COMMUNICATION ANALYSIS AND PROGRAM DESIGN
IN GENERAL RADIOLOGY AT MICHIGAN MEDICINE

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EXECUTIVE SUMMARY

The purpose of this research project was to evaluate the communication program implemented in the General Radiology Department in the University Hospital of Michigan Medicine. The research conducted for this project indicated the communication tools utilized by the General Radiology department, the validity of these tools and the areas of communication that needed improvement. The research problem paved the way for the researcher to fully analyze the communication program in General Radiology and to design a new program that would better serve the radiologic technologists, the workflow of the department and all patients that receive care from the General Radiology department. The research conducted for this program design involved gathering data from the radiologic technologists who utilize the current communication tools and also gathering data from healthcare professionals employed in various departments elsewhere in Michigan Medicine to truly visualize the communication possibilities within Michigan Medicine.

The data extracted from the optional surveys proved that radiologic technologists are dissatisfied with the department’s current communication tools. The participating technologists were asked questions which dictated the reliability of these tools and malfunctions that occur on a regular basis with the devices. The survey also proved that the need for a new communication program exists in the General Radiology Department. The data extracted from the interviews demonstrated which types of communication programs other departments in Michigan Medicine follow. While these departments follow similar workflows as General Radiology, their communication programs varied immensely. From the extracted data, the researcher constructed descriptive and inferential statistics which furthered the process of creating an improved communication program design.
A complete program design was constructed and recommended for implementation immediately in the General Radiology Department. The new communication program revolves around utilizing the established MiChart program in Michigan Medicine and integrating that program with iPhones. The radiologic technologists will utilize the iPhones to receive ordered exams from requesting physicians. When a physician places an x-ray order, a notification is sent to a coordinating iPhone. The technologist receives the notification and is able to review the order, the patient’s name and location and also the requesting physician’s contact information.

While this program design is indeed feasible to achieve, it must begin the implementation process immediately. This is because it is expected to take one year for a complete integration of the program. All healthcare professionals that will be associated with this communication program will be required to participate in a computerized training module through the usage of the already established training program, MLearnings. The MLearning program will guide professionals through step-by-step training for the communication program and will be mandatory for all healthcare professionals to complete in an annual basis. General Radiology should begin upgrading MiChart immediately to begin this communication program. Lastly, monitoring the program every six months through the use of surveys will be required to ensure the success of communication at Michigan Medicine.
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Introduction

In the healthcare industry, patients are the number one priority. After all, health care is a business, and unfortunately, sick people are the customers. All tasks in a hospital, from cleaning the floors to providing imaging to treating illnesses, revolve around patients’ needs. While many healthcare facilities strive to provide the safest patient care of utmost quality, some often fail due to one component: miscommunication. Actually, communication is a key tribute to organizational success in any business. Employees in a firm will likely struggle to achieve that firm’s goals if they do not possess the proper communication skills or tools. To tell the truth, the skill of communication is the number one soft skill that employers look for in potential employees (Mello, 2017). The healthcare industry is no different than any other type of business when it comes to recognizing the indispensable asset of communication. Miscommunication in health care resulted in extra costs of $1.6 billion in the year of 2016 (Rechtoris, 2017). Furthermore, at least forty percent of patient safety mishaps are the result of miscommunication between employees (Chassin, 2013). Regrettably, Michigan Medicine and its General Radiology Department of the University Hospital are not exempt from these statistics.

The Michigan Medicine Radiology Department was established in April of 1896. While the Radiology Department had only just begun to take popularity, it has since evolved into a department that administers approximately 500,000 radiological exams every year (Regents of the University of Michigan, 2016). The Radiology Department consists of seven sub-departments. General Radiology, one of the sub-departments, obtains radiographic images, or x-rays, for all adult patients throughout Michigan Medicine. The 76 radiologic technologists
employed in General Radiology work in several different areas within Michigan Medicine. Technologists are expected to work individually and also as a team when required to do so.

**Problem Statement**

As previously mentioned, communication errors are extremely costly. In addition to this, miscommunication results in a deterioration of patient care in the General Radiology Department and the department’s overall workflow. Currently, there are no policies within General Radiology which address the importance of communication. The main regulation technologists must adhere to is the “General Radiology Code of Conduct.” In the Code of Conduct, it is stated that technologists must make every effort to minimize patient safety errors that arise due to negligence (University of Michigan Health System, 2015). Although “negligence” is addressed, communication and its effects on patient care are not acknowledged. Furthermore, the expectations for proper communication are absent from the Code of Conduct. Consequently, the General Radiology Department does not specify what effective communication should consist of, which in turn leads to an increased number of miscommunication incidents.

In addition to this, it is important to acknowledge the workflow of the technologists in the General Radiology Department. The 76 radiologic technologists are often dispersed throughout various locations within Michigan Medicine. These locations include all inpatient rooms of the Cardiovascular Center, all inpatient floors in the University Hospital, the Emergency Department in the University Hospital, all of the operating rooms in the Cardiovascular Center and the University Hospital, the Gastrointestinal Fluoroscopy Department and the main inpatient imaging rooms in the University Hospital. The tools that are provided for the technologists to utilize to communicate with each other are a Motorola pager and/or a Cisco wireless phone. The reliability of the department’s communication process lies with the dependability of these
communication tools. These instruments are out of date. The Motorola pagers fail to transmit messages or send messages with jumbled letters and characters of no meaning. The Cisco wireless phones constantly lose service and drop calls without any warning. If the tools fail to operate, communication in the department fails. This domino effect is a burden that rests heavily on the General Radiology Department as a whole and the patients it serves.

**Research Questions:**

There is a clear need to address the communication process in the General Radiology Department. Failure to do so will only result in continued risk to the patients that the department serves and a forego of increased costs to resolve the errors that miscommunication causes. In a department that must stay current on all equipment, the communication tools have fallen short of the demands of technologists. To design an improved communication program, this research addresses the question, “How can communication between all employees be improved upon within the General Radiology Department at the University Hospital of Michigan Medicine?” To adequately analyze the research question and reach an efficient solution, this research question will be divided into the following sub-questions:

- What types of tools are used for the technologists to communicate with each other? To what extent are these tools valid?
- To what extent do the qualities of effective communication coincide with what the technologists perceive effective communication to be?
- What types of communication tools and programs are implemented in other departments at Michigan Medicine?
- What type of communication program could be implemented in General Radiology that would reduce miscommunication errors?
Research has been conducted in a structured manner that adequately addresses each sub-question. Literature related to each sub-question, a survey to establish the validity of the communication devices provided in the department and an interview with employees in outside departments at Michigan Medicine have all been utilized to address the sub-questions. The literature and data have been applied to a methodology which will be discussed in Chapter 3.

**Assumptions:**

The researcher assumed that all technologists participating in the survey provided for research purposes have experience in utilizing the Cisco wireless phone and the Motorola pager. The researcher also assumed that all participants in the survey and interviews answer questions honestly and to the best of their knowledge. Lastly, the researcher assumed that the communication process conducted in the General Radiology Department would not drastically change in the duration of this research project.

**Scope/Delimitations**

This research report solely focuses on the lack of communication expedited by General Radiology Technologists between the years of July 1, 2015 and July 1, 2016. While other degrees of miscommunication may have occurred between technologists employed within the remaining sub-divisions of the Radiology Department at Michigan Medicine, these occurrences are not included in this research report. Data has been collected in the form of a survey and interview only from Michigan Medicine employees that were employed between July 1, 2015 and July 1, 2016. This is because these are the years used to compare miscommunication mishaps.

**Definition of Terms**
The following definitions for terminology utilized in this research paper have been provided to reduce the likelihood of misinterpreting any information in this research.

- **Radiologic Technologists**: Professionals in the medical field who complete diagnostic imaging, or x-ray, examinations on patients for treatment purposes. These professionals utilize technical radiation factors to create anatomical images of patients’ bones and soft tissues which are used in the diagnoses and treatment plans of patients (American Society of Radiologic Technologists, 2017).

- **Michigan Medicine**: Formerly known as the University of Michigan Health System, this medical facility consists of roughly 30,000 employees and serves patients from every county in the state of Michigan. In 2016, Michigan Medicine served over two million outpatients and almost 50,000 inpatients (Michigan Medicine, 2017).

- **General Radiology Department**: Sub-department within Radiology in Michigan Medicine which services patients for the purposes of x-ray and fluoroscopy images.

**Summary**

Overall, this research aims to analyze the communication program utilized by the General Radiology Department of the University Hospital of Michigan Medicine. Communication is a vital asset to any organization, but this is especially so in General Radiology. It is imperative that patient care is the first priority of the General Radiology Department, and communication plays a key role in accomplishing quality patient care for all individuals. It is with hope that the research conducted in the duration of this project identifies the inadequate areas of the General Radiology communication process and sheds light on a new program design which will better serve the radiologic technologists, their workflow and all patients.
Chapter II: Literature Review

Introduction

A wide expansion of scholarly literature exists on communication and its effects on organizations. Extensive literature was reviewed and is presented with efforts to enlighten the qualities of effective communication, situations that can lead to limited communication and programs that are utilized within organizations to promote successful communication. The literature is organized into subtitles that reflect the primary research problem, its sub-questions and associated variables which may exist during interactions. Prior to this organized evaluation of the research problem, a discussion of the overall objectives of this complete literature review is provided. Following the discussion of objectives, a complete list of the possible variables which may exist during communication in a health care setting is identified to the reader. Next, the discussion of each variable in detail is provided to elaborate on how these variables can affect the health care industry. Afterwards, a needs assessment is provided along with an identified setting of any further conducted research and program implementation. Each aspect of this literature review is essential to the full comprehension of communication as a vital asset in General Radiology.

Objectives

It is imperative to explore published writings which relate to the research question and its sub-questions before discussing the methodology can begin. The goal of examining available literature is to shed light on existing communication styles, methods and programs that prevail in organizations outside of Michigan Medicine. In addition to this, the intention of the literature review is to address any possible variables and limitations which may currently exist in the communication program in General Radiology and also variables which may affect the program design of the future communication process.
Prior to completion of the literature examination, the research will identify the issues and variables that may exist during communicative interactions. The necessity of this task is relevant to ensuring that all aspects of communication related to the interaction program in General Radiology are addressed. Upon completion of the literature examination, a needs assessment will be presented. The goal of the needs assessment is to address a need in the clinical environment and demonstrate that the perceived need is actually necessary for General Radiology’s prosperity. The overall objective of this literature review is to ensure that a complete method of research is dedicated to the communication program in General Radiology. Once again, the objective of this research project is to identify the areas of weakness in the current communication program and produce a new communication program design which benefits the technologists and the patients they serve.

**Issues and Variables**

The variables that can exist in any type of communication are substantial to the success rate of each interaction. Also, different variables are likely to exist within each interaction, and not all interactions will present equal numbers of variables. In health care, these factors can result in major communication errors. This is concerning because of the focus of the healthcare industry - healing sick people.

The variables which can exist in the current communication program in General Radiology Department are as follows:

- Comprehension levels between the sender and the interpreter of information.
- Skill levels of communication.
- Skill levels of listening.
- Tone of the speaker
• Attitudes and behaviors of the speaker and listener.
• Accuracy of the message being conveyed.
• Health literacy.
• Amount of practice dedicated to communication.
• Employee satisfaction rates.
• Acceptance of diversity in the workplace.
• Amount of value that the organization places on communication.

These variables are identified and analyzed in detail in following section of “Background/Examined Literature.”

**Background/Examined Literature**

*Effective Communication Qualities.* There are a variety of factors that exist between individuals attempting to converse. One major variable is the fact that the listener may comprehend information differently than the sender. For successful communication to occur, the sender and the receiver must make the same comprehensions when partaking in interactions (Grover, 2005). Generally, if this does not occur, a miscommunication error exists. If this does not occur in healthcare, task performance and production may deplete, and quality of patient care may diminish. In addition, there are variables that exist based on the level of communication skills of individuals. Ultimately, there are basic communication skills that one must acquire to participate in successful interactions. These include asking open-ended and closed questions, listening and paraphrasing. Open-ended questions are essential in acquiring a variety of responses that could lead to unexpected and useful information while closed questions allow for quick and vital conversations to occur (Grover, 2005). For example, instead of asking, “Has a portable x-ray been completed on this patient yet?” one could ask, “Why hasn’t the portable x-
ray been completed on this patient?” This allows for the speaker to gain more of an understanding about the situation with the portable x-ray instead of only knowing if the x-ray has been completed.

Another variable in effective communication is the skill of the listener during an interaction. Listening is must be practiced when communicating in the health care setting. This includes keeping eye contact and focusing on the current information being transmitted instead of what may be coming next (Grover, 2005). Furthermore, paraphrasing the discussed information is a technique that indicates one understands the collected material. Here, elaborations on the topic can occur (Grover, 2005).

Besides these variables, the tone of the speaker’s message is another factor which may deplete the quality of the interactions. Staying assertive is a technique that must be utilized to form respectful, professional relationships. Assertiveness allows for professionals to remain expressive while building respect (Grover, 2005). The acronym, C.A.R.E., can help professionals remember to stay assertive. Clarifying the problematic behavior, articulating the problem associated with the behavior, requesting a behavioral change, and encouraging the change are the C.A.R.E. methods that will help any professional solve communicative behavior problems (Grover, 2005). When faced with tense situations in healthcare, such as a trauma emergency, the C.A.R.E. acronym will assist the team to work together to complete the ultimate goal of saving the patient’s life. During these types of scenarios, keeping the message clear and concise are two rules that the communicator should keep in mind. This will eliminate misunderstandings and misconceptions (Ramsey, 2002). Furthermore, the communicator should remain honest when conversing. Lying is contagious and will likely lead to more lies (Ramsey, 2002). If a radiologic
technologist did not complete an x-ray on a patient, he should not state that he did. This is a demonstration of poor patient care and an ineffective workflow.

Lastly, the speaker’s attitude and behavior are variables that will greatly affect the quality of his words. Communicating out of anger is one action that should never be followed. Angry words will fail to enlighten the audience and will only stir angry emotions (Ramsey, 2002). Even more, messages should stay consistent at all times, and reasoning should be given when necessary. Conversing the exact same facts to every audience and answering the “why” questions will enhance the validity of the message (Ramsey, 2002). Lastly, communicators who listen to their own words can change how they communicate when necessary.

Communication Challenges in Healthcare. Communication that remains unpracticed in healthcare will likely lead to diminished patient care. The likelihood of practicing constant communication is a variable that exists in healthcare. This is because healthcare is constantly advancing in terms of technology and treatment methods, so communication must advance as well (Baker & Watson, 2015). This means that all healthcare professionals must remain practiced in conversing with patients effectively to keep the quality of care at the highest standard. When conveying a message in healthcare, the recipient must always be considered (Baker & Watson, 2015). This is especially true when the recipient is a patient. When clear communication about patients’ treatment plans is utilized, the providers have the abilities to increase the health outcomes of those patients (Ilgun, Turac & Orak, 2014). Furthermore, healthcare professionals must also consider the patients’ family members when transmitting important messages. This is because family often plays a large role in decision making and treatment (Baker & Watson, 2015). With that being said, communication can often be pushed to the backburner in healthcare. Communication, or lack thereof, is the leading cause of patient deaths in healthcare (Coiera,
Remaining educated on the importance of communication in the healthcare world is the best way for all healthcare professionals to keep patients safe while increasing the quality of care through communicating.

Health literacy, or lack thereof, is a factor that severely affects the workflow and quality of patient care in a clinical setting. From a patient to provider standpoint, health literacy can prevent patients from receiving proper treatment plans due to their lack of understanding when communication with the physicians (Ilgun, et al., 2014). From a radiologic technologist to provider standpoint, health literacy can prevent the technologist from completing the tasks that the provider needs to provide proper treatment plans from patients. The largest challenge with the concept of health literacy is the fact that it is difficult to measure (Ilgun, et al., 2014). There are a variety of scales which healthcare professionals can make use of to attempt to measure health literacy. The Rapid Estimate of Adult Literacy in Medicine (REALM) test is the method of testing that health care professionals most prefer. This test requires individuals, such as the patient or the family members, to view a list of 66 medical terms and pronounce each word clearly. The reader will receive a score which is dependent on the number of correctly pronounced words (Ilgun, et al., 2014).

Reasons Behind Failed Communication. One factor which may lead to failed communication in healthcare is employee satisfaction levels. To analyze employee satisfaction of organizational communication a sample of 100 employees within a single company were examined. The research executed the case study and survey methods to identify the success of organizational communication based off of seven elements. These seven elements are “complete and true information, confidence between managers and employees, healthy and secure work conditions, fair payment, continuity of work without conflict, enjoyment in work, pride in
company and belief in its future,” (Spaho, 2010). Researchers sampled 100 employees in Bosnia and Herzegovina and provided each employee with a short questionnaire. The researchers concluded that, based off of the seven reasonings, 25% of the participants were completely dissatisfied with their organization’s communication while 60% were partly dissatisfied (Spaho, 2010). Finally, the researchers identified a proper solution to the results. Incentive programs that focus on team building and increasing employee morale will surely increase organizational communication (Spaho, 2010).

Because the United States is a diverse country that welcomes a variety of cultures and languages, healthcare organizations often encounter communication barriers between professionals. Stereotyping an employee based off of gender alone can immediately restrict conversation. Assuming that a female will only discuss her feelings while a male will only demonstrate authority results in communication that promotes that one gender is inferior to the other (Rawluszko, 2009). In addition to this, acknowledging cultural equalization is a crucial aspect of communication that can go unnoticed in an organization. Addressing each culture as an equal to the next shows consideration and that everyone is valued (Rawlusko, 2009). Failure to do so may lead to discrimination and stereotypes. Lastly, harassment and disrespect are conversational actions that will also diminish communication within an organization (Rawlusko, 2009). All of these barriers are variables that will immediately restrict the success of a healthcare facility if they are not vanquished appropriately.

As previously mentioned, it is no doubt that communication between healthcare professionals can be flawed. Because one is not born with the skills to communicate, he or she must practice. Children must be taught to communicate with others at an early age; if not, their brains may shut down the idea altogether (1996). Furthermore, the sender of the message focuses
on how he or she understands the context instead of how the receiver comprehends the material. This type of communication is practiced at an early age when children learn to state their needs and wants (Pierce, 1996). These two concepts are apparent in the healthcare industry. For example, management may only tell employees information on a need-to-know basis and even sugar coat that information. This revolves around communication remaining as a me-concept (Pierce, 1996). Communication patterns such as this can result in miscommunication between healthcare employees and management. Lastly, these types of practices result in healthcare professionals feeling unheard and unimportant which may inhibit their ability to participate in successful conversations (Pierce, 1996).

Strategies and Programs that Amplify Communication. A variety of communication tools and designs exist which can be utilized in healthcare facilities to improve the quality of conversation between professionals and patients. The Situation, Background, Assessment and Recommendation, or SBAR, strategy is one tool that can be practiced by healthcare facilities to ensure that proper communication is consistently utilized. This method requires the healthcare professional to state the problem at hand, any information related to the problem, his or her evaluation of the problem and a proposed solution (Clochesy, Dolansky, Hickman & Gittner, 2015). Communication researchers used focus groups where this method was applied to participants. These researchers found that SBAR3 engaged patients in the treatment of their care by asking questions and requiring elaborations of treatment methods, thus resulting in fewer errors (Clochesy et al., 2015). Another strategy that should be utilized by healthcare professionals is the “Ask me 3,” or AM3” method. This tool focuses on professionals acknowledging the following statements to patients, what the problem is, what must be done, and
why this action must be done, Clochesy et al., 2015). Although the success rate of AM3 is not conclusive, this strategy still promotes effective communication within healthcare organizations.

Utilizing employee incentive programs is a strategy that companies can use to improve any aspect of an organization. To complete this strategy, there are a number of steps which organizations should follow. First, management must clarify an incentive to employees that will result in an increase the productivity or quality of the organization (Bolger, 1996). This will motivate employees to work towards the incentive. Next, management must acknowledge the goals of the program and the variables that could affect those goals. The goals must be feasible and realistic in order for the program to remain successful (Bolger, 1996). Management must then decide between an open-ended program or a closed-ended program. Open-ended programs can award all participants who reach the program goals while closed-ended will only award the program’s top performers (Bolger, 1996). Establishing an appropriate budget and the rules of the incentive program will be the next steps for management to follow. Prior to implementing the program, it must be approved by the top-management team in the organization. At this point, the incentive program must be ready to execute (Bolger, 1996). Once approved, the program is ready to be put into action. Here, management can determine the benefits of the program and if it was successful (Bolger, 1996). This type of guide can be utilized to construct any type of incentive program with the hopes of solving quality problems within an organization. This includes issues with communication in a health care facility.

To add to these strategies, training programs with a focus on communication strategies should be implemented in healthcare facilities. One training program that was implemented by Spectrum Health in Grand Rapids, Michigan proved that communication training can lead to less miscommunication between healthcare professionals. Spectrum Health has identified that
healthcare professionals must possess communication skills that will enhance trusting relationships while following the guidelines necessary to transmit confidential information (Becker, 2015). Such an actualization has resulted in the DiSC assessment. DiSC is a behavioral evaluation that was implemented by Human Resources that focuses on team building between all of the departments of Spectrum Health (Becker, 2015). Basically, DiSC is a short evaluation that each employee participates in. The assessment establishes the employee’s behavior patterns and how he or she can express his or her behavior in a professional and efficient manner (Becker, 2015). This simple program has improved teamwork and communication at Spectrum Health immensely. Overall, DiSc reduces stereotypes and assumptions that exist between different departments and promotes powerful teamwork that enhances patient care (Becker, 2015).

In 2010, Michigan Medicine implemented a new program, MiChart, to better serve its patients. Stage three of the implementation process of MiChart was introduced to Michigan Medicine employees in June of 2016 (Schade, 2014). The initial purpose of MiChart was to provide a thorough, electronic documentation of patient records. This third stage of implementation is called EPIC and serves many different aspects of patient care at Michigan Medicine. EPIC replaced all physician and nursing documentation, pharmacy documentation, paper orders, inpatient and outpatient portals, scheduling for all types of appointments including surgeries and many other aspects of patient care (Schade, 2014). The beauty of EPIC is that many different types of communication between healthcare professionals can exist in one program. Doctors can put in orders for patient imaging and can communicate special instructions, nurses can document each patient’s care as completed step-by-step and phone numbers for every member of each patient’s care team is provided. Furthermore, all professionals can send each other notes within each patient’s charts that may depict patient care
instructions or occurrences that existed during care (Schade, 2014). MiChart is a program which focuses on intensifying the accuracy of patient care documentation while increasing communication between all professionals in Michigan Medicine.

Lastly, a study which evaluated patient-care handoffs in children’s hospitals, specifically during transportation to radiology, proved that increased communication during handoffs reduced miscommunication errors. In this study, 23 hospitals and their handoff processes were observed (2014). The study gathered the most beneficial results from Akron Children’s Hospital in Akron, Ohio. Akron Children’s Hospital implemented a Ticket-to-Ride handoff process which provided radiology employees with beneficial information regarding inpatients that were scheduled for imaging. This information included the patient’s current breathing status, limitations and treatment plan (2014). Implementing this new communication plan paid off in major ways. Because of the Ticket-to-Ride process, there was a 94 percent decrease in patient care errors during the handoff process of inpatients at Akron Children’s Hospital (2014). This strategy proves that solutions to failed communication exist and quality of patient care can certainly flourish because of improved installments of new communication plans.

**Needs Assessment**

*Perceived Need within General Radiology.* Communication is an essential aspect of health care that can be used misguided if it is not taken seriously. Communication is as simple as sending or receiving a direct message to or from an outside party but can become misinterpreted when the sender or the receiver do not possess the proper skills or resources (Gordon, Mendenhall, & O’Connor, 2012). The purpose of this needs assessment is to assess the communication tools utilized in the General Radiology Department at the University Hospital of
Michigan Medicine and determine whether these tools need to be replaced with more reliable resources.

The current communication tools used in General Radiology have proven to be unreliable on many occasions. Each technologist is required to carry a Cisco 7925G wireless phone and a Motorola pager. The Cisco wireless phones have much difficulty connecting to the wireless router system within the hospital. This makes it difficult to complete phone calls in many areas throughout the University. In addition, these phones often break very easily. The Motorola pagers are sturdy but often send pages with mismatched characters or fail to send pages at all. These undependable devices contribute to many communication errors within the General Radiology department. In fact, misguided communication within health care is responsible for approximately 30 percent of medical errors (Brusin, 2014). Providing the radiology employees with a reliable communication system would essentially reduce the high numbers of errors that occur every day.

History of Communication Devices. The Motorola pagers have been utilized by general radiology for the past seventeen years (W. Bell, personal communication, September 12, 2017). This paging system has not been addressed, evaluated, or changed within this time frame. When issues have occurred in the past that have caused delays in pages, the radiology employees were faced with coping with the delays for the system to be fixed.

The Cisco 7925G wireless phones have been utilized for the past three years. These phones are a corporate price of $500 each (D. Burch, personal communication, September 12, 2017). The cases and carrier clips for the phones are bought separately. Each phone is covered with a zCover gloveOne carrying case at approximately $50 each and a Cisco Unified Wireless IP phone clip at approximately $30 each (D. Burch, personal communication, September 12,
2017). The carrying case does not cover the screen of the phone, nor protect the phone from shock or water. The phone clip is not sturdy which often results in the phone falling off the clothing. The department has sixteen phones which equals a grand total of $9,280. Because of the great expenses of these phones, management has applied strict rules on how to carry the phones and use them. Many technologists view these phones as a strain to the department and stressful tools. Utilizing these phones becomes a hassle because they are difficult to clean and only work in specific areas of the hospital.

Prior to utilizing the Cisco phones, the department used Motorola i850 Nextel phones provided by Sprint. These phones were utilized for approximately four years, but were discontinued by Sprint. The cost of these phones is currently confidential. These phones were great because they provided “Nextel Direct Connect” services that acted like walkie-talkies. They were very bulky phones, but were shock resistant. The discontinuation of these phones forced the department to search for an alternative.

*Types of Assessment Tools.* Assessment tools are crucial when addressing a need within a department. When used correctly, assessment tools can help prove whether a need is in demand and can be supported. Furthermore, assessment tools also provide the structure for the information collected and can help draw conclusions from this information (Royse, Badger, & Staton-Tindall, 2009). The assessment tools chosen for this specific needs assessment are a survey and an interview. The survey will be provided to technologists for feedback regarding the current communication tools and their understandings of effective communication qualities. A survey will be the best assessment tool in this aspect because it can be done in a timely fashion with little resources and can provide direct data in an organized manner. The interview will be utilized for employees within Michigan Medicine that work in departments outside of General
Radiology. The interview will address what types of communication programs these employees use in their departments. An interview is the best assessment tool in this aspect because it will allow the employees to elaborate on their communication programs and provide in-depth, detailed answers. Providing the correct assessment tool is imperative because it needs to be easily approachable by employees (Royse, Badger, & Staton-Tindall, 2009). These two assessment tools will be conducted in an approachable, unaggressive manner.

Setting

Ultimately, the setting of the conducted research took place in the University Hospital of Michigan Medicine. While much of the research occurred in the General Radiology Department, additional research occurred in outside departments within the University Hospital of Michigan Medicine. Research in outside departments mainly focused on different communication programs that existed within those departments. The researcher predicted that the overall atmosphere of the conducted research would occur in a fast-paced, tense environment that revolves around caring for critical patients. The following types of communication are evaluated during the research process: face-to-face, texts via pagers and phone conversations.

The design of a new communication program as well as the implementation of that program took place in General Radiology in the University Hospital of Michigan Medicine. It is fully expected that this new program has the ability to replace the current communication process that General Radiology currently utilizes. This means that the success of this program design rests on its capability to address the demands of the technologists in the fast-paced, stressful environment of a Level 1 Trauma Center.

Conclusion
A variety of communication variables exist in any type of interaction, and these variables are especially apparent in the clinical setting. These variables can damage the General Radiology Department if they are not appropriately addressed. Furthermore, miscommunication will continue to harm the department as long as the technologists do not commit to communicating effectively in a diverse environment of healthcare professionals and patients.

There are various strategies that one could approach to become a better communicator. Keeping the intended message clear and concise while remaining completely honest will help reduce distortion of the message. In addition, utilizing open-ended and close questions when necessary can optimize conversations and allow the sender to acquire the right types of information. When caring for patients, healthcare professionals should consider the C.A.R.E. method in order to convey and solve behavioral problems. To reduce the limitations of communication, management should focus on keeping communication accurate and true and also limiting the stereotypes and discrimination caused by diversity. Lastly, there are numerous strategies that one could practice to enhance his or her communication level. The SBAR and AM3 methods can be utilized in any healthcare facility and directed towards patients and colleagues. Both of these methods allow for the elaboration of vital information. The DiSC program is another method that organizations should consider to assist in building communication and teamwork between different departments of professionals. The General Radiology Department can benefit from any of these strategies. Overall, communication is a vital process that should never go unnoticed or unpracticed. As healthcare continues to advance and change, communication must follow suit.
Chapter III: Research Methodology

Introduction

The variety of literature provided demonstrates that communication can be found in various professional settings and can also be evaluated effectively in healthcare. This does not exclude Michigan Medicine. Given the vital role that the General Radiology Department plays in patient care, ignoring the communication process within the department is not an option. This research seeks to analyze the current communication method utilized in General Radiology and to provide a general resolution to this method. The following sections in this Methodology chapter will depict the research process step-by-step and in its entirety.

Research Approach

Because communication already exists within General Radiology, an evaluation of the communication program as a whole was necessary to determine its effectiveness. By utilizing the explanatory design method, it was most feasible to collect data through the quantitative design approach. The quantitative research method was particularly useful in generating the statistics needed to determine the validity of the communication devices provided by General Radiology. The validity of these tools was measured by usage of the Likert scale in the form of a short survey. This survey allowed all of the General Radiology technologists to rate general, non-biased statements in regard to the communication devices in an organized manner. The survey only identified the strengths and weaknesses with the current communication program in General Radiology and addressed the technologists’ perceptions of proper, successful communication.

To view the research problem in its complete context and to search for a solution which strengthens the current communication program in General Radiology, the qualitative design approach was utilized. A phenomenological study was conducted through the use of an interview
to understand what types of communication programs other departments in Michigan Medicine utilize. This approach was most useful because it allowed the researcher to gather different communication techniques that are used elsewhere in the hospital in an organizational manner. The interview also allowed the researcher to analyze each communication program in depth and gather the strengths and weaknesses from each program. Lastly, the interview was the best choice for this phase in the data collection because it allowed participants to answer questions in a detailed manner.

Data Collection Approach and Procedures

Types of Collected Data. To adequately answer the primary research problem and its sub-questions, a various amount of specific data was accumulated. First and foremost, the researcher discovered which exact communication devices are currently used by the technologists in the General Radiology department. The researcher then collected data that assisted in determining if theses communication tools are indeed valid and appropriate for the department. Validity was determined by acquiring information regarding the technologists’ experiences with the communication tools.

Second, the researcher collected adequate amounts of data that allowed for an understanding of how the technologists interpret communication. This included gathering information regarding the importance of keeping communication consistent and the necessity of successful communication. The researcher also collected information which displayed the technologists’ perceptions of the qualities of communication that they view are most important in the healthcare industry. Here, the content analysis approach was utilized to identify patterns between the technologists’ responses.
Lastly, the researcher obtained data regarding the communication programs that other departments in Michigan Medicine utilize. The research identified if these communication programs are successful and if these programs are accessible to General Radiology. Because the workflow of the University Hospital is far more intense than many other sub-facilities in Michigan Medicine, the gathered research solely focused on different departments within the University Hospital. All of this data aided in answering the sub-questions and most importantly the primary research question, “How can communication between all employees be improved upon within the General Radiology Department at the University Hospital of Michigan Medicine?”

Data Collection Procedures. As previously mentioned, a combination of a survey and an interview was conducted to complete the data collection process. These two methods provided the researcher with sufficient information to determine a solution the research problem at hand.

Both, the survey questionnaire and face-to-face interview questions, were created only for this specific study. These two data collection methods were only utilized for the purpose of this research and no other research. Because of this, the validity of the two collection methods was not tested. However, the data produced from the survey questionnaire and the interview questions allowed the researcher to address the primary research question and its sub-questions. All respondents of the survey represent a horizontal, professional relationship with the researcher in the sense that they all possess the same profession with the same job duties and expectations. The respondents of the interview represent a vertical, professional relationship with the researcher in the sense they perform different job duties within Michigan Medicine. Copies of the survey questionnaire and the face-to-face interview questions are provided in Appendix C.
Survey Procedure. In hopes to generate responses from 30 surveys, all technologists from the target population were provided with a short, hard-copy survey. The survey remained anonymous and was approved by Central Michigan University through the utilization of the CMU Research Application Process. The survey consisted of a permissions letter to conduct the study from the General Imaging manager and a consent letter which explained the reason for the survey and the research conducted and also the importance of providing answers to their truest form. The consent letter also disclosed the existence of anonymity of the participants.

The survey questionnaire and a blank envelope were both provided in each technologist’s radiology mailbox. This was the only contact information acquired to administer the survey. It was then the responsibility of the survey participants to complete the survey within ten days of distribution, seal it in the blank envelope and return the completed survey to the researcher’s radiology mailbox. All radiology mailboxes are located in a confined, secure room where the rule of anonymity can be followed. It is important to indicate that pregnant women, who are considered to be of a vulnerable population, were included in sample population. This is because many women in the target population were pregnant during the course of the study and not including them in the study would leave the results of the survey incomplete.

Face-to-face Interview Procedure. The face-to-face interview questions were provided to Central Michigan University through the CMU Research Application process to receive approval. To conduct an adequate sample from all areas in the University Hospital, four participants, each from different departments, were interviewed. These different areas included Computed Tomography, Emergency Room Nursing, Transportation, and Nuclear Medicine. It is important to note that these interviews were conducted outside of the Michigan Medicine buildings in an informal, nonaggressive manner. All potential candidates were contacted through
the use of the Michigan Medicine email list. This email list can be filtered to any department and provides the email addresses of all participants in that department. The first respondent from each department was selected to participate in the interview. As with the survey questionnaire, pregnant women were included in the random sampling process. If a selected participant wished to exclude his or herself from the interview process at any time, the researcher then chose the second respondent from that department to partake in the interview.

The face-to-face interviews were conducted in a location of choice by each of the participants. Each individual interview lasted no longer than thirty minutes and was conducted outside of the Michigan Medicine healthcare facility. Because these interviews were not anonymous, each interviewee was provided with a consent form that must be signed prior to the interview. The interviewer also discussed the consent form with the interviewee before any interview questions are asked. Each participant was recorded by use of a pseudonym that consists of a series of letters and numbers. This will ensure that the results of the interview will remain anonymous to Michigan Medicine and to Central Michigan University. The total interview process was expected to take no more than ten days. A copy of this consent form will be provided in Appendix B.

**Target Population**

The target population for this study was the 66 technologists employed in the General Radiology Department between July 1, 2015 and July 1, 2016. This ensured that only the technologists who have had much experience with communication in General Radiology were sampled. Furthermore, this eliminated the newest technologists from participating as they may have provided information based off of inexperience with communication devices or lack of knowledge of the General Radiology protocols.
The target population for the interview process was approximately 170 Emergency Room Nurses and 46 transporters (D. Burch, personal communication, September 12, 2017). In addition to this, the target population also consisted of 32 computed tomography technologists and 27 nuclear medicine technologists. As previously stated, a participant from each area was selected which resulted in four interview participants. The target population only consisted of professionals who have been continuously employed from July 1, 2015 to July 1, 2016. This allowed for the accessibility of interview participants who have had much experience with their communication programs and can provide honest, in depth answers.

**Data Analysis and Synthesis**

Two approaches were used to analyze all of the data collected. The first of these was descriptive statistics. This was especially apparent in the data collected from the survey questionnaire and also in some interview questions. Because the Likert scale was utilized in the surveys, the responses from each question was organized to find the mode, mean and the standard deviation. Finding the mode of each response allowed the researcher to identify which responses occurred most frequently for each question. This resulted in identifying the number of respondents who felt similar about each question. The mean identified the average response for each question. This resulted in the researcher establishing the balanced response for each question. The standard deviation for each response measured the variation between responses. This allowed the researcher to analyze if the responses for each question were similar or if some participants felt strongly one way versus others that felt the opposite.

The second approach that was utilized was inferential statistics. This approach was apparent in the data collected from the interviews and the open-ended questions from the survey questionnaire. It was the responsibility of the researcher to analyze the data collected from the
smaller interviewed sample in order to make general presumptions about the target population as a whole. The technologists’ viewpoints of successful communication along with the communication programs that other departments use was also analyzed through inferential statistics.

By utilizing these two approaches, the researcher expected to find the primary reasons for miscommunication in General Radiology. The researcher also anticipated the ability to narrow down which tools caused miscommunication errors more frequently than others. Lastly, the researcher expected to reach a general solution as to a proper communication program that could be implemented in General Radiology.

Validity

The validity of this methodology and research process was briefly discussed in previous sections, but has been collected and summarized for a complete understanding of the reliability of the chosen methodology. While the interview and survey questions were created solely for this research which limited the validity of these questions, the researcher felt confident that the responses from these two types of data collection were valid in completing the necessary research. The Likert scale was used in the surveys to ensure that validity of the responses. The Likert scale allowed the respondents of the survey to provide answers which indicated whether they strongly disagreed, disagreed, were neutral to, agreed or strongly agreed to each of the statements in the survey. To determine if the communication tools utilized in General Radiology were indeed failing the department, the validity relied on the survey responses from the technologists. Furthermore, inferential statistics supported the validity of the open-ended questions within the survey. These questions were essential to completely understanding how the
technologists perceived successful communication. Lastly, inferential statistics also supported the validity of the conducted interviews.

**Methodological Limitations**

A variety of known limitations existed with the selected methodology. First, the sample size of the face-to-face interview was relatively small in comparison to the sample size of the survey questionnaire. This could have led to incorrect inferences made upon the communication programs that other departments in Michigan Medicine utilize. Interviewing a larger sample size would not have been feasible as it would interfere with the timeliness restrictions of this research.

Likewise, the face-to-face interviews were not conducted anonymously. This could have led to false information presented from any of the participants. The researcher understood that participants may have been hesitant to answer questions in their truest form due to the concern for anonymity. The reduce this limitation, the researcher discussed the importance of truthfulness and completeness prior to the interview and also emphasized the anonymity of the results.

In addition to the prior limitations, this research only identified communication habits in a time zone of one year. It is likely that communication habits could vary from year to year, especially with the recruitment of new technologists. The researcher also understood that communication habits may have developed prior to July 1, 2015 and may have presented bias results from the sample population. It is also understood that participants may not remember the exact date of miscommunication occurrences and may provide information that occurred prior to July 1, 2015 or after July 1, 2016.

Even with considering these limitations, the researcher believed it is still of utmost importance to conduct this research. These limitations were not expected to obscure results in a
manner that could have provided an invalid study. Improving the communication process in General Radiology continues to remain of utmost importance to the department as a whole as the results were expected to increase patient safety and patient care.

Summary

The selected methodology addressed the research question in its entirety and all of its sub-questions. First, a survey was provided to a target population of 66 technologists in hopes to generate a sample of 30 radiologic technologists employed in General Radiology. The sample addressed the weak areas of the department’s current communication program through usage of the Likert scale and inferential statistics collected from the open-ended questions. Then, an interview was provided to four professionals who work in different areas of the University Hospital of Michigan Medicine. One professional from each of the following areas was selected: Emergency Room Nursing, Computed Tomography, Nuclear Medicine and Transportation Services. Inferential statistics were utilized to analyze the responses from these interviews. The purpose of the interview process was to research the different communication programs that are utilized in different departments of the University Hospital of Michigan Medicine. While there were some limitations to the chosen methodology, the researcher believed that this was the best method to analyze the current communication program in General Radiology and to search for a communication solution that will best suit this department.
Chapter IV: Data Analysis

Introduction

The methodology discussed in chapter three was successfully implemented for these research purposes and achieved phenomenal results. The surveys were provided for 66 technologists and the researcher reached the intended sample population within a ten-day period. The interviews were conducted within the same ten days with four healthcare professionals. The researcher was able to generate descriptive and inferential statistics from the surveys and interviews which is discussed in depth in the succeeding sections. In addition to this, a proposed and detailed project design is also discussed in the succeeding sections. This project design includes an overview, the personnel and equipment necessary for the project, the time-frame required for implementation, its coordination with other programs within the health system, the programs benefits and costs and a monitoring plan for the program.

Description of Data Sources

Data for this specific research project were collected from various sources within Michigan Medicine to effectively analyze General Radiology’s communication program and compare that program to other communication processes followed by staff within the University Hospital. To begin the research process, a survey consent letter, a survey and a blank envelope were placed inside each radiologic technologist’s employee mailbox. As mentioned in previous sections, only radiologic technologists employed between July 1, 2015 and July 1, 2016 were a part of the target population. This totaled 66 technologists who were eligible to complete the survey. The technologists ranged from 23 to 59 years of age, and all technologists represented a horizontal, professional relationship with the researcher. The technologists were instructed to seal their surveys in the blank envelopes and place the envelopes in a larger envelope in the
researcher’s employee mailbox. After the ten-day period, the researcher collected the envelope and inspected 33 participants had optionally completed the survey. All 33 technologists perform various tasks within the department which require them to carry both communication tools supplied by the department. The initial goal was to collect 30 responses from the radiologic technologist target population. All 33 responses were considered valid data due to the surveys being answered in completion and were further used to determine the effectiveness of General Radiology’s communication process.

The data sources for the interviews were four professionals employed within the Michigan Medicine health system between July 1, 2015 and July 1, 2016. These sources were kept anonymous for this research study and will be further referred to as “Source A,” “Source B,” “Source C” and “Source D.” It can be stated that “Source A” was employed in Computerized Tomography as a CT technologist, “Source B” was employed in Nuclear Medicine as a nuclear medicine technologist, “Source C” was employed in Transportation as a transporter and “Source D” was employed in the Emergency Room as an ER nurse. As stated previously, all four of these departments are located within the University Hospital of Michigan Medicine. The age range for these sources is 26 years to 42 years. These four sources were the first to respond to department-wide emails that were sent in regard to this research study as discussed in previous sections.

**Technical Interpretation of Pertinent Data**

The results from the data collected were analyzed through descriptive statistics as well as inferential statistics. All results from the survey and interviews reflected answers that were deemed appropriate to the questions asked and were taken into account as valid results which could be used for analyzation. Answers were determined “appropriate” because they were related to the questions being asked and did not stray from the topic of discussion.
Descriptive Statistics for Survey. Descriptive statistics were used to analyze the first nine questions of the optional survey provided to the radiologic technologists in General Radiology. A copy of this survey can be found in Appendix C. The results from each question has been organized into tables, and the mean, mode and standard deviation were calculated from the results. It is important to note that the standard deviation for the results only represents the sample size and not the target population.

The first question on the survey asked, “On average, how many days a week do you carry a Cisco wireless phone and a Motorola pager?” The respondents were given an option of one day, two days, three days, four days or five days. The results from the question are presented as in Table 1.1.

Table 1.1

<table>
<thead>
<tr>
<th></th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Day</td>
<td>0</td>
</tr>
<tr>
<td>2 Days</td>
<td>0</td>
</tr>
<tr>
<td>3 Days</td>
<td>4</td>
</tr>
<tr>
<td>4 Days</td>
<td>8</td>
</tr>
<tr>
<td>5 Days</td>
<td>21</td>
</tr>
</tbody>
</table>

Table 1.1 depicts the mode of the results to be “five days” meaning that most of the respondents carry the communication tools five days per week. The table also depicts the average response to be 4.5 days that technologists carry the communication tools. The standard deviation for the responses is 0.712 which means that the variation of responses is similar to the mean of the responses.
The second question of the survey asked, “I rarely have any issues with the communication devices provided to me on a daily basis.” The respondents were asked to rate the statement as to whether they strongly agreed, agreed, were neutral to, disagreed or strongly disagreed with the statement. The results are depicted in Table 1.2.

Table 1.2

Table 1.2 depicts the mode of the results to be “disagree” although “strongly disagree” was a close response. This means that most respondents felt that they experienced issues with the communication devices on a daily basis. The average response to the statement is 3.97 which means that the average response was to disagree with the statement. The standard deviation of the responses is 1.104. This means that the standard deviation of the responses is similar to the mean of the responses.

The third question on the survey asked, “I feel secure in sending important messages to my coworkers via the Motorola pagers because pages send quickly and correctly.” The respondents were asked to rate the statement as to whether they strongly agreed, agreed, were
neutral to, disagreed, or strongly disagreed with the statement. The results of the statement are depicted in Table 1.3.

Table 1.3

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
<td>3</td>
<td>13</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 1.3 depicts the mode of the results to be “disagree” meaning that most of the respondents disagreed with the statement. The average of the results was 3.72 which means that the average response was to disagree with the statement. The standard deviation of the responses was 1.232. Similar to the previous two questions, the standard deviation of the responses is similar to the mean.

The fourth question asked, “There are numerous occasions where I cannot contact an employee via the Cisco wireless phone because of a lack of wireless service or some other malfunction.” The respondents were asked to state whether they strongly agreed, agreed, were neutral to, disagreed, or strongly disagreed with the statement. The results of the statement are depicted in Table 1.4.

Table 1.4
Table 1.4 depicts the mode of the responses to be “agree.” This means that respondents mostly agreed with this statement over any of the other responses. The mode of the responses is 2.27 meaning that the average response was to agree with the statement. Lastly, the standard deviation of the responses is 1.306. This means that the standard deviation represents the average of the responses.

Question five of the survey asks, “I often receive multiple pages via the Motorola pager that are unreadable due to errors in the paging system.” Once again, the respondents were asked to state whether they strongly agreed, agreed, were neutral to, disagreed, or strongly disagreed with the statement. The results of the questions are displayed in table 1.5.

Table 1.5
Table 1.5 depicts the mode of the responses to be “agree.” This means that respondents agreed with the statement more often than any other type of reaction. The average of the responses is 2.5 which means that respondents were borderline with agreeing with or were neutral to the statement. The standard deviation of the responses is 1.228 which means that the variance of the responses still represents the average of the responses.

Question six of the survey asks, “I rarely have difficulty in completing my assigned tasks due to malfunctions with one or both of the communication devices.” Respondents were asked to rate the question in the same format that questions two through five were rated. The results of the question are displayed in Table 1.6.

Table 1.6
The results from Table 1.6 display the mode response of the statement to be “disagree.” This means that respondents disagreed with the statement more than any other reaction. The average response was 3.73 which means that the average response was to disagree with the statement. Lastly, the standard deviation of the responses is 1.206. Once again, the variance of the answers still represents the mean of the answers.

Question seven of the survey was, “The communication standards of the General Radiology Department are presented to me in a clear manner on an annual basis.” Respondents were asked to rate this statement in a similar manner to the previous statements. Table 1.7 depicts the responses for this statement.

Table 1.7
Table 1.7 shows that the mode of the responses is to “strongly disagree” with the statement. Respondents strongly disagreed with the statement more than indicating any other response. The average of the responses is 4.4 which means the average is to disagree with the statement. Lastly, the standard deviation of the responses is 0.863 which means that the variation of the responses is similar to the average of the responses.

Question eight asked the respondents, “I feel that the unreliability of the communication devices has resulted in delays in patient care on numerous occasions.” The respondents were asked to rate the statement to indicate whether the strongly agreed, agreed, were neutral to, disagreed, or strongly disagreed. The results from the question are displayed in Table 1.8.

Table 1.8
The mode for the responses of question eight is “strongly agree” which means that the survey participants strongly agreed with this statement more than providing any other reaction. The average of the responses is 1.91 which means that the average response was to agree with the statement. The standard deviation of the responses is 1.33. The variance of the responses still represents the mean of the responses.

Finally, question nine asks the participants, “A communication program would be beneficial for me and the department as a whole.” The respondents were asked to rate the statement in a same manner presented in questions two through eight. The results of the question are displayed in Table 1.9

Table 1.9
The mode of the responses, as displayed in Table 1.9 is “agree,” but “strongly agree” is a close second. Overall, it is safe to say that most of the respondents either agreed with the statement or strongly agreed. The average response to the statement is 2.24. This means that the average response to the statement was to agree. Lastly, the standard deviation of the responses is 1.146. This means that the variance of the responses closely represents the average of the responses.

*Inferential Statistics for Survey.* Inferential statistics were used to analyze one question in the survey and all of the interview questions with the four participants. This was the best method of analyzation because these questions were open-ended questions which allowed for a wide variety of answers. A copy of the interview can be found in Appendix C.

Question number four in the survey asked participants to rate the statement, “There are numerous occasions where I cannot contact an employee via the Cisco wireless phone because of a lack of wireless service or some other malfunction.” Along with this statement, participants were also provided with a blank space where they could describe malfunctions other than “lack of wireless service” that occurred with the Cisco wireless phones. Responses for this portion of question number four varied but can be simply summarized. Other malfunctions of the Cisco wireless phones included “dropped calls” where employees could no longer hear the person
whom they were communicating with, the phones turning off when supplemental battery is still available, the phones not charging and the phones breaking easily when accidently dropped less than five feet even in their protective cases. These various malfunctions with the Cisco wireless phones imply that there are multiple reasons that employees cannot contact each other or other professionals in the University Hospital.

*Inferential Statistics for Interviews.* “Source A” for the interview was a computed tomography technologist. The interview was conducted at a local library and lasted approximately twenty-six minutes. The results from the interview are categorized by the questions of the interview.

1. **Is your department required to communicate with each other to complete daily tasks? If so, in what way?** “We communicate with each other on a regular basis to complete CT scans. We also have to speak with patients, doctors and nurses on a regular basis. Sometimes we have to call doctors if they ordered something wrong, or sometimes we call the nurse if something happened to the patient. Very rarely, we call other departments to correlate appointment times for patients.”

2. **What types of communication tools does your department utilize to interact with each other?** “We typically just use our department phones if we need to call someone. They are just the regular, standard black phones that have a cord. They sit on the desks in our core areas. Our bosses have pagers in case we need to contact them, but none of us carry any pagers.”

3. **In your opinion, are these tools effective in your department? In other words, can you rely on these tools?** “Yeah, I’d say the phones work just fine. It would be
nice if we had a few pagers for people who have to go up to the fourth floor and do the rare, portable CT scan. For the most part, though, the phones serve their purpose.”

4. **Is there any other type of communication that your department utilizes to interact with each other?** “We use email when we need to contact the department as a whole about important information. Of course, we talk face-to-face as well. We are a simple team, and we don’t require much to succeed.”

5. **Are there any types of communication tools/programs that you feel could benefit your department more than your current communication program?** Besides having pagers when we do portable exams, not really. We don’t really work outside of our department, so we don’t need a lot to work well with each other. I think we even looked into getting pagers for when we do portable CT exams, but were turned down.

It can be inferred that the workflow for the Computed Tomography department, as indicated by “Source A,” is slightly different than the workflow of General Radiology. Because computed tomography technologists do not travel outside of their department, they do not require much need for communication tools.

“Source B” was a nuclear medicine technologist. The interview was conducted at a McDonald’s restaurant mid-day. The interview was completed in twenty-two minutes. The results of the interview are organized by the questions of the interview.

1. **Is your department required to communicate with each other to complete daily tasks? If so, in what way?** “Yes, we have to constantly work as team because our exams take such a long time to complete. One tech will complete the IVs for all of the patients while one tech will do all of the scanning for the patients. We are divided up
into mini-sections, so we have to call each other from time-to-time. Our department is pretty small compared to some, so sometimes we just walk to each other. We also have our own radiologists that we work with to approve our imaging, and we talk to patients on a regular basis.”

2. **What types of communication tools does your department utilize to interact with each other?** “We have department phones in each of our cores, but we pretty much use our own two feet to talk to each other. We only call each other or doctors or nurses if we cannot leave our patients by themselves. When we are on-call on the weekends, we use the hospital pagers. The radiologists will page us when a study needs to be done and then we come in.”

3. **In your opinion, are these tools effective in your department? In other words, can you rely on these tools?** “Yeah, for the most part, I’d say the phones work fine. Except, one time when I was on call, a radiologist paged me, and I never got it. The radiologist was really mad because of the delay, and my boss had to go through the paging audit trail to prove that the page never went through.”

4. **Is there any other type of communication that your department utilizes to interact with each other?** “We just walk to each other and talk in person. That works best for us because we can give each other paperwork and really get our messages out clearly. We mainly work with outpatients, so we typically just stick to our little areas.”

5. **Are there any types of communication tools/programs that you feel could benefit your department more than your current communication program?** “We aren’t allowed on the Internet in our department, so that really limits what programs we can
use to communicate. We are stuck with the old-fashioned pencil and paper techniques if we have notes that we need to pass along. It would really be helpful to have access to the Internet, so we could use MiChart to write each other notes about exams and patients.”

“Source B” implied that the Nuclear Medicine department does not have an established communication program. This source indicated that they use “pencil and paper” which implies that there is one common area where such notes can be seen by all technologists. Similarly to Computed Tomography, Nuclear Medicine uses the standard department phones when they cannot talk face-to-face with each other.

“Source C” for the interview was a transporter for the hospital which means he/she transports patients to their appointments. This interview lasted thirty-eight minutes and was conducted at Panera Bread restaurant. The results of the interview are organized by the questions of the interview.

1. **Is your department required to communicate with each other to complete daily tasks? If so, in what way?** “We communicate mostly with our supervisors, patients and the nurses on the floors. We call our supervisors when we have questions, but we mostly work with the nurses on the floors when we pick up their patients for their appointments. Oh yeah, and we talk with the different departments when we drop patients off to them.”

2. **What types of communication tools does your department utilize to interact with each other?** “We use iPhones that are integrated with MiChart. We can’t make phone calls on them or text each other. What happens is, when we are assigned to pick a patient up, our iPhone notifies us the information we need to get the patient and take
them to the appointment. All of the patient runs are put in the MiChart system, organized by appointment times, and then assigned to us. When we have to call our supervisor or anyone else, we have to find an available phone in the hallways to use.”

3. **In your opinion, are these tools effective in your department? In other words, can you rely on these tools?** “Yes, the iPhones work great! We used the paging system before, and it was horrible and delayed all the time. The iPhones are never delayed, and we never miss our runs.”

4. **Is there any other type of communication that your department utilizes to interact with each other?** “There isn’t really any formal kind of communication we use other than the iPhones. If I want to partner up with someone for a run, I just check the system to see if they are available, and then I text them with my own cell phone. That’s not really allowed, but we do it anyways.”

5. **Are there any types of communication tools/programs that you feel could benefit your department more than your current communication program?** “It would be awesome if we could make phone calls on the iPhones and text people. All that is blocked so we don’t abuse the system, but we could really use those features. There’s tons of times when we have to call someone, but can’t find an available phone anywhere. If we could use our own iPhones for that, it would save us a lot of time.”

“Source C” depicts a program that is foreign to General Radiology. While General Radiology does utilize MiChart, the Transportation department seems to use MiChart in a different manner. It can be inferred that the iPhone/MiChart system assigns the transporters their work, but they cannot fully use the full capabilities of the phones. The communication program established by the department is effective, but it does possess limitations.
“Source D” was a nurse that works in the Emergency Room at the University Hospital. This interview was conducted at Starbucks coffee house and lasted twenty-eight minutes. The results from the interview are organized by the interview questions.

1. **Is your department required to communicate with each other to complete daily tasks? If so, in what way?**  “Yes, all of us nurses communicate with each other, the doctors and the patients we take care of. We pretty much have to communicate with everyone in the hospital to facilitate the care of the patients. We work with the inpatient nurses when we need to admit patients. We work with professionals in all of the imaging departments. We work with a ton of different types of doctors.”

2. **What types of communication tools does your department utilize to interact with each other?**  “We use Cisco phones and the pagers provided by the hospital. We are actually in the process of getting our phones upgraded to the newest model. I’m not sure what the model is, but every time a phone breaks, we ask for a new one and get a newer model phone. We use the phones more than the pagers. They alert us when trauma patients arrive or when we have our safety huddles. The pagers are just used when someone needs to remind us of a patient’s appointment.”

3. **In your opinion, are these tools effective in your department? In other words, can you rely on these tools?**  “I’d say we can rely on the phones and pagers for the most part. Like I said before, we don’t really use the pagers a whole lot. We typically stay in the Emergency department, so we don’t have to travel much. Sometimes, we get calls and we can’t hear each other. When that happens, we just hang up and call each other back.”
4. **Is there any other type of communication that your department utilizes to interact with each other?** “We do a lot of our communication through MiChart when we are discussing patients. We write a lot in the patient’s charts and can write each other notes about patients in MiChart. We try to use MiChart for most of our interactions unless we need to talk to someone quickly about a topic. When that happens, we just call the person if we can’t talk to them face-to-face.”

5. **Are there any types of communication tools/programs that you feel could benefit your department more than your current communication program?** “I feel like our department is pretty happy with our communication tools since we have not switched to anything newer. It seems like we just keep upgrading to newer versions of the phones which makes me think that we are stuck with them no matter what. It would be nice to be able to make phone calls and hear the other person on the line, but I don’t know what kind of service we need to make that happen.

It can be inferred from “Source D’s” responses that the emergency room nurses communicate in a similar manner as General Radiology. They are provided the same tools as General Radiology, although, they are upgrading to newer versions of the Cisco wireless phones. It does not seem that this department uses the pagers as much as General Radiology. This implies that they may not experience many malfunctions due to lack of use.

**Summary of Analytical Results**

The data received for this research adequately answers the research question and its sub-questions. The participants of the surveyed proved that the communication tools provided to them malfunctioned on a regular basis and cause delays to patient care. When asked if the Cisco wireless phones and Motorola pagers malfunctioned, a vast majority of the participants stated
that they did. The technologists identified that both of these tools malfunctioned and stated these malfunctions. The technologists also indicated that a communication standard was not presented to them on an annual basis. This led the researcher to infer that the technologists did not perceive these aspects of communication to be effective tools. The results from this aspect of the survey assisted the researcher in answering the sub-question, “What types of tools are used for the technologists to communicate with each other? To what extent are these tools valid?” and the sub-question “To what extent do the qualities of effective communication coincide with what the technologists perceive effective communication to be?”

The results from the interview indicated that other communication programs exist outside of the General Radiology department. While these programs may not be the perfect fit for the workflow of General Radiology, the interviews provided valid information that was essential in formulating a successful communication program for the department. The discussions of these communication programs assisted the researcher in answering the sub-question, “What types of communication tools and programs are implemented in other departments at Michigan Medicine?” and the sub-question, “What type of communication program could be implemented in General Radiology that would reduce miscommunication errors?”

The final question of the survey was “A communication program would be beneficial for me and the department as a whole.” Most of the participants of the survey “strongly agreed” or “agreed” with this statement. This indicates the need for an improved communication process in General Radiology that can better serve the radiologic technologists and their patients. This confirmed that a program design focused on communication in General Radiology is indeed essential to the success of the department.

Design Specifications
Design Overview. The combination of collected data from the interviews and surveys and the information provided in the literature review offered substantial information that paved the way for a new communication program in General Radiology. The projected program design for improved communication focuses on utilizing the MiChart software system as the foundation for the project. As stated in the literature review, MiChart is the program that Michigan Medicine utilizes for all of its patient care aspects. To use MiChart to its fullest potential, General Radiology could emulate different aspects of the communication programs that are set in place by other departments and combine those aspects to create one successful communication program.

The projected program design begins by emulating the Transportation department’s communication program. General Radiology should purchase iPhones that are similar to the tools that Transportation utilizes and should integrate these iPhones to collaborate with MiChart. The iPhones and MiChart integration would allow doctors and nurses from various locations to communicate with the radiologic technologists. For example, when a physician places an order for a portable x-ray, a notification is sent directly to the coordinating iPhone. The notification would include the patient’s name and room number, the exam that needs to be conducted, and the contact information for the physician who placed the order. This would give the radiologic technologist immediate access to exams that need to be performed without any delays in patient care. By providing the contact information of the physician who ordered the exam, the technologist could communicate with that physician at a faster pace if it were necessary.

Although this communication program emulates aspects of the Transportation communication system, there are some features that need to be added. The radiologic technologists must have access to the calling and texting features of the iPhones. This access
would essentially replace the need for the Cisco wireless phones and the Motorola pagers. Instead of utilizing the paging system, technologists could text each other via the iPhones. Likewise, instead of utilizing the Cisco wireless phones, technologists could call healthcare professionals via the iPhones. The improved devices could be restricted to making phone calls and texts to only in-hospital phone numbers. This would limit the usage of the iPhones for personal reasons.

*Equipment and Personnel.* The equipment that would be necessary for this program design is the iPhones and an upgrade in the MiChart system that integrates these iPhones with the General Radiology’s workflow demands. Of course, this program design also requires personnel to implement and monitor this program. Michigan Medicine already has 250 MiChart professionals in place to monitor and amplify the program (Schade, 2014). These professionals could certainly upgrade the MiChart and EPIC system to meet the demands of the projected program design.

*Location and Structure of Delivery Site.* The location for the implementation of this program would take place in the General Radiology Department in the University Hospital. This is the core location where all of the radiologic technologists begin their work shifts and collect their communication tools. This location has excess computers that may be needed to access MiChart and storage options for the iPhones.

*Training.* Of course, a new program requires all professionals to receive training. Michigan Medicine completes much of its training on new software through the usage of “MLearnings.” MLearnings are computerized training modules that are mandatory for professionals to complete when new software is implemented in the health system. These modules offer step-by-step simulations of the new technology that teach professionals how to use
the new software. MLearnings will be the training that will be required for all of the healthcare professionals, including the radiologic technologists, to complete prior to implementation of the projected communication program. The healthcare professionals will be required to complete one MLearning which will vary in duration between 30 minutes and 60 minutes. The 30-minute session will be provided to physicians and nurses, while the 60-minute session will be provided to the radiologic technologists.

*Time-Frame for Implementation.* A program design such as this requires a detailed upgrade of the MiChart and EPIC system. This upgrade could take six to nine months to create. Then, healthcare professionals need to be provided 30 days to complete their MLearnings regarding the upgrade. It is projected that the communication program will be completely implemented and running successfully after one year. This is because it may take various trial runs to ensure that the program runs smoothly and that there are no missing holes in the design.

*Coordination with Other Programs.* The overall goal of implementing MiChart in the Michigan Medicine health care system was to provide healthcare professionals with one substantial system that can integrate the various demands of patient care (Schade, 2014). This projected program design works to accomplish that goal. Healthcare professionals that are employed in Michigan Medicine already have access and background experiences with MiChart. This projected communication program will collaborate with all of the other aspects of MiChart and EPIC to create smooth communication with the wide variety of patient care and departmental needs.

**Program Benefits and Costs**

The cost of this program design may come at a hefty price, but its benefits outweigh these costs. The greatest asset of this projected program design is that the foundation for the design is
already implemented at Michigan Medicine. The previous implementation of MiChart saves Michigan Medicine much money and time that would be needed for this projected project design. However, the General Radiology department will endure the costs of iPhones and protective cases for the phones. Because the department purchases Cisco wireless phones as needed, the costs of the iPhones will simply replace the costs the Cisco wireless phones. At this point in the project design, it is impossible to indicate an exact cost of the MiChart upgrade needed for the new communication program. With that being said, the personnel needed for the communication program are already in place at Michigan Medicine. This will save the company much money that is needed to hire MiChart personnel. Lastly, Michigan Medicine has previously placed Verizon, AT&T and Sprint cell phone towers within the health system. This means that the iPhones can operate with any provider and will have service anywhere in the health system.

The ultimate benefit of this communication program is the increased quality of patient care. Technologists will receive ordered exams faster and will be able to contact healthcare professionals anywhere in the hospital as needed at a more reliable rate. Text messages will reduce the malfunctions that are experienced with the Motorola pagers. Technologists will also be able to make phone calls via the iPhones at any location in the hospital because of the wireless towers that are located.

**Financial Feasibility**

In 2014, the reported operating revenue for Michigan Medicine was 2.1 billion dollars (Schade, 2014). Michigan Medicine continues to thrive year after year which makes it extremely feasible to implement this projected communication program. Even more, the health system is currently working to progress MiChart further into the healthcare system to ensure the system is efficient for all areas of patient care. The MiChart budget may have to be increased for the
implementation of a new communication program, but it is achievable to fund this program. The General Radiology department will have to adjust its budget to purchase the iPhones. The department is granted a substantial budget for new equipment at the beginning of every fiscal year which makes the purchase of the iPhones feasible. The exact costs of the iPhones cannot be incurred because it is likely that the department would order these phones in bulk which would reduce the cost of the phones. When the quality of patient care is at risk, the cost of increasing that care is a high priority.

**Monitoring and Evaluation Plan**

It is likely that the projected communication program will not perfectly meet the needs of the radiologic technologists and patients after its immediate implementation. With that being said, the technologists will need to rate all of the aspects of the new program after six months to address areas of the program that may need adjustments. This program will continue to be monitored bi-annually to ensure that it is running smoothly and meeting the demands of the General Radiology department as a whole. The technologists will also be required to complete the previously mentioned training MLearnings on an annual basis to ensure that proper communication techniques are followed at all times. This will assist in guiding the General Radiology department towards successful communication.

**Summary**

Overall, the descriptive and inferential statistics that were generated from the surveys and interviews provided the researcher with a vast amount of information that was utilized to create a new communication program design for General Radiology. The radiologic technologists that participated in the surveys indicated that they do experience malfunctions with both of the
communication tools that are provided by the General Radiology department. The interviews proved that various communication systems exist within Michigan Medicine.

A new communication program design exists through the usage of MiChart and iPhones. The MiChart system can eliminate confusion between physicians who order exams and technologists who complete those exams. The iPhones can allow the technologists to communicate freely within the healthcare system without experiencing malfunctions. The program is costly, but it is financially feasible for the Michigan Medicine budget and the General Radiology budget. Patient care is of utmost importance to General Radiology and this projected communication program works to meet the demands of the radiologic technologists while keeping patients a top priority.
Chapter V: Summary, Conclusions and Recommendations

Summary

It is safe to indicate that the goal of any healthcare system is to treat sick patients in an efficient and successful manner. Michigan Medicine certainly strives to achieve that goal, and the General Radiology Department in the University Hospital understands this goal. The researcher worked to define and illustrate a detrimental aspect of the General Radiology that deteriorated the workflow of the department and patient care. The researcher defined the goal of the research to be to design a new communication program which pushes the General Radiology towards success in establishing an improved workflow and eliminating miscommunication errors. The research problem and its sub-problems were identified immediately, and the researcher conducted a literature review to address each of the sub-problems. The researcher then worked to dictate a methodology that supported the research problem and would provide adequate data to create a new communication program for the General Radiology Department. Surveys and interviews were conducted with radiologic technologists and other healthcare professionals employed at Michigan Medicine. The surveys and interviews yielded impeccable results and paved the way for the researcher to design a communication program that suits the demands of the radiologic technologists. All-in-all, the goal of the program design was achieved, and the researcher succeeded in creating a communication program that reduces miscommunication in General Radiology and increases patient care.

Research Problem. The research problem was created for the sole purpose of identifying a communication program that amplifies the success of the General Radiology Department. The identified research problem was, “How can communication between all employees be improved upon within the General Radiology Department at the University Hospital of Michigan
To properly address this problem, four sub-questions were constructed. These sub-questions were:

- What types of tools are used for the technologists to communicate with each other? To what extent are these tools valid?
- To what extent do the qualities of effective communication coincide with what the technologists perceive effective communication to be?
- What types of communication tools and programs are implemented in other departments at Michigan Medicine?
- What type of communication program could be implemented in General Radiology that would reduce miscommunication errors?

Together, these sub-problems and research question addressed every aspect of the communication program implemented in General Radiology and also addressed the needs defined by the radiologic technologists.

**Research Objective.** As previously mentioned, the objective of this research was to evaluate the current communication program utilized by the General Radiology Department, define the need to create a new communication program and then move forward with a program design that better addressed communication in the department. The objective was achieved through a strategic literature review, a systematic methodology plan and successful implementation of that methodology plan.

**Decision Criteria.** The decision to create a new communication program was based off of the information provided in the literature review and the data received from the implemented methodology. Overall, the surveys proved that the radiologic technologists employed in General Radiology experience many malfunctions with the Cisco wireless phones and the Motorola
pagers. In addition to this, the literature review proved that there are numerous variables that can exist in communication and that there are programs that successfully limit these variables. The literature review also demonstrated that communication programs successfully exist in healthcare facilities. Together, the vast amount of information easily demonstrated the need for a successful communication program in General Radiology making it an easy decision to construct a program design.

Conclusion

The interpretation of data and literature is demonstrated by addressing each of the sub-problems and dictating the data and literature that supports them.

- *What types of tools are used for the technologists to communicate with each other? To what extent are these tools valid?* The radiologic technologists that participated in the survey indicated that they utilized the Cisco wireless phones and the Motorola pagers for mostly five days a week but at least for three days a week. Most of the participants also indicated that they experienced malfunctions with each of the communication tools on a regular basis. The malfunctions with the Cisco wireless phones included dropped calls, lack of wireless service, absence of volume when an established phone call is made and lack of power. The malfunctions with the Motorola pagers included receiving unreadable pages, receiving delayed pages and not receiving pages at all. This data indicated that the communication tools are not valid.

- *To what extent do the qualities of effective communication coincide with what the technologists perceive effective communication to be?* The radiologic technologists indicated in the surveys that they did not receive any information regarding positive communication habits from their employer. The literature review provides numerous
variables that can exist during interactions. These variables included the skill levels of the listener and the speaker, the tone of the speaker, health literacy, accuracy of the message being conveyed and the comprehension levels between the sender and receiver of the information. All of these variables can affect communication in the workplace and must be addressed for successful communication to occur. The data collected from the survey indicated that many of these variables likely exist because of the malfunctions of the communication tools. Lastly, the literature indicated that there are many training methods that exist which can promote successful communication in the workplace. One of these methods was the implementation of the C.A.R.E. method which works to reduce miscommunication in the workplace.

- What types of communication tools and programs are implemented in other departments at Michigan Medicine? This was answered through the utilization of interviews with four health care professionals that are employed in different departments in the University Hospital of Michigan Medicine. These departments included Computed Tomography, Nuclear Medicine, Transportation and the Emergency Room. The interview yielded that newer models of the Cisco wireless phones are used by nurses in the Emergency Room while the Transportation department uses MiChart and iPhones to communicate. The interviews also proved that not every department requires an expansive communication plan. Computed Tomography and Nuclear Medicine do not use updated communication tools and communicate through older technological tools.

- What type of communication program could be implemented in General Radiology that would reduce miscommunication errors? Through a collaboration of the literature review and the data received from the interviews, a potentially successful communication
program was designed. The researcher worked off of programs that already exist in Michigan Medicine, as dictated in a blog by Sue Schade, and established a successful plan to develop those programs further. The researcher considered all of the qualities of effective communication indicated in the literature review. These qualities included listening, paraphrasing, utilizing calm tones and asking open-ended questions. It was considering these qualities that motivated the researcher to construct a program that allowed for open and quick communication between radiologic technologists and physicians who order x-ray exams. Lastly, the survey demonstrated the need for a new communication program. When asked if a communication program would benefit the General Radiology Department, survey participants responded with agreeable reactions.

Recommendations

Based off of the literature and the data received from the implemented methodology, the researcher recommends that the General Radiology Department in the University Hospital of Michigan Medicine implements a successful communication program that better serves patients and the workflow of the department. This recommendation is based off the survey responses from 33 radiologic technologists and the literature discussed in preceding sections of this chapter. A brief description of the program design is dictated in the succeeding sections.

Action Plan. General Radiology will utilize MiChart and iPhones to better communicate with each other and the other various healthcare professionals, including doctors and nurses, employed in Michigan Medicine. The program will allow physicians to place x-ray orders in the MiChart system. Immediately after the order is placed, a coordinating iPhone will receive a notification that indicates the exam information, the patient’s name and room number and the ordering physician’s contact information. The radiologic technologist will have access to the
calling feature on the iPhones to call physicians or other healthcare professionals as needed. In addition, the technologists will have access to text other healthcare professionals when required to do so to complete x-ray exams. The calling and texting features will be limited to contacting only professionals within Michigan Medicine.

It is estimated that this program can be implemented within one year. The 250 MiChart professionals employed by Michigan Medicine will be responsible for creating this upgrade and the associated MLearnings to provide proper training for all healthcare professionals associated with this upgrade. The program design is indeed financially feasible for Michigan Medicine and the General Radiology Department. Lastly, the program will continue to be monitored every six months to ensure its success in the General Radiology Department.

*Link to Data.* This program eliminates the malfunctions of the current communication tools that were indicated by the participating technologists of the survey. Once again, the technologists indicated that various malfunctions exist with the current communication tools which delays patient care on a regular basis. Technologists also indicated that communication standards are not presented to them on an annual basis by their employer. Through the use of the projected communication program and its MLearning training process, communication standards will be presented to radiologic technologists and all other healthcare professionals on an annual basis. Essentially, this communication program eliminates the miscommunication errors and delays in patient cares that were identified in the survey and interview process.

*Link to Literature.* The literature review demonstrated that successful communication programs exist inside of Michigan Medicine as well as in various healthcare facilities. While Michigan Medicine has consistently worked to implement different aspects of MiChart and EPIC in its healthcare facilities, outside facilities use the other communication methods. These
methods include the Ticket to Ride, SBAR3 method and DisC assessment. While this projected communication program does support different aspects of those communication methods, it is the best program that will securely support the communication process in General Radiology. The literature proved that communication is vital to the healthcare industries, and other health care facilities are taking advantage of various programs to better their communication. The projected communication program strives to achieve those same goals and work towards creating a smooth, efficient workflow in General Radiology where patients can remain the focus of all technologists.
References


Appendices

Appendix A: Permission to conduct study

Appendix B: Consent form for informal interview

Appendix C: Survey and interview questions

Appendix D: RRA Approval from Central Michigan University
August 27, 2017
Lauren Rosebush
3503 Pheasant Run Circle, Apt. 4, Ann Arbor, MI 48108

Dear Lauren Rosebush,

I have reviewed your request to conduct a research project involving the General Radiology Department and the University Hospital of Michigan Medicine and the collection of data through surveys, interviews and internal research involving our communication devices that will be used. I feel that this project will be beneficial to the General Radiology Department and Michigan Medicine. You have my permission to survey any technologists, interview employees, and use internal data related to our communication program for this project.

The following stipulations should be observed: The research and administration of surveys and interviews must be done on personal time, no part of this project should interfere with the workflow of the department and no part of this project can include specific patient information such as names, birthdays, medical registration numbers and/or accession numbers.

If you have any questions regarding this letter of approval, please email me at rmiddlem@med.umich.edu.

Sincerely,

REbecca Leonard
Manager, General Imaging, GI/GU
Department of Radiology
1500 E. Medical Center Dr  |  Ann Arbor, MI 48109
Office: 734-936-0012  |  Pager: 734.936.6266  #35863
rmiddlem@med.umich.edu

MICHIGAN MEDICINE
UNIVERSITY OF MICHIGAN
Date

Dear Participant:

My name is Lauren Rosebush and I am a graduate student at Central Michigan University. For my final project, I am examining our communication process in General Radiology. Because you are an employee in the General Radiology who is required to follow this communication process, I am inviting you to participate in this study by completing the attached survey.

The following questionnaire will require approximately 15 minutes to complete. There is no compensation for responding nor is there any known risk. In order to ensure that all information will remain confidential, please do not include your name. Copies of the project will be provided to my Central Michigan University instructor. If you choose to participate in this project, please answer all questions as honestly as possible, seal them in the envelope provided to you and return the completed questionnaires promptly to the stamped envelope in my mailbox. Participation is strictly voluntary and you may refuse to participate at any time.

Thank you for taking the time to assist me in my educational endeavors. The data collected will provide useful information regarding the communication process in General Radiology. If you would like a summary copy of this study please complete and detach the Request for Information Form and return it to me in a separate envelope. Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me at the number listed below.

Please note that if you are not satisfied with the manner in which this study is being conducted, you may report (anonymously if you so choose) any complaints to the MSA Program by calling 989-774-6525 or addressing a letter to the MSA Program, Rowe 222, Central Michigan University, Mt. Pleasant, MI 48859.

Sincerely,

Lauren Rosebush
heise1lm@cmich.edu
Instructor: Robert Weltzer
weltz1re@cmich.edu
b) Interview Consent Form

Hello, my name is Lauren Rosebush and I am a graduate student at Central Michigan University. I am conducting research on communication processes that are utilized in Michigan Medicine. This research will fulfill my master’s degree requirements. You were selected to participate in this study because you are an employee of Michigan Medicine who utilizes a communication program which differs from the General Radiology Department.

I anticipate that this interview will take less than 30 minutes to complete. There is no compensation for responding nor is there any known risk. In order to insure that all information will remain confidential, I will not record your name. I will only record you as a survey subject a, b, c, ord. Copies of the project will be provided to my Central Michigan University faculty monitor. Participation is strictly voluntary and you may refuse to participate at any time.

I appreciate your willingness to help with my project. The data collected will provide useful information regarding the future of General Radiology’s communication process. If you would like a summary copy of this study please let me know at the end of the survey/interview and I will add your name to a list that I will maintain separately from my survey/interview notes. If you have questions later, please contact me at (248)662-8737. My faculty monitor is Robert Weltzer and he can be reached at weltz1re@cmich.edu

Please note that if you are not satisfied with the manner in which this study is being conducted, you may report (anonymously if you so choose) any complaints to the MSA Program by calling 989-774-6525 or addressing a letter to the MSA Program, Rowe 222, Central Michigan University, Mt. Pleasant, MI 48859.

Let’s begin with the first question.
Appendix C

(a) Survey

Please answer all of the questions provided. Rate the following statements according to your personal experiences with communication in General Radiology. Please do not provide false answers. If you feel that you cannot answer a question truthfully, please skip the question.

1. On average, how many days a week do you carry a Cisco wireless phone and a Motorola pager?
   - [ ] 1 day
   - [ ] 2 days
   - [ ] 3 days
   - [ ] 4 days
   - [ ] 5 days

2. I rarely have any issues with the communication devices provided to me on a daily basis.
   - [ ] Strongly agree
   - [ ] Agree
   - [ ] Neutral
   - [ ] Disagree
   - [ ] Strongly Disagree

3. I feel secure in sending important messages to my coworkers via the Motorola pagers because pages send quickly and correctly.
   - [ ] Strongly agree
   - [ ] Agree
   - [ ] Neutral
   - [ ] Disagree
   - [ ] Strongly Disagree

4. There are numerous occasions where I cannot contact an employee via the Cisco wireless phone because of a lack of wireless service or some other malfunction.
   - [ ] Strongly agree
   - [ ] Agree
   - [ ] Neutral
   - [ ] Disagree
   - [ ] Strongly Disagree

   Please state what other types of malfunctions occur:

5. I often receive multiple pages via the Motorola pager that are unreadable due to errors in the paging system.
   - [ ] Strongly agree
   - [ ] Agree
   - [ ] Neutral
   - [ ] Disagree
   - [ ] Strongly Disagree

6. I rarely have difficulty in completing my assigned tasks due to malfunctions with one or both of the communication devices.
   - [ ] Strongly agree
   - [ ] Agree
   - [ ] Neutral
   - [ ] Disagree
   - [ ] Strongly Disagree

7. The communication standards of the General Radiology Department are presented to me in a clear manner on an annual basis.
   - [ ] Strongly agree
   - [ ] Agree
   - [ ] Neutral
   - [ ] Disagree
   - [ ] Strongly Disagree

8. I feel that the unreliability of the communication devices has resulted in delays in patient care on numerous occasions.
   - [ ] Strongly agree
   - [ ] Agree
   - [ ] Neutral
   - [ ] Disagree
   - [ ] Strongly Disagree

9. A communication program would be beneficial for me and the department as a whole.
10. What do you feel are the most important qualities of communication?

11. Do you feel that everyone in General Radiology possesses the same strengths and weaknesses in communication? Please explain your response.

b) Interview

1. Is your department required to communicate with each other to complete daily tasks? If so, in what way?

2. What types of communication tools does your department utilize to interact with each other?

3. In your opinion, are these tools effective in your department? In other words, can you rely on these tools?

4. Is there any other type of communication that your department utilizes to interact with each other?

5. Are there any types of communication tools/programs that you feel could benefit your department more than your current communication program?
Dear Lauren,

Your Research Review Application has been reviewed and approved. You may start your data collection. This approval will not expire as long as your topic and methodology remain unchanged. If your topic or methodology changes, please submit a new Research Review Application and supporting documents to your instructor by e-mail.

Please contact your instructor if you have any questions. Also, be sure to check with your instructor concerning the due dates for your project.

Good luck with your project. This is the only notification you will receive. Please keep a copy for your records.

Kim Gribben

Assistant Director, MSA Program