The use of teams in the delivery of primary health care is essential and increasing.\(^1,2\) Team building is a continual and ongoing process requiring recurrent training and reevaluation of procedures and goals.\(^3\) More than just a group of individuals coming together, the execution of a successful team produces results greater than the sum of its parts.\(^4\) A team's structure often influences the behavior of each team member;\(^4\) and as such, collaboration and preparation for teamwork among members is key and a skill to be acquired.\(^1,5\)

Elements of productive team functioning within primary health care have been noted. Grumbach and Bodenheimer\(^6\) delineate five key characteristics of cohesive primary health care teams: clear goals and outcomes, clinical and administrative systems, division of labor, training of members, and effective communication. Other authors note that health care teams operate most successfully when they have a purpose, good communication, coordination, protocols, conflict resolution mechanisms, and the committed participation of each member.\(^2\)

Electronic medical records (EMRs) are a new and promising tool for enhancing health care delivery,\(^7-10\) as such, interest in EMRs both nationally and internationally is considerable.\(^10-13\) In this paper, the term EMR depicts the electronic record of patient encounters within primary health care practices that is used daily in patient care. In addition, the EMR being used in this study also had capabilities common across most EMR systems, including management functions such as the messaging system. EMRs have also changed the working environment for those delivering primary health care services.\(^11,14-16\) While teams who use EMRs can be productive,
disparities in experience, understanding, and skills can leave team members feeling less than satisfied and not working to their full capabilities. Clinicians’ perceptions of EMR barriers and the impact on patient care are important determinants of successful EMR implementation and adoption. Implementation studies have outlined barriers, facilitators, and organizational factors involved in the implementation and adoption process. The need for various training methods and developing “superusers” have also been noted over the continuum of adoption and implementation. However, less is known about the role of teams in the EMR post-adopter phase.

This paper examines the elements of team behavior when using an EMR as experienced in primary health care practices following the initial implementation period.

Methods

Overview

This descriptive qualitative study was conducted as a follow-up investigation to a previous qualitative EMR adoption study. Both studies were situated within a larger project known as the DELPHI project (Deliver Primary Healthcare Information). DELPHI began in 2005 by facilitating the uptake of EMRs in group primary health care practices across Southwestern Ontario to create a researchable database. Following recruitment of the practices and hardware implementation, participants within the project received training on the EMR software. After this initial implementation, the first qualitative study was conducted in 2006 and aimed to uncover participants’ views of early EMR implementation as well as the perceived barriers and facilitators to the adoption process.

The goal of this follow-up investigation was to understand the views of those who were past the initial adoption phase and had been using their EMR for approximately 2 or more years. Participants were asked to recall their experience of EMR implementation and discuss their team’s current usage, as well as ongoing issues or concerns.

Description of Participants

The study participants were recruited from the original study participant pool of 30 EMR users across six family practice sites all using the same EMR software. Of the original 30 participants, seven had moved, three refused, and one person was on leave, constituting the final sample of 19 participants (located in three urban and three rural practices). Participants comprising the teams were seven family physicians, seven interprofessional health providers (including nurses, medical assistants), and five administrative staff (e.g., receptionists). Of the family physician participants, five were men, and two were women; all other participants were women. On average, each family physician’s practice had approximately 1,300 patients. The study was conducted in Southwestern Ontario between December 2008 and March 2009.

Data Collection

Semi-structured interviews were conducted with each of the 19 participants at their practice sites by two of the researchers (LBD, ALT). The interview questions, totaling 14, explored the adoption process and barriers and facilitators to ongoing EMR use; for example, interview questions included: “Where do you see yourself on the continuum of EMR use?” and “Where do you see the practice team as a whole?” Field notes were generated after the interviews. All interviews were audiotaped and transcribed verbatim.

Data Analysis

Each transcript was independently reviewed and coded by three of the researchers to establish main concepts and themes emerging from the data. Subsequently, the researchers (LBD, ALT, JBB) met to evaluate and compare their separate coding, resulting in an agreed-on coding template. This template was used when reviewing subsequent interviews and modified by the team as new themes emerged. Further amalgamation and interpretation of the themes was conducted during regular meetings of the analysis team. The techniques of immersion and crystallization were used throughout the analysis process, whereby the researchers immersed themselves within the transcripts to allow thoughtful consideration of the data, followed by additional reflection leading to a crystallized interpretation and understanding. Theme saturation was achieved by approximately the 11th interview. However, the researchers were committed to ensuring that all the practice sites had a voice and thus completed the data collection and analysis on all interviews.

Credibility and Trustworthiness of Data

Trustworthiness and credibility of the data was enhanced by three principal means: rigorous checking of the verbatim transcription of the interviews; field notes were taken, essential to aid the accuracy of data interpretation; and independent and team analysis was conducted. Reflexivity is important to a study’s credibility and trustworthiness, enhancing the precision and quality of the research. Delineating the researcher’s ability to recognize their own influence on the study, reflexivity, especially when conducted within a team, can help reduce biases while promoting more thorough conceptual thinking.

Ethics approval for this study was received from the University of Western Ontario’s Review Board for Health Sciences Research Involving Human Subjects (number 11151E).

Results

In inquiring about participant experience of using EMRs in their practices after adoption, what emerged from the analysis were five interwoven elements of team behavior when using the EMR. First, consistent data entry was imperative to successful EMR utilization. Second, different
provider and staff roles on the team resulted in variable use of the EMR functions. Third, team members continued to seek out a team champion/problem solver to help overcome obstacles. Fourth, communication and EMR usage were further enhanced by using a common messaging system within the EMR software. Finally, addressing challenges encouraged team members to learn additional features and advance the adoption process. These elements were not found in isolation but rather were interwoven, with each element affecting and influencing the other.

The Five Elements
Desire for Consistent EMR Usage. A pervasive theme was the desire for the whole team to be “on the same page” with regard to how they were using and entering data into the EMR. Consistency of use within the team was deemed a critical component to the successful usage of the EMR: “They like it and they understand now the importance of being consistent.” Many participants recognized the value of consistency but also realized that it takes time and commitment to achieve: “It’s a goal to work toward. You have to have everybody on the same page, everybody working together.”

Frustration about the lack of consistency was evident among the teams as some recognized the benefit and additional efficiencies consistent data entry provided: “Some of them are just not using it to its full capacity. Everybody needs to use it and everybody needs to use it properly and input the same way.” In fact, when team members were asked where they fell on the EMR use continuum, dissonance was also apparent, with responses ranging widely from a low of 10% use to a high of 95%.

Variability in EMR Use. Over time the teams recognized diverse EMR usage among various members. For example, administrative staff primarily described using the scheduling and billing portions, while physicians and nurses described greater use of the clinical portions of the EMR: “They use the features that are for them, so the secretary for instance will tend to use the demographic part for scheduling. Our nurse probably uses the labs and the referral section.”

Participants in the same role also used the EMR in different ways. For example, what was recorded where, how often, and computer proficiency levels could vary from provider to provider. This team member explained: “It’s quite variable...some of the doctors are typing their whole calendar in and they’re producing prescriptions and referrals. Some doctors are just doing a problem list, putting in blood pressures and that kind of stuff.”

Having used the EMR for 2 years or more, participants had begun to recognize the difficulties of EMR data variability: “I think for efficiency and accuracy, it is very important though that all the providers use it in the proper way, and not one of them do it this way and another one do it that way.” Improving consistency in the team’s EMR usage required guidance and direction, necessitating the continuation of the presence of a team champion or problem solver.

Presence of a Team Champion/Problem Solver. Though further along the EMR adoption continuum, participants continued to discuss the importance of having someone within their team who acted as a “go to person,” with advanced EMR proficiency. The team champion or problem solver was described as having the ability to answer questions, troubleshoot, and encourage others to advance their own skills. One champion participant stated: “They’ll all come to me and ask me ‘How did you do that? How do you do this?’ [...] and there’s still a lot of things that I do that they have no clue how I do that.” Another team champion expressed: “They do view me as more of the expert. That is definitely my role in the office. [...] I knew coming into this practice that I was more computer savvy than they were. I’m the consultant about the function of the program.” Team members were often overwhelmed with learning all the features of the EMR and suggested that the champion frequently helped them to overcome obstacles: “She taught me a heck of a lot. And then I try to pass it on to other people. I think we’re all learning every day. Something you don’t know how to do and you do it. “Oh gee that’s so simple.” [then you] pass it on to somebody else. “This is so easy, do this.”

Communication and Messaging. The use of the EMR common messaging system was viewed as facilitating team communication. While novel in the initial qualitative study, the use of the messenger in this follow-up study was more integrated and normalized into the team’s everyday work: “We use the messenger system all day long to convey information back and forth with our reception staff.” The messaging system also enhanced both efficiency and consistency: “It’s more efficient time-wise because the receptionists don’t come looking for you anymore. You don’t have pieces of paper and messages everywhere. The messages are on the messenger.” The strength of the EMR messaging system for office effectiveness and productivity was also noted: “The internal messaging back and forth with each other is great. Something that one of the health care providers is wanting us to follow through, it’s right there.”

Eagerness Equals Advancement. Guidance and encouragement fostered eagerness in the team’s desire to learn more and understand the benefits and possibilities of what the EMR had to offer. This in turn often led to participants’ continuation and even further interest in the usage of the EMR, as this team member stated: “The nurse practitioner, she does very well on the EMR and she’s been able to even show us during our lunch, different features that we could be using. But it just seems like there’s so much on there that
we’re not even anywhere near using what we could be. I’m sure because they’ll bring something up and it’s like Wow! Didn’t know that was there.”

A team’s recognition of the value of the EMR was key in their eagerness to continue learning new features and deem the adoption worthwhile: “It does give you a lot of flexibility, there’s a lot of efficiencies that we’ve been able to capitalize on.” Such recognition often fostered a feeling of possibility and enthusiasm within their team as this participant affirmed: “I think we get excited where we could go with it.”

Discussion
This is one of few studies to explore the experience of a 2-year process of EMR use from implementation through the post-adopter phase. This paper has elucidated five interwoven elements emerging from the analyses of team behavior when using an EMR.

Team frustration with the lack of consistent data entry was evident. This reflects a recognition that moving forward with enhanced EMR capabilities such as patient population queries would not be a possibility without more consistently entered data. A recent study of team effectiveness within primary care teams noted that variation in operations and approaches created problems and dissonance for team members.29 In this current study, participants expressed a desire for fellow team members to get on the “same page” with EMR usage to ease workflow and accelerate task completion. The findings suggest that similar usage and entry of data can vary due to computer literacy, commitment level to the EMR process, value placed on the data, and personal experiences of gains from the software. Timely orientation and early demonstrations of the software to new users may increase motivation and appreciation of the utility of the EMR, as well as demonstrate the potential benefits and expediency to everyday work. Perhaps only when the EMR has proven its usefulness and benefits to efficiency will all adopters see the necessity of proper EMR usage.

The findings also indicate that different team members made use of the EMR in different ways for different purposes. It is imperative for collaborative relationships that one’s professional role and duties are clearly understood and outlined.5,30 Within an interprofessional team there is a need to be open, flexible, and willing to share with others,30 although time constraints for collaborative sharing have been noted as an obstacle.5,6 By assigning clear EMR roles and responsibilities, each individual member’s contributions are maximized, team productivity and service levels remain high, and goals become more attainable.17 Therefore, continuous EMR training mechanisms and teaching tools should accommodate various needs, and use a range of methods, as each team member’s EMR user requirements may differ depending on their skill level and position within the team.

Participants continued to identify the important role of an EMR champion within their practice who encouraged EMR usage and was available to problem solve. Support and encouragement from a “champion” has been noted in the literature as crucial throughout the implementation process.20,31,32 Our study revealed the champion’s role appears to continue into the post-adopter phase, remaining important even after using the software for 2 or more years. EMR champion users in general have more positive attitudes and are crucial to getting other team members to use the EMR.33 Our analysis revealed their continued presence within the practice is required to maintain commitment to the EMR and to push the team toward the next level of advancement. Technological challenges, staff turnover, and varying computer skill levels are perhaps a few reasons as to why there is a continued need for a champion and why, at the 2-year mark, many practices are still not fully using the EMR.

Good communication among team members is essential for team effectiveness.30,34,35 Participants identified the messaging system within the EMR software as a practical, useful and important tool for enhancing efficiency within the team. Our findings are consistent with prior work where the use of the messaging system was shown to improve the timeliness and accuracy of messages, as well as increasing the comprehensiveness of documents resulting in fewer errors.15,33,35 Agreement on methods of communication by all team members should be established to improve effectiveness.30 Successful communication has also been linked to increased patient safety and improved patient outcomes.36,37 Perhaps as a method to engage future teams and their members to the EMR is to first introduce useful features such as the messaging system, thus integrating the EMR into everyday tasks sooner rather than later.

Team members exhibited a genuine eagerness to advance their knowledge and skills with the EMR. This motivation can be further encouraged by high-level EMR users within the team. In fact, mentoring and ongoing training ensures team members continue their professional growth and advancement.17 Without such support, lower-level EMR users may remain undeveloped.33 Active involvement of team members in practice improvement is the most successful method to decrease resistance to change.3

A limitation of this study is the constrained geographic area of the participants, Southwestern Ontario. In addition, there were slightly more male physician participants in this study than the Ontario average.30 A key strength of this study was the opportunity to follow the same participants over time, allowing for their description of experience and capturing the movement from implementation to after adoption.
Conclusions
This study describes five elements related to team behavior for those teams who had used an EMR within their practice for 2 years or more. Consistent data entry among team members was deemed essential for both the efficiency and productivity of the practice. Functions of the EMR software were used differentially based on the user’s role within the practice as well as on the personal style and skill of the user. Team champions/problem solvers remain a key component of the team’s success, trouble shooting daily issues and providing encouragement. Communication was enhanced by the messaging system within the EMR software, which provided a central location to send messages to other team members. Guidance and support fostered user enthusiasm prompting EMR feature optimization, advanced usage, and enhanced appreciation of the EMR’s value. These findings highlight important elements of team behavior that promote EMR implementation and also provide insight for primary health care providers moving through the continuum of initial to advanced EMR adoption.

ACKNOWLEDGMENTS: This study was presented at the 2009 North American Primary Care Research Group Annual Meeting in Montreal and the 2009 Trillium Primary Care Research Forum, McMaster University, Hamilton, Ontario. We thank the study participants. The views expressed here are those of the authors and do not necessarily reflect the views of the Ontario Ministry of Health and Long-Term Care who funded the DELPHI project. Amanda Terry, PhD, was supported by a post-doctoral fellowship from the Canadian Health Services Research Foundation and the Canadian Institutes of Health Research. Amberdeep Thind, MD, PhD, is funded by the Dr Brian Gans D, Kralewski J, Hammans T, Dowd B. Medical groups’ adoption of electronic health records and information systems. Health Aff 2005;24:1323-33.
22. Smith PD. Implementing an EMR system: one clinician’s experience this residency’s implementation plan succeeded by leaving as little as possible to chance. Fam Pract Manag 2003;10:37-42.
31. Passage N. Pick the right team for an EMR home run. Behav Health 2006:26-44.
34. Steinbrook R. Health care and the American community, urban, hospital, and academic family physicians’ experiences with electronic medical records: implementation experience in community, urban, hospital, and academic family medicine. Can Fam Physician 2010;56:40-7.