message.

Third patient portal correspondence: One week after the quit date, the pharmacist messaged the patient through the patient portal and asked him/her to complete "Step 3" of the smoking cessation program booklet, which included handouts that provided tips on staying smoke-free. The pharmacist asked the patient how life had changed since quitting smoking, whether the patient had noticed any physical changes since quitting, and whether the patient had smoked any cigarettes since the quit date. If the patient did not respond in one week, the pharmacist sent a reminder message.

Fourth patient portal correspondence: One month after completion of "Step 1," the pharmacist messaged the patient through the patient portal with a link to an online survey to evaluate patient satisfaction with the interaction with the pharmacist and the online delivery of the smoking cessation program. A reminder message was sent one week from the date the survey was sent.

Fifth patient portal correspondence: Two months after the patient's quit date, the pharmacist messaged the patient through the patient portal to determine smoking status. If the patient did not respond in one week, the pharmacist sent a reminder message.

Pilot Data Summary

During the pilot program in 2014, eleven patients (N=11) enrolled in the smoking cessation program during their pharmacist visit and completed "Step 1" of the program (see Table 1 for demographic information). Seven patients participated in the first patient portal correspondence, completing "Step 2" of the

smoking cessation program (n=7, 63.3%). Five of these patients participated in the second patient portal correspondence, communicating with the pharmacist on their quit date (n=5, 71.4%). Three of the five patients reported quitting smoking on their quit date (n=3, 60%), but only two participated in the third patient portal correspondence one week after their quit date, completing "Step 3" of the program (n=2, 66.7%). These same two patients remained smoke-free at their two-month follow-up (n=2, 100%).

Lessons Learned

Delivery of a PCMH pharmacist-run smoking cessation program through the patient portal of an EMR can be a convenient and effective model for coaching a patient to quit smoking with appropriate patient selection and program management techniques. Our experience piloting the program taught us several valuable lessons we would like to share for pharmacists interested in implementing a similar program.

Verify patient internet access. In order for the patient portal smoking cessation program to successfully engage patients, it is important to make sure the patients have the required tools necessary to be active and successful participants in the program. We recommend enrolling patients into the program after an initial face-to-face visit with the pharmacist because this allows a professional relationship to be established and provides an opportunity for the pharmacist to make sure the patient has all the tools and resources needed to quit smoking. To communicate through the patient portal of the EMR, the patient must be able to readily access the internet. Our patient portal can be accessed through either a traditional computer or through a smartphone application, so we asked each patient during the pharmacist visit how the patient planned to access the patient portal. If patients do not have access to a computer or smartphone, they may be more likely to become disengaged or lost to follow-up.

Ensure patient understanding of necessary technology. In addition to having access, it is imperative that patients understand how to navigate the patient portal. We trained each patient at the pharmacist visit about how to log in and send messages through the patient portal, then assessed their comfort level with navigating the system. If the patient was uncomfortable using the patient portal after in-person training, the patient was given a telephone follow-up option instead so he/she could still participate in the smoking cessation process with pharmacist guidance. We recommend a thorough training session, including logging in to the patient portal, retrieving a message sent from the pharmacist, and sending a message to the pharmacist to assess navigation capabilities. While we coached the patients through this process, we did not have an objective measure for assessing whether or not they were proficient enough to utilize the patient portal messaging system which would have been helpful in determining which patients to follow-up with via telephone vs. patient portal.

Enhance patient recruitment. Additionally, we recommend a more robust recruitment process than described in our model. We telephoned patients documented as smokers in the EMR and asked if they were interested in quitting smoking in the next 30 days. Through this process, we found that the smoking status documented in the EMR was not always accurate, so pharmacist time was lost calling patients who had already quit smoking. For patients still smoking, we recommend utilizing a validated tool to assess readiness to quit rather than asking a direct question. With our process, we only learned if a patient was interested in quitting, but not necessarily whether the patient was ready to quit or the patient's degree of readiness. Physician referral of patients interested in quitting could also be considered as an alternative recruitment method. Patient-initiated interest in quitting smoking may also result in a more motivated patient population than provider-sought patients.

Integrate the program into pharmacist workflow. We found that managing the program became complex as the number of participating patients increased. In our described model, there are many dates to keep track of to remember when to message each patient throughout the quitting process. This program as described can be time consuming if not worked into the daily pharmacist workflow at the PCMH. We suggest establishing a reliable tracking system so the pharmacist knows which patient to contact on which dates. We used Microsoft Excel® spreadsheets and clinic calendars to keep our daily messaging tasks organized. We also recommend routine checking of patient portal messages, as patients may start to utilize the messaging system more often once introduced to this convenience. Let patients know the timeframe in which they can expect a response from the pharmacist; for example, within 48 hours of message receipt. Patients should be informed not to use the portal for urgent or emergent issues specific to the smoking cessation program or other health care issues that may require immediate response.

Create a robust follow-up system. We recommend integrating a follow-up system for patients who become disengaged in the online patient portal program. In our program design, we did not have a routine method for following-up with patients who stopped responding to our patient portal messages. Consider a telephone call if there is no patient response two weeks after the patient portal message, or perhaps create a flag in the patient's EMR so that the next provider who sees the patient can ask about participation in the program. This can help clarify whether

the patient is lost to follow-up due to technical issues with the online messaging system, lack of interest in quitting smoking, or other reasons not yet identified.

Ask for feedback. We designed the smoking cessation program to be delivered through the patient portal as an option for patients who might find this delivery model more convenient than traditional face-to-face or telephone models. Secure messaging through the patient portal allows communication and information transfer to be completed in any setting or time of day that is most convenient for the patient. It is prudent to ask for feedback on whether patients find the online messaging convenient as intended, or if they would prefer a more traditional face-to-face or telephonic method of communication. Patient portal delivery may not be the right delivery method for all patients, and so it is important to assess whether patients struggling to quit would be willing to try an alternative method of coaching. Patient feedback should also be solicited regarding the content of the smoking cessation program. Periodically revise and update information shared with patients based on evidence-based medicine and patient feedback regarding usefulness of information shared.

Future Directions

When developing a novel patient care program, it is important to track outcomes to help determine the success of the program and guide quality improvement. Program evaluation might include collecting information on the demographics of patients who choose to enroll in the smoking cessation program, smoking cessation history including pack years and number of prior quit attempts, patient quit motivation and perceived barriers to quitting, patient engagement in each step of the program, as well as quit success on quit date and periodically thereafter (consider following-up with patient at three, six, and twelve months post-quit date). Data can be collected regarding whether pharmacologic smoking cessation aids were used and what type, along with whether patients were engaged in two-way communication with the pharmacist. Similar data can be collected for patients who prefer telephone or face-to-face follow-up and quit success compared across these methods. Ultimately data should be evaluated to determine if the costs and provider time associated with the program are justified by positive clinical outcomes for the patients.

Conclusion

Secure messaging through the patient portal of the EMR can be an effective way to deliver a smoking cessation program for appropriately selected patients, and aligns with PCMH standards measured by NCQA as the program uses HIT to engage patients in self-management. Careful consideration of your patient population prior to enrollment, as well as integration of the program into pharmacist workflow, will help to maximize success.

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Figure 1: Program Summary

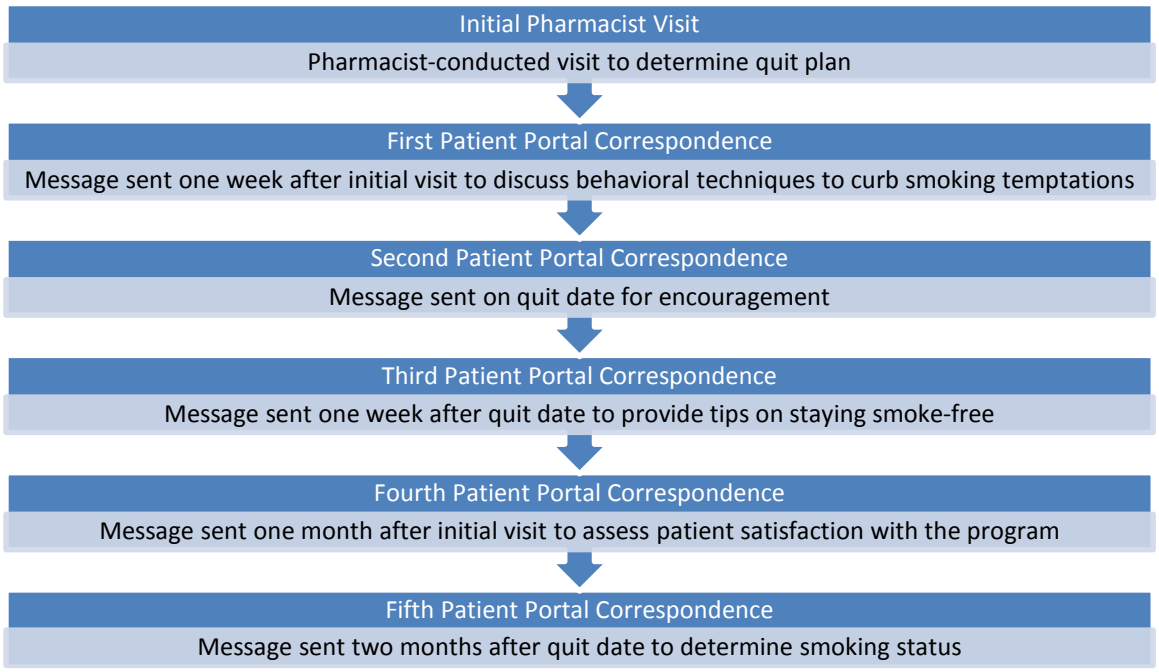

Table 2: Demographics

Patient Demographic Characteristics	N=11
Age (years),	
Mean ± SD	50.8 ± 9.0
Median (IQR)	52 (42-59)
Min - Max	39-65
Gender	
Male	8 (72.7%)
Female	3 (27.3%)
Race	
Caucasian	8 (72.7%)
Black or African American	2 (18.2%)
Asian	1 (9.1%)