Information technology in the healthcare industry is used to improve effectiveness in patient care and work processes. This study examines the ways in which clinical trials research staff incorporate text-messaging with patients into their job duties, and ways in which the healthcare settings where they work account for the text-message relationship. This study was conducted through semi-structured interviews with nine research staff employed at a clinical trials unit. It investigates the motivations, the perceived effectiveness, and the management support and policies that exist to structure text-messaging relationships with patients. Results indicate that text-messaging is anticipated as effective in keeping patients engaged in care, observed as effective for time-management and technological benefits, and structured informally through guidelines made at research staff’s discretion. Results are applicable to the healthcare field as it continues to adopt new technologies that need to be managed and evaluated.

Headings:

Text messaging
Patient care
Clinical trials/ staff
THE USE OF INTERACTIVE TEXT-MESSAGING WITH PATIENTS BY CLINICAL RESEARCH STAFF

by
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A Master’s paper submitted to the faculty of the School of Information and Library Science of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Science in Library Science.

Chapel Hill, North Carolina
April 2010

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Introduction

In the health care field, new information technologies are being adopted to treat patients and improve services. Devices such as Personal Digital Assistants (PDAs), mobile phones, and e-mail allow doctors and nurses to reach reference information faster, consult with other health care professionals, and keep track of patient data (Stiles et al., 2007; Dee, Teolis, & Todd, 2005; Garrett & Klein, 2008). New technology impacts both how healthcare is provided to patients, and how patients learn about their health. The August 17, 1998 issue of *Time* magazine reported on doctors who use e-mail to communicate with their patients (Gorman, 1998). Ten years later, in 2008, *Time* reported that doctors are performing health exams online, and that patients can view their medical records from the internet (Kingsbury, 2008). Electronic medical records are one way that technology is being used to more effectively communicate with and treat patients. Mobile phones are another technology used for communication among co-workers and for healthcare workers to communicate with patients (Thompson, 2005; Blake, 2008).

Text messaging is a technology available through mobile phones. Also known as “short message service” (SMS), it allows for a limited number of characters to be sent between mobile phones. Text messaging is a fairly recent technology, and is increasing in popularity as a communication device, especially among young people. Results from a 2008 survey conducted by CTIA, the International Association for the Wireless Telecommunications Industry, indicated that 75 billion text messages were sent in June
2008 compared to 28.8 billion messages in June 2007. This represents a 160% increase in text messaging activity over one year (CTIA, 2008). In April 2006, the Pew Internet and American Life Project reported that 65% of cell phone users ages 18 to 29 use their cell phones for text-messaging, as compared to 37% of cell phone users ages 30 to 49, and 13% of cell phone users ages 50 to 64 (Rainie & Keeter, 2006). The healthcare field has taken notice of text-messaging as well. In a conference on mobile technology in 2007 Janice Nall of the Center of Disease Control and Prevention presented twelve characteristics of text-messaging applicable to healthcare. Among these characteristics were: “Reaches across demographic lines—underserved populations; contextual; inexpensive to own; two-way communications—engagement opportunities; immediacy of action and response” (Terry, 2008, p. 520-521). Nall’s observations are seen in recent studies investigating text messaging as a communication device between patients and their health care providers. In many of these studies, patients are teenagers who suffer from chronic diseases or conditions, such as Diabetes type I, HIV, organ transplants and eating disorders (Franklin, Greene, Waller, Greene, & Pagliari, 2008; Fredericks et al., 2008). These are diseases where the patient can live outside a health care facility, but which require the patient to be monitored by doctors and nurses. From the patient’s perspective, text-messaging allows for patients to ask questions (whether medical- or advice-related) of their doctors in a way that's convenient for them; and from the healthcare provider’s perspective, text messaging allows doctors and nurses to monitor their patients and send out reminders for appointments and medications. The studies have shown text-messaging to be a successful medium for patient communication, precisely because it allows young adult patients to communicate with the health care
professionals in a way that is convenient for them (Fredericks et al., 2008; Franklin, Greene, Waller, Greene, & Pagliari, 2008). In another study, text-messaging was used as a preventative measure among teens, educating them about HIV (Cornelius & St. Lawrence, 2009). Advice hotlines have been made available through text message, such as the “Birds and Bees Text Line” on sexual health (Hoffman, 2009). The philosophy behind these services is that users are more comfortable texting questions than they are asking them in person (Franklin, Greene, Waller, Greene, & Pagliari, 2008; Lim, Hocking, Hellard, & Aitken, 2008).

Although there have been numerous studies conducted on the effects of text messaging on patients, few have addressed how text messaging impacts the jobs of health care professionals. Some studies have touched on the issue indirectly, but even these have only looked at the use of text messaging for administrative purposes, such as the use of texting to schedule appointments or communicate test results (Menon-Johansson, McNaught, Mandalia, & Sullivan, 2006). This type of text messaging relationship is initiated by the health care workers, and does not involve an exchange of information. Another type of text messaging relationship is an interactive, advice-giving relationship between patients and health care workers. However, previous studies on this type of relationship focus on how patients respond to this type of text messaging, not health care workers (Franklin, Greene, Waller, Greene, & Pagliari, 2008; Fredericks et al., 2008; Li, Chang, Hung, & Fu, 2005). In these studies, nurses are the ones maintaining the text messaging relationships with patients (Franklin, Greene, Waller, Greene, & Pagliari, 2008; Fredericks et al., 2008; Cornelius & St. Lawrence, 2009).
The current study will examine how research staff in a clinical trials unit incorporate texting into their job duties and how the health care setting where they work accounts for the interactive text message relationship. It asks: What motivates the adoption of text-messaging for communication with patients? Are these text-message relationships structured formally, through official policies and management support, or informally through individual research staff’s discretion? What is this technology’s perceived effectiveness?
Literature Review

Text messaging through mobile phones has been found to be useful in the monitoring and treatment of patients with chronic diseases, and for administrative functions such as appointment reminders (Fredericks et al., 2008; Franklin, Greene, Waller, Greene, & Pagliari, 2008; Menon-Johansson, McNaught, Mandalia, & Sullivan, 2006). Numerous studies have been conducted on the effectiveness of text messaging in patient care; however, few have studied the effects of text messaging on the jobs of health care workers (Franklin, Greene, Waller, Greene, & Pagliari, 2008; Fredericks et al., 2008; Cornelius & St. Lawrence, 2009). The literature relevant to this study falls into five categories of research: (1) uses of mobile phones in healthcare (2) factors which contribute to the adoption of mobile technologies in healthcare settings; (3) ways in which healthcare workers use information technology in their jobs, and ways in which it improves their job effectiveness; (4) text messaging and its effects on patients; and (5) information and social support needs of patients. Each of these areas of research will be reviewed, in turn.

Uses of mobile phones in healthcare

Krishna, Boren & Balas (2009) examined research on the use of text and voice messaging for health information, disease management, and improved processes of care. Twenty-five studies were selected for examination after searching in MEDLINE for
randomized controlled or controlled studies relevant to health improvement or education using mobile phones. Twenty-three of the studies used automatic texts or voice messages systems to send messages to patients by computer and two of the studies used message systems that involved interactive, two-way communication between healthcare workers and participants. Studies fell into two categories: “process of care” and “outcomes of care” (p. 237). Process of care is defined as the delivery of healthcare to patients. Research done in this category examined the use of messaging for appointment reminders and notifications of test results. Research done in the “outcomes of care” category examined the use of messaging to encourage behavioral change in patients that would result in better treatment outcomes, such as taking medications on time. Altogether, 60% of the studies reported successful outcomes of care, such as improving patient outcomes and the administration of healthcare to patients, as a result of mobile messaging based intervention.

Lim, Hocking, Hellard & Aitken (2007) reviewed research on the use of text-messaging for sexual health prevention and treatment. Categories of text-messaging found in the literature included: appointment reminders, communication of test-results, medication reminders, communication between doctors and patients, and anonymous sexual health queries. Appointment reminders, communication of test-results and medication reminders fall into the same “process of care” category observed by Krishna, Boren, & Balas (2009), and communication between doctors and patients, and anonymous sexual health queries fall into the “outcomes of care” category. Based on their review of literature, Lim, Hocking, Hellard and Aitken concluded that text-messaging improves healthcare services and information access for sexual health.
Both of the studies by Krishna, Boren & Balas (2009) and Lim, Hocking, Hellard & Aitken (2007) examine the research on the use of mobile phones in the healthcare field. Both studies observe that mobile phone messaging fall into two categories: (1) messages which automatically send out information with no possibility of reply, and (2) messages which allow for two-way interactive communication between healthcare professionals and patients or information-seekers. These two studies demonstrate the types of research on the effectiveness of mobile phone messaging for information dissemination, office workflow and patient care in healthcare settings.

Factors which contribute to the adoption of mobile technologies in healthcare settings

Wu, Wang, and Lin (2005) conducted a study in Taiwanese hospitals on the factors which contribute to technology adoption in health care settings. Their hypotheses were based on theories, such as computer self-efficacy, and “technology acceptance and innovation diffusion” (p. 1). Technology acceptance and innovation diffusion are influenced by whether a new technology is compatible with workers' job duties. Wu et al. (2005) hypothesized that computer self-efficacy may directly influence a healthcare workers' acceptance of new technology, and that their self-efficacy may be influenced by management support and/or by technology support. To test these hypotheses, questionnaires were distributed to various types of healthcare workers in Taiwanese hospitals (doctors, nurses, lab assistants) who used mobile technology (such as PDAs, laptops, GPS, or smartphones). They were asked to provide ratings of their computer self-efficacy and the compatibility of mobile devices with their work activities. Results of the study indicated that computer self-efficacy and compatibility are related to users'
intentions to use new technology. Technical support and training were positively linked to computer self-efficacy. However, there was no connection found between the level of management support and computer self-efficacy.

The results of this study correspond to the innovation-decision process model proposed by Rogers (1995). The introduction of any innovation or new technology to a setting results in certain behaviors leading to its successful adoption or rejection. Rogers models this behavior, mapping the stages that individuals or decision-making groups take in their adoption of an innovation. In this model there are five stages: knowledge, persuasion, decision, implementation, and confirmation (p. 163). The results from Wu et al. (2005) correspond to the knowledge and persuasion stages in Rogers’ model. Wu et al. (2005) found that, in order for new technologies to be adopted successfully in healthcare settings, technical support and training should be provided and the technologies must be compatible with the potential adopters’ job responsibilities.

For mobile technologies to be adopted by healthcare settings, the administration and management in those settings must support the initiative. In Europe, regulatory policies have been developed to discourage the use of mobile phones in hospitals after their use was determined by several studies to detrimentally impact the use of medical equipment and disrupt the atmosphere of the hospital (Derbyshire & Burgess, 2006). In an editorial written to the *British Medical Journal*, Derbyshire and Burgess discuss whether mobile phone restrictions in hospitals developed by Medicines and Healthcare Products Regulatory Agency (MHPR) are necessary. They argue that the use of mobile phones does not interfere with medical equipment and disrupt the atmosphere of the hospital. Derbyshire and Burgess note that contrary to the fears of the MHPR, doctors
who use mobile phones have quicker communication times thus reducing the amount of medical error, and mobile phones might help alleviate patients' feelings of loneliness rather than disrupting the atmosphere. Derbyshire and Burgess conclude that the benefits of mobile phone use in hospitals outweigh any potential harm, and that hospitals should encourage mobile phone use rather than restrict it.

Similarly, Ettelt, Nolte, McKee, Haugen, Karlberg, Klazinga, Ricciardi & Teperi (2006) conducted a literature review on technological advances in mobile phones to address whether the policies restricting mobile phone use in European hospitals are justified. The study concluded that current advances in mobile phone technology have minimized the risks to hospital equipment, and that hospitals should considered lifting policies that restricted their use.

A study by Pinnock, Slack, Pagliari, Price & Sheikh (2006) demonstrates the concerns of adopters of mobile phones in healthcare settings. A survey was sent to general practitioners, nurses, and patients to gauge their potential interest in using mobile devices to monitor patients' asthma. The study found interest in the prospect of increased patient monitoring and communication between the two parties but skepticism about the cost and practicability of mobile technology. A weakness to the study was a low survey completion rate of 35%, which the authors attributed to participants' disinterest in the use of mobile technology. This study demonstrates the attitudes involved in the adoption of mobile technologies in a healthcare setting, especially those of cautious adopters.

Ways in which nurses use information technology in their jobs
As the internet and mobile technology are integrated into the healthcare field, nurses' ability to access information and treat patients has changed drastically. Courtney, Demeris, and Alexander (2005) discuss information technology (IT) and its role in nurses' job duties. Through a review of current literature, they demonstrate that IT changes nurses' workflows and “point of care.” “Point of care” is the place at which nurses interact with their patients (p. 317). Courtney et al. state that IT allows for “point of care” to take place at a distance by connecting nurses and patients through mobile technologies. They demonstrated this finding through a case study on “telehomecare,” which is a program that allows nurses to communicate with patients at home. It relies on technology such as videoconferencing, the internet, and monitoring devices. The authors remark that, in this case study, IT is changing nurses' workflows considerably. Nurses now manage patient care through technology as well as in-person. They conclude that health care administration needs to address the way IT is influencing nurses’ job duties, and provide appropriate support.

Similarly, Randell, Mitchell, Thompson, McCaughan and Dowding (2009) examined the information needs of primary care nurses. They interviewed nurses from three different sites as to how they access information while treating patients, how they use electronic information tools (mobile and stationary), and what types of information they would like to have more access to. Results suggest that the computer is the most prevalent electronic tool used at work, and it is mainly used for electronic patient records. Most information is still accessed through consultations with colleagues. A majority of nurses in the study do not use the internet regularly at work and are not confident in their computer skills. Of the nurses who do use the internet, 5 out of 27 use it to keep current
on information, and not in consultations with patients. Electronic databases are seen as tools for studying new information, but not as tools for accessing information for patient care. This study was conducted from 2001-2002, so the results found may not be relevant to today's primary care nurses. There also may be a difference between the information needs of primary care nurses versus hospital nurses or nurses in a clinical research setting. The type of setting in which the primary care nurses were located was not described in the study. This study is applicable to the current study because it addresses how nurses use electronic information tools in their jobs. However, these are stationary tools, such as internet and electronic databases accessed through home and work computers, as opposed to mobile information tools.

A qualitative study of nurses' use of mobile technology was conducted by Garrett and Klein (2008). The study looked at nurses' perceptions of PDAs, the types of tools on PDAs that would be most useful to their job duties, and any constraints present in the work environment that would limit the adoption of such a device. Both questionnaires and interviews were used so that the full influence of PDAs could be determined. Three types of participants from the University of British Columbia and University of Victoria, Canada were involved. Advanced nurse practitioners (ANPs) were selected to receive questionnaires. ANPs were defined as being nurses who used “advanced, in-depth nursing knowledge and skills” to treat patients (p. 2148). Focus group interviews were conducted with nurse practitioners. Nurse practitioners (NPs) were included to provide variation from the ANP in terms of the number of years on the job and use of new technology (it was expected that NPs use technology more). Finally, information technology managers (ITMs), who are in charge of managing and supporting
information technology in healthcare settings, were interviewed individually. It was thought that the ITMs could provide insights into any technological restrictions on adopting PDAs in practice.

Results found that PDAs were seen as useful because they facilitated easy access to reference materials and drug information. The wireless ability of PDAs was appreciated by nurses because it allows for mobile access to information. In terms of a PDA’s physical features, many nurses commented that the screen size was too small to comfortably read text. Concern over the security of any data entered into the PDA was brought up by nurses. Nurses indicated that they were motivated to use PDAs by the potential to provide improved patient care, which could mean more time spent with patients or improved diagnosis and treatment because of quicker access to information. Another theme found in the results was a need for technical training and support of the PDAs. Support meant both technical support and financial support. There were no distinctions made between the responses of the three categories of respondents; however, quotations by individual respondents were used to support the study conclusions. The issues approached in this study could be easily used to research a different type of technological device used in healthcare (such as text messaging). Themes found in the results of this study could be readdressed at a different time to investigate if the technological devices for nurses have changed to better fit their needs.

Along with PDAs, one of the current mobile technological devices used by nurses is text messaging. Text messaging is used to interact with patients. This could take the form of reminding patients of appointments or monitoring patients with chronic diseases. Appointment reminders by text require no interaction between healthcare worker and
patient and could be an automated or one-time event. However, monitoring a chronic disease could involve a dynamic interaction between patient and nurse that takes place over an extended period of time. The studies that have been done on text messaging in healthcare address both of these types of interactions (Menon-Johansson, McNaught, Mandalia, & Sullivan, 2006; Fairely, Levy, Rayner, Allardice, Costello, et al., 2003; Franklin, Greene, Waller, Greene, and Pagliari, 2008).

Text-messaging and its effects on patients

Menon-Johansson, McNaught, Mandalia, and Sullivan (2006) conducted a study that addressed text messaging in an administrative role. They observed a sexual health clinic that provides Chlamydia test results to their patients via text messaging. The purpose of the study was to look at the effectiveness of sending out test results to patients through text messaging. The study was conducted by comparing patients who received their test results via text message, and those who received them the traditional way, via phone or clinic appointment. The various traditional methods were grouped into a single variable for testing purposes. The study found that, for the patients whose results were positive, the ones who received their results via text messaging took less time to come into the clinic for the first treatment appointment than those who received their test results through the traditional method (phone or appointment).

Text messaging patients' test results also took up less hours of staff time. The time from testing and diagnosis of Chlamydia until treatment is an important time frame, because the quicker the disease is treated, the less likely it is to reoccur or spread to another person. The study determined that text messaging is a more efficient way to
communicate test results, both for the treatment of the disease and the time commitments of the health care staff. In this way, the study looked at how non-interactive text messaging affects the jobs of healthcare workers and treatment of patients.

The use of text-messaging for appointment reminders is another administrative use of text-messaging. Its role in reducing patient non-attendance at clinic appointments and raising cost-efficiency for healthcare providers is examined by three different studies. The first, Geraghty, Glynn, Amin & Kinsella (2008), implemented their research by sending one group of participants a text-message three days in advance of their appointments. A control group consisted of participants who were not sent reminder text-messages. Results indicated that the text-reminder group had a lower non-attendance rate than the control group, and that text-message reminders had the greatest impact on the age group of zero to thirty years. This is an important finding for clinic efficiency because their younger patients were most likely to miss their appointments. The study calculated the cost-efficiency of sending text messages and found that the cost per non-attendance is less than with the traditional method of telephone reminders. Patients did not have the ability to reply with text-message if they were unable to make their appointment time, but the study believed that giving patients this ability would lower the non-attendance rate even more.

The second study, Downer, Meara, Da Costa & Sethuraman (2006) also conducted their research by comparing two groups of participants, those who had been sent a text-message reminder and those who had not. Similar to results found by Geraghty, Glynn, Amin & Kinsella (2008), the results in this study indicated the failure-to-attend rate was lower for the trial group that the control group, and text-messaging
reminders method have higher revenue per schedule outpatient appointment than the traditional method. Like Geraghty, Glynn, Amin & Kinsella (2008), patients were not able to text-message back using the appointment reminder texts. The authors concluded failure-to-attend rates might have been lower if patients had the interactive text-messaging option. The study concluded that text-message appointment reminders are an effective way of improving patient appointment attendance and increasing revenue per scheduled appointment.

The third study, Leong, Chen, Leong, Mastura, Mimi, Sheikh, Zailinawati, Ng, et al. (2006), conducted their research using three groups of participants: (1) participants who were sent text-message appointment reminders, (2) participants who received mobile phone call reminders, and (3) participants who received no reminders. The study found results similar to Geraghty, Glynn, Amin & Kinsella (2008) and Downer, Meara, Da Costa & Sethuraman (2006). Participants who were sent text-message reminders had higher appointment attendance rates than participants who did not receive any reminders, and in this study, text-message receivers had higher appointment attendance rates than participants who received mobile phone call reminders. The study also concluded that sending reminders through text-message is more cost-effective than reminders sent by calling a mobile phone. All three of the studies conclude that text-message appointment reminders are more efficient for patient attendance rates and more cost-efficient for healthcare settings. However, all three of these studies used non-interactive text-messaging with patients, and all three observe that interactive text-messaging might have made a difference in study outcomes.
Other studies have examined how text-messaging is used by health care workers to monitor and treat patients. Fairely, et al. (2003) researched text-messaging as part of a medication adherence program for HIV patients. The adherence program consisted of an educational segment, a personalized regimen schedule set up by individual counseling, and reminders and adherence aids. The patient could pick from several different reminding devices, one of which was text-messaging. The purpose of the study was to research the effectiveness of the adherence program in reducing the amount of times a patient missed their medication dose. After starting the five-month adherence program, patients were telephoned monthly to determine how many doses they missed. Then patients' medication adherence record during the program was compared to their record before starting the program. Results showed that patients took medication more regularly with the adherence program than they did without it.

The study does not elaborate on any differences that existed between the patients who used text messaging as their adherence aid, and those used the other devices, such as a dosette box, or timed pill box. The study does not elaborate on the form of the text-messages, such as whether these messages were sent from individual nurses that the patients worked with, or from a general phone number by whatever nurse was on duty, or by an automatic computer system. The study found that patients were able to page a nurse or counselor if they had a question about their medication or regimen, but there is no indication as to whether patients could use text-messaging to ask these questions or if they could respond to their medication reminders with a text-message. The use of text-

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1 A timed pill box, or a pill box with an alarm on it, is a device that is programmed to remind the patient when it’s time to take a dose of medication (Raven, 1991).
messaging by this program is limited in the sense that it only functions to serve as a reminder. There is no interactive quality. Because of this it might not have been a big impediment for the nurses to send out the text-messages; however, this is not discussed in the article.

Franklin, Greene, Waller, Greene, and Pagliari (2008) conducted a study that used interactive text-messaging to monitor diabetes patients. The study worked with a group of young adults, males and females ages 8-18, with Diabetes type 1. "Sweet Talk" is a text-messaging support system that sends out automatic text-messages to patients one or two times a day, as a means of passive support. The content of the text-messages was crafted to encourage patients to take control of the management of their illness (such as maintaining a healthy diet, regular insulin injections, and glucose testing). However, patients could respond to the texts and ask questions through texts, and they would receive an individual response. The point of the study was to look at how the patients interacted with the text-messaging in order to gauge how successful it was for encouraging the self-management of their disease. The results of the study found that there was no direct link between the frequency of text-messages sent and clinical or psycho-social characteristics of the participants, such as age, gender, duration of diabetes, insulin regimen, and social deprivation score. However, the study did find that patients responded to text-messages and were asking questions via text-messages. The content of patient text-messages was observed in eight categories, these included: submission of blood glucose readings, questions about the disease, information about disease management, personal health management, and social support messages. The study
concluded that subjects’ engagement with the system signifies that the system was successful in providing some support.

This study provides a good example of text messaging used in both interactive and non-interactive ways. Interactively, patients were able to ask program nurses medical and non-medical questions via text messages, and could receive responses from nurses. Results indicated that social messages, which had no relevance to diabetes management, represented 6% of the text messages sent by patients. The article does not describe how nurses responded to these types of patient text messages, or how they dealt with the differences in medical and non-medical advice questions. Instead this study focuses on describing the effects of text messages on the patients. It categorizes the different types of text messages sent to nurses, and it looks at how patients with different characteristics, such as male and female, responded differently. This might be an important consideration when looking at how research staff interact with their patients via text messaging. Different types of patients may respond differently to text messaging, and research staff might have to allow for these differences when setting up a text messaging relationship.

Information and social support needs of patients

Klamm (1998) and Marcus, Garrett, Kulchak-Rahm, Barnes, Dortch, and Juno (2002) studied how technology is used to provide information support to patients with cancer. Klamm conducted a content analysis of the messages posted at an internet support group for colorectal cancer patients. She found that the discussion posts on the website fell into several different categories. The majority of the posts were in the “information
giving/seeking” category. This included medical advice on treatment drug information, symptoms and costs. The second and third categories, in terms of the number of posts, were “personal opinions” and “encouragement/support” (p. 33-34). Klamm concluded that the online discussion content was similar to content recorded in traditional cancer support groups, and that nurses should be aware of online support resources that may be beneficial for cancer patients.

Marcus, Garrett, Kulchak-Rahm, Barnes, Dortch, and Juno (2002) conducted a study on the content of telephone calls to the Cancer Information and Counseling Line. This counseling service is staffed by licensed counselors and provides counseling services to patients who are recently diagnosed, undergoing treatment, or are recovering survivors from cancer, and their families and friends. Results showed that, although 77% of the callers contacted the service for medical information, 67% of the callers had received psychosocial counseling or support by the time the phone call was over. Marcus et al. (2002) concluded that the counselors and healthcare providers should keep the psycho-social health of patients and their friends and family in mind, as well as their medical questions. They also found that telephone may be a useful way to counsel patients as opposed to traditional face-to-face counseling.

The studies by Klamm (1995) and Marcus et al. (2002) feature two major types of patient information needs, medical information and supportive counseling. Both studies look at how technology can provide access to this information and social support. The results and observations found in these studies may be applicable to the care of patients with other long-term or chronic illnesses besides cancer, and other technologies used to care for these patients, such as text-messaging.
Conclusion

The use of information technology in the healthcare field is changing the work environment and job duties of those in the field. This is seen in the way information is gathered and shared, co-workers and colleagues communicate with each other, and the manner in which patients are treated. Mobile information technology brings greater freedom in the use of information in the healthcare settings. Text messaging brings greater flexibility in treating and monitoring patients. However, along with the benefits of new technologies comes the responsibility for implementing and monitoring them. Several studies have looked at the factors that encourage or prevent healthcare settings from adopting mobile technology, and have found that several of these factors could relate to the continual management of mobile technology. However, no studies have focused on the management of text messaging in healthcare settings and, more specifically, none have looked at the management of interactive text messaging relationships with patients.

Studies on the information needs of healthcare workers in their jobs have looked at how nurses access information, the types of technological tools they use, and how this technology could be improved. Several studies have observed that one of nurses' motivations for using new technology is improved patient care. Text messaging is a technology that has been seen to have positive effects on patient care, and so more and more healthcare workers might be inclined to adopt this new technology. However, the role that text messaging plays in their job duties and their perceptions of it are topics that
have not been highly studied, although there have been similar studies done on other electronic devices such as PDAs (Garrett & Klein, 2008).

Previous studies of text messaging services have focused on two types of relationships: non-interactive and interactive. Research on both of these types has mainly looked at the effects on patients. Non-interactive text messaging does not require a big role for healthcare providers, since there is no response from the patient address. However, an area that has not been addressed by previous studies, and could be addressed, is the role of healthcare workers in interactive text messaging. This might be especially relevant in text messaging relationships where the job duties of the healthcare provider are not as clear-cut, such as when patients can ask non-medical advice questions. Studies such as Klamm (1995) and Marcus et al. (2002) have shown that non-medical advice questions are prevalent in patient’s information needs.

The role of text messaging in healthcare is growing as technology becomes more advanced and as more patients consider it their preferred method of communication. By studying the role of this technology in practice of healthcare professionals, new ways of using text messaging for improved workflow and patient care can be developed. Thus, the current study focuses on the use of interactive text-messaging by research staff in a clinical trials unit, its perceived effectiveness and its level of integration into unit structure and management.
Methods

A semi-structured interview method was used to determine research staff’s text-messaging relationships with patients and the use of text-messaging at their workplace. Questions addressed both objective and subjective elements of these two topics. There were objective questions on the logistics of research staff members’ text-message duties and the role of management with regards to texting. There were subjective questions that asked for research staff members’ opinions on both of these topics to gauge the perceived effectiveness of text-messaging. This is a relatively unexplored area of research, and the flexible structure of the questions allowed research staff to mention ideas and implications of the technology, even if the researcher did not ask about them directly. The subjective nature of the interviews allowed for varying perspectives in response to the questions. In this study, the use of interviews allowed for an initial investigation of text-messaging in the healthcare setting, and set the groundwork for future, more in-depth studies on the topic.

Description of Sample Population and Sampling Technique

For this study, nine research staff were interviewed, including four nurses, one physician’s assistant, and four non-medical licensed staff. All are employed in the same clinical trials unit and all have patients under their care. Five of the research staff said they use text-messaging in their jobs, and four of the research staff said they do not use
text-messaging in their jobs. Gender and age varied among the research staff, but were not relevant to this study.

Participants were recruited from a clinical trials unit where fifteen nurses and research staff directly care for patients. Of the 15 eligible participants in the unit, about half use text messaging with patients and half do not. Research staff were recruited for this study by attending one of their staff meetings. A hand-out with information about the study and the researcher’s contact information was given to potential subjects at this time. An e-mail message was sent out after the staff meeting to all research staff at the clinical trials unit who directly care for patients. This was to account for staff not present for the staff meeting and to inform them of the study and request their participation. If interested, potential subjects sent an e-mail to the researcher indicating their willingness to participate and the researcher arranged a time for an individual interview session. Follow-up phone calls were made to all research staff who did not respond to the e-mail, re-requesting their participation. Research staff were interviewed on their work time. Because of this, and the fact that research staff were working professionals, no tangible inducement for participation was given, although a token of appreciation was given at the end of each interview.

The Interview Guide

Semi-structured interviews were used in this study because of their potential to uncover “partially formed attitudes” which may not have been realized by the respondent until prompted by a question (Kahn & Cannell, p. 18). Rubin and Rubin (2005) describe an interview as like “night-vision goggles,” because it allows meaning to be extracted out
the ordinary (p. vii). Interviews allow researchers to examine the attitudes, values, hopes, and reasoning behind a topic, and then to analyze why respondents expressed these views and if they are relevant to the purposes of the study (Kahn & Cannell, 1957). Interviews allow for researchers to learn about an event while not actually observing it for themselves, to hear about it from varying points of view, and then to analyze it using an outsider’s perspective. In this study, interviews were able to capture research staff’s opinions on the effectiveness of text messaging in their jobs. The flexibility of the interview questions allowed research staff to elaborate on issues that the interviewer may not have thought of, or stress the importance of one issue over another.

The interviews were based on an interview guide, a set of questions that could be adapted according to the individual responses of the interviewees (see Appendix A). Questions could be accompanied by sub-questions or prompts, as needed. Sub-questions are more specific questions related to the main question, and could be asked following the main one. Prompting questions, located in parentheses directly following the main question, are questions or points that could be asked of the respondent if they had not brought it up themselves in response to the main question.

The interview guide is grouped into several types of questions based on whether or not the respondent is a text-message user in their job. The first group is a set of basic questions that applies to all participants. These questions ask for basic information about the participant's healthcare career, and text messaging in their personal life. The next four sections are designated for only those participants who use text-messaging with patients. If the participant does not use text-messaging, then the interviewer skipped these sections, and jumped to the designated section for non-texting research staff.
The first section of questions, aimed at research staff who use text-messaging, asks about the logistics of texting with patients. Included are topics such as how research staff and patients initiate a text messaging relationship and the general structure of the relationship. The next section asks questions about the instrument through which texting takes places, most likely a cell phone. This touches on the financial and security issues that might be involved in using a cell phone for patient interactions. The third section of questions looks at the logistics of text messaging in the health care setting, in this case, at the clinical trials unit. This section covers questions about the existence of protocol, procedures, and guidelines. The last section (for the text-messaging research staff) asks subjective questions about the perceived effectiveness of text messaging with patients.

The final section of the interview guide is aimed at research staff who don't use text-messaging to communicate with their patients. These questions investigate why these research staff do not use text messaging, and what factors would influence them to adopt the technology. Potential factors that might be given as prompts to respondents if they don't mention them independently, are management support, training sessions, and guidelines. These would coincide with the questions asked of the texting group about the existence of management and technical support.

Study Procedures

Participants were interviewed at their workplace, or a location convenient to them. Interviews lasted between 20 and 40 minutes. Participants were given a consent form to sign at the start of the interview. The consent form included information about
the study, and a question about whether participants were willing to have their interviews recorded. If participants were not willing to have their interview recorded, the researcher would have taken notes on the interview, but all participants agreed to have their interview recorded.

Participants were then asked questions from the interview guide. The questions asked of the individual participant depended on whether they use text-messaging in their job or not. After the interview was completed, participants were given a token of appreciation. There was only one interview session per participant. Interviews were audio-recorded, and then transferred onto the researcher’s computer after the interview.

Data Analysis

Immediately after individual interviews, if a particular response or point in a response seemed important, it was written up in a memo and referred back to at a later point. The interviews were fully transcribed right after they were completed and before the other interviews were conducted. This helped speed the data analysis process along at the end, and gave the interviewer a sense of themes and concepts already occurring in the interviews before all of them have taken place. After all the interviews were completed and had been listened to, the important themes and concepts were clarified and synthesized (Rubin & Rubin, 2005). Codes were assigned to those themes and concepts to make them easier to identify. All the codes were then sorted and grouped with one another. This process helped determine how the themes and concepts related to one another, and how they formed the reality of research staff’s use of text messaging.
Results and Discussion

Description of Sample and its Context

This study was conducted at a clinical trials unit that employs fifteen research staff. The research staff are responsible for different aspects of patient care in a variety of different protocols or studies. Responsibilities depend on the presence of a medical license and the particular protocol to which they are assigned. Research staff who are medically licensed care for patients’ health as it is directly related to the protocol. These research staff are not the primary healthcare providers, although they can refer patients to other medical providers if healthcare is needed that does not fall within the scope of the protocol. The healthcare responsibilities of medically-licensed research staff include checking in with patients at appointment visits, assigning medications as part of the protocol, and keeping track of patients' adherence and reactions to those medications.

Research staff can be coordinators of a protocol, which means that they are in charge of the implementation of the study. Research staff can also work on a protocol, but not as coordinators of that protocol. Research staff in these positions care for patients, but if they don’t have their medical license, then they can’t answer specific health questions. They generally care for patients by scheduling appointments and clinic visits,
and answering general questions about the disease or social support questions. They report to the coordinator of the protocol in their care for patients.

Research staff are not required to communicate with their patients outside of work hours (9AM-5PM, Monday through Friday), but they are required to carry a pager, so they can be contacted in an emergency. The amount that patients are required to communicate with research staff beyond appointment visits is determined by the protocol. Some protocols require patients and research staff to communicate only when scheduling check-up appointments or when there is an emergency. This might mean a patient and research staff go several months without communicating. Other protocols might involve communication every few days. If the patient just started taking a new medication, research staff check in on them every few days to make sure they are taking the medication correctly and that they are not experiencing any adverse side effects. It is the job of the research staff to make sure patients are aware of study procedures and that they understand how to take their medications properly. In the beginning, this often involves regular check-in to make sure the patient understands everything about the medication.

Protocols can be treatment based or observational. In treatment protocols patients are expected to follow medication regimens. Observation studies gather data from patients about the progression of the disease, and do not involve medication regimens. Research staff without a medical license can coordinate an observational protocol because it doesn’t involve managing patients on medication. Research staff on observation protocols still may need to communicate with their patients regularly, but the communication won't involve answering specific medical questions. Communication on
observational protocols involves general disease related questions and social support topics such as coping with the disease. If a patient asks a specific medical question that the research staff aren't qualified to answer they refer the question to a licensed professional.

Communication with patients is initiated at their first appointment. Patients are given an information sheet to fill out. The information sheet asks for patients' address(es), phone number(s), and an alternative phone number (such as a family, friend, or neighbor). There is also a check box where patients can check whether it is okay to leave voice messages or not. It is important for research staff to know how much information can be communicated on a voice message for patient confidentiality. A voice message could be overheard by another person, especially if it is left on a home answering machine instead of a mobile phone voicemail.

Patient confidentiality is an especially important issue in this clinical trials unit because of the nature of the disease. Patients are chronically infected with this disease, and co-workers, friends and family may not know about their diagnosis. Patients may come to the clinical trials unit just recently diagnosed. The age of patients can range from 18 to their 70s. Different protocols involve patients of different ages. Patients for all protocols tend to come from disenfranchised population groups. They may have low income levels, be unemployed, or homeless. The number of patients enrolled in a study varies from protocol to protocol. It can be from 20 patients to over 100.

According to research staff who use text-messaging with patients, the majority of text-messages with patients are logistical questions about appointment times or
scheduling. Other text-message content may be questions related to a medication, the study, the disease, general healthcare, or social support. Social support content is defined as questions and comments not related to healthcare. According to research staff who use text-messaging, the majority of text-messages are initiated by patients. Research staff generally initiate text-messages only for appointment scheduling, or to check on a patients' transition with a new medication.

Introduction

Research staffs' views on the effectiveness of text-messaging with patients fall into two categories: anticipated effectiveness and observed effectiveness. Research staffs' motivations for starting a text-messaging relationship with a patient or continuing to use text-messaging with a patient are influenced by its anticipated effectiveness. Text-messaging is anticipated to be especially effective in keeping patients engaged in care.

The observed effectiveness of text-messaging consists of characteristics about text-messaging that research staff observed after they started text-messaging with patients. The observed effectiveness of text-messaging is not the primary motivation for using text-messaging, but it may contribute to its continued use.

The reasons why research staff do not use text messaging may depend on whether the research staff does not text with their patients as a general rule, or whether they are abstaining from using text-messaging in a specific situation with a patient. Reasons for not text-messaging as a general rule and not text-messaging in certain situations may overlap.
Management plays only a minor role in the decision of research staff to adopt text-messaging. So far management has played only a minor role in the development of regulations on the use of text-messaging with patients. Rules and guidelines on the use of text-messaging with patients are either adapted from pre-existing guidelines or developed by research staff.

This chapter presents and discusses the details of these findings, providing examples of the evidence on which they are based.

*Motivations for using text-messaging: Anticipated effectiveness*

*Keeping patients engaged in care - age of patients*

One of the reasons research staff use text-messaging with patients is because they believe it is effective in keeping patients engaged in care. Patients' full participation in care is necessary for the successful completion of the protocols. This means making sure that patients understand their part in the protocol, such as taking their medications correctly. As one research staff member said,

“At this job you’re doing patients a service by giving them care, and they’re doing you a service by being in our study. So as long as it’s within the protocol we make being a part of this study as easy as we possibly can. So we do whatever it takes to make sure they adhere to the protocol and show up for study visits.” (interviewee 9)

Other research staff articulated similar attitudes. They are willing to adopt the form of communication with which their patients are the most comfortable. According to many research staff who use text-messaging with patients, this appears to be the preferred form with younger patients. Neville, Greene, McLeod, Tracy and Surie (2002) used a similar philosophy to structure a treatment for young people with asthma using text-
messaging. In a letter to the editor of the *British Medical Journal*, they write that “doctors try to make young people comply with treatment while young people try to make the disease comply with their lifestyle” (p. 600). Neville et al. broke away from the traditional role of the doctor and structured their treatment to comply with young people's lifestyles, just as research staff in this study adopt text-messaging to fit treatment into the lifestyles of many of their young patients.

Both texting and non-texting research staff commented in their interviews that patients under the age of 35 preferred texting as a form of communication. This observation corresponds with the data from the Pew Internet survey that found young people between the ages of 18 and 29 use cell phones and text-messaging more than any other age group (Rainie & Keeter, 2006). Despite this data and their own expectations, research staff found that not all patients under the age of 35 uses cell phones and text-messaging, and there were cases of older patients using text-messaging. Research staff noted that, in some extreme examples of text-message usage, patients would use text-messaging as their only form of communicate with research staff and would not pick up phone calls.

The research staff who use text-messaging with patients all work on protocols with an average patient age between the range of 20 to 30 years old. Research staff who said they don't use text-messaging with patients work on protocols where the average patient age is older than 30; however, they still may have patients younger than that age. One research staff member who doesn't use text-messaging remarked that, if she had a population of patients in their older teens and 20s, then she would adopt text-messaging
to communicate with them (interviewee 5). Text-messaging is seen to be an effective way of communicating with patients when it is their preferred mode of communication.

**Keeping patients engaged in care - research staff accessibility**

Research staff remarked that the use of text-messaging makes them more accessible to patients. This is “because they can send me this at any time, unlike a phone call. And I can receive it at any time, and respond generally, relatively quickly, even if it’s not actually answering their question, they get validation, and some sort of connection,” as one research staff says (interviewee 6). Another research staff observed that patients with whom she uses text-messaging will use her as a “gateway” to the rest of their care. When patients have a question about any aspect of their healthcare, they can call the clinic or they can contact the research staff on the study. This particular research staff member has found that patients text her their questions instead of calling the clinic, making her the “first-contact” person for all questions, whether related to the study or not. She believes this is because text-messaging makes her more accessible for patient questions than a phone call (interviewee 8).

One interviewee remarked that sending a text-message as opposed to a phone call lowers the threshold for contact. She feels that because of this, her patients ask her questions through text that they would not have called her about -- questions about the disease, their medications, and general healthcare. She compared it to her own experience contacting a doctor. “It would take a lot for me to call my doctor. I would have to wait until I was really sick” (interviewee 8.) Because research staff work with patients with chronic illnesses, there is a lot for patients to learn about taking care of their illness. One interviewee says that, although research staff can try to teach patients about caring for
their illness at appointment visits, patients may not absorb the information at that time. The interviewee went on to say that text-messaging provides a way for the patient to learn about caring for the disease on their own time, because with text-messaging, patients have a “very easy way of shooting that question, and getting the answer right back.” The interviewee said she would rather patients text her a question about their healthcare than for them to try to find the answer on the internet (interviewee 8). Research staff believe text-messaging allows them to be more accessible for patient questions and concerns, whether this is because text-messaging lowers the threshold for contact or quickens response time. Either way, some research staff believe their increased accessibility to patients is more effective for keeping patients engaged in care.

Text-messaging is not the only mode of communication that is believed to be effective for keeping patients engaged in care. One research staff said her patients regularly contact her outside of appointment visits through her cell phone (non-texting), work phone, and pager. She said she tells patients that they have no reason for not contacting her with a question because they have all three numbers. She believes that, by giving patients all three phone numbers, one of which is her cell phone number which she keeps on her at all times, she “reassures patients that I'm available to them,” and keeps patients engaged in care (interviewee 5).

The differences in research staff’s opinions of effective means of communication with patients might be related to their patients' preferred means of communication. The research staff who use text messaging do so with a younger patient age group, where patients' preferred modes of communication is often text-messaging. Research staff who
say they don't use text-messaging mainly work with patients over the age of 30, which is an age group where text-messaging is not as popular a form of communication.

**Keeping patients engaged in care - keeping track of a transient patient population**

Text-messaging is also viewed by research staff as effective for engaging patients in care in that it helps research staff keep track of patients. Many patients enrolled in the protocols may lack employment, consistent income, stable housing, and stable support networks. Patients may work more than one job to pay all of their expenses. Some patients buy cell phones or phone cards with only a limited of minutes. When their minutes run out and they cannot afford to buy more, they are not able to talk on the phone, but they can use the phone for text-messaging. Patients using these cell phone plans bought by the minute end up changing their number numerous times. Research staff have found that patients often forget to update them about changes in their phone number or address. Research staff have observed that younger patients are especially not responsible about updating contact information. One research staff commented that, before she started using text-messaging with her patients, she would lose her patients all the time, meaning that their contact information would change and she wouldn't hear from them again (interviewee 8). Since she started using text-messaging with patients over a year ago, she's lost only one patient, and not because of missing contact information.

Research staff who use text-messaging believe it is a more efficient way to keep track of patients because they think patients find text-messaging a less-invasive way to communicate with research staff. As one interviewee said, “I think texting is seen as very non-invasive...some of them say they don't like phone calls because they consider them
annoying. But they don't find weekly texts at all annoying” (interviewee 6). This interviewee said she checks in with her patients every two to three weeks by text-message. She may just send a simple message, such as, “Happy Friday, how are you?” She finds that this type of check-in is successful in keeping track of patients because it keeps her on their radar, so if they do change their contact information, they are more likely to remember to tell her of the change. Research staff have also found text-messaging an effective way to communicate with patients who work several jobs. Research staff have observed that patients who work several jobs may not have time to talk on the phone, but they still can text research staff while they're at work. As B. J. Fogg, Director of the Stanford Technology Laboratory, says, “Mobile matters because the phones are always with us, so we can use them in different contexts in our lives” (Terry, 2008). This statement seems especially applicable to research staffs' descriptions of patients working two jobs. They may not be able to set aside time to call research staff with a question, but they can text while in the context of their job.

The technology characteristics of text-messaging may help research staff better keep track of transient or financially burdened patients. Some research staff experienced patients who had sent out a text-message to a large number of people at the same time, including research staff, to let them know their phone number had changed. The one-to-many technological feature of text-messaging allow patients to more easily inform research staff about updates than would have been possible through telephone calls. Text-messaging is also used to communicate with patients with financial limitations, who are restricted from talking on the phone, but who can send text-messages. Several research
staff said their first experience using text-messaging with patients occurred because one of their patients was only available to communicate through text-messages.

Not all research staff saw text-messaging as the most effective way to communicate with a disadvantaged patient population. One research staff member who doesn't use text-messaging with her patients, says her patients are allowed to call her anytime between the hours of 5 AM and 11 PM. She makes herself available to patients for as many hours as possible because she understands that patients may have complicated lives, work more than two jobs, and may not be able to call her during the normal work hours of 9 AM to 5 PM. Another research staff member who does not use text-messaging with patients, said that many of her patients don't have cell phones because they can't afford them, and many times even their home phones get disconnected. Her situation demonstrates that text-messaging is only an effective way to keep track of patients if patients have cell phones and, presumably, are willing to use text-messaging. Research staff who use text-messaging with their patients find it effective in keeping track of patients with unstable or insecure living environments because of the non-invasive and technological characteristics of text-messaging.

**Keeping patients engaged in care - perceived patient benefits**

When discussing the effectiveness of text-messaging, research staff mentioned the reasons why they think their patients benefit from the use of text-messaging as a means of communication. These include: preference for text-message as a form of communication, increased confidentiality, quick response time, and social support.
As previously mentioned, research staff remarked in their interviews that many younger patients prefer text-messaging as a form of communication. One research staff member said she sees emotions from patients through text-message that she doesn't see face to face. Similarly, another interviewee remarked that she thinks it’s easier for patients to ask her questions through text-message that they wouldn't be comfortable asking in person. She thinks this is because questions about the disease often touch on sensitive subjects. This observation is similar to findings by Levine, McCright, Dobkin, Woodruff and Klausner (2008) in their study on SEXINFO, which is a text-messaging service where San Francisco youth can ask anonymous sexual health questions and receive referrals for healthcare. The study found that SEXINFO increased awareness among youth about STIs, and was accepted by the youth as a way to obtain sexual health information and sexual healthcare referrals (p. 394-395).

The sensitive nature of the disease means it’s important for patients to be able to preserve their privacy surrounding the disease. That's why research staff ask patients at the first appointment how much information they can leave in voice messages. Some research staff believe the non-invasive characteristic of text-messaging gives patients more privacy and confidentiality when communicating with research staff. Unlike phone conversations, communication through text-messages cannot be overheard by a third party, and it can be done inconspicuously while engaged in other activities. There is some debate between research staff as to whether text-messaging is more or less confidential than phone communication. This will be discussed further in the section, “Reasons for not texting with patients: Confidentiality of the message.”
Some research staff believe patients use text-messages to receive quick, direct responses to questions. As one interviewee said: “if they're reading something online, and they want to verify that it’s true, they might not think about it later when I see them, so they'll text me” (interviewee 1). Another research staff member believes that patients text him not out of the importance of the question, but because they like having an immediate answer from someone (interviewee 9). One research staff said that patients might like using text-messaging as opposed to a phone conversation, because text-messaging allows one to directly ask a question without becoming engaged in conversation (interviewee 4). Several research staff who use text-messaging said that, when they answer patients' text-messages, they feel patients receive validation and gain trust in the relationship with research staff (interviewees 6 &8).

A trusting relationship between patients and research staff can also be cultivated through texting about social support issues. Klemm (1998) and Marcus, Garrett, Kulchak-Rahm, Barnes, Dortch and Juno (2002) concluded that the internet and telephone hotlines can be important venues for psychosocial and informational support needs of cancer patients. In the same sense, text-messaging might be an important place for the informational and social support needs of patients at the clinical trials unit. Like cancer patients, they too are coping with a major illness that impacts all aspects of their life. Their information needs consist of learning how to manage their disease in relation to medications and treatment. Their psychosocial needs may include managing their emotional life and the disease in relation to their family, friends and co-workers. For patients who may not have a strong social support network coming into treatment, this kind of need may be especially strong. Research staff who text message with patients say
that they get questions and comments from patients that are not healthcare related (interviewees 6, 8 & 9). These messages can be holiday greetings, prayers, questions about life and relationships, or just a comment about having a bad day. One research staff says that, if she gets a message from a patient about a bad day, she'll write something reassuring back to them (interviewee 8).

Providing social support for patients does not just occur with research staff who use text-messaging. Research staff who don't use text-messaging with their patients say they get advice questions over the phone. However, giving social support to patients may be easier through text-messaging because of its technological affordances. For example, some research staff send out mass text-messages to patients for the holidays, just to say, in the words of one research staff, “I'm thinking about you. Hope you're well” (interviewee 8). Text-messaging allows research staff to send out supportive greetings because they take advantage of the one-to-many aspect of text-messaging to send out greetings en mass to many patients at once. One research staff member believes the strength of her relationship with patients comes from giving patients' social support as opposed to medical support (interviewee 8). According to research staff, text-messaging may keep patients engaged in care because patients prefer and benefit from its use.

Research staff who use text-messaging with patients do so because they anticipate that it will be effective in keeping patients engaged in care. Text-messaging is believed to be effective in keeping patients engaged in care because of the age of certain patients, research staff's increase in accessibility to patients, the ability to keep track of transient patient populations, and the perceived benefits patients receive from text-messaging.
**Motivations for using text-messaging: Observed effectiveness**

The observed effectiveness of text-messaging includes the characteristics of text-messaging that research staff observed after they started text-messaging with patients. These observed characteristics are not the primary motivation for using text-messaging because they are not known prior to use, but they may contribute to the continued use of text-messaging. The characteristics of text-messaging that influence its observed effectiveness include time-management and technological benefits.

**Time management**

Some research staff have adopted text-messaging to keep the patients engaged in care only to find that it also is more effective because it saves them time. As one interviewee said, “The phone is hit or miss. What I've found is most effective is to send them a text 'call me when you get a sec' and wait for them to call” (interviewee 6). This type of behavior, texting patients a message to call research staff, or using text-messaging as a replacement for a voice message, is prevalent among research staff who use text-messaging with patients. A few research staff indicated that there have been times when they have tried calling a patient several times without any response, but then got an immediate response after they texted the patient a message to call them (interviewees 4, 6 & 9). In these cases, research staff are getting in contact with patients more efficiently, and in less time, by using text-messaging instead of using the phone.

Text-messaging can also save time in managing appointment visits. Research staff who use text-messaging with their patients said that patients are less likely to leave them uninformed of appointment cancellations or tardiness if patients are running late to an
appointment or need to cancel an appointment (interviewees 4, 8 & 9). One research staff member said that, “even though [patients] still might be inconsistent about coming on their appointment time, I know when they’re not going to show up. I’m not over there waiting for them, because they feel very comfortable texting me that they can’t come” (interviewee 8). She said that, before she used text-messaging with patients, she would often be waiting on appointment days for patients who would never show up. Another research staff mentioned that patients will text her when they are running late for an appointment. This is observation is a twist on previous studies (Downer, Meara, Da Costa, & Sethuraman, 2006; Geraghty, Glynn, Amin, & Kinsella, 2008; Leong, Chen, Leong, Mastura, Mimi, Sheikh, Zailinawati, Ng, Phua, & Teng, 2006), that researched the effects of text-message pre-appointment reminders on appointment attendance rates. The earlier studies found that text-message reminders were more effective and more cost-efficient than traditional methods. These studies did not address whether patients' ability to make changes to their appointment times via text-message would have any effect on attendance rates. It is not known whether the clinical trials unit text-messages their patients with pre-appointment reminders, but it has been observed by research staff that patients' ability to change their appointment via text-message is effective in appointment attendance rates. Research staffs' indications that text-messaging keeps patients engaged in care also may translate to time-effectiveness for research staff. One research staff says that before she used text-messaging with patients, “I would leave a message for someone and they would stand me up over and over again, and half of my job was trying to find them, and bring them back” (interviewee 8). But since using text-messaging she has
better communication with her patients, and doesn't have to spend as much of her time attempting to get in touch with them.

Text-messaging is thought to be more time-efficient than pagers in the hospital, because the non-invasive characteristic of text-messaging allows communication to happen between research staff and other healthcare workers while they are with a patient in an appointment visit. A pager would not have allowed research staff to communicate with another healthcare professional during an appointment because they would need to take time out to make a phone call, but text-messaging can be used to quickly send a message without interrupting the visit. As one interviewee said, text-messaging decreases the time spent “playing pager tag” (interviewee 6).

**Technological characteristics**

The research staff who use text-messaging with patients also noticed a variety of technological characteristics that made text-messaging more effective than other communication alternatives. These technological characteristics include its relative permanence, its visual format, and its mass communication abilities. Some research staff mentioned that receiving information via text-message allows them to access that information at a later date more accurately than if they had received the information aurally through a phone call. This is especially relevant for recording content from patients' text-messages in their medical charts. Not all text-messages and phone calls are recorded in patients’ charts, but if there is one that is medically significant, research staff will often add the content of the exchange to the chart (more on this will be discussed in the later section, “Guidelines: Patient charts”). As one research staff member says, the “texts will tell me the exact dates and exact times for when I write that summary. And if I
have to call a physician for a problem, I have [the content] right there” (interviewee 8). So the semi-permanence of the information contained in the text-message allows the information to be accessed accurately at a later date. This is more effective than an aural phone call, where the research staff would have to rely on their memory to access the information accurately at a later date, or on the accuracy of notes they may have taken on the phone call.

The visual characteristics of text-messages also contribute to their effectiveness. One research staff mentioned that the ability to see the words of a message written out helped her manage patient calls during off-work hours. If a patient contacts her through text-message in the middle of the night, she can assess the urgency of the message by reading it, and then decide whether to write back or call. With a phone or a pager, she would have to call the voice mail or the phone number to listen to the message, and then decide how to respond to the patient. In this scenario, a text-message allows research staff quicker access to the same information contained in a voice message by reducing a step in the process.

Several research staff mentioned that they think their patients benefit from the visual form of text-messages. Sometimes research staff send instructions to patients about procedures that they need to prepare for, or explanations for standard symptom concerns that patients may have. Research staff think that having this content in written form is beneficial for patients because it allows patients to refer back to the information, and they don't have to try to remember it from an oral conversation. They believe that patients aren't as likely to absorb the information if it comes through phone as opposed to text (interviewee 4 & 8).
The third technological characteristic of text-messaging that was mentioned as being effective is its mass communication abilities. The mass communication abilities of text-messaging include two different types. One is the ability to send mass texts. Also described as the one-to-many ability, this is where one person can send the same text to many different people at once. As previously discussed, the one-to-many ability has been used by research staff for social support purposes, as in, “It takes no effort for me to send a mass text, 'Happy Valentines Day. I'm thinking about you. Hope you're well'. But to call all those people would take forever” (interviewee 8). According to this interviewee, mass texts are an efficient way to provide social support and they have a positive effect on her relationships with patients.

The second type of mass communication is the ability to engage in text-message conversations with multiple people at once. Research staff saw this feature as effective for the number of patients that can be communicated with through text in their own separate conversations at one time, thus increasing the availability of one research staff to respond to patients. This is compared to phone communication, where only one patient can be engaged in conversation with research staff at once.

In summary, the observed effectiveness of text-messaging includes those characteristics that have impacted the efficiency and effectiveness of research staffs’ jobs, but did not determine their initial decision to use text-messaging with patients. The text-messaging characteristics that contributed to its observed effectiveness were related to time management and the technological characteristics of text-messaging.
Reasons against using text-messaging with patients

Research staff’s decisions against using text messaging with patients may be the staff member’s general policy or may apply only to a specific situation with a patient. The reasons for not text-messaging as a general policy include: the level of communication with patients that is necessitated by the protocol, the job position of research staff in the protocol, research staff perceptions of patient means and level of comfort with text-messaging, the comfort level of research staff with text-messaging technology, the desire to separate personal and professional lives, financial implications, and influences from practices at previous jobs. Reasons against text-messaging as general rule and not text-messaging in certain situations can overlap. These include: confidentiality of the message, importance of the message, difficulty of message explanation, and the need to problem-solve or interpret the message. Each of these reasons will be discussed in this section.

Level of communication with patients that is necessitated by the protocol

The protocols that research staff work on determine the amount of communication that they need to initiate with patients. The major reasons research staff gave for initiating communication with patients were scheduling, communicating lab results and checking in on a patient’s transition with a new medication. Some of the research staff said they work on protocols where they only initiate communication with their patients for appointment visits. As one interviewee said, “For me there doesn’t need to be a constant contact with someone every day or every week. It’s really just surrounding when they’re supposed to be in for a visit” (interviewee 4). Of the five research staff who use text-
messaging with patients, four of them work on protocols where they initiate communication regularly with patients. Of the four research staff who said they don't use text-messaging with patients, three of them said they currently work on protocols where they don't communicate with patients regularly, and one of them said she does communicate with patients regularly. For this communication she uses the phone.

Two of the research staff who don't use text-messaging and don't initiate communication with their patients regularly said they would still use the phone to communicate with patients if they were on a protocol that required regular communication, although one of them said she would consider using text-messaging if she worked on a protocol with younger patients. One of the three research staff who do not use text-messaging with patients and do not communicate regularly with patients said she would mostly likely use text-messaging with patients if she were on a protocol that required more communication, but she still had some misgivings about it, including confidentiality and personal-professional barriers. Research staff who do not communicate with patients regularly said they are available for patient questions by phone, but that they do not think their patients have a need to contact them regularly with questions or check-ins. The amount of communication required by different protocols does not determine whether a research staff uses text-messaging with patients or not, but it may affect some research staff who may be interested in using text-messaging but do not feel that their protocol necessitates it.

**Job position of research staff in the protocol**

As mentioned in the “Description of Sample and its Context,” there are several different roles that research staff may take in a protocol. There is a research coordinator
(or coordinators, depending on the protocol), who is in charge of the protocol, and there are research assistants who work under the coordinators of the study. Coordinators and assistants both interact with patients, but in different capacities. Coordinators are usually the primary contact for patients while assistants are the secondary contact. As one research assistant says, her communication is “much less than [her] coordinator, which is a constant. People are always getting in touch with her” (interviewee 4). Even so, it was mentioned by another research assistant that sometimes he forms stronger relationships with patients than the coordinator, and so these patients contact him first with questions.

In a treatment study, the coordinator is in charge of medical related questions from patients, while assistants may interact with patients about appointment scheduling, general disease-related questions and social support, and refer any medically-related questions to the coordinator. The roles of coordinators and assistants in communicating with their patients may vary depending on the specific coordinators, assistants, and patients involved.

The communication method that research staff use can also be influenced by job position. One research assistant says that his method of communication with patients is based on the communication method that the coordinator of the study uses. The coordinator of the study determines the communication method to be used with each patient. Therefore, if a coordinator does not use text-messaging with patients, the research assistant does not use text-messaging with patients, even though he might use it with patients on other protocols and with other coordinators. Similarly a research staff member who coordinates a study says she does not use text-messaging with patients because she inherited the study from previous coordinators who used the phone with
patients. This research staff member was just continuing the communication method established with patients before she took charge of the study. Thus, the job position of a research staff in the protocol can influence their communication level with patients and their communication method. Even if research staff might be open to using text-messaging with patients, it might not be an option for them, based on their role in the protocol.

*Research staff perceptions of patient means and comfort with text-messaging*

Some research staff mentioned that not all of their patients have cell phones. In these cases, research staff would not be able to use text-messaging with patients even if they wanted to. However, one research staff member who does not use text-messaging with patients mentioned that he sees patients use text-messaging during appointment visits, but he has not suggested text-messaging as a means of protocol communication with them. In this case other factors might be influencing his decision to not use text-messaging with patients. One research staff member was not sure how patients would feel about text-messaging, and questioned whether they would appreciate a text-message or be annoyed by it. If research staff do not believe that their patients have access to text-messaging or are comfortable with using it for protocol communication purposes, it may affect whether they use text-messaging with patients.

*The comfort level of research staff with text-messaging technology*

Several research staff who do not use text-messaging with patients indicated that one of the reasons is because they are not comfortable with text-messaging as a technology. One research staff who doesn't use text-messaging with patients said that patients will occasionally text-message her, and she will text them back to call her. She
says part of the reason she does not use text-messaging is because she is not adept at it, and she finds phone communication quicker and easier for her (interviewee 5). She also doubts the confidentiality of text-messaging (more on this in the section “Why text-messaging is not used: Confidentiality of the message”). The decision to not use text-messaging with patients is not necessarily determined by a research staff’s comfort level with the technology, as some research staff who do not use text-messaging with patients use it in their personal life.

**The desire to separate personal and professional lives**

As addressed in a previous section, some research staff believe their use of text-messaging makes them more accessible to patients. This may mean they feel they are more accessible during all hours of the day or just during work hours, depending on how they choose to manage their phone. Some research staff who do not use text-messaging with patients questioned whether the level of accessibility that text-messaging may impose on personal life is appropriate. Remarks by one research staff on this issue were made under the assumption that she would be using her personal phone for text-messaging with patients (for more on the use of personal vs. work phones seeing the section called “Guidelines: Using a personal phone”). This research staff member believes that phone communication “is a proper barrier between the coordinator and the subject” in that it provides a clearer distinction between research staff and patient, whereas text-messaging “can fuzzy that line, and [patients] can think of you more as their friend” (interviewee 3). She went on to say that she did not think being a patient's friend is a bad thing, but that it is not appropriate for her role as research staff. This attitude may draw on the non-invasive and accessible characteristics of text-messaging, which other
research staff have observed, and which allow patients to text-message staff more openly about questions or emotions that are not necessarily health or protocol related. What is the line between the roles of friend and research staff? The placement of this line and the definition of the appropriate relationship between patients and research staff may vary among research staff. However, for at least two research staff in this unit, the line between personal and professional is kept in place by using the phone to communicate with patients instead of text-messaging.

Financial implications

All of the research staff who use text-messaging with patients use their personal phones, except for one. For one research staff member who do not use text-messaging with patients, the use of personal phones and the financial implications that accompany this was mentioned as a factor in his decision not to use text-messaging with patients. In order to text-message with patients, he would need to buy a phone that has text-messaging capabilities. The research staff who use text-message with their patients said their finances are not affected by the use of text-messaging on their personal phones.

Influences from practices at previous jobs

Two of the research staff who do not use text-messaging with patients discussed how practices from previous jobs influence their decisions not to use text-messaging with patients. One research staff said that, in her previous job, text-messaging was prohibited from a legal standpoint. According to her previous job, text-messages, as opposed to phone calls, were not documented with the intention to stand up in the court system. Phone calls were documented by a computer system while text-messages were not.
Although this research staff member no longer works at that job, she still believes that it is “good practice” not to use text-messaging with patients.

Another research staff who does not use text-messaging with patients mentioned how she learned, in her previous job, not to give out her personal cell phone number to patients. She was taught to set boundaries with patients and to be careful about protecting her personal information. She believes that her current attitudes about withholding her cell phone information from patients might come from her previous job. Since there is no standard for work cell phones at the clinical trials unit yet, and she doesn't feel comfortable using her personal cell phone, this research staff member is not in a position to text-message with patients.

Practices from previous jobs do not always determine whether or not a research staff chooses to use text-messaging with patients. Some research staff did not use text-messaging with patients in their previous jobs, and yet they decided to use it with patients in this job setting.

Confidentiality of the message

Research staffs’ perceptions of (lack of) message confidentiality was given as a reason not to text-message with patients. This reason applies both to research staff that do not use text-messaging with patients as a general policy, and to research staff that normally use text-messaging with patients but may choose to abstain in certain situations. Research staff who text-message their patients said that they would never text-message lab results to a patient. One interviewee said this was because he wanted to make sure the results were going to the patients, and not somebody else who might be reading in the
message. To inform patients of lab results, all research staff agreed that a phone conversation would be more appropriate than a text-message. According to research staff, this is because it is possible to recognize a patient’s voice through the telephone, thereby confirming that it is the actual patient receiving the message. The study by Menon-Johansson, McNaught, Mandalia, and Sullivan (2006) on the use of text-messaging to decrease scheduling time for treatment appointments for Chlamydia contradicts the opinions of research staff in that Menon-Johasson et al. used text-messaging to send test results to patients. However, no personal identifying information or diagnoses were sent.

Research staff who do not use text-messaging with patients voiced concerns about patient confidentiality surrounding communication other than lab results. Some research staff questioned the confidentiality of text-messaging in all circumstances because, due to the lack of voice recognition, they are not able to confirm the identity of the person with whom they are texting (interviewees 5 & 7). Previous studies, such as Downer, Meara, Da Costa, and Sethuraman, (2006) and Geraghty, Glynn, Amin, and Kinsella (2008), used text-messaging to send appointment reminders to patients and noted in their study limitations that there was a small percentage of text-messages that were sent to the wrong phone number, so the intended patient never received the message. Presumably this is a confidentiality issue as well as a logistical flaw. However, there is another confidentiality issue that these studies did not address, which is that, even if a text-message is sent to the correct phone number, a third party might read the message on the intended recipient's phone. This is the problem with which some research staff at the clinical trials unit are concerned.
Because patient confidentiality is such an important part of protocols in this clinical trials unit, research staff are very aware of the need to preserve patient confidentiality. No official guidelines on patient confidentiality exist in the protocols for communication with text-messaging, like they do for phone and e-mail use. One research staff who doesn't use text-messaging with patients says he's proficient in the privacy procedures surrounding phone and voice mail communication, but he's unsure about how confidentiality would be preserved through text-messaging. Another research staff member who does not use text-messaging with patients voiced similar concerns. It is unclear whether future official guidelines on text-messaging confidentiality would affect these research staffs' decisions to use text-messaging. They didn't say whether it would make a difference or not, only that their current skepticism with text-messaging confidentiality affected their decision not to use it. Some research staff who use text-messaging with their patients have adopted unofficial methods of ensuring patient confidentiality in text-messages (see the section, “Guidelines: Confidentiality and security measures”).

**Importance of the message**

Research staff articulated in interviews that the importance of a message for patients often corresponds to a need for a level of confidentiality that cannot be secured through text-messaging. It is not clear what constitutes an important message. Some research staff who use text-messaging with their patients mentioned that lab results are important enough to communicate through phone and not text-message. Another research staff who uses text-messaging with patients indicated that she will not put anything
“specific” in text-messages and text-messages her patients to call her when she has something specific to tell them (interviewee 6). “Specific” information could mean personal health information or other personally identifying information, which other research staff said they did not put in text-messages. For some research staff that do text-message with patients, the level of importance they are comfortable sending via text-message varies on a patient by patient basis. Their decision to send certain information over text-message depends on the patient's environment, phone security measures, and what information the patient is comfortable receiving through text-message (to read more on text-messaging security measures, see the section: “Guidelines: Confidentiality and security measures”). On the other side of the issue, one research staff who does not use text-messaging with patients said that any message that could be sent through text-message is important enough to communicate through phone. She said that, “If it’s that important to text me, then call me” (interviewee 5). The definition of what constitutes an important message varies among research staff, but there is agreement that at least some messages are important enough that they should be communicated through a telephone call and not a text-message.

**Difficulty of message explanation**

Research staff who text-message with patients said that, when patients ask them a question through text-message that requires a lengthy or more in-depth answer, then they will switch to phone communication. One research staff member indicated that she is able answer basic symptom questions through text-message with a set of standard texts that she keeps in her phone. But she said she always calls patients for “really personal health
information,” which she defines as sexual or other personal health information. She said this information is harder to explain via text-message (interviewee 8). She does not elaborate on why this information is harder to explain via text-message, but it might be because it involves sensitive information which can be negotiated easier through a phone conversation, or it is individualized information that does not have a standard response.

One research staff member defined the threshold for when a text-message conversation should switch to a phone conversation as more than two to three texts from each side. At that point, he said, “You might as well just talk on the phone” (interviewee 9).

**The need to problem-solve or interpret the message**

Because text-messaging is a written form of communication, it does not come with vocal cues or body language to give an additional level of interpretation and understanding. Some research staff said they preferred to use phone communication for the additional level of communication that vocal cues provided. One research staff member said that, although she uses text-messaging with patients, her preferred mode of communication is phone because she gets a better sense about what the patient is communicating. Text-messaging is too impersonal for her (interviewee 1). The need to interpret patients’ communication more accurately was brought up by several research staff as a reason to talk on the phone with patients. One research staff member who does not use text-messaging with patients said she prefers phone communication because it “gives her the liberty to actually get at the root of a question or a problem” (interviewee 5). She believes that, although patients may think they are asking her a yes or no question, there is usually more to it than that, and a phone call allows her to explore patients' questions further. Similarly, a research staff member who uses text-messaging
with patients said that, if “a certain topic requires discussion,” she uses the phone (interviewee 6). Research staff may have different definitions for when a conversation requires discussion on the phone, but they all agreed there are situations when problem-solving, interpretation or discussion with a patient necessitates a phone conversation.

**Management**

The impact of management on research staffs’ decisions to adopt text-messaging varies. The unit's management staff did not make a blanket decision on whether text-messaging should or should not be used by research staff in their communication with patients. However, the use of text-messaging with patients has been a topic of discussion in several staff meetings. These discussions allowed research staff to voice their concerns about the use of text-messaging, and allowed others to highlight the benefits and advantages that they found in their use of text-messaging. No official decision on the use of text-messaging has come out of the staff meetings, although several research staff considered the use of text-messaging as a “hot topic” (interviewee 3) and one that was bound to come up again in future discussions and staff meetings. One research staff member who does not use text-messaging believes that “impromptu rules” about text-messaging have been decided upon by the unit, such as waiting for the patient to initiate text-messaging and not sending lab results or other personal information over text (interviewee 3). However, another research staff indicated that no rules had been decided upon, and the unit was still discussing it (interviewee 8).
One research staff member said that management staff supported her use of text-messaging with patients when she first started using it. According to her, management staff supported text-messaging with the attitude that, “If this is what our patients want and prefer, and if this is what helps us reach them, we need to meet them where they are” (interviewee 6). This attitude echoes the one brought up by research staff about keeping their patients engaged in care. Management staff do not require research staff to use text-messaging with patients, but they do support research staff who choose to do so.

In general, the only communication technologies that are provided to research staff by the unit are a pager, a desk phone, and a computer. Research staff are not provided with cell phones, except for one research staff who has one because of the high volume of text-messages she receives from patients. In her case, management felt a work cell phone was necessary so she could turn off the phone and maintain a healthy work-life balance. Several research staff believe that the provision of work cell phones in the unit is a realistic possibility in the future. This is because they see cell phones becoming more and more important for communication with patients as more people in the world use them, in general.

**Guidelines**

The role of text-messaging in patient care is still relatively new and unstructured, and the unit has not implemented any formal guidelines on it. Several research staff said that the unit consulted the organization’s lawyers about the use of text-messaging with
patients, but did not receive any clear advice on what guidelines they might impose to structure its use (interviewee 1, 3). Therefore, unofficial or impromptu guidelines currently structure the use of text-messaging. These guidelines fall into four categories: use of a personal phone, security and confidentiality, initiation of communication with patients, and patients' medical charts. Research staff who text-message with patients said they came up with their own guidelines when they first started text-messaging with patients, or they learned practices from other research staff who had been text-messaging with patients before them, or their guidelines came from a combination of both of these. Research staff who do not use text-messaging with patients said they know of at least some of the unofficial guidelines of text-messaging through staff meetings.

The guidelines that research staff use to structure their communication practices with patients include HIPAA (the Health Insurance Portability and Accountability Act), GCP (good clinical practice), and the protocols. When asked in the interviews about the guidelines they follow for patient communication, research staff mostly just mentioned they do not share personal health information over non-secure forms of communication. This means being especially aware of the content of the message and who might be able to access it besides the intended recipient when sending it over a non-secure source. According to research staff, text-messaging is not specifically addressed in HIPAA, GCP or the protocols but some research staff said that they adapt the content of these guidelines to their use of text-messaging. One research staff member said that she thought text-messaging should be treated like a phone call in the guidelines, instead of like an e-mail message. She said that the protocol she works on requires phone conversations to be
summarized in the patient's chart, and she believes text-messages should be treated the same way.

**Use of Personal Phone**

All research staff interviewed who use text-messaging with patients use their personal phone to do so, except one. Research staff who use their personal phones for text-messaging said that they feel comfortable giving out their personal cell phone number to patients. They have found that patients have not abused this privilege in general. One research staff member said that, if she feels patients are over-stepping the boundaries with the use of her personal phone number, she'll confront them about it. However, so far she’s found that “patients don't really walk over those bounds unless they have to. They know when I'm at work, they know when I'm at home” (interviewee 1). Some research staff are more selective in choosing to which patients they will give out their cell phone number. Several research staff said that they prefer giving out their cell phone number to patients they already know or with whom they have a relationship. That way, they can better judge if the patient will be likely to abuse the privilege (interviewees 4,9). Research staff did not indicate whether there were guidelines on the use of personal cell phones in the unit, and research staff who do not use text-messaging with patients encompass varying levels of personal cell phone use with patients. Because of the differing practices of research staff on whether or not to use personal phones with patients, it may be assumed that guidelines do not exist on the use of personal phones in the unit, or that guidelines allow the use of personal phones if research staff choose to do so.

**Security and Confidentiality**
Research staff who use text-messaging with patients have similar methods for ensuring confidentiality in the use of text-messaging. These research staff said that, once they have confirmed the use of text-messaging with a patient for the first time, they'll inquire about the security options on a patient's phone, and ask the patient how secure a potential text-message conversation would be. If a patient has a password-protected phone, and he or she is the only person that knows the password, then some research staff said they'll be more flexible with the information they will send through text-message. For some research staff, security measures are addressed on a case-to-case basis, depending on each patient's individual situation.

Some research staff use a security question or an inside joke to ensure confidentiality over text-message. They create this inside joke or security question with a patient in the beginning stages of a text-message relationship. Then, each time a new text-message exchange is initiated, the research staff will ask the inside joke or security question to the patient, to make sure it is really the patient on the other end (interviewees 6 & 8). This method addresses the concern that some non-texting research staff have about the lack of vocal recognition in a text-message. One research staff member said that, if anything worries her in a text-message, then she'll stop texting and ask the patient to call her when they get a chance (interviewee 8). This demonstrates the importance that research staff place on maintaining security and confidentiality, even if there are not standard guidelines for text-messaging.

Since most research staff use their personal cell phone to text-message with patients, they are also maintaining confidentiality on their side. Most of these research staff indicated that they password-protect their phone, or they code patient names in the
contact list on their phone. Most research staff who use text-messaging also said that they delete any non-medical or non-protocol-related texts immediately from their phone. They save the medically-related ones until they are able to record them in the patient's chart.

**Initiation of text-messaging with patients**

The subject of communication with patients is brought up at a patient's first appointment. Patients are given an information sheet to fill out with their address(es) and phone number(s). There is also a place on the sheet for patients to give permission for research staff to leave voice messages on their phone. Then research staff will ask patients how much information is okay to leave on a voice message, and clarify the confidentiality of the voice messages. Research staff who use text-messaging with patients have different approaches in how they initiate text-messaging with patients. Some of them initiate a conversation about text-messages at the information sheet stage. One research staff member asks patients about their preferred form of communication while listing the option to say that it’s text-messaging. This conversation might go something like, “What is the best way to contact you? Phone? Text?” (interviewee 6). Other research staff members will tell patients that they can contact them through phone or text-message, thus informing the patients that they can use text-message with them (interviewee 8,9). Another research staff member said she does not approach the subject of text-messaging with patients at all. If patients ask her about it or if they initiate a text-message with her, then she will know she can use text-messaging with them. The next time they see each other after the first text-message exchange, she will confirm with them that text-messaging is an acceptable form of communication (interviewee 1).
In general, research staff who use text-messaging with their patients agree that they wait for the patient to initiate the first text-message. However, several research staff said that, if they are having difficulty contacting a patient through phone, they might initiate a text-message with them. As one research staff says, “If someone’s having trouble reaching a patient, I’ll say, ’Have you tried texting? You might be able to say 'Hi this is…, is texting better for you?’” The research staff who have used this method of text-message initiation said it has been successful in reaching patients in the past (interviewee 4,6,9).

According to research staff, the idea has been brought up at staff meetings that a possible addition to the information sheet could be a check box that patients would check if they were interested in text-message communication. Some research staff who don't use text-messaging with patients indicated that they know their patients use text-messaging in their personal lives, but that they have never used it with research staff. The check box on the information sheet might only be applicable to research staff who are open to using text-messaging with their patients, because some research staff who do not want to use text-messaging with patients may have patients who would be interested in that form of communication.

In summary, the interviews with research staff who text-message with patients demonstrate that there is no standard method for initiating text-messaging with patients.

Patient charts

Research staff who use text-messaging said that they summarize the content of patient text-messages in patient charts when appropriate. There were differing opinions
between research staff as to when a text-message from a patient qualified as chart-worthy information. One research staff member said that anything related to the protocol went into the patient's chart (interviewee8), but another research staff member said that she only recorded texts when they indicated the patient was having an “adverse event,” such as an allergic reaction, or non-medically related, but significant event, such as going to jail. She said that all communication with patients, whether text-message or not, was determined by the protocol (interviewee 1). It is unclear whether different protocols have different conditions for when to record communication in a patient's chart or if all protocols have similar conditions about patient charts. In either case, research staff are adapting protocol guidelines to determine when and how to record text-messages in patient charts, since text-messaging is not specifically mentioned in the protocols.

Conclusion

Interviews with research staff found that their motivations for using text-messaging with patients are based on the anticipated effectiveness and observed effectiveness of text-messaging. Text-messaging is anticipated to be effective in keeping patients engaged in care. Text-messaging is observed to be effective in time-management and technology capabilities. Interviews found that the reasons research staff gave for not using text messaging included: the level of communication with patients that is necessitated by the protocol, the job position of research staff in the protocol, research staff perceptions of patient means and level of comfort with text-messaging, the comfort level of research staff with text-messaging technology, the desire to separate personal and
professional lives, financial implications, and influences from practices at previous jobs.

Reasons for not text-messaging as a general rule and not text-messaging in certain situations can overlap. These include: confidentiality of the message, importance of the message, difficulty of message explanation, and the need to problem-solve or interpret the message.

Interviews found that management does not play a major role in determining research staffs’ use of text-messaging. Management supports the use of text-messaging with patients, but it does not require that all research staff use text-messaging. Official guidelines on the use of text-messaging with patients do not exist in the unit or the unit’s protocols. Research staff who use text-messaging adhere by ad hoc guidelines that they have developed amongst themselves or are based on other formal guidelines.
Conclusion

The information and communication technologies in use by the healthcare industry are constantly changing and growing in number. Improved patient care, improved communication between healthcare workers, and ease of access to information are just a few of the motivations for the adoption of these new technologies. Text-messaging is one of the recent technologies seen in the healthcare field, and its impact is still being discovered. Studies on text-messaging thus far have examined text-messaging use for administrative purposes, such as appointment scheduling, and have researched its impact on patients and the outcomes of their treatment. In these studies, the text-messaging used with patients is either a non-interactive, one-way message that patients cannot respond to, or an interactive, two-way message that patients can respond to with questions or comments. The effectiveness of interactive text-messaging on patient outcomes has been studied in the literature (Franklin, Greene, Waller, Greene & Pagliari, 2008), but there has not been much research on the effectiveness of interactive text-messaging in the jobs of healthcare workers. This current study examined how research staff in a clinical trials unit incorporate texting into their job duties and how the healthcare setting where they work accounts for interactive text messaging with patients. It asks: What motivates the adoption of text-messaging for communication with patients? Are these text-message relationships structured formally, through official policies and
management support, or informally, through individual research staff’s discretion? What is this technology's perceived effectiveness?

Research was conducted through semi-structured interviews with nine research staff at a clinical trials unit. Interviewees consisted of five research staff who said they use text-messaging with their patients, and four who said they do not use text-messaging with their patients. Results show that research staff who use text-messaging with patients are motivated by its anticipated effectiveness. These research staff anticipate that text-messaging will be effective in keeping their patients engaged in care by allowing research staff to be more accessible to their patients, by giving research staff the ability to better keep track of their patients, and through the benefits they perceive patients receive by using text-messaging. Motivations for continuing to use text-messaging come from its observed effectiveness. Research staff observed text-messaging to be effective for time-management and technological characteristics that make text-messaging more effective than other communication alternatives. The characteristics include the relative permanence, visual format, and mass communication abilities of text-messaging.

For research staff who said they do not use text-messaging, there were a number of reasons for their decisions not to use this technology. Research staff’s decisions not to use text-messaging were often influenced by a combination of several of these factors. Factors influencing the decision not to use text-messaging included: the level of communication with patients that is necessitated by the protocol, the job position of research staff in the protocol, research staff perceptions of patient means and level of comfort with text-messaging, the comfort level of research staff with text-messaging technology, the desire to separate personal and professional lives, financial implications,
and influences from practices at previous jobs. Factors which were raised by all research as influencing their decisions not to use text-messaging in general or in specific situations included: confidentiality of the message, importance of the message, difficulty of message explanation, and the need to problem-solve or interpret the message. Each research staff interviewed has a different combination of past experiences, current job responsibilities, types of patients, and types of protocols, all of which may have contributed to their perceptions of the effectiveness and implications of text-messaging with patients.

The role of management was found to play only a minor role in the motivations of research staff who use text-messaging. Text-messaging was noted by research staff as being a popular topic for discussion in several past staff meetings, so it is a visible topic within the unit. According to research staff, the use of text-messaging is not yet addressed in healthcare guidelines and protocols. To structure their use of text-messaging, research staff said they adapt rules from other guidelines, or create guidelines amongst themselves according to their own discretion.

There are several limitations to this study. The first is its lack of context. The researcher did not observe the research staff in their actual use of text-messaging with patients. She has not seen how a research staff’s use of text-messaging may have evolved over time. The researcher had to take the research staffs’ word that what they recount is what actually took place, or what they currently feel about a past incident is the same as how they felt about it at the time it took place. The lack of context might be especially apparent in this study because the researcher does not have previous experience researching or working in the medical field. Therefore, participants might have
mentioned some things that make sense in the context of certain medical knowledge, but were not picked up or understood by the researcher because she does not have that contextual knowledge.

In addition, for interviews, there are limitations imposed on human communication. No matter how well a researcher forms questions, if the respondent is not motivated to communicate with the interviewer, if there are psychological barriers (such as memory failure or emotional forces), or if there are language barriers, then the information will not be communicated effectively (Kahn & Cannell, 1957). Kahn and Cannell also point out that an interviewer does not know the respondent outside the context of the interview. Therefore, it is hard to grasp the full meaning behind a response, when the interviewer does not know all of the background that went into creating that response.

The reliability of the interview depends on the degree of structure in the interview. In a semi-structured interview, reliability can be achieved through the interview guide, which imposes some structure on the types and order of the questions asked. However, the interview guide is flexible, and can change in each interview, thereby limiting how easily the method can be replicated. This flexibility is both a strength and a weakness of semi-structured interviews. In this study, interviews did not have a standard set of answers to pick from. Interviewees were allowed to answer questions at their desired length and amount of detail. There is no way to know if participants accurately articulated their beliefs to the researcher. The data analysis depended, in part, on the subjective perspectives of the researcher. Two participants may have articulated the same view on a topic with two different amounts of detail or two
different ways of articulating their responses, and the researcher may have interpreted those responses as two different opinions. Since this was an exploratory study, standardization during data collection and analysis was sacrificed in order to capture the experiences of both users and non-users of text-messaging for communication with patients.

This particular study does not include a large sample of participants. There were nine research staff interviewed, all of whom work in the same clinical trials unit with similar patients and studies. Therefore any conclusions reached by the study about the effectiveness and use of text-messaging may be strongly influenced by the particular types of patients they work with, or the way the particular clinic is managed. Thus, the results of this study may not be applicable to healthcare workers in other situations, although that could be determined by future research.

Future research could examine attitudes toward and use of text-messaging by healthcare workers in different settings. Research involving a larger and more diverse sampling of healthcare workers would build on the results of the current study. It might help determine in what situations and with which patient populations text-messaging could be used most effectively. More research could be done to collect the perspectives of patients and healthcare workers who use text-messaging together, and track where their perspectives on the effectiveness of their text-messaging relationship differ or are in agreement.

The results of the current study could be used to inform healthcare management about the scope of text-messaging with patients, thereby facilitating the creation of
formal structures and policies to support the use of text-messaging. This might be especially applicable to other clinical trials units, where management and workplace structure might be set up similarly to the one in this research study. New guidelines and policies could draw out the benefits of text-messaging and find solutions to the issues that raised skepticism among some of the research staff. Results from this study could be used to create publicity that informs healthcare professionals about text-messaging with patients, thereby providing evidence-based support for their decisions about whether their work would benefit from the technology.

Text-messaging is just one of many new information technologies that has been introduced into the healthcare field. The questions raised in this research study may inform the larger issue of how healthcare settings can efficiently incorporate new information and communication technologies to improve patient care, communication, and access to information.
References:


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Appendices

Appendix A: Interview Guide

For all interviewees: Background Info:

How long have you worked as a research staff? (in this clinic?)

How many patients do you currently work with? How were they assigned to you?

Describe your use of text-messaging in your personal life, if you use it. (how often do you use it, how did you get started?)

Are patients expected to communicate with research staff outside their appointments at the clinic?

For those who text: Questions about texting logistics with patients:

1. What prompted your use of text messaging in this job? (supervisor or management decision? Other research staff using it? Patient requested it?)

2. Do you use text messaging with all of your patients? Or only some? How many patients are you texting with currently?

3. How are text messaging relationships initiated with patients? (Are they given a list of communication means and they choose text messaging? Do you ask them if they want to use it or do they ask you?)

4. Describe your availability to respond to patient texts at and off the clinic grounds? (Are you required to be available to respond at any time? Or only when you are on call? Is dictated by policy? Who takes your patients texts if you are not available to respond?)
5. Did you use texting as a nurse in previous job settings? If so, how text messaging in this job setting similar or different from the other ones?

For those who text: Questions about the text messaging instrument (phone):

6. Who provides phones that you and your patients use to text? (Do you use your personal phone for texting with patients? Does the patient use their personal phone? Who pays for the texting service?)

7. Does the availability or absence of materials and/or financial support affect your decision to use text messaging with your patients?

8. How do you handle security issues on the phone?
   1. If you use your personal phone for texting, how do you separate out work information from personal information?

For those who text: Logistics of texting at clinic (or what types of things did management do to help you adopt texting?)

9. Did you have to learn new skills to text message with patients?
   1. What did you learn? (security? Protocol?)
   2. How did you learn? (Does the clinic provide training sessions or an orientation on text messaging procedures with patients? Did you develop your own set of procedures to follow? If so, did you share those procedures with other nurses in the clinic?)

10. Are there any written guidelines that you follow for text messaging communication? (Guidelines such as how you record information, what types of information you can discuss with patients)
   1. If guidelines are present, do they impact your text messaging relationship with patients? Positively or negatively?
   2. If guidelines are not present, would you consider them helpful and/or necessary?
3. If guidelines are not present, do you share “best practices” information with other nurses in the clinic?

11. Was text messaging communication with patients initiated as a clinic-wide decision? If so, was it decided informally at a staff meeting? Or official decision from management?

For those who text: Perceived Effectiveness:

12. What is your preferred method of communication with patients, and why?
   (If text messaging, because you feel there is more communication with patients? Patients are benefiting from it? Because the device is easier to use? Or it is an easier form of communication to use when on call outside of work?)

13. Is there anything you would change about text messaging with patients the way it is now, to make it more efficient for your work? (management, technology, more structure?)

For those who don't text:

14. Have any of your patients requested communication by text messaging? If so, how did you respond to the request?

15. Do you communicate with your patients outside the clinic? If so, how?

16. What do you like about your current form of communication with patients? (its more familiar, its more efficient, its easier to use)

17. Why don't you use text messaging with patients? (lack of financial support, technical support?)

18. Was text messaging communication with patients initiated as a clinic-wide decision? If so, was it decided informally at a staff meeting? Or official decision from management? Were research staff given a voice in the decision making process?

19. Do you see yourself adopting text messaging in the future? If so, what are some things management could do that would help you adopt text messaging?
1. Formal policies/guidelines on how to proceed in a text messaging relationship?
2. Financial and/or material support?
3. Training sessions on the technology?
4. Technical support?