

KNOWLEDGE SHARING PROCESSES AND TOOLS IN U.S.A PRIMARY HEALTH CARE: ANALYSIS OF FOUR CASE STUDIES

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This paper focuses on knowledge sharing as an important area in the study of knowledge management (KM). The paper's primary goal is to examine how health-care practices employ knowledge sharing tools and processes to the benefit of their daily work processes. In addition, the study seeks to understand how knowledge sharing would contribute to practices' performance. Adopting a qualitative approach, four health care practices were selected from within a research network to represent larger and smaller practices with different performance levels, two high-performing practices (HP) and two low-performing practices (LP), using standard clinical and health care practice measures. Data collection and analysis involved several iterative steps including interviews and field notes of observations. Four case studies were developed reflecting how each practice implemented knowledge sharing tools and processes and how this implementation influenced performance. The study found that all of the four practices manifested and implemented knowledge sharing tools including *knowledge artifacts; sharing social tools, meetings, and communication channels*; and processes including *training and apprenticeship and communities of practices*; however, the level of implementation varied among the four practices. A comparison of the high-performing and low-performing practices showed that even though the high-performing practices implemented and invested more in knowledge sharing, knowledge sharing processes and tools were not completely integrated throughout the practices including the high performing ones. Moreover, in all practices there was little evidence of encouragement to efficiently use knowledge sharing tools either among staff members or between patients and the practice.

1. Introduction

Recently, leaders and executives in health organizations have increasingly recognized that in order to maintain or gain advantages, organizational knowledge needs to be not only managed but also shared among clinical as well as clerical staff (Orzano, et al., 2008). Thus, health-care organizations need to focus on tools appropriate for knowledge sharing. Lee and Al-Hawamdeh (2002) define knowledge sharing as the deliberate act in which knowledge is made reusable through its transfer from one party to another. Moreover, Polanyi (1966) identifies two types of knowledge: tacit and explicit knowledge. For each of these two types of knowledge there exist specific tools and processes that can facilitate and encourage knowledge sharing. This paper identifies and discusses different types of tools that foster the sharing of tacit as well as explicit knowledge in primary health care practices.

2. Literature Review

Many of the studies investigating knowledge sharing focus on three main aspects: technology, processes, and people. Executives place a stronger emphasis on the role of people in enhancing organizations' ability to compete based on knowledge (Ruggles, 1998). Knowledge sharing is a people-to-people process (Ryu, Ho, and Han, 2003). Still, knowledge sharing is often difficult to implement because people are sometimes reluctant to share knowledge that is perceived to be valuable and important, and look suspiciously upon knowledge from others (Davenport and Prusak, 1998). Changing this natural tendency is the biggest impediment to the knowledge sharing processes.

Research related to knowledge sharing and changing work relationships among professionals in health care has begun to emerge (Stefanelli, 2004; Ryu et al., 2003). Ryu et al. (2003) proposed a model for knowledge sharing behavior using existing theories in social psychology. In their study, the authors showed how social psychology theories—including the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB)—can be used to explain the knowledge sharing behavior of physicians. The study found physicians' subjective norms—i.e. their beliefs about how people they care about will perceive the behavior in question—to have the strongest total effect on their willingness to share knowledge. Also, attitude and perceived behavioral control—i.e., people's perceptions of their ability to perform a given behavior—were found to have a significant effect on physicians' knowledge sharing behavior. These conclusions underscore the importance of creating an environment in which physicians can have positive subjective norms and attitudes towards knowledge sharing.

Thus, knowledge sharing cannot be mandated or forced, and an enabling environment that has the appropriate tools and processes to encourage and facilitate knowledge sharing is necessary for better knowledge sharing practices. The main purpose is to identify tools and processes that facilitate knowledge sharing among physicians, practice staff, and patients. Few studies focus on identifying appropriate tools and processes for knowledge sharing in particular contexts. Many studies emphasize the role of information and communication technologies (ICT) that are usually seen as valuable tools for mediating organizational communication and knowledge sharing. Such tools are often used to improve communication and create a more efficient “alternative organization.” In addition to the ICT infrastructure, the following processes also contribute to better knowledge sharing: *communities of practice* (Wenger, McDermott, and Snyder, 2002; Cheuk, 2004), *meetings* (Walz, Elam, Curtis, 1993), *training*, and *apprenticeship*. Informal social networks—usually labeled as communities of practice – are effective for establishing the habit of sharing knowledge and for the embedding processes and practices in the organization (Cheuk, 2004). Group meetings are considered to be a useful environment for learning as well, since they allow team members to share information and learn about other domains relevant to their work (Walz et al., 1993). For example, in many cases meetings are more efficient for the transfer of explicit knowledge (Dyer and Nobeoka, 2000). There is a need for other types of activities that ensure the transfer of more complex knowledge such as “tacit” knowledge. Training and apprenticeship would allow the network members to efficiently transfer more complex—tacit and implicit— knowledge (Polanyi, 1966; Dyer and Nobeoka, 2000).

3. Purpose Statement and Research Questions

This paper reports on a study with a modest aim, one that examined the knowledge sharing environment in four health-care practices to establish how they were sharing knowledge among staff and with patients. The ultimate goal of a long term study is to determine whether knowledge sharing initiatives are factors in predicting better health-care performance, but this study does not pretend to make that cause and effect claim. It was preliminary to developing hypotheses that could be tested later in a randomized clinical trial. Two main questions guided the preliminary study.

1. How do certain health-care practices exhibit knowledge sharing tools and processes?
2. What hypotheses can be developed from this limited study to guide additional research?

4. Methods

This research is part of a larger research project “TALKS^{DM}” (*Taking Action by Learning and Knowledge Sharing in Diabetes Management*) which aims to develop a socio-technical model of knowledge management for primary health care. The project focuses on how clinicians, nurses and staff *share, find, and develop* knowledge in order to *make decisions, execute tasks, and learn* in regard to care for diabetic patients, and it seeks to formulate hypotheses about how these knowledge sharing processes relate to the practices’ overall performance. Qualitative methods were used to conduct the research including observation, field notes, and interviews. The four health-care practices selected for the purpose of this research share several characteristics. They are all located in New Jersey, USA, and were selected based on a variety of criteria including clinical and productivity measures (Table 1). Two are considered high performing (HP #17 and #21) and two are low performing (LP #22 and #3) practices.

5. Data Collection and Analysis

A grounded theory approach was used to develop an overview of knowledge sharing tools and processes by means of examining interview transcripts, observation notations, and field notes. The leading researcher, a practicing physician, visited the practices and conducted face-to-face interviews with all clinical staff and some of the clerical staff, observing interactions among staff and patients while on site. Field notes were recorded, and the recordings were later converted to written transcripts. Three of the researchers coded the transcript and observation data independently using a template—developed by the TALKS^{DM} project, complemented with additional insights from open coding.

Table 1. Practice Selection Characteristics

Criteria	HP#17	HP#21	LP#22	LP#3
Clinical (1=Upper Quartile/2=Lower Quartile)				
Diabetes (meeting targets: HgbA _{1c} ≤ 8, LDL ≤ 100, BP ≤ 130/85)	1	1	2	2
Hypertension (meeting target: BP ≤ 140/90)	1	1	2	2

Cholesterol (screening for cholesterol within 5 years)	1	1	2	2
Productivity (1= reported losing money within the past three yrs/2=stay same or gained)	2	2	1	1
Learning (assessment from facilitators of the practice's uptake of the quality improvement process scale 1-5, 1=greatest).	1	1	5	5
Size (N=number of approximate full time equivalent clinicians)	4	4	2	3
Type of Medical Record (EMR=1/paper=2)	2	1	2	1
Affiliation with Health System (Yes=1/No=2)	1	2	1	2

Two of the coders adopted a different view for the coding: One coder used Atlas TI, content analysis software, to identify micro categories; and the other coder used Microsoft Word's comment feature to identify and record macro categories. The research team constructed tables in order to identify KM associated processes and tools used within each practice.

Following the coding, research team meetings and discussions helped refine and validate the analysis and interpretation of the data. The data were then re-examined, based on the developed tables where the researchers looked for confirming and disconfirming evidence (Orzano et al., in review). In the following section, four case studies will be presented providing some background knowledge to the structure of the practice, management style, staff, and relative information that can help one acquire a view of the performance level of each practice. For confidentiality and to protect the identity of the practices, practices are identified by numbers rather than names. These numbers were randomly assigned and do not reflect any ranking or performance level.

6. Case Studies: Medical Practice Profiles

Case studies are fundamental ways in which scholars conduct scientific research (Feagin, Orum, and Sjoberg, 1991; Stake, 1995; Yin, 2003). By means of case studies, the causal mechanism linking the independent and the dependent variables under scrutiny can be specified in detail. Integration is not the only virtue of case study research. There are situations where very little is known about a particular phenomenon, or research is particularly difficult to undertake in a certain area. Under such circumstances, case studies play a path-breaking or a so-called "exploratory" role, serving to open up the way to a previously unfamiliar or inaccessible area of research (Yin, 2003). According to Yin, the goal of conducting exploratory studies is "to develop pertinent hypotheses and propositions for further research" (p. 6).

Case studies such as those that have been investigated within the framework of the TALKS-DM project can best be described as "exploratory," in the above-mentioned sense. Because the research is practically nonexistent in this area, our study is path-breaking.

6.1 Medical Practice #17

The practice consists of between five and ten physicians including the owner of the practice; several nurses, and clerical and administrative staff. The practice has gone through major turnovers during the last two or three years. Nurses are not connected with specific physicians. They basically monitor the flow and fill in where they are needed. They usually

communicate with each other if a change in focus is needed in order to maintain patient flow. The glass-walled meeting room enables knowledge sharing because the design allows people to share knowledge implicitly whenever a meeting takes place.

6.2 Medical Practice #21

This practice has several offices located in New Jersey, and serves as an urgent care center and as an occupational health service for local companies. The leading physician is the owner of the practice. Each office has a nurse team leader and a team leader for the clerical staff. It is a large group of physicians, other clinical staff, and administrative staff. One person supervises all three offices in the practice though she is, for the most part, based in one place and just visits the other two offices. The owner of the practice decided that he would let his staff know about researchers coming to the practice and that he would assign a contact person to facilitate their visits.

6.3 Medical Practice #22

The practice is run as a partnership. Even though the physicians share everything within the practice, they manage their patients separately. The practice consists of physicians, several other clinical staff, and administrative staff. The practice members were introduced to the research during a meeting. The principal researcher explained the purpose of the research to all members of the practice and to the two doctors. The researcher was pleasantly surprised to have such an opportunity; it was the first and only time in the study. The researcher was attracted to the practice atmosphere (climate) because requests and sharing between practice members and between staff and patients were handled in a caring and expeditious manner as he observed. Staff members used the term 'family' to describe the culture of this practice and 'team' to describe the professional working and social relationships.

6.4 Medical Practice #3

This practice is owned by several physicians. The leading physician holds a variety of graduate degrees and has worked for about five years as a medical firm executive. The practice is struggling with issues of management, communication, and team work. The relationships among the physicians are not clear. The level of communication is low, causing problems in the management system. Frustration seems to abound, especially over decisions concerning new systems or opportunities. A significant point to be mentioned here is how the staff learned about a recent project, the current KM research project. In this case, a note was attached to paychecks explaining the purpose of the project. In general, it seems as though there is less formal implementation of communication and knowledge sharing tools than in other practices in this study.

7. Medical Practices' Implementation of Knowledge Sharing Processes

In the following section, we present the ways practices exhibited knowledge sharing tools and processes. In some cases levels of implementation have caused positive sharing behavior and motivated members; in others, the lack of knowledge sharing has led to

frustration and less motivated staff. Knowledge sharing practices are articulated through several major tools and processes: *knowledge artifacts*; *sharing social tools-meetings*; *communication channels*; *training and apprenticeship* and *communities of practices*. Definitions of these tools and processes are presented in Table 2. This list is not conclusive; still, it provides an overview of tools adopted by health-care practices to share knowledge.

Table 2. Knowledge Sharing Tools and Processes

<i>Knowledge Sharing Tools</i>	<i>Definitions</i>
Knowledge Artifacts	Selected artifacts including educational materials, bulletin boards, manuals and procedures and patients' medical records
Meetings	Meetings; face-to-face conversation as important knowledge sharing tools.
Communication Channels	Channels for communicating among staff members and between staff and patients including face-to-face, written communication, or mediated communication technologies such as databases and decision support systems
<i>Knowledge Sharing Processes</i>	<i>Definitions</i>
Communities of Practice	Group of named individuals who interact both in face-to-face and virtual environment to exchange experience and knowledge; share learning and build knowledge and expertise (Cheuk, 2004).
Training and Apprenticeship	Incidents in which staff is exposed to training or teaching opportunities provided by the practice or other organizations, and also the learning opportunities provided to non-staff members, including medical students.

7.1 Knowledge sharing tools: Knowledge artifacts

Table 3 presents the use of knowledge artifacts in the four health care practices. A knowledge artifact is an object that conveys or holds usable representations of knowledge. However, it does not have any innate knowledge processing capability. Knowledge embodiment in an artifact can be explicit, tacit, or implicit in nature (Holsapple, 2001). Four knowledge artifacts were identified including: educational material; bulletin boards; manuals and procedures; and patient medical records. All practices relied heavily on bulletin boards to share knowledge as well as communicate decisions; however, there were issues of accuracy and currency in the information provided. As obvious in low performing practices, lack of manuals and work procedures resulted in instances of incomplete learning manifested by miscues in preparing patients for procedures and handling patient requests. In the high performing practices manuals are used heavily by staff either to communicate about daily work or even to inform others about new decisions or actions. These manuals are especially important with the night shift who are usually challenged in finding information they need to do their work.

Table 3. Knowledge Sharing Tools: Knowledge Artifacts

Practice No.	Knowledge Artifacts
Practice #17	Education Materials: Different types of educational material, e.g health related-issues, popular

magazines, and a current practice brochure.

Bulletin Board: Used for posting new information staff needs to know about (work schedule).

Manuals and Procedures: Practice 17 relies on two types of manuals: The *CheckOut Book*—a Front Desk guide that includes the practice’s work and The *Communication Manual*—for the recording of new decisions.

Practice #21 **Education Materials:** Mostly magazines and non-medical related publications and a few health-related magazines.

Bulletin Board: The bulletin board had notices indicating the protocol to receive referrals and a sheet on fees for certain reports and copying records

Manuals and Procedures: There were no clinical manuals; however, staff members individually rely on their personal notes. There are manuals relating to insurance issues.

Practice #22 **Education Materials:** The practice offers their patients different types of educational material regarding health and diseases, in print as well as in electronic versions available on the websites of the practice and the pharmaceutical companies.

Bulletin Board: list practice members and their weekly schedules, home/cell home numbers.

Manuals/Procedures: No manuals or written procedures, only relies on individual efforts.

Patients Medical Chart: emphasis placed on the use of patient chart when communicating among staff. Issues regarding records include poor legibility and difficulty to read them.

Practice #3 **Education Materials:** Magazines, medical literature everywhere in the practice.

Bulletin Board: Contains business, medical information, and employees' personal information.

Manuals and Procedures: There is neither a particular protocol nor manuals for work procedures. Members work based on their own experience and personal notes.

Patient Medical Records: Very well organized from the point of view of utility & efficiency.

7.2 Social knowledge sharing tools: Meetings

Meetings are often essential for knowledge transfer and diffusion. Issues related to meetings in this study included inconsistent meeting frequency and the problems with the meetings themselves such as lack of focus, announcements of decisions already made, and limited problem solving activities. Lack of meetings, in some cases, resulted in less feedback to and from staff; less information for staff about new decisions; lack of a sense of identity with the practice causing frustration and disgruntled staff members.

Table 4. Social Knowledge Sharing Tools: Meetings

Practice No.	Meetings
Practice #17	Staff says meetings no longer necessary since there is much overlap during work schedules that gives staff opportunities to communicate. Meetings are done separately based on jobs. When the issues are appropriate, nurses will attend the business meetings, and that usually happens once a month.
Practice #21	There are no formal ongoing meetings, ad hoc meetings. Meetings among clerical staff and meetings among clinician staff are rarely held. There are also meetings across the three

	locations, usually for office managers, nurses, and physician assistants (PAs).
Practice #22	Few formal meetings held; However, once a meeting was held, the staff members assigned a facilitator to take meeting minutes and circulate them to staff. Meetings are more commonly called in this practice when major issues need to be solved or questions need to be answered.
Practice #3	The practice's owner—a physician, decided not to have regular meetings in the practice, figuring that the practice is small and that members talk to each other all the time. However, they do gather as a group for special meetings, such as luncheons sponsored by pharmaceutical representatives; but not all the practice staff participates in these meetings.

7.3 Knowledge sharing tools: Communication channels

There were active opportunities for sharing and communicating using different types of communication channels. Face-to-face communication seemed to be the dominant tool used by practice staff. Practices varied in using mail or phone to communicate lab results with patients. There were few attempts to encourage patients to use e-mail and browse practices' websites to find and develop knowledge. In some cases, despite implementation of expensive technologies like an Electronic Medical Record (EMR), practices relied more on social than technical strategies, and these often seemed just as effective for sharing knowledge.

Table 5. Knowledge Sharing Tools: Communication Channels

Practice No.	Communication Channels
Practice #17	<p>With Patients: Mail and phone are used heavily to communicate lab results. Patients say they feel satisfied about receiving their lab results through mail or by phone.</p> <p>Among Employees: Physicians prefer face-to-face communication with colleagues as well as using a communication book.</p>
Practice #21	<p>With Patients: Staff relies heavily on faxing to communicate patient prescriptions to the pharmacies. Surveys are used to elicit feedback from patients.</p> <p>Among Employees: Face-to-face communication is the easiest way to ask questions and receive answers. Email is used between offices and within individual offices.</p>
Practice #22	<p>With Patients: mail is the major communication channel used with patients.</p> <p>Among Employees: Staff members prefer direct, face-to-face communication. Phone and written communication are common among the night shift.</p>
Practice #3	<p>With Patients: phone or mail is usually used to communicate with their patients. In addition, the practice developed an internet site that garnered an award for being outstanding. The site has multiple functionalities including accessibility to patient records, abilities to make schedules, inquiring about referrals and renew prescriptions. However, despite all the functionalities provided by the online webpage, patients still end up making phone calls</p> <p>Among Employees: new phone and email systems were implemented; however, they're not used efficiently. Mostly staff and physicians communicate by paper and pen.</p>

7.4 Knowledge sharing processes: Communities of practice

Table 6 presents types of relationships between the four health-care practices and professional communities of practice. These “communities of practice” not only enhanced broader sharing and greater opportunities for knowledge creation, but also provided a means of leveraging scarce practice resources. In the high performing practices, participation in these professional practices was appreciated; however, among low performing practices, there was less respect for these practices.

Table 6. Knowledge Sharing Processes: Communities of Practice

Practice No.	Communities of Practice
Practice #17	Relationships between PHOs and practices focused on contracting with managed care companies and credentialing clinicians for participation. PHOs do chart audits of certain disease entities and feed information back to practices and post results in their websites and newsletter.
Practice #21	Practice members used to attend meetings held by Regulation, Accreditation, and Payment (RAP) Practice Groups, yet, issues such as time and cost might hinder staff and/or managers from attending these communities of practice gatherings.
Practice #22	Staff members do not find a benefit from the IPA meetings, they don't discuss staff or health-care issues related particular practice, only offer general and fit-for-all type of knowledge.
Practice #3	Limited participation with other practices. Relies on consultation for work improvement.

7.5 Knowledge sharing processes: Training and apprenticeship

Training and apprenticeship are essential processes especially for health-care practices. In fact, Polanyi (1966) identified apprenticeship and experience as the best processes for sharing and learning tacit knowledge. Whereas lower-performing practices relied solely on observation for training and ongoing support of personnel, higher-performing practices supplemented observation with manuals for finding and developing knowledge, especially for new employees and medical students.

Table 7. Knowledge Sharing Processes: Training and Apprenticeship

Practice No.	Training and Apprenticeship
Practice #17	Two levels of training: One implemented in practice; the other, by external training seminars. Employees share their training experience with other practice members. There are opportunities for internships encourage interns to become acquainted for future job opportunities.
Practice #21	Training is done on the job through observation and working with others. Consistent training for night shift personnel is lacking. There is a close relationship with PA students essential in exchanging know-how knowledge within the practice.
Practice #22	Staff goes through on-the-job training through observation. The practice is always open to medical students seeking apprenticeships, and through externships.
Practice #3	Little attention paid to formal training due to budgeting issues. Training is conducted by watching others. In reaction to mistakes occurring, guidelines are established by to prevent future problems. Medical student serve in primary care roles as part of their medical curriculum.

8. Discussion

All four health-care practices displayed patterns of sharing knowledge among their members as well as with other communities of practice. However, a comparison of the high-performing and low-performing practices showed that all have limited knowledge sharing practices. Additionally, knowledge sharing processes and tools were not completely integrated throughout the entire practice. The in-house training and teaching of staff in the high-performing practices was more formalized and documented than that in the low-performing practices; the latter seemed more likely to depend on on-the-job training and observation. On-the-job training can be very efficient and effective when conducted in a consistent manner, but staff from two practices complained that their training was strained and time consuming and sometimes excluded night shift staff.

Knowledge artifacts seemed to play a vital role in sharing knowledge. Each practice developed knowledge artifacts that could meet its members' needs. The high-performing and low-performing practices provided educational health material for their patients, in print as well as electronically. However, clinical staff made little effort to encourage their patients to visit websites for updated information. The physicians interviewed said that the younger generations are more eager to go online for information compared to the older patients. The lack of manuals and procedures was very obvious in the low-performing practices. Staff members depended primarily on individual notes to provide guidelines on how to do their work. Most notes were developed by staff in training. The high-performing practices seemed to rely heavily on manuals and procedures for communication with each other, in addition to using updates about new decisions and meeting minutes.

Sharing knowledge was not well performed among communities of practice. Members of low-performing practices described meetings as not beneficial and reported that staff quit participating. Such meetings focused on updating administrative or health-related information. In high-performing practices staff insisted on sharing experiences about management issues; sharing helped them solve and even prevent problems. Although many staff members may have stopped attending PHO meetings, there was evidence of good relationships with the hospitals and some consultancies.

Communication among patients and staff members in all four practices seemed to be conducted by phone and face to face; communicating by mail was also common. Interestingly, communication technology was hardly used to communicate with patients, and little effort was being made to encourage patients to communicate using new technologies. In some practices communication technology was very advanced. Patients were able to access their health information from anywhere and share it with consultants and hospitals in times of emergency. They could also order prescription refills and schedule appointments online. Within the practices, members seemed to prefer face-to-face conversations rather than utilizing more technological forms of communication. However, email is widely used in these practices, as well as communicating through practice manuals, such as the "communication book" one practice keeps. An interesting point here is the relationship between the day and night shifts and the more common use of phone communication, especially when urgent issues need to be solved. It seems as though

daytime staff encouraged the night shift to use the telephone to avoid problems that might occur when information is not shared in time.

Our findings suggest that while some types of knowledge sharing exist in each practice in some way or another, such practices are not fully integrated into the work flow within practices. The sharing of knowledge is an individual effort in many cases. The value of knowledge sharing processes and tools could be considered essential to delivering excellent service in health care as it is in some businesses, but knowledge sharing was seldom systematized in the practices we studied.

9. Conclusion and Implications

This study aimed to provide some examples from the health-care sector on how knowledge is shared among employees, and sometimes among staff and patients. The study results are consistent with those present in the literature on knowledge sharing, according to which organizations invest in technologies and tools to enable knowledge sharing, since they believe knowledge is crucial for their success; however, the use of these technologies is not always well integrated with the general business strategies. Davenport and Prusak (1998) find that the challenge of taking advantage of knowledge sharing processes and tools is to integrate them with different aspects of the business: strategy, process, culture, and behavior—i.e., knowledge sharing processes and tools have to be "baked" into key work processes. Major factors necessary to motivate knowledge sharing among organizations' employees are an enabling environment and an appropriate organizational culture that significantly strengthens knowledge sharing success and stimulates and sustains success in the organization (Hislop, 2007). Various ways to create an enabling environment necessary for motivating knowledge sharing is by linking knowledge sharing goals with the organization's vision. In addition, management support for knowledge sharing is the key factor influencing individuals' knowledge sharing (Connely and Kelloway, 2001).

The implications of this study suggest that there may be a connection between performance and knowledge sharing activities in a primary health care practice. A causal relationship could not be established because of the exploratory nature of the study that focused on case studies. It is interesting to note, though, that the information about high and low performance of the practices was withheld from the researchers who coded the data and conducted the analysis. Despite the fact that the "coding" researchers did not have data from the performance measures, each of them independently identified the high and low performing practices based on the level of knowledge sharing activity that they found. One might consider the coders' high and low performance identification as anecdotal data, but it was an intriguing finding nevertheless. A continuation of the research is needed in order to gather quantitative and qualitative data from a larger number of practices chosen randomly. The valuable template of tools and processes developed in the early research phase can serve to guide the researchers who go into the field (i.e. health care practices) to observe, interview and administer surveys to practice staff and (possibly) patients. It is hoped that interventions might be developed to help health care professionals and clinical support staff increase and improve knowledge sharing and management within practices so that

researchers could study whether the increased levels of knowledge sharing might benefit both patients and practices.

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