

MASTER'S THESIS

Identifying communication precursors to medical error in an in-patient clinical environment

A palliative sedation therapy case study

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Abstract

Objectives

The objective of this thesis is to identify and understand communication and information exchange events and their influencing factors that are precursors to medical errors.

Methods

Palliative Sedation Therapy is used as a case study to understand how communication and information sharing occur on an in-patient palliative care unit. Data sources were non-participant observation and interviews. Directed content analysis was used to analyze the data, with previously published conceptual models of communication acting as the guides for this analysis.

Results/Discussion

Results identified several communication issues that have the potential to act as precursors to medical error at different points in the communication act. A model identifying the points where these precursors can impact communication was created.

Conclusion

These results can be used to identify how improvements to communication and information exchange can increase the effectiveness of communication and reduce the likelihood of medical errors occurring.

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Dedication

I would like to dedicate my thesis to my grandparents, who – although they probably don't know it – are the reason that I first became interested in gerontology, and later palliative care. To my grandparents, who have supported and encouraged me at every opportunity, thank you. This thesis is especially dedicated to my grandmother, whose last day showed what a blessing good health professionals and access to therapies such as palliative sedation really are.

CHAPTER I: Introduction

This chapter provides an overview of the motivation for and objectives of this study. The background rationale for this study will be identified, followed by the thesis objectives, and finally the overall organization of this thesis will be described.

1.1 Background

Palliative care is a complex healthcare environment that involves interdisciplinary teams working with patients with terminal illnesses and their families in order to provide high quality care to effectively manage patients' symptoms. The provision of high quality care in this environment, just as in other areas of healthcare, is extremely important. And just as in other healthcare environments, medical errors can occur and the likelihood of such events occurring is increased by the complexity of the patient's case and the number of healthcare professionals involved in providing care (Timmons, 2005). The ability to ensure safe and effective care in palliative care requires the coordination of many different healthcare professionals – physicians, nurses, and a variety of allied health professionals such as pharmacists, social workers, psychologists, physiotherapists, etc. – working together on an ongoing basis.

The importance of effective communication in order to provide high quality care has been identified through many studies which have cited communication as one of the leading factors influencing the likelihood of medical errors or adverse events occurring (Alvarez & Coiera, 2006; Cresswell, Fernando, McKinstry, & Sheikh, 2007; Leape et al., 1995; Stetson et al., 2001). The USA's Joint Commission identified communication issues as a root cause in over 60% of reported sentinel events (Timmons, 2005). The prominence of communication as a precursor to medical error in these studies underscores the importance of incorporating communication strategies into quality improvement approaches such as the incorporation of evidence-based guidelines into routine practice. If we can understand how communication occurs – between all members of the healthcare team using any medium to communicate – it becomes possible to identify the potential areas for weakness in such a

system of communication, and more importantly, methods of overcoming these weaknesses. Such an approach could provide a proactive means of preventing medical errors, since these errors are really an indication that there is an underlying problem in the communication act that needs to be resolved. These issues are what need to be modelled and understood in terms of the inter-relationships between components of the communication act in order to develop solutions to overcome them.

To address the issues above, the communication space within the palliative care environment will be studied. As observing all aspects of a palliative care unit would be too large an undertaking for the purpose of a master's thesis, this study is limited to observing the practice of palliative sedation therapy (PST) as a case study for the wider operations of the unit. The practice of PST, from the decision to provide PST to a patient to its implementation, stabilization, and monitoring of the patient's condition, will serve as an excellent case study for this research due to the complexity of the communication involved in implementing and monitoring such a practice. The principles of PST require effective communication in order to provide high quality, safe, and appropriate medical care. As identified earlier, without effective communication, the potential for errors increases significantly. Therefore, understanding how an interdisciplinary team communicates is necessary to identify methods of enhancing that communication and reducing errors. The rationale for a qualitative study on this topic is that while a quantitative study on would be able to identify whether or not the protocol was being adhered to and how well factors relating to the patient's care were being recorded, it would not be able to identify the reasons *why* care is occurring in the manner that it is, nor could it provide insight into the methods the team members use to ensure accurate and timely communication of relevant information. The interpretive nature of a qualitative study to be able to drill down into this issue to see the details is instrumental.

Current research has looked at medical errors in healthcare and has identified that errors in communication are a leading cause of these medical errors. However, to date research has not gone a step farther in understanding how components of the communication act are linked to different types of medical errors. Dissecting the communication act into its

components makes it possible to understand where the potential exists for different types of errors to occur, and creates the potential for identifying changes in procedure to prevent these errors from occurring.

1.2 Objectives

The objectives of this thesis are to identify communication precursors to medical errors by studying the communication acts involved in providing care. This is done through combining what is already known about the role of communication in healthcare settings with what is known about medical errors and palliative care in order to understand the communication practices that can influence the occurrence of these errors. As such, the objectives of this study are as follows:

1. Use PST as a case study to identify communication precursors to medical error through the creation of a communication model that addresses interdisciplinary communication, and the factors that influence that communication.
2. Identify the aspects of communication involved in coordinating individuals and processes, and their influencing factors, in order to create a clearer picture of the role each plays in understanding communication.
3. Identify implications of this communication model on future research in the areas of communication and medical errors and the potential for process redesign to better support communication.

Communication in healthcare and medical errors are both areas in which significant research has been done. Although communication has been identified as a key factor involved in many situations of medical error, and methods of avoiding/correcting these communication problems have been suggested in other literature (Patterson, Cook, Woods, & Render, 2004), the actual types of errors that have occurred are rarely tied into this analysis. Bringing together these two areas – communication and medical errors – and studying the relationship between them in a clinical setting in which they have been insufficiently studied – palliative care – allows us to create a deeper understanding of which types of errors involve communication, and can lead to increasingly targeted methods of preventing these errors.

1.3 Thesis Organization

This thesis will first discuss existing literature in the areas of medical error and the role of communication in medical error. It will then make the case for looking at communication as a precursor to medical error in a palliative care environment and detail why PST provides a solid case study for observing communication on the unit. The methodology and data collection methods for this study will be described, followed by the method of analysis. The study's results will be presented and then discussed. Finally, future directions and contributions of this thesis to the literature will be stated, as will the study's limitations.

CHAPTER II: Literature Review

Chapter II reviews the existing literature on medical errors, communication, and palliative care. The shortcomings in current research that form the basis for this thesis are highlighted.

2.1 Literature Search Strategy

There are several different areas of literature involved in this study. As the study setting is a palliative care in-patient unit and uses the practice of PST as a case study, literature on both PST and palliative care were reviewed. Communication as it relates to communication among interdisciplinary and multidisciplinary teams within a healthcare setting was also explored. Finally, literature surrounding medical error and medication error were reviewed.

An initial literature search was conducted for the thesis proposal to determine whether other research had already been conducted on this topic. This search resulted in 416 results once duplicate articles were removed. This literature search was set up so that new articles were ‘pushed’ to the researcher using an automated alert on a monthly basis whenever new articles matching the search criteria were. 96 additional articles were identified in this manner as of August 31st 2012 – 95 through OvidSP and 1 through Google Scholar.

Triangulating using the general topics of palliative care, communication, and medical error resulted in 416 search results with duplicates removed using the search strategy described Appendix A during the original search. Of these articles, 53 were deemed relevant to this study. Six articles were identified that dealt with medical error in a palliative care setting. One article examined the prevalence and types of error in palliative care (N. Taylor, Fisher, & Butler, 2010), while a second looked at increases to error reporting as a result of an educational intervention (Boyer, McPherson, Deshpande, & Smith, 2009). A 2010 publication performed a brief literature review and identified the dearth of information and studies in the area of palliative care and medical error (Dietz, Borasio, Schneider, & Jox, 2010). Other studies discussed issues relating to how or why palliative care is an area of care with a high potential for error (Lightfoot, 1998; Myers & Lynn, 2001), and one study identified the high number of errors that can occur during medication reconciliation

procedures (Kemp, Narula, McPherson, & Zuckerman, 2009). Overall, the conclusions drawn from these studies further validate the importance of additional research into the area of medical error in palliative care. While there has been limited research to date in this area, the literature that does exist highlights the importance of this type of research and points to the need for further studies.

As stated, updates to this search strategy have been performed on a monthly basis. 96 additional articles were identified by OvidSP. Of these 96 articles, none directly related to the study although 9 provided insights into various components, such as the use and effectiveness of multidisciplinary and interdisciplinary teams in providing palliative care to patients (Abdulrahman & G.O, 2011; Mancini, 2012).

This literature review was created in consultation with a University of Ottawa librarian, and was conducted using the University of Ottawa's Medline OvidSP access. It used a combined search in the following databases (dates reflect the original search date):

- Embase (1947 to 2012 January 12)
- Ovid HealthStar (1999 to November 2011)
- Ovid MEDLINE In-Process & Other Non-Indexed Citations and Ovide MEDLINE (1948 to present)
- PsychINFO (1808 to January Week2 2012)
- Embase (1974 to 2012 Week 01)
- Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations (January 12, 2012)
- Ovid MEDLINE without Revisions (1996 to January Week 1 2012)
- Ovid MEDLINE Daily Update (January 12, 2012)
- AMED (Allied and Complimentary Medicine) 1985 to January 2102

The search strategy incorporated both MeSH terms and keywords and searched for articles in English and French. Additional searches using keywords and key articles were also performed using the search engine Scopus to trace key authors and key references. Keywords used for these searches include:

- palliative care
- end of life
- medication OR medicat*
- error OR slip OR monitor* OR track*
- patient
- palliative care
- communication
- team
- medical error
- medication error
- systems approach
- palliative care

Each result was reviewed by the researcher by examining the article's title. If the title appeared to be relevant the abstract was reviewed, and if inclusion/exclusion could not be determined from the abstract the entire article was read. Articles were excluded if they did not relate to error or communication in a palliative care environment, or if they dealt with communication between the palliative care team and the patient/family. Although at minimum the abstract of these articles were always reviewed, the dynamic between the healthcare team and the patient and/or patient's family is not the area of interest of this study. Studies about communication in pediatric palliative care were excluded due to the differences in nature between pediatric palliative care and palliative care administered to adults. Literature reviewed for this study falls into three main categories, as outlined in Figure 1 below: communication, medical error, and palliative care with a focus on the practice of PST.

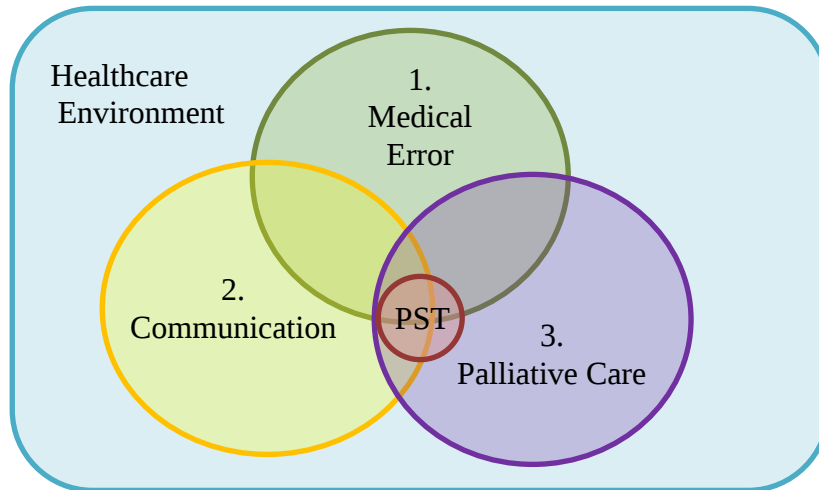


Figure 1. Areas of study for this thesis (not to scale)

The literature will be discussed as outlined in Figure 1. The existence of medical errors in healthcare will be discussed, followed by the role that communication plays in these errors. The importance of effective communication in preventing medical errors will then be highlighted. And finally, how these two areas – medical errors and communication – are related in the field of palliative care will be reviewed. A table highlighting some of the key points and key articles discussed below can be found in Appendix B.

2.2 Medical Error in Healthcare

Over the past 12 years, the presence of medical errors in healthcare has been brought to the front of international attention with reports such as the US Institute of Medicine's release of the report *To Err is Human*, identifying that a much higher than previously thought number of medical errors and adverse events occur every year in healthcare (Committee on Quality of Health Care in America, 2000). The increased emphasis on medical errors, and correspondingly patient safety, is likely a result of many studies coming after *To Err Is Human* that identified similar numbers of medical errors and adverse events in countries other than the USA. When a similar study was conducted in Canada, the results confirmed that not only do medical errors and adverse events occur in Canada, but that many of the most serious medical errors and adverse events could have been prevented (Baker et al., 2004). Patient safety, through decreases in these medical errors and increases in the quality

of care that is provided to patients, has become a major buzzword in our healthcare system, and there is a desire to move beyond simply identifying the issues surrounding patient safety and towards finding effective solutions to these issues (Braithwaite & Coiera, 2010).

The fact that so many of these medical errors could have been prevented is especially relevant in sectors of the healthcare system which provide care to predominantly older and sicker patients, such as palliative care. Several studies that have looked at risk factors for adverse events and medical errors have found an increase in the likelihood of these events occurring when patients are either older or sicker than the average. One study found that older adults are 2 to 3 times more likely to have a medication error occur than are adults under the age of 30 (Whitecar, Maxwell, & Douglass, 2004). There are several reasons for this increased risk. Older adults in general are more likely to be taking a higher number of medications, which can lead to complications and different medications interacting with each other. Their bodies also do not process medications as efficiently as those of younger adults, which changes their body's response to what could, in a younger patient, be considered a typical medication dosage (Whitecar, Maxwell, & Douglass, 2004).

The main risk factors that have been identified as increasing both the patient and the provider risk of an error occurring are displayed in Table 1. From the patient side, the factors displayed in Table 1 are all factors that could be attributed to patients who are receiving in-patient palliative care, and the provider factors are as likely to be present in palliative care as they are in any other area of the healthcare system. It is the potential for risk factors on both the patient's and the provider's side that most clearly demonstrate that palliative care is an environment in which the potential for error exists. Yet few studies have been conducted in this area (Dietz, Borasio, Schneider, & Jox, 2010; Sirriyeh, Armitage, Lawton, & Gardner, 2010), and those few that do attempt to quantify the errors in palliative care rely solely upon errors reported in incident reports, a method that has been identified in other areas of healthcare as extremely unreliable (Boyer, McPherson, Deshpande, & Smith, 2009; Cresswell, Fernando, McKinstry, & Sheikh, 2007; Grepperud, 2005).

It is possible that the reason for this dearth of studies is due in part to palliative care being a relatively young medical profession (Dietz, Borasio, Schneider, & Jox, 2010), and that its patient-tailored approach would make medical chart review for identifying best practices and deviations from appropriate care difficult. However, comparing how an interdisciplinary palliative care team functions with the current literature describing common situations that have the potential to lead to error will enable a clearer understanding of what is being done in palliative care to ensure safe and effective care delivery.

Main Provider Factors	Main Patient Factors
• Memory loss	• Multiple medical conditions (comorbidities)
• Attention switching	• Receiving multiple medications (5+)
• Deviations in skill performance & actions	• Receiving antipsychotic medication
• Cognitive load	• Receiving anti-infective medication
• Errors in reasoning	• Receiving antidepressant medication
• Decision biases	• Older adult
• Faulty heuristics	
• Competence of provider	

Table 1. Patient and provider factors affecting the likelihood of medical errors occurring (Boyer, McPherson, Deshpande, & Smith, 2009; Field et al., 2001; Zhang, Patel, Johnson, & Shortliffe, 2004)

As can be seen in Table 1, the majority of identified provider factors are related to communication: how information is communicated and when it is communicated can have a significant impact on how it is remembered and used. Communication failure has been repeatedly identified as one of the key reasons for many medical errors, and improving communication among team members is also cited as one of the key methods of preventing medical errors (Alvarez & Coiera, 2006; Cresswell, Fernando, McKinstry, & Sheikh, 2007). The interdisciplinary nature of palliative care indicates the importance of communication in ensuring that healthcare providers function as a team to deliver effective high quality care to their patients. Without this, the ability of the various health professionals to provide optimal care is limited, reducing their effectiveness and the quality of care their patients receive. Effective communication among the members of a palliative care team is therefore a central component to the provision of high quality patient care.

2.3 Communication in Healthcare

Communication is one of the fundamental elements of the healthcare sector. The variety of individuals involved and the myriad of tasks that must be completed in a coordinated manner – all at different times and by different people – create an environment that could not function without communication and the exchange of information. The role of communication within the healthcare system and the key role it plays in maintaining effective patient care has been identified repeatedly in healthcare and communication literature (Coiera, 1996; Stetson et al., 2001). Communication has been described as “the cement which holds [healthcare] teams together” (Poole & Real, 2003).

However, this ‘cement’ must facilitate effective communication, described as fundamental to providing high quality patient care (McHugh, Crandall, & Miller, 2006; Propp et al., 2010). To be effective, a communication act must transmit the intended information in a manner that allows it to reach the recipient in a format that is understood by the recipient. The recipient should then be able to indicate to the sender that the information has been received and understood (Hargie & Dickson, 2003). Without this confirmation of the receipt of information, a communication event may be more accurately described as ‘information exchange/sharing’.

There are a variety of types of communication and information exchange that occur in healthcare, ranging from writing and reading written accounts of a patient’s condition in a patient medical chart, to formal meetings among the healthcare team to discuss the status of various patients – typically referred to as Rounds – to the informal conversations that occur among health professionals on an ongoing basis throughout the day (P. Hall, Weaver, Gravelle, & Thibault, 2007; C. Kuziemyky & Varpio, 2010). Informal communication has been cited as one of the dominant methods of exchanging information in a timely manner and is integral to the provision of care (Coiera, 1996). And all of these communication and information exchange acts contribute to the overall functioning of the healthcare unit within what is referred to as the *clinical communication space*.

2.3.1 The Clinical Communication Space

Communication is an integral component of the healthcare system. It encompasses every clinical transaction of information, such as conversations - whether face-to-face or conducted via another mode of communication - or transactions between health professionals, sending or receiving of patient's health information, or medical opinions (C. Kuziemsky & Varpio, 2010; Schoop, 1999). All of these different information transactions come together to form what is referred to as the *clinical communication space* (Coiera, 2006). Of all of the information that can be conveyed, there is one key repository of this information that is often overlooked or inadequately incorporated into system improvements: "the biggest information repository in healthcare sits in the heads of the people working within it, and the biggest information network is the complex web of conversations that link the actions of these individuals" (Coiera, 2006). Understanding which health professionals make effective use of the clinical communication space to relay information and how they go about doing this is essential to understanding how communication impacts the workflow and quality of work of health professionals in palliative care.

2.3.2 Common Ground

A key component of the clinical communication space is how knowledge overlaps between health professionals in order to facilitate communication. Different health professions undergo different education and are taught to think in different ways and use different terminologies (P. Hall, Weaver, Gravelle, & Thibault, 2007). Because of these differences, they may place emphasis on different aspects of patient care, test results, etc. If two health professionals are discussing a patient and do not understand the relevance of the information being conveyed by the other person, they are unlikely to provide high quality care to that patient (Clarke & Brennan, 1991; Schoop, 1999). These periods of overlap in knowledge that must occur to effectively convey information between health professionals are referred to as *common ground* – "the shared knowledge, language, and beliefs necessary for communication to occur" (C. Kuziemsky & Varpio, 2010). Common ground can be latent – existing prior to the necessary exchange of knowledge – or it can be created by the health

professionals in a specific situation to convey specific information, depending both on the situation in which the communication is occurring and the information that is being conveyed. However, in either regard, a lack of sufficient common ground can result in ineffective and suboptimal care, workarounds, and even medical errors and adverse events (C. Kuziemyky & Varpio, 2010).

2.3.3 Awareness

In highly collaborative environments, such as healthcare delivery, individuals must develop and share an awareness about activities and information, and each other, in order to coordinate work processes. Awareness is a way of structuring information to provide the correct information for the right task. Several studies have described the role that awareness plays in facilitating collaborative activities by providing connectivity between people and processes (C. E. Kuziemyky & Varpio, 2011; Reddy, Shabot, & Bradner, 2008).

The goals of palliative care and the interdisciplinary manner in which it is provided will be outlined below to illustrate the relevance of understanding both the clinical communication space and the use of common ground and awareness in this environment.

2.4 Palliative Care

Palliative care is defined by the World Health Organization as “an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual” (World Health Organization, 2011). These patients are typically receiving a high number of medications which are often of high or unusual dosage (Kemp, Narula, McPherson, & Zuckerman, 2009; Kemp, Narula, McPherson, & Zuckerman, 2009; Sirriyeh, Armitage, Lawton, & Gardner, 2010) and are being cared for by a variety of health professionals – not only physicians and nurses, but pharmacists, physiotherapists, occupational and recreational therapists, spiritual care, social workers, dieticians, and psychologists (Rock, 2003). It is this “whole person” approach which differentiates

palliative care from other areas of the healthcare system. This view of the patient as a person, and the focus on ensuring that their care is tailored to their needs, is of paramount importance. In fact, a recent study has shown that palliative care, used in combination with treatment for metastatic non-small-cell lung cancer, increased both quality and length of life (Temel et al., 2010). This information is relevant to this study because it demonstrates the importance of the roles of all of the different members of the interdisciplinary team in palliative care, further justifying the importance of understanding how communication occurs among the team members.

Palliative care is further complicated by the fact that it is a setting in which care goals are tailored to the overall needs of the patient, both medical and non-medical. Guidelines exist in palliative care; however, the individuality of patients' needs due to their differing comorbidities and care goals requires that care plans be tailored to meet the needs of each patient. Guidelines are created at the population level, and the individuality of patient needs in palliative care means that translating some of these guidelines to the patient level can be difficult. In this setting even more so than other healthcare environments guidelines cannot be used as rules. The individuality of patients and the differing doses of medications that are prescribed combine with the factors common to all healthcare environments to create an environment in which there is significant potential for medical errors to occur (Sirriyeh, Armitage, Lawton, & Gardner, 2010).

2.4.1 Medical Errors in Palliative Care

Three 2010 publications identify both the potential for serious medical errors in palliative care and the surprising dearth of studies examining this topic (Blinderman, 2010; Dietz, Borasio, Schneider, & Jox, 2010; Sirriyeh, Armitage, Lawton, & Gardner, 2010). As discussed above, despite the high number of studies that have looked at medical error in acute care settings, the structured literature search conducted identified only six articles that dealt with medical error in the palliative care setting and only two that in any way measured its prevalence. According to both of these studies, errors that occur in palliative care are almost exclusively minor errors that do not result in harm to the patient. Both studies were

quantitative studies that made use of incident reports to identify the prevalence and severity of medical errors in palliative care (Boyer, McPherson, Deshpande, & Smith, 2009; N. Taylor, Fisher, & Butler, 2010). However, several studies conducted in other areas of the healthcare system have questioned the use of incident reporting for this purpose, as it has repeatedly been found to be unreliable (Boyer, McPherson, Deshpande, & Smith, 2009; Cresswell, Fernando, McKinstry, & Sheikh, 2007; Grepperud, 2005). Studies looking at medical error and adverse drug events have determined that voluntary reporting of events through incident reports does not capture the vast majority of incidents (Christiaans-Dingelhoff et al., 2011; Cullen et al., 1995; J. A. Taylor et al., 2004). Reporting is often biased based on when in the care process the error occurred, whether it was an incident that would be noticed, and the relationship between the individual responsible for initiating the error and the individual who witnessed the error (Boyer, McPherson, Deshpande, & Smith, 2009). Due to this variability, the ability to guarantee the reliability of the results of studies based entirely on incident reporting is limited.

It is not only this questioning of the voluntary incident reporting systems that indicates that additional research needs to be undertaken in this area. Even if incident reporting as a data collection method is viewed as reliable, the fact that the errors that were identified were so minor would indicate that palliative care is much more effective than other areas of care in preventing serious medical errors from occurring. How this is accomplished is worth studying. Irrespective of whether or not the published studies are accurate representations of what is occurring, they therefore provide a compelling rationale for studying how a palliative care unit communicates, and how this communication influences the potential for medical error.

2.4.2 Communication in Palliative Care

Due to its interdisciplinary nature and the variety of individuals involved in different components of a patient's care, the ability to keep all members of the team up to date on the status of patients is instrumental to high quality patient care. Added complexity occurs when all team members are not available at all times, making it necessary to employ not only

synchronous communication acts, such as a telephone call or verbal face-to-face discussion, but also asynchronous communication acts, such as a written update in a patient medical chart or leaving a note for a specific individual (C. Kuziemsky et al., 2009).

These different communication events can also be designed as formal, regularly occurring events that are built into the team member's days, or they can be informal events that occur on an as-needed basis among subsets of the interdisciplinary team. The regularity with which informal methods of communication are used in order to keep everyone informed on patients' conditions underscores the importance of communication in promoting effective teamwork. In an interdisciplinary team, communicating across different disciplines and ensuring that the information that is communicated is useable and understood by the different providers adds another layer of complexity to the process (P. Hall, Weaver, Gravelle, & Thibault, 2007).

As described above, good communication in a palliative care setting is essential to providing high quality care (Hausser & Walsh, 2008; Wiegand, 2009). The wide variety of health professionals involved in providing care to patients is indicative of the complexity of keeping all relevant health professionals 'in the loop' on patient's care. Although formal team meetings may occur on a regular basis, a patient's condition can change quickly, making these formal meetings insufficient. Informal meetings between members of the team occur on a regular basis through the use of structured information tools, as well as unstructured conversations between the clinical team members to communicate medication changes and changes in patient condition. The complexity of this healthcare setting and the communication intensive nature of the work provide an ideal setting for understanding the role that communication plays in preventing and promoting medical error.

2.5 Gaps in the Literature

As has been outlined in the above literature review, current literature dealing with team communication within a clinical communication space and the understanding of common ground has been looked at predominantly through the lens of classifying these interactions in order to understand how they happen and when/how the different types of communication

occur in a complex care environment. This research will use the practice of PST as a case study to move beyond simply identifying different methods of communication, and will work to identify their effectiveness and offer suggestions for improving methods of communication among team members in areas that are identified as weak. Table 2, below, describes the information that is and is not known about communication in palliative care settings. Recently published studies in palliative care and medical error research also identify a need for further studies and an increased number of studies in this area (Dietz, Borasio, Schneider, & Jox, 2010; Sirriyeh, Armitage, Lawton, & Gardner, 2010). The following chapter will identify how these questions will be addressed in this research study.

What do we know?	What do we still need to find out?
1) Common ground is required between clinicians in order to provide high quality medical care	• How is common ground achieved and maintained within a specified medical process, such as the practice of PST?
2) Communication issues are a leading cause of medical errors	• What interventions/what areas of focus will prevent these types of errors from occurring?
3) Medical errors occur in all areas of the healthcare system	• What are the precursors to these errors? • How can we identify why they occur?
4) Palliative care is a complex interdisciplinary clinical environment	• What are the implications of this clinical environment on effective communication practices?

Table 2. What is known/not known about clinical communication in palliative care? (Alvarez & Coiera, 2006; Coiera, 2000; Gong, Zhu, Li, Turley, & Zhang, 2006; Sirriyeh, Armitage, Lawton, & Gardner, 2010; Stetson et al., 2001; Zhang, Patel, Johnson, & Shortliffe, 2004)

CHAPTER III: Methodology

Chapter III describes the methodology of the study, which was designed to address the gaps in knowledge identified in Table 2.

3.1 Case Study

A case study approach is best used in situations in which it is both the individuals and the environment in which they exist that are of interest to the researcher – these things cannot be easily separated and should not be for an overall understanding of the context in which the individuals exist. According to Stake (2005), a case study is a bounded system, the context of the case is of importance, and there is the ability to triangulate and validate the study findings. The practice of PST on an in-patient palliative care unit meets these criteria. The fact that when correctly administered PST occurs only when a patient is expected to live no more than 2-3 weeks creates a natural time boundary that prevents the collection of information from dragging on, and provides clear boundaries around the scope of the study. This natural limitation of the size of the communication being observed also decreases the scope of the potential confounding influences that must be taken into consideration.

This case study focuses on not only understanding the situation in which this particular palliative care service works, but is looking for this case to provide insight into the general field of interdisciplinary team communication (Stake, 2005). Stake (2005) defines this type of study as an instrumental case study because it is using a case to “provide insight into an issue” rather than focusing solely on the case in question. This type of analysis is recognized as a valuable use of the case study methodology (Stake, 2005).

This case study makes use of several different methods to ensure the credibility of its data and to provide the necessary information to make it a trustworthy case study:

1. Member Checks: Member checks were performed with all willing interview participants to ensure that data collected, study findings, and the workflow model of PST created is consistent with the knowledge of study participants.

2. Coding Checks: Coding checks were performed by the researcher's supervisor on a subset of transcripts in order to ensure consistency of coding.
3. Provision of Thick Description: A description that is as detailed as possible while still maintaining the anonymity of the case is provided so that anyone looking to determine the transferability of this study's results will be able to understand the study's setting and circumstances, as well as the results found.
4. Triangulation: Information was obtained from three different qualitative data sources (observations, interviews, and documentation). This information was compared on an ongoing basis in order to determine the reliability of the data obtained.

(Lincoln & Guba, 1985; Miles & Huberman, 1994; Stake, 2005)

A qualitative analysis in this area is recommended because while a quantitative study could provide information on whether or not the practice of PST is understood at a theoretical level, it will not be able to identify what factors are influencing its implementation such as hand-overs and shift changes, level of comfort with the practice, or patient/family characteristics. This qualitative perspective has the ability to understand the complexity of communication surrounding the use of PST on the unit.

3.1.2 PST as a Case Study for Communication in Palliative Care

This thesis looks to gain insight into how an interdisciplinary team communicates to promote best practices and deliver patient care. Through this, the practice of PST will be used to gain an understanding of communication on the unit, which will be modelled to develop an understanding of how medical errors occur within this context. The importance of communication among healthcare providers in palliative care and the complexity of this area of care have been described in Chapter II of this thesis. A practice such as PST should require the input of all team members who possess knowledge that will influence the decision to initiate PST, making PST a communication intensive intervention on the unit requiring the collaboration of many different care providers. The fact that the practice of PST involves specific medications allows for clear evaluation of how communication is

dealt with when it pertains to the healthcare team, specific medications, the patient, and the overall processes involved in the practice of PST.

Poor communication between health providers could have serious repercussions. It could result in patients who do not require PST receiving it, as well as the possibility of patients receiving either inadequate doses of medication, which results in distress for the patient and family as the patient experiences continued discomfort from their symptoms, or too high of a dosage, which may reduce the patient's consciousness beyond what is necessary.

This study occurred prior to the introduction of a formal PST Guideline to the palliative care unit. Its goal has been to determine how and why, from both a team and individual role perspective, the current practice of PST is implemented and how communication surrounding this practice is structured. Understanding both the micro and macro components of this implementation make it possible to evaluate how the various healthcare providers involved understand, communicate, and implement the practice of PST.

3.2 Study Design

This thesis used a case study design, as described above, of one practice (the practice of PST) within one palliative care in-patient unit in a hospital. In designing the data collection phase of this research, it was determined that there were two possible methods of identifying embedded units of analysis within this palliative care unit: One method was to use the three clinical teams working on this palliative care unit as individual embedded cases. The major difference between the three teams on the unit is that the medical personnel (i.e. attending physician, fellows/residents and medical students) are responsible only for a certain set of patients, while the allied health members have the potential to be involved with patients across all three teams on the unit, and the regular nurses on the unit are rotated among the three clinical teams on a regular basis so that all nurses will work with each of the clinical teams in a one year period.

The other method of identifying embedded units of analysis identified was looking at differences between the three nursing shifts (Day, Evening, and Night). Consultation with

clinicians involved in this study suggested that differences between the three nursing shifts would elucidate factors that are relevant when examining communication patterns due to the differing resources that the shifts have access to. For example, access to an on-site pharmacist, other allied health team members, on-site physicians, and use of a pharmacy technician exists only from ~8:00-17:00, which is largely during the Day shift. For most of the Evening shift and all of the Night shift the only access to these resources is through an on-call pharmacist and an on-call physician. Because of this potential difference, an effort was made to recruit nurses who regularly work all three shifts. The decision of which embedded unit of analysis to use was made after data collection had begun so that the researcher could determine which unit was a better fit for the purposes of this study. This was made possible by the fact that data collection was not influenced by the unit of analysis. Upon review of the data, it was determined that the most meaningful embedded units of analysis in terms of communication strategies are the three different nursing shifts due to the differences in their access to resources.

Ethical Approval

Ethical approval for this study in the form of a delegated review was obtained from the hospital's Research Ethics Board (REB), as the primary location of the research being conducted. As the researcher is a student at the University of Ottawa, administrative approval was also received from the University of Ottawa's Humanities REB. Finally, as two of the Co-Investigators on this study (Dr. José Pereira and Dr. Michelle McKinnon) are physicians practicing with another local hospital, a delegated review was also completed by that hospital's REB and study approval was obtained.

3.2.1 Setting

This research was conducted with a palliative care team working exclusively with in-patient palliative care patients within a hospital. The researcher received permission to work with this team and buy-in from key team members in order to begin establishing connections to conduct the research project. This study had the potential to involve all health professionals working on the palliative care unit, including the physicians, nurses, and the unit's allied

health professionals (pharmacists, spiritual care, social worker, psychologist, recreational therapist, occupational therapist, and physiotherapist). Non-clinical staff on the unit, such as the ward clerks and the porter, were also aware of the study and had the opportunity to be involved.

A detailed schematic of palliative care unit can be found in Appendix C. There are three “wings” to this palliative care unit, created by three medical/clinical teams. Patients’ Medication Administration Record binders (MAR binder) and medical chart are kept at each nursing station according to which physician the patient is assigned to and therefore which wing the patient is associated with. Nurses rotate between the three wings roughly every three months. Both Registered Practical Nurses (RPNs) and Registered Nurses (NRs) work on the unit.

3.2.2 Sampling Techniques

Intended participants of this research were any members of the palliative care unit who are involved in the practice of PST and the general running of the unit itself from the perspective of the observations. This meant those potentially involved in the study included the following: representatives of each nursing category (RN and RPN) and each nursing shift (Day, Evening, Night), attending physicians, fellows/ medical residents, medical students/learners, the pharmacists, the social worker, the occupational therapist, the physiotherapist, the recreational therapist, the psychologist, the ward clerks, the porter, and anyone else who believed that they were involved in the practice of PST or who was recommended to the researcher by a participant.

Non-participant observations were conducted in a purposive manner in order to ensure that observations covered not only the three different nursing shifts, but also all meetings and different key time points during the day, such as the ‘priority setting’ period when the physicians first arrive on the unit in the morning. Observations were also conducted on different days of the week to obtain insight into the differences that naturally occur on the unit throughout the week.

A convenience sample was used for obtaining participants to conduct interviews. As described below in section 3.2.3, individuals working on the unit were invited to participate in an interview, and those who were interested in doing so approached the researcher. Interviews were conducted with all interested participants who asked the researcher for an interview.

3.2.3 Recruitment

Making staff aware of this study and then recruiting participants involved several different methods:

1. **Presentations to Staff:** After approval from the research site REB, two separate presentations to members of the palliative care group were given.
 - a. The researcher presented the proposed research at the palliative care unit's Work in Progress Rounds. This presentation was given to the physicians, unit managers, research staff, and other unit staff who are involved in research. The presentation discussed the rationale for the study, what research into this area had already been done on the unit, and how the results would provide useful information to the unit. The researcher also answered questions in relation to the scope of the study and how the data would be analyzed and compiled.
 - b. The researcher also presented this study to the staff on the palliative care unit (PCU) during their monthly staff meeting, and handed out an information sheet (similar to what would later be posted on the unit). In a brief oral presentation, the researcher discussed the study's objectives and the expected benefits to the unit. She also discussed how she would go about her data collection, and who and how many people she would be looking to involve in the research. Additionally, the researcher provided the staff with a brief idea of what additional means would be used to inform them of the study once recruitment and data collection began.

2. Introduction to the unit: The unit's Advanced Practice Nurse showed the researcher around the unit to acquaint the researcher with the layout of the unit so that she could gain a better understanding of how the unit functions as a whole, the physical layout of the unit, etc. Over the course of this tour, the researcher was introduced by the Advanced Practice Nurse to various staff members.
3. Information Sheet posted on the unit: Upon receipt of approval from all three REBs, posters advertising the study were placed around the palliative care unit to inform all staff that the study had begun and to ask anyone who was interested in participating to contact the researcher.
4. Email Contact: Although originally it had been proposed that the researcher would obtain a list of all of the eligible staff members and contact them herself in order to obtain a random sample of participants, this method of recruitment was not accepted by the research site's REB as the contact information and staff names were not something that the researcher would ordinarily have access to. Instead, the researcher revised the recruitment process so that the office of the unit's Director sent out a general email to all staff on the unit who were eligible to participate, and asked them to contact the researcher if they were interested in participating in this study. Within this email notice, there was an assurance that participation would in no way impact the individual's employment with the unit or other work at the hospital, and staff were further informed that if there was a high rate of interest not all individuals who were interested in participating would be contacted for an interview or shadowing.

An effort was made to recruit members of all of the different groups involved in the practice of PST and nurses from all three nursing shifts for interviews. In total, 107 individuals were involved in observations. Table 3, identifying the different professions involved in the non-participant observations can be found below. Of these, 17 individuals participated in interviews and one individual was shadowed to gain insight into the nursing workflow. These interview participants were representative of the healthcare team and included members from multiple different disciplines (physicians, nurses, and allied health). Due to the small number of health professionals in some of the categories identified in Table 3,

individual observations and interviews cannot be tied to specific individuals and a more detailed description of participants is not included in this thesis due to the potential for individuals to become identifiable. Recruitment materials described in this section can be found in Appendix D.

Position	No. of Individuals
<i>Allied Health</i>	
Chaplain	1
Dietician	1
Pharmacist	2
Pharmacy Student	1
Pharmacy Technician	1
Physiotherapist	1
Physiotherapy Aids	3
Porter	2
Psychologist	1
Recreational Therapist	1
Social Worker	1
Unit Manager	1
Unit Manager's Assistant	1
Ward Clerk	4
<i>Physicians</i>	
Physician	6
Medical Resident	8
Medical Student	9
Nursing Student (RN)	3
Occupational Therapist	1
Personal Care Attendant	3
<i>Nurses</i>	
Advanced Practice Nurse (RN)	1
Practical Support Nurse (RN)	1
Registered Nurse (RN)	35
Registered Practical Nurse (RPN)	19
Total Participants	107

Table 3. Professions involved in non-participant observations

3.2.4 Data Collection Methods

Multiple types of data collection are recommended for this type of study in order to see not only what individuals say they do using interview data, but also what they actually do through non-participant observation (Reddy & Spence, 2008). Figure 2 below shows the timeline of data collection.

Type of Data Collection	February	March	April	May	June	July	August
Observations - General							
Observations - Shadowing							
Interviews Conducted							
Documents Collected							

Figure 2. Summary of Data Collection Timeline

Non-Participant Observation

Non-participant specific observation was predominantly used as the method of observation for this study. This observation involved observing how the team interacted around specific areas (such as at team rounds or at the nursing stations) and did not follow any specific individual through the completion of activities. In total, 76 hours of non-individual specific observation occurred. Observations were done of all three nursing shifts, and all major meetings (including priority setting each morning and team rounds for each wing which occur once per week in the afternoon). Each time period was observed a minimum of twice until the researcher was confident that she had learned the patterns of that time frame. One instance of shadowing a nurse - 2 hours – also occurred in order to provide insight into the nursing workflow on the unit. This observation identified a specific individual who consented to be observed while carrying out their routine duties. The individual was shadowed and their conversations were recorded.

Transcripts of non-participant observation were created by the researcher making use of her field notes, which were written using the audio-recordings of the observation periods and a standardized template that included information on the individuals involved in the communication acts, the purpose of the communication, any resources used, the method of

communication (e.g. face-to-face, telephone, written, etc.), and whether there was an interruption or an error in this communication act. This standardized observation template was based loosely on the Post-Observation Summary sheets created by Miles & Huberman (1994). These notes were written up and discreet periods of communication were identified using methods proposed by Spencer, Logan and Coiera (2002) and Miles and Huberman (1994). The template used for general observation field notes can be found in Appendix E, and the template for observation of team rounds can be found in Appendix F. The template created by the researcher to transcribe observations can be found in Appendix G.

Semi-Structured Interviews

Semi-structured interviews with probes were conducted in order to make it possible for variations in knowledge among the different health professionals to be appropriately assessed, and to provide a deeper insight into the practices and procedures that the researcher observed while on the unit conducting observations. In total 17 interviews were conducted, ranging in length from 14 minutes to 1.5 hours. Overall, the interviews were approximately 30 minutes in length.

A set of general interview questions were developed in consultation with the researcher's supervisor and the study's clinician co-investigators, and were further refined throughout the data collection process (see Appendix H for the general interview guide). The interview guide was then tailored to the relevant questions for each participating profession. Wording of questions was likewise tailored to the profession of the individual answering the questions.

Documents/Literature

Documentation including the Champlain PST Guidelines and Protocols, which can be considered as the ideal "best practice" document for PST in this setting, are used as a comparison to the actual practice of PST that is occurring on the unit. Blank copies of documentation typically used on the palliative care unit were obtained so that the layout and information required for each document could be identified as needed.

3.4 Analysis

In total, 404 pages of observation data (44 transcripts) and 169 pages of interview data (17 transcripts) were transcribed. Upon completion of the transcription, 49 transcripts – for a total of 314 pages of observation data and 95 pages of interview data – were reviewed and coded prior to the researcher and her supervisor determining that saturation of the data had been achieved through the identification that no new codes were being identified in the data. Appendix I demonstrates this through showing the dates upon which codes were created and modified. Eventually, no new codes were appearing in the data at which point the researcher and her supervisor determined that saturation of the data had been reached.

3.4.1 Directed Content Analysis

Coding of this data was done based on a directed content analysis approach. The goal of content analysis is to improve the understanding of a phenomenon when some knowledge of the area of research already exists (Hsieh & Shannon, 2005; Krippendorff, 1980). Directed content analysis should be used when “existing theory or prior research exists about a phenomenon that is incomplete or would benefit from further description” - when you are looking to expand or build upon currently existing theory (Hsieh & Shannon, 2005).

Although this study is based on existing models of the clinical communication space and common ground, these models are not sufficiently detailed to be considered a theoretical framework. However, when determining the type of analysis that would be conducted for this study, it was decided that although there is no existing theory on the topics under study the conceptual models created by Coiera et al. (2000), Clarke & Brennan (1991), and Malhotra et al. (2007) provide sufficient information regarding how communication does and needs to occur in order to be effective in healthcare for a more directed approach to content analysis than would be expected in a conventional content analysis.

In keeping with the methodology of directed content analysis, the researcher used a combination of deductively and inductively determined codes. The coding tree developed (see Appendix J) can be considered an overarching conceptual framework for this research

with sensitizing concepts. Coding and analysis was performed using QSR NVivo 9 qualitative data analysis software. A basic coding framework was developed by the researcher in consultation with her supervisor upon the completion of transcribing all data. At this point the researcher had a good understanding of the conceptual models upon which this study is based and a solid knowledge of her own data as she transcribed all observations herself and reviewed all interview transcripts. This knowledge allowed the researcher to create a coding tree that was applicable to the coding needs of this study. Upon beginning to code the data, the researcher added additional codes as needed to accurately capture the full extent of the data being presented. These inductively added codes largely ‘filled out’ and added to the general themes that the researcher had already identified (see Appendix J for the coding tree). Selections of the coded transcripts were reviewed by the researcher’s supervisor in order to ensure consistency of data coding. Throughout the coding and analysis process, the model of communication began to emerge and was regularly reviewed and refined by the researcher and her supervisor. As another form of validation of the data, the researcher’s model was reviewed at peer debriefings sessions at three different time points throughout the development stage.

3.4.2 Model Development

The development of a communication model was identified in objective #1 as one of the main goals of this study. In order to understand how an interdisciplinary healthcare team communicates, it is necessary to understand what the different components of this communication are. The variety of data sources in this study provide a rich understanding of how communication occurs on this palliative care unit. By reviewing the data and identifying patterns in the processes that team members engage in to communicate with one another, it becomes possible to identify the steps in an act of communication and through this identify the different components of a communication act.

The focus of this thesis study is on the ability of multiple team members to transfer information amongst each other. Therefore, the focus of the model that was created for this thesis is on understanding the different components of the communication act involved in

determining how to share information in an appropriate and effective manner. The model of communication created will be discussed in greater depth in Chapter IV.

CHAPTER IV: Results

The results outlined below discuss communication observed on the palliative care unit and how the case study provides insight into this communication. An understanding of the various components of the communication model and how this model is used in the practice of PST was gained through analysis of the identified themes and matrix coding to identify trends in the data. An example of the analysis comparisons – including the code matrix and the data summary table – can be found in Appendix K.

Figure 3 provides an overview of the layout of the results, indicating in which sections of the chapter each discussion takes place. There are three pieces to these results. The first piece provides context by describing the practice of PST on the unit and identifying overarching aspects of communication and communication issues and errors (Figure 3, sections 4.1.1-4.1.3). The second piece is a description of the communication model, and factors influencing the model, created based on the observations and interviews conducted for this thesis (Figure 3, section 4.2.1). Finally, the characteristics of common ground and awareness are discussed in the context of their role in preventing the occurrence of communication issues and medical errors (Figure 3, section 4.2.2).

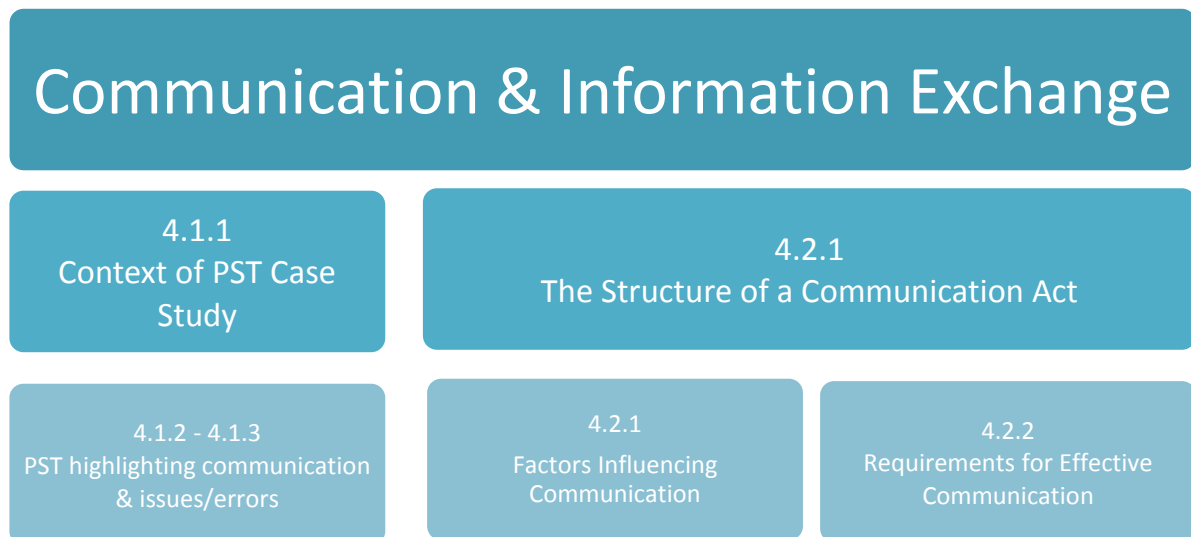


Figure 3. Layout of results chapter (numbers refer to section numbers in the Chapter IV)

4.1 Communication within the practice of PST

The overall context of the practice of PST has been described previously in Chapter III, section 3.1.2. PST is used in palliative care to relieve uncontrollable symptoms when a patient's symptoms cannot be controlled in any other reasonable manner and the patient is nearing the end of their life. Interview participants were asked questions about how PST was implemented on the unit, and under what contexts they believed it would be used in order to elucidate any potential variations in implementation which would impact the PST workflow. The following section will review how PST occurs on this unit, and identify the complexity of communication regarding care provision in this interdisciplinary practice and how communication acts as a precursor to medical error.

4.1.1 Overview of PST Workflow

Through observations and interviews with members of the healthcare team, the following descriptive workflow model (Figure 4) was created to illustrate the practice of PST as used on this unit. This diagram was shared with interview participants to validate its accuracy.

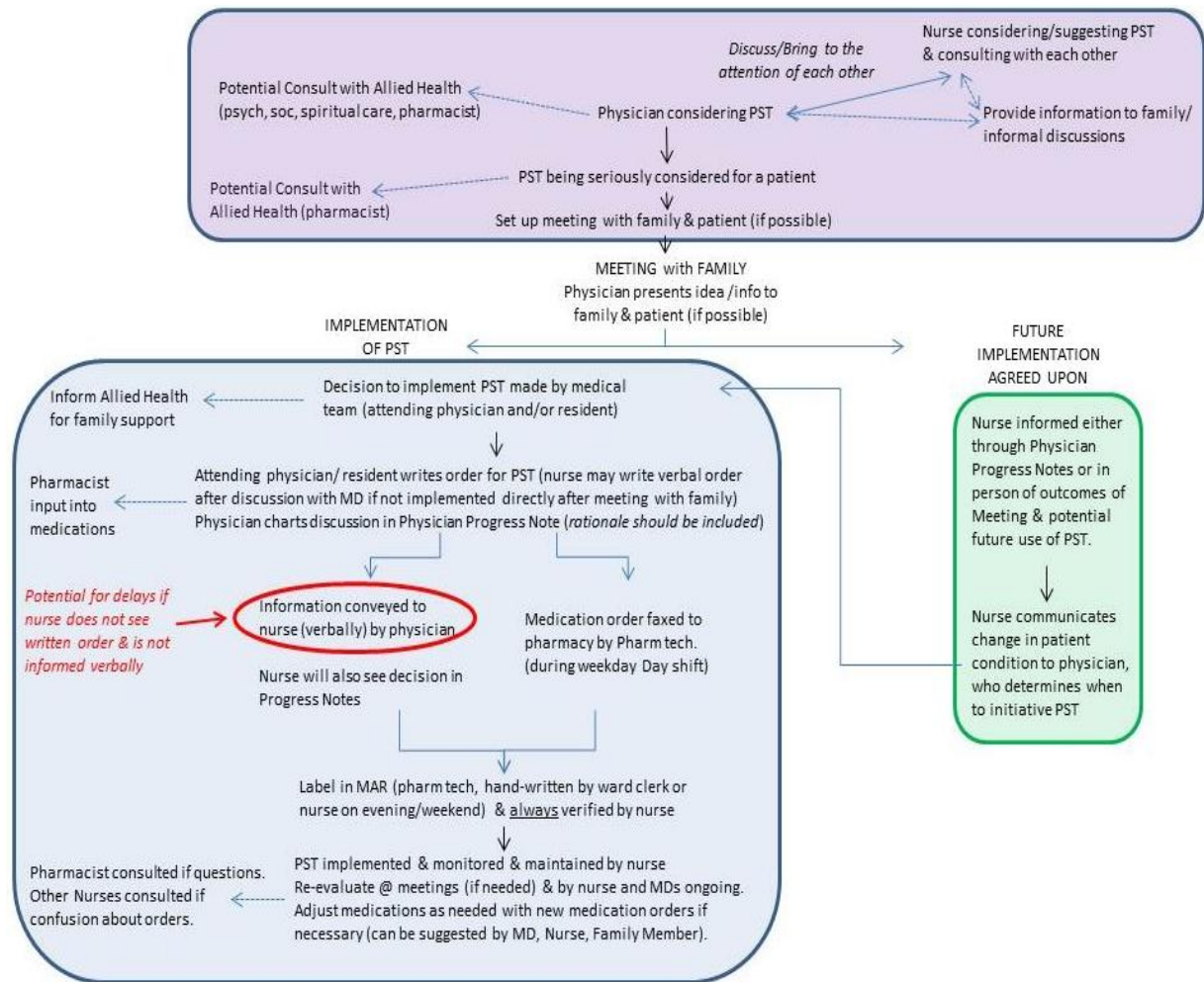


Figure 4. Workflow model of the practice of PST on this unit

The initial idea that PST may be needed originates from either the nurse or the physician. Discussion with other health professionals and the patient and/or patient's family then occurs prior to any decision being made. If the decision is made that PST may be needed, a note is written in the patient's medical chart to indicate this. When the decision is made that PST should begin the physician writes a medication and treatment order, which is sent to the pharmacy. Upon receiving the necessary information, the nurse begins PST with their patient. Medication doses are increased and/or decreased in consultation with the patient's physician.

Each of these different actions can be considered a separate step within the practice of PST. The number of steps involved in the practice of PST, the number of different interdisciplinary team members with the potential to be involved in any given step, and the different methods of communication that can be used at each of these exchanges highlights the complexity of this particular practice.

4.1.2 Understanding of PST on the Unit

In order to make this PST workflow model (Figure 4) as detailed as possible, the researcher asked interviewees about where they would find information, how they would share it, and the quality of this information. Overall, individuals felt that they had two main sources of data: their colleagues and written notes. Which resource individuals made use of depended on what information they were looking for and the shift they were working. One nurse described this difference in the following quotation:

During the Day shift you have the privilege to be with the interdisciplinary team, which is awesome because you have answers right away. But in the Evenings and Nights you don't. - Nurse

Verbal Information: The availability of colleagues as sources of information was a point raised by several participants, as which team members they have access to depends on the time of day and the day of the week. Allied health and physicians are typically on the unit for the majority of the Day nursing shift Monday-Friday, with one resident and one attending physician being present on the unit during the day on Saturdays and Sundays. When physicians and allied health are not on the unit, nurses are largely dependent on verbal information from other nurses and written information from the rest of the team.

Written Information: The most frequently cited written sources of information were the progress notes in the patient medical chart and the MAR binder. These two resources are reviewed by nurses at the beginning of their shift, and they are required to read 24 hours back in the progress notes to obtain background knowledge about their patients' conditions and medical history. The quality of written information was noted as a potential source of

concern, as information is not always written as clearly as it could be, or may not be carried forward in the progress notes.

Often there is a write up about PST by either the resident or the doctor. One of them usually writes what has been discussed, how it has been decided, and pharmacy involvement. If you read their notes you normally know what has been decided. I don't know that nursing has always written it black and white. Often you would write that 'the CADD was installed' or "the CADD was changed", "the order was implemented", or something along those lines. - Nurse

Experienced palliative care nurses believed that this limited information in the nursing progress notes and the medication list in the MAR binder were enough information for them to identify that their patient was receiving PST; however, it was insufficient for nurses who were less experienced in palliative care. The inability to make these connections is not a reflection of the nurse's abilities. It is a reflection on the importance of clear documentation, especially when nurses do not have the background knowledge that would otherwise allow them to identify this practice as PST. The potential for team members to have less familiarity with these practices increases the need for other members of the team to support them by communicating information on a frequent basis and explaining any information that is not understood. Without this increased communication, the potential for medical errors and decreased quality of care increases.

The idea that team members with less palliative care experience require additional information and explanation hints at the importance of being (1) familiar with your environment and (2) familiar with your team member's information needs and your own needs. This could be described most simply as a need for contextual awareness, or simply a need for *awareness*. A definition of awareness was introduced earlier in this thesis in section 2.3.3.

In this interdisciplinary team, documents in the medical chart and MAR binder are used by a variety of different health professions, so the documentation needs to reflect the varied backgrounds and knowledge of its users. Team member's ability to understand their own information needs and those of their colleagues impacts the utility of any shared form of communication or documentation. Ultimately, the utility that individuals gain from their

methods of communicating and sharing/seeking information need to be balanced with the utility that is gained by the entire team's ability to use the same communication and information sharing methods effectively. This give and take ideally results in a balance in which individuals from all disciplines – and therefore collectively the interdisciplinary healthcare team – are able to optimize their usage of resources and minimize the negative repercussions of loss of common ground.

4.1.3 Potential for Error & Communication Issues

Section 4.1.2 highlighted the reliance that is placed on written documents and the importance of effectively communicating among members of the interdisciplinary healthcare team. Information needs to be clearly written and easily understood by any member of the team who reads it. For a practice such as PST, this type of effective communication is especially important.

The potential complexity of understanding care goals based on the information provided in a practice such as PST, as described above and alluded to in Figure 4, provides insight into the importance of communication in this practice. The completion of each step in the practice of PST and the beginning of each new step are marked by communication activities occurring, such as consulting with a pharmacist or writing a progress note. This reliance on communication was illustrated not only by interview participants indicating that they would look for information in the medical chart and MAR binder, but that at each nursing shift transition the researcher observed that the outgoing nurses would frequently find the oncoming nurse who would be looking after their patients to give a verbal debrief. Although patient handovers are not required on this unit, they were a commonly witnessed occurrence. Clearly, the flow of information is viewed as necessary by these nurses for providing effective care.

In terms of the practice of PST on the unit, there is not only the handover between nurses to transfer information, but also information sharing among the various health professionals on the unit. The involvement of these different health professionals at different points in the practice of PST identified in Figure 4 increases the complexity of this workflow because

each person must be brought into the discussion at the correct time or they will not be able to contribute to the patient's care or support the patient's family to the full extent of their ability.

As the process of care becomes more complex and the communication needs for ensuring effective care becomes greater, the points in this workflow where the potential for errors to exist increases. Figure 4 illustrates how the number of possible combinations of team members involved in any one step of care, the variety of methods of communication that could be used, the amount of information that needs to be shared, and the workflows of different team members combine to create a scenario where there is a great deal of potential for errors to occur. A clear understanding of what is happening with their patient and what the overall expectations of care are on the unit is needed for team members to be in a position to avoid these errors. Knowing when and where to share the information that you possess is as important as knowing when and where to find information when you need it. At any given point during the practice of PST, there is the potential for errors to occur if the correct method of communication is not chosen or if a step is skipped.

4.1.3.1 Communication Issues & Errors on the Palliative Care Unit

As has been outlined in the section above and shown in the PST workflow (Figure 4), there are a variety of decisions and communication flows in the practice of PST. At each step of the PST workflow, there are several factors influencing how the needed communication act is carried out. These factors will be discussed in greater detail in section 4.2. This section provides an overview of the communication issues and medical errors identified during this study.

These identified communication issues and medical errors may occur at any point during the communication act. Describing them prior to an in-depth discussion of the components of the model of a communication act (section 4.2, Figure 5) permits a more comprehensive explanation of the issues that can occur within each step of the model. It is through this identification of weaknesses in the communication act that the opportunity to identify specific points where communication can be strengthened is presented, thereby improving

the communication between team members and reducing the likelihood of medical errors occurring. The following sections are separated into a discussion of communication and information issues and medical errors.

Communication & Information Issues

Through observations on the unit and interviews with staff members, several common information/communication issues were identified. Table 4 identifies the number of each type of issues that were identified. Upon reviewing these issues after the completion of initial coding, they were grouped into three higher level categories as follows:

1. Issues with Quality of Information. The quality of available information encompasses issues such as missing information or information that, while available, the recipient questions the accuracy of.
2. Issues with Access to Information. The ability to access information when it is needed is a key component of ensuring a successful workflow in healthcare. When information cannot be accessed due to a lack of available resources or the availability of other members of the healthcare team it delays the ability of others to complete their work and provide care to patients, and may result in additional work for those who are trying to find resources or people that are not readily accessible.
3. Issues with Awareness of Unit Practices. Not every unit in every hospital functions in exactly the same manner. There are practices that are specific to individual units and resources are used differently by different units and different hospitals. It is therefore important for members of the healthcare team working on this palliative care unit to understand the practices specific to this unit in order for them to function effectively as an individual and for the team to function effectively as a whole.

Issue	No. of Events
Quality of Information	132
Access to Information	29
Awareness of Unit Practices	25

Table 4. Types of communication & information issues identified

These three themes identify the way in which an individual's ability to work effectively and efficiently was affected during the period of observation. In identifying when these different types of communication/information issues occur, it was noted that while issues related to quality of information could occur at any point during a 24 hours period, access to resources was typically identified during the Day shift and during transition periods between nursing shifts. Issues around awareness of unit practices were typically identified during the Day shift and more specifically during Team Rounds. This is likely due in part to the fact that having all members of the healthcare team together during Team Rounds permits them to ask questions about the unit's protocols that they would otherwise not have an opportunity to voice in the presence of the researcher.

Communication or information issues, while they did inhibit the effective workflow on the unit, could frequently be overcome with work-arounds. They are indications of inefficiencies and potential problem areas, but they may not be medical errors per se. The types of medical errors identified during the course of this research are outlined below.

Types of Medical Error

Three types of medical error were identified during the data analysis process. These errors were (1) medication errors, (2) documentation errors, and (3) process errors. Situations where there was a potential for errors to occur were also identified. These types of medical errors are identified in Figure 5 (model of a communication act) as being evident at step #4 – the point where an action takes place. Identifying them at this point in the model occurs because it is at this stage that the active error can be seen – it is difficult to identify an error earlier in the communication act without significant testing of the hypothesized points where these errors could occur. Within the following discussions, the different types of errors that may occur and explanations of the most common reasons for these errors are provided.

Table 5 identifies the number of instances of each type of error that was identified during the time spent doing observations on the palliative care unit and through interviews with participants. The numbers of events are not mutually exclusive, as there is a certain amount

of overlap anticipated. For example, it is possible that a documentation error could lead to a medication error.

Type of Medical Error	No. of Events
Medication Error	11
Documentation Error	59
Process Error	127

Table 5. Types of medical error identified

(1) Medication & (2) Documentation Errors

Medication errors were not identified frequently on the unit and when they did occur they occurred for a number of different reasons, making the frequency of each type of error very low. Documentation error was more prevalent, with a lack of clarity in documentation being the overarching theme identified. This could be someone using a short form that is not understood by all members of the unit, or the actual diagnosis and rationale for that diagnosis not being clearly written in either the progress notes or the medication/ treatment orders.

One nurse asked another nurse for assistance clarifying a written order because the nurse did not understand the short form used by the physician. The other nurse was able to clarify what the order meant.

(3) Process Errors

Process errors were the most frequently identified type of error. Process errors encompassed several different occurrences. One of the most frequent overarching items was the completeness and current-ness of documentation. For example, if names are not provided on documentation feedback cannot be given if someone is completing a task incorrectly. Or if complete information is not provided – such as a rationale for why something is occurring - additional work becomes necessary to identify why someone would want that procedure done. Alternatively, without the rationale another member of the healthcare team may disregard/misunderstand a treatment order or unintentionally misuse that medication order because they have a different view of what is needed for a patient. The two quotes below

highlight how easily this type of event can occur when access to team members is limited and documentation is insufficient.

Sometimes the doctors do not really take your word for it that a patient needs PST, or they may see the patient at a moment when they are calm and comfortable and the next moment they are jumping out of bed, restless, severe pain, vomiting, nauseous. – Nurse

Sometimes we use medications for symptom control and they are sedating medications and nurses use them liberally. But during the Evening and Night we are not there to see the patient in that moment, and you can't really judge. – Physician

Another process error that was noted was the timely delivery of information. This was typically brought to light during Team Rounds when the medical team would describe a change to a patient's care plan that they had implemented and the order would not yet have been transcribed into the MAR binder so the nursing staff would not be aware of it.

There was discussion between a nurse and resident about what an order should be for a patient and where it was written. The pharmacist clarified what had already been written in the medical chart. The appropriate tags were not up in the chart because the orders had been processed by the pharmacy but not by the ward clerk, so things had not yet been transcribed.

A common process error that was also identified on the unit was the completeness of information provided during PA system announcements. Frequently only 'who' was provided, and that individual is left to determine 'what', 'where', 'when', and 'why' they are being paged, as in the example below.

"[Nurse]" was announced over the PA system. The person who made the announcement was not the ward clerk.

Potential for Error

Through the interviews and observations conducted for this study, 104 situations with the potential for errors to occur were identified in several different overarching situations. Potential for error around documentation occurred in situations where the timely updating of documentation was necessary for its accurate usage but may not have occurred, or where the

actual accuracy of the documentation was in question. Wording choices also had the potential to lead to errors where misunderstanding wording could result in the wrong action being taken.

Verbal discussions where no notes are taken but a significant amount of information needs to be remembered and interruptions were two other areas that were identified as having high potential for errors to result from incorrectly remembered facts.

The attending physician, dietician, pharmacist and resident are talking about a patient's food. No one is writing anything down during this conversation so they will need to remember what they decided to do.

Lastly, access to resources at the time that they are needed was identified as a situation that could lead to errors. For example, in the case of PST several nurses identified that they could determine whether a patient was undergoing PST through the medications being used and their dosage. While this is possible, it is not a guaranteed method of determining the patient's treatment plan. However, it could be the only option available to the nurse if they have access to the MAR binder but not the patient's medical chart at the start of their shift.

As demonstrated by the variety of communication issues and medical errors identified above, there are several ways in which a communication act can end incorrectly or make producing the desired result difficult. In the context of studying communication, these issues and errors can be identified as relating to a lack of awareness of unit practices or a lack of common ground existing for the task at hand. How these communication issues and errors occur within the context of communication and the existence of common ground/awareness on a palliative care unit will be incorporated into the discussions of the components of the communication model (Figure 5) below in section 4.2.1 and the relationship between common ground and awareness will be further expanded upon in section 4.2.2.

4.2 Modelling Communication

The communication intensive nature of PST provides an excellent platform for modelling communication. Breaking down communication to identify its components allows us to

understand how each component contributes to the overall effectiveness of the communication act being undertaken. *How* a team chooses to share information, and *what factors* influence that choice is important to understand. The potential benefits and drawbacks to those choices also play a role, and whether information that is communicated is actually understood by those who receive it is yet another factor to consider. Without this common understanding of information – this common ground – any information that is shared is potentially meaningless or could even be harmful if it is misunderstood. One allied health team member described this process of ensuring that all practices are completed correctly and understood by the various team members as ensuring overlap of processes among the team.

We each have our part to play and as a collaborative process we sometimes overlap a little bit to make sure that the T's are crossed and the I's are dotted. You want to make sure that everybody is on the same page. - Allied Health

Understanding how communication occurs requires understanding the several underlying steps that individuals take in the process communicating information to another individual. The correct execution of these steps will allow the individual to achieve their goal of imparting the correct information to the intended recipient in a manner that is understood as it was intended to be. Incorrect execution will result in the individual needing to either restart the communication act while reformatting or re-structuring the information that was previously conveyed, or will result in an individual imparting incorrect information that has the potential to create errors. The conceptual model of the communication act outlined in Figure 5 was created using the information obtained through the PST case study. The model outlines the components and relationships of the communication process. Such a model is essential to understand how communication acts as a precursor to medical errors.

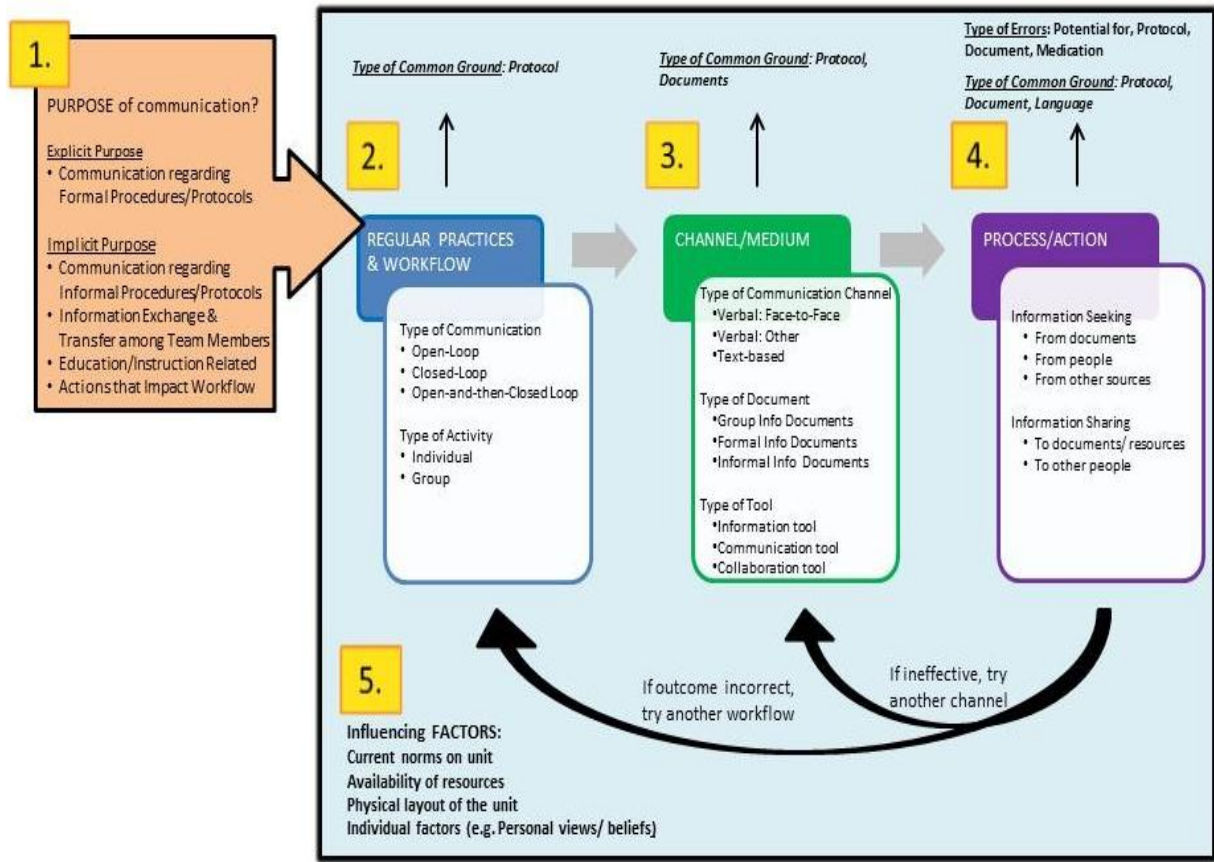


Figure 5. Model of the communication act

4.2.1 The Model of a Communication Act

Each component (also referred to as a ‘step’) of the model of a communication act will be described in sections 4.2.1.1 – 4.2.1.5. The importance of common ground in each component of the model will also be outlined. The yellow boxed numbers 1-5 in Figure 5 identify which component of the model is being discussed. Where appropriate, quotes are used to demonstrate how each component of the model is necessary to the overall goal of effective communication.

Ideally an individual member of the palliative care team should have an understanding of which method of communication is the most appropriate in each different situation they may be faced with. In order for this understanding to exist, a team member must understand the context in which they are working and how their role fits into the larger unit’s practices. This

concept, referred to as awareness, was introduced in section 4.1.2. It will be discussed in more detail in section 4.2.2 of these results; however, it is mentioned here as it is an important point to remember as the sections of the communication model are being reviewed.

Communication models typically represent an ideal or linear communication scenario, which is rarely reflective of real world practices. Figure 5 presents the different choices an individual has available to them within each step in order to carry out a communication act (represented by steps #2-4 in Figure 5), recognizing that there is variability in the choices made based on a variety of different influencing factors (represented by #5 in Figure 5). The different decisions that are made in order for a communication act to take place will be outlined through the discussion of the individual steps in the overall model of the communication act. A summary diagram will be shown prior to the discussion of each step to provide a reference to the reader of which step of the overall model is being discussed.

4.2.1.1 Step #1: Purpose of Communication

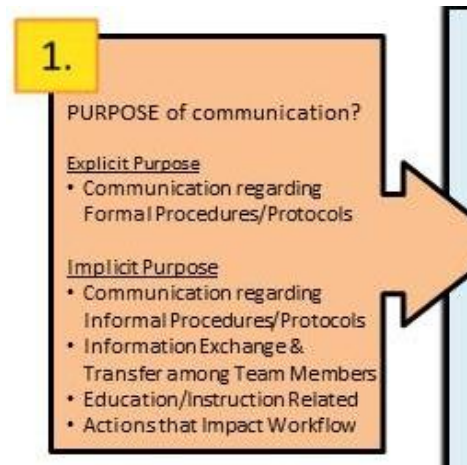


Figure 6. Purpose of communication (for complete communication model, see Figure 4)

As identified in Figure 5, determining that there is a need for communication – in other words, identifying a purpose – is the initial trigger that begins a communication act. Communication occurs for the purpose of imparting information to another individual or

obtaining information from another individual/artifact. This imparting of information can occur in a variety of different ways and for a variety of different reasons. The goal or intended purpose of communicating with another individual is an important factor to consider because the purpose behind the communication will influence the channel an individual chooses to use and the actions that they take in order to communicate their information. For example, if an individual considers their information to be of an urgent nature, they may choose to find the person who requires this information and impart the information verbally face-to-face rather than writing a note that the individual may not see until later in the day.

Explicit & Implicit Communication Purpose

Figure 6 identifies communication acts as a result of either an explicit or implicit purpose. This means that all communication events can be viewed as occurring either because they have to (explicit purpose) or because someone has deemed it necessary without there being an explicit purpose (implicit purpose). Each instances of communication identified was coded according to the purpose behind the communication act. The codes were grouped according to higher level codes to indicate the overarching purpose behind the communication, such as *Actions that Impact Workflow* or *Communication regarding Informal Procedures/Protocols*. They were then grouped into higher level themes to show whether they were explicit or implicit purposes. These grouped themes are displayed in Table 6.

Code	Definition
Communication of Explicit Purposes Communication that is tied to formal/explicit processes.	
<i>Communication of Formal Procedures/ Protocols</i>	Communication that occurs as a result of a formal procedure or protocol that requires this communication to occur. E.g. Updating documentation, Changes to procedures, Verifying/co-signing medications
Communication of Implicit Purposes Communication that is not tied to any formal/explicit procedure or protocol but that must occur in order for members of the healthcare team to provide care to their patients.	
<i>Communication regarding Informal Procedures/ Protocols</i>	Any communication that, while there is no specific protocol in place to facilitate it, occurs as a direct result of the need for communication to provide care to patients. E.g. Patient Hand-off, Decision making
<i>Information Exchange & Transfer among Team Members</i>	Communication intended to share/obtain information to improve the ability of the team members to function as a team. E.g. Obtaining Information, Coordinating Care
<i>Education/ Instruction Related</i>	Communication that occurs in the role of education or providing instruction to another member of the healthcare team.
<i>Actions that Impact Workflow</i>	Actions that are a part of the workflow of the unit, but that due to their nature impact the ability of team members to efficiently complete their work. E.g. Clarify Confusion/Error/Misunderstanding, Looking for Someone, Request for Assistance

Table 6. Identification of the purpose of communication related to an explicit or implicit purpose.

Overall, there were a variety of purposes for engaging in a communication act, with implicit purposes comprising the majority (76%) of all identified communication events. As will be described in subsequent sections, the reason for entering into a communication act influences the manner in which it is carried out.

4.2.1.2 Step #2: Regular Unit Practices & Workflow

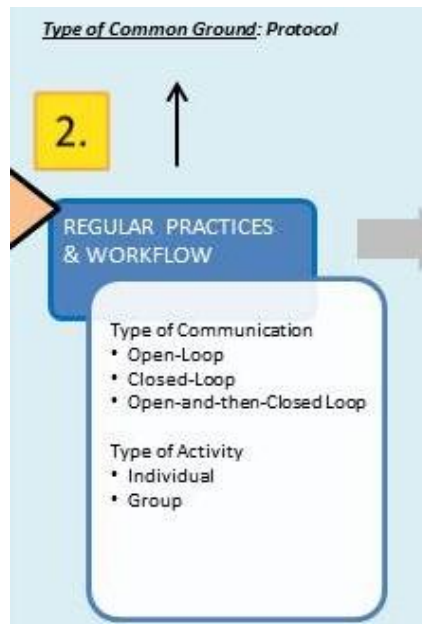


Figure 7. Regular practices & workflow (for complete communication model, see Figure 4)

As outlined in Figure 7, step #2 of the communication act involves identifying what the regular unit practices and workflows are that team members use to convey information. In order to perform this step the individual team member must have some knowledge of the protocols and workflows – both overt and implied – that exist on the unit. This idea of having a common understanding – a common ground – around workflows and communication protocols on the unit can be identified as *protocol common ground*. A more detailed explanation of protocol common ground will be discussed in section 4.2.2 of this thesis. The two areas in which an individual needs to have protocol common ground at this step of the communication act are accurately identifying the type of communication and the type of group or individual activity. Both are discussed in further detail below.

Type of Communication: Open-Loop versus Closed-Loop

One of the initial concepts identified through observations on the unit was the difference between open-loop and closed-loop communication. Open-loop communication is any situation in which information is transmitted in such a manner that there is no confirmation

that the information is seen and/or understood by its intended recipient(s). An example of this would be a nurse writing a progress note at the end of her shift – although she knows that the next couple of nursing shifts and possibly the physicians or other members of the interdisciplinary team may read this progress note she will not receive any confirmation that this has occurred. Close-loop communication is any situation in which information is transmitted in such a manner that there is confirmation that the information transmitted was received and understood. An example of this would be a face-to-face conversation between a physician and a nurse confirming a change in medications for a patient.

It may be more accurate to describe open-loop communication as *information/knowledge exchange/sharing* rather than communication since by definition communication requires a reciprocal confirmation of receiving the information shared. However, for simplicity of understanding how these terms are related the term ‘open-loop communication’ has been used throughout this thesis. Under certain circumstances, it makes sense for open-loop communication to remain open, such as when a progress note is written and is left in the medical chart for other team members to read as needed. In others, such as when a referral request is made for an allied health member of the interdisciplinary team and that person follows up with the physician after seeing the patient, the communication loop may initially be ‘open’ but should eventually be ‘closed’. A summary of the different circumstances in which open- and closed- loop communication can occur and examples of how they have the potential to interact are outlined in Figure 8.

Open-Loop ONLY Should be open & stays open Example: Progress Note	Open, should be Closed & eventually IS Closed May not happen right away, but in a timely / expected manner there is confirmation of information received/ shared Example: Flag put down in Chart
Open, should be Closed & IS NOT Confirmation of receipt of information does not occur Example: order not seen until end of shift, flag not raised so medication not ordered	Closed-Loop ONLY Loop is closed immediately due to the nature of the interaction <i>*this would be considered 'communication'*</i> Example: verbal exchange

This is communication, the rest could be considered "knowledge sharing".

Figure 8. Identification of communication vs. knowledge exchange/sharing

The other consideration that is made when determining the regular practices and workflow is the type of activity that is needed to carry out this communication act.

Type of Activity: Group versus Individual

The decision of whether to involve others in an activity or to perform it alone is influenced by the needs of the particular communication or information exchange activity that is being undertaken. In situations in which communication is required – thereby implying the need for a second individual to confirm the receipt and understanding of the message communicated – a group activity is automatically required. However, not all information exchange that occurred on the palliative care unit required immediate feedback. Activities such as writing a progress note or leaving a note for another individual indicating that a patient medical chart has been moved to another wing of the unit for the day are not

activities that require confirmation that they have been seen. An individual only needs to see the note about the location of a certain patient's medical chart if the individual is looking for that medical chart. Likewise, an individual only needs to read a progress note if they are responsible for the care of that patient in some way and require the information contained in that progress note. On the palliative care unit, both group and individual activities occurred on a regular basis, although group activities occurred more frequently than individual activities.

Group Activities

Group activities were largely verbal in nature, with the large majority occurring during face-to-face verbal communication. These group activities were coded as a correct usage, incorrect/unnecessary usage – in which either the actual activity was incorrect/unnecessary or it would have been unnecessary if an earlier activity had not included an error - or neither correct nor incorrect. Table 5 identified the number of coded incidents of each type of group activity in order to provide insight into the trend identified.

Necessity of Group Activity	No. of Events
Neither correct nor incorrect	28
Correct usage	513
Incorrect or Unnecessary usage	134

Table 7. Breakdown of group activities

The majority of correct group activities were verbal information sharing among team members about patients' conditions, and what the team members wanted to do for the patient or thought the patient needed. This includes activities such as discussing the current status of patients, any needed medication adjustments, and the updating of documents.

At Team Rounds to get the whole team on board with using PST for a patient we are all coming together to ensure we have the same idea of what is going on, the same view. – Nurse

Updating each other about when team members – typically nurses and occasionally physicians – are leaving the unit or returning to the unit, or if they are going to be difficult to find for a period of time, also occurs on a regular basis.

One nurse told another nurse where she could be found because she has to go into a patient's room for a procedure.

Other group activities occur frequently at shift transitions, such as confirming that documents are up-to-date, that medications and keys have been counted, and that verbal patient hand-offs have occurred when they were needed.

In terms of incorrect or unnecessary group activities, most were caused because of an issue with some previous activity. For example, if a written document had been up-to-date and accurate then the subsequent activity would have been unnecessary. During observations there were several examples of unclear documentation leading to unnecessary group activities. Here is one example:

A nurse asked a physician for clarification about the route of administration for a medication, because the instructions on the order were not clear.

Another identified instance that was coded as an unnecessary group activity was the verbal updates given to one team member by another team member about a written progress note or medication/ treatment order change. These situations occur because someone is either confirming that their team member has seen the updated documentation, or is informing the team member that there are updates to documentation that this person needs to be aware of. These situations may or may not be 'unnecessary' but they were coded as such by the researcher as they were seen as a duplication of effort. However in consultation with a member of the palliative care unit they were identified as instances of collaboration that had previously not been occurring on the unit. Historically on this unit without these instances of collaboration written documentation had not been seen in a timely manner and implementation of new treatments had been delayed unnecessarily.

A physician confirmed that a nurse had seen the medication order that had been written for their patient, and that the patient would receive the first dose of the

medication shortly. The nurse replied that she had seen the order, and that the medication had been given. The physician thanked the nurse and left.

Individual Activities

Individual activities were largely identified as relating to referencing documents, writing in documents, and announcements over the PA system.

As demonstrated in Table 6, the majority of identified individual activities were correct in their manner of execution and in the need for that particular activity to occur.

Necessity of Individual Activity	No. of Events
Correct usage	162
Incorrect usage	36
Unnecessary usage	11

Table 8. Breakdown of individual activities

Activities that were identified as incorrect largely related to written documentation that either did not provide sufficient information or provided incorrect information. Unclear documentation, which could result in an individual having to spend time to determine whether the documentation was up-to-date and correct or whether that documentation needed to be updated, was also an identified unnecessary task on the unit.

PA system announcements that did not provide sufficient information were the other large source of incorrectly executed individual activities.

“[Nurse]” was announced over the PA system. The person who made the announcement was not the ward clerk. No indication was given as to what the nurse being called was supposed to do, or where they were supposed to go.

Activities that were identified as unnecessary were almost entirely due to misplaced documentation.

A nurse is looking for a patient’s charts and cannot find it.

4.2.1.3 Step#3: Channel/Medium of Communication

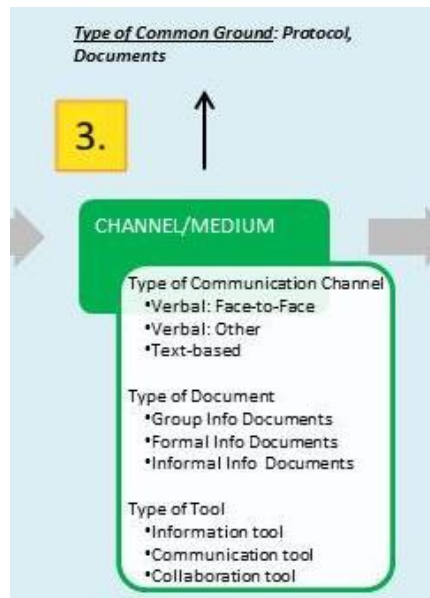


Figure 9. Channel/Medium step (for complete communication model, see Figure 4)

A channel or medium refers to the manner in which communication will take place. As identified in this study, existing mediums can be categorized first as either verbal or text-based communication, and then can be further categorized according to the type of written medium (document) and the type of tool. All of these choices are influenced first by the workflow and unit protocols as described in section 4.2.1.2 – and therefore protocol common ground – and then are also influenced by the existence of a shared understanding of the purposes of these different communication mediums and documents. Step #3 of the model thereby introduces the existence of *document common ground*, which will be described in greater detail in section 4.2.2. Document common ground provides context for why a choice about a particular type of communication channel would be chosen over another, or why a group information document that can function as a communication tool may be the ideal choice of channel for sharing certain information. How these three different components of Step #3 are used on the unit are described below.

Type of Communication Channel

Three overarching types of interaction among the health professionals on the unit were identified through this study. The first – written or text-based communication – occurs when an individual is either imparting information to a document or obtaining information from a document of some variety. The second is verbal communication excluding face-to-face interactions. Verbal communication includes telephone calls between team members, PA system announcements, and use of other communication devices such as pagers and walkie-talkies. The third category, face-to-face verbal communication, was categorized separately due to the differences in situation that must occur for an individual to be speaking directly to another individual. One major advantage of the third category is that the person who is looking for or imparting information can obtain instant confirmation that information is received and understood in a manner that is not always guaranteed through other methods of verbal communication. However, another variation is the fact that outside of the day shift, the vast majority of the time there is no face-to-face availability of allied health or physicians for the nurses. Although they may still be available via telephone in the case of an on-call physician and an on-call pharmacist, this is a potentially significant difference in the availability of resources as described by the quote below.

On Days you work as a team. Evenings you have to keep your head cool. And on Nights, it's completely different ... you have a very skeleton staff, so basically you work alone by yourself. – Nurse

As indicated in the model of the communication act (Figure 5), the type of communication or information exchange that needs to occur is influenced by the purpose of a communication act. Using matrix queries to look at the trends among the different purposes for communication and the three main types of communication (see Table 7) it showed that verbal face-to-face communication is the most frequently documented in this study. This table is not intended to quantify the results of this study, but simply to provide insight into the trends in the data captured during the course of data collection.

	Purpose of Communication				
	<i>Communication of Formal Processes</i>	<i>Communication of Informal Processes</i>			
Info Document	Communication regarding Formal Procedures/ Protocols	Communication regarding Informal Procedures/ Protocols	Information Exchange & Transfer among Team Members	Education/ Instruction Related	Actions that Impact Workflow
Text-based Communication	30	9	24	2	3
Verbal, F2F	91	99	326	52	202
Verbal, non-F2F	18	3	34	1	47

Table 9. Types of communication used for each purpose of communication

Key findings from analysis of this information indicate that the majority of text-based communication involves either updating documentation or providing information that multiple people may need to access, such as a progress note. As this unit is largely paper-based, the importance of clearly written accurate notes is paramount. When the accuracy of documentation is questioned, members of the healthcare team have to spend time confirming the information that was unclear, or obtaining additional information to clarify the information.

At a Team Rounds meeting, an allied health team member asked why a patient was on isolation – there was an “i” beside the name. The physician identified why the patient had been on isolation, but stated that the patient no longer is. The allied health team member said that she would have that note removed from the patient’s chart as it was no longer accurate. The patient’s nurse knew that the patient was no longer on isolation but the documentation had not been updated.

Another frequent occurrence was the combination of written and verbal communication to drive patient care, such as when a face-to-face confirmation occurs to ensure that the intended recipient of the written update had actually received it. Or someone may verbally confirm with a colleague in a face-to-face conversation that they had performed a task that they said they would do.

The verbal face-to-face interactions that most commonly occurred during this study were instances of seeking the opinion of a colleague or a quick touch-base to obtain or provide information that is relevant to the activity the individual is performing.

Type of Document

There are a variety of different documents that are used on this unit on a regular basis. The uses for these documents vary according to the needs of the unit. During the transcription and initial coding of transcripts, each type of document that was used was identified in the coding. Upon review of the overarching uses of these documents, the researcher and her supervisor determined that they could be categorized into three main groups:

1. Formal Information Documents. These documents exist because they serve a function that is required by a formal protocol. For example, a MAR binder is necessary for nurses to know what medications should be given to a patient and when.
2. Informal Information Documents. These documents exist because they have been independently created by staff members in order to make facilitate their own work. For example, the majority – if not all – staff carry with them a copy of a list of all of the patients on the unit and who the attending physician for each patient is.
3. Group Information Documents. These documents may have been formally created and there may now be a protocol attached to them, but they were created with the purpose of facilitating communication among members of the healthcare team or even possibly outside of the team. They are not necessarily a document that you would find on a different unit (unlike a MAR binder or patient medical chart) – they are specifically designed for the needs of this unit. For example, the priority board has been created for nurses from all three shifts and allied health team members to write brief notes for the physicians so that the physicians can see a one-page list of whether there is anything that is urgently needed for any of their patients first thing in the morning when they arrive on the unit floor.

These three types of information documents, while different, were similar in terms of the types of issues that were identified as occurring with their use on the unit. In each instance of using a document, information needed to be complete, legible, and understandable to its audience. The document also needed to be available at the point in time where it was needed – for example at shift transitions a well written progress note is not useful if the oncoming nurse cannot access it to read it because another member of the healthcare team is using the medical chart. And finally, documents as a means of information exchange requires that the healthcare team as a whole have a common understanding of what information will be written in which documents, so that individual team members know where to look for information.

Type of Tool

The types of documents were discussed above. Taking this a step further, the purpose to which different methods of communication are used will now be reviewed. These ‘tools’ for communication or information exchange can be documents, but they can also be communication tools such as the PA system on the unit. Different methods of communication serve different functions and may be needed at different times. For example, the availability of information may be paramount in certain circumstances while in others it is more important that the information is acknowledged to have been received – i.e. communication occurring. In other circumstances actual collaboration among team members is needed. The ability of different tools to act in each of these capacities demonstrates the versatility of the tools being employed by this palliative care unit to maintain a team awareness and cohesiveness. Table 8 demonstrates the different uses of some of the tools identified during the course of this study. The different tools are described following the table.

Document	Collaboration – Current	Collaboration – Potential	Communication – Current	Communication – Potential	Information – Current
Med flow sheet, MAR					X
Progress Notes			X		X
PA system				X	X
Priority Board		X	X	X	X
Medication/ Treatment Order			X		X
Physician Board, Team Rounds		X			X

Table 10. Examples of tools used for information exchange, communication, and collaboration and that have the potential to act as other types of tools

Information tools

The vast majority of tools that the researcher observed on the unit were information tools. These are tools designed to provide information to someone who is actively seeking this information. There is no method of indicating to the person who originally wrote the information that someone has reviewed their information. Examples of an information tool would include a progress note that is written by a nurse, or an informal note stuck into the front of a patient's MAR binder providing information about the patient, or a reminder over the PA system for nurses to update the priority board.

Communication tools

Communication tools are those which have the potential to provide information to their users about whether the information that was originally transmitted to them has been received and processed.

A good example of this is the priority board. The priority board has the potential to be a communication tool and is occasionally used as such when it is fully utilized by all members of the healthcare team. However, it must be readily available for it to be used. The nurses

make an effort to update it at the end of the Evening and Night shifts and the Day nurses also add their notes at the beginning of their shift.

A regular nurse described the priority board's use to a floating nurse: The board is for priorities – if a nurse wants the doctor to see the patient in the morning because there is a new symptom or a change in the patient's condition etc. he should write on the priority board. Tomorrow morning the doctors will look at the board and if there is anything that needs the doctor's attention they will see it and go see the patient. And then based on what the Day nurses think are priorities they will put a star beside the patient's name.

The medical teams are aware of the priority board's presence and the researcher frequently noted members of the medical team – including attending physicians, residents, and medical students – all referencing the priority board before they began reviewing other information when they arrived on the unit in the morning. When this resource is not readily accessible however, it may not be able to serve its intended function.

One of the medical students asked the other if he knew where the “board with concerns on it” [the priority board] was. Neither of them had seen it because it was hanging up rather than being on top of the medical chart trolley, so instead of looking for it they continued reviewing patient medical charts.

Collaboration tools

A collaboration tool is one that facilitates the sharing of information and coordination of care in such a manner that healthcare team members are working together to reach their goals for their patient. As can be seen in Table 8, although there are some documents that have the potential to act as collaboration tools, there were currently none that were identified as fulfilling this role.

4.2.1.4 Step #4: Processes/Action involved in Communication

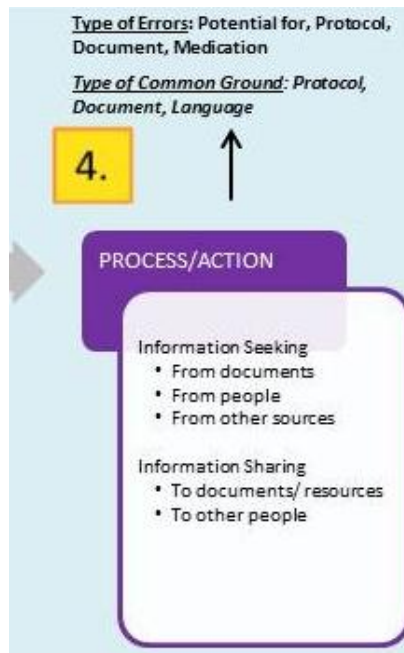


Figure 10. Process/Action step (for complete communication model, see Figure 5)

This step of the communication model is where action takes place. Up to this point, the individual has been processing what they need to do and deciding how they are going to do it. In the Process/Action step the individual is committing to performing an action in order to either obtain or share information. The decision about which approach will be used is based upon the determined purpose of the action – as identified in step #1 (Figure 6) – and the previously made decisions in steps #2 & 3 (Figures 7 & 8). Each of these steps has built on the previous step in order to reach this final point – the communication act taking place.

For a communication act to be successful, the individual must have a knowledge of protocol common ground to identify whether any particular action/process is required, they must have document common ground to ensure that they are correctly utilizing the channel they have selected, and now they must also have the ability to perform this action in a way that is meaningful to themselves and their team members through a shared language usage and common meaning of vocabulary. In other words, they must have *language common ground*.

Language common ground and the relationship it plays in ensuring effective communication will be discussed in further detail in section 4.2.2.

In the following section, the two main processes/actions are described, which provide additional context for the importance of common ground, and also identify situations in which different communication actions are utilized. Although there are a variety of approaches in which this action can ultimately take place, as identified in step #4 of this model, there are two overarching processes: *sharing* information, or *seeking* information. These two overarching approaches are discussed below.

Information Seeking versus Information Sharing

These two categories – information seeking and information sharing – can also be identified more descriptively as information pulling and information pushing. When an individual is in need of additional information, they will look for that information from sources they are familiar with and that they have identified as having access to the needed information – they will ‘pull’ this information from these sources. These sources may be documents or they may be other individuals. For example, a nurse reading the progress notes from a previous shift is an example of information seeking.

In contrast, information sharing occurs when an individual has information that they believe needs to be shared with others. This sharing can occur through an individual actively looking for another individual to share information with, or they may write down the information that they have– they are ‘pushing’ the information to this other source. In this context, writing in the progress notes would be considered information sharing of information that is relevant for future nursing shifts to be aware of.

In this study, the information that was sought or shared was categorized into one of four categories: medication, patient, process, or staff. Table 12 provides an indication of how the unit being studied makes use of information seeking and information sharing, and which resources were the most frequently used for each purpose. The table also displays the number of times the researcher identified an information sharing or information seeking

event, and the location to which people were sharing information or from where they were seeking information. This table is designed to provide an indication of the trends seen on the unit – it is not an attempt to quantify the data discussed below.

	Type of Information Sought or Shared			
	Medication Information	Patient Information	Process Information	Staff Information
Information Seeking				
• From Documents	24	62	1	18
• From People	17	54	36	37
• From Other Resources	2	6	1	0
Information Sharing				
• To Documents	10	43	4	11
• To People	107	306	105	111

Table 12. Identification of the manners in which different types of information are exchanged

As Table 12 shows, both information seeking and information sharing occurred frequently on this unit. Information seeking from people and documents such as a patient's MAR binder or medical chart were common occurrences on the unit. These resources are familiar to all health professionals and they were described as ready sources of information.

The MAR is a summary. In the MAR you can see how many PRNs a patient received since yesterday. – Nurse

I would look for information in the progress notes, the patient's chart, their Kardex, their medication record. I would speak with the physicians; I would speak with the outgoing nurse when we do shift report. – Nurse

Information pushing to documents also occurred frequently. These events are related to providing regular updates in the form of writing a progress note or adding information to the priority board, which other team members will read at a later point in time.

All of your notes should be well written and say things like 'palliation sedation level is X' and describe how the family is coping, and what the reaction of the patient is. Sometimes the patient needs more medication and you need the notes to be aware of this. – Nurse

Information sharing to other people was noted in Table 12 to be extremely common on the unit. Requesting medication verification and co-signature, discussing patients throughout the shift and during patient handoffs at shift transitions, as well as announcements over the PA system are all common reasons for verbal communication to occur. Whether sharing or seeking information, patient information was the most frequently exchanged information on the unit.

In instances of both information seeking and information sharing there is the potential for something to go wrong. When seeking information, there is the possibility that the information sought will be incorrect – likely because it is out of date – or the information will not be in the location expected and the individual will have to take the time to search for the information that they need. In the first situation, the potential for inaccurate information to be used creates the potential for errors to occur. In the second, time spent looking for information is time spent away from the activities that the individual needs to complete. When sharing information, the potential for errors to occur is likely to be tied to the manner in which the information is shared. If two team members do not have a similar understanding of a process one may misunderstand the other. However, what is more likely to occur is that in a non-face-to-face information sharing event, the information provided will be insufficient.

These potential problems with the communication acts used on the unit are a result of the method of communication chosen, the manner in which information is shared and often the information itself being incomplete or inaccurate. However there are other factors to consider in determining why a particular method of communication was chosen over another. Section 4.2.1.5 below outlines some of these influencing factors that have the potential to play a large role in individual's decisions about how to communicate information.

4.2.1.5 Step #5: Influencing Factors

There are a variety of factors other than simply the desire to communicate itself that influence the method of communication that is chosen and how effective that method of

communication is. As indicated in component #5 of Figure 5, these factors are not necessarily acknowledged during the act of communication, but through an individual's knowledge of these factors the decision about which method of communication to use may be influenced. Described below are the most commonly identified factors during the course of this study.

Shiftwork

On the unit being studied there are essentially three different shifts, all identified by which nursing shift is currently working: the Day shift, the Evening shift, and the Night shift. During the Day shift, physicians and allied health are on the unit after roughly the first hour of the shift. During the Evening shift, the physicians and allied health have largely left the unit after the first two hours of the shift. During the Night shift, only nurses and a personal care assistant are present on the unit. This allocation of personnel is depicted in Figure 6 below.

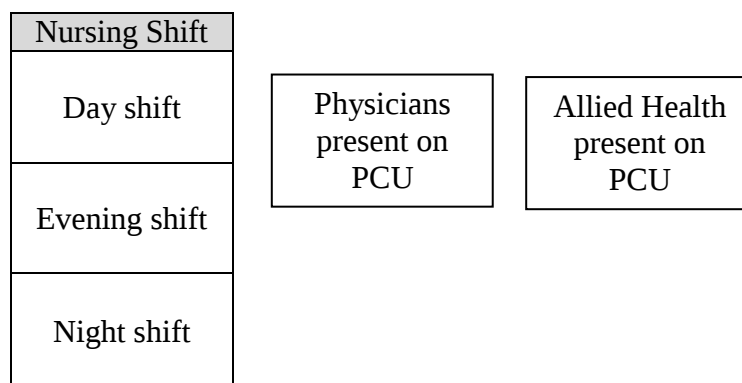


Figure 11. Presence of different team members on the palliative care unit

Shift work was frequently commented on as a factor that impacted the ability of team members to obtain information in a timely manner.

On Days it is Days, and if they are going to use palliative sedation then it is usually more verbal and it's usually written on the order sheets right away and the nurse initiates it. – Nurse

The resources that individuals have available to them, in the form of their colleagues, is reduced for the majority of the Evening shift and the entire Night shift. Nurses have access

to one another but cannot interact in person with any members of the medical team or the allied health team. The medical team, in the form of an on-call physician – typically one of the unit’s residents or possibly a fellow – is available by phone for all hours when a physician is not present on the unit.

The nurse got on the phone with the medical resident to ask for clarification on the frequency of a medication dosage for a patient. The nurse stated what they thought it should be, but stated that they did not want to make an assumption. Once the nurse received an answer, the nurse then asked another question about the same patient because the medical resident was on the phone... In three instances where the nurse asked for clarification on medications, the medical resident was able to tell the nurse what the medication was when the nurse spelled out what had been written by the attending physician.

As described in the observation above, the medical resident on-call may be used as a resource when necessary; however, it is not necessarily always a convenient communication approach. The nurses will have to wait to receive a phone call from the on-call physician after they are paged, meaning that depending on the number of other nurses and what they are currently doing the nurse who has requested that the physician be paged will need to remain close to the telephone. From the physician’s perspective, a great deal can change for a patient after they have left for the evening and before they return in the morning.

The consequence is that physicians must attempt to anticipate what their patients will need, and put their trust in the nurses to obtain any medications or contact the on-call physician should their patient’s status suddenly change overnight.

Physical Layout of the Unit

The physical layout of the unit is shown in Appendix C. Although it was not a factor that was initially considered, the observations provided the researcher a perspective on the impact that the physical layout of the unit had on the healthcare team. The presence of three distinct physical wings meant that often an individual would be on one side of the unit when someone was looking for them on another. A very frequent use of the PA system was to call for a nurse or other member of the healthcare team who was needed.

“[RN] telephone, [RN]” was announced over the PA system.

However, this is ineffective if the nurse did not know what she was being asked to do or where to go. It could also result in inefficiencies if a nurse was working with a patient on one side of the unit and someone was paging them on the other side – the nurse would not be able to leave their current activity to answer the PA system announcement, so the person making the announcement would have no way of knowing where that nurse could be found.

4.2.2 Common Ground – Multiple Types Identified

As introduced in section 2.3.2 and described throughout these results, common ground exists whenever there is a shared understanding or shared context among team members. Without this common ground the interdisciplinary team would not be able to communicate effectively because the information being communicated would not be understood in its proper context. Situating this information in context requires a shared awareness of the needs of all members of the healthcare team. Common ground is essentially the protocols, the documents, and the factors specific to this palliative care context that make this team awareness actionable. An example of this would be the descriptive workflow of PST (Figure 4). Without an awareness of the unit’s norms regarding the practice of PST, it would be difficult for one team member to understand the roles of the various other team members, which in turn affects their ability to effectively contribute to this practice. During the course of this research, an effort has been made to understand not simply the overarching presence of common ground but to identify more specifically whether there are different components to common ground. The possibility of there being different types of common ground that are important to varying degrees depending on the situation in which communication or information exchange are occurring was identified. Depicted in Figure 5 and highlighted below in Figure 12 are the different types of common ground identified in this thesis. Descriptions of each type, although briefly provided earlier in this thesis, will be articulated out below and examples will be provided.

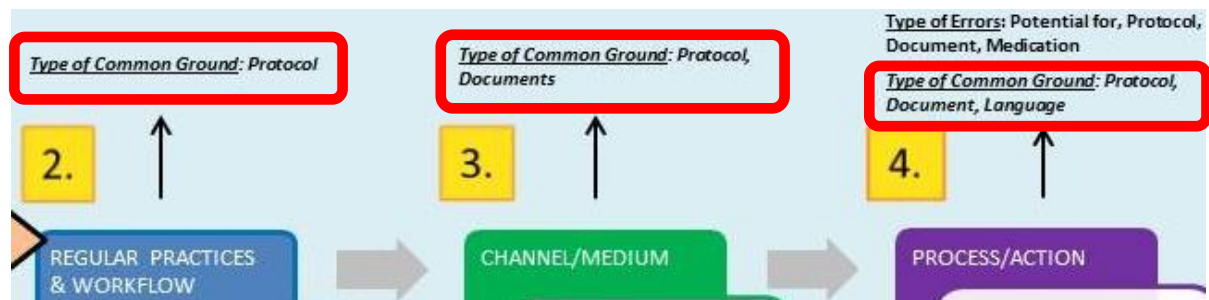


Figure 12. Types of common ground identified

Protocol Common Ground

When working as a team, bottlenecks are created when someone has not performed a task that another person requires to have completed before they can begin their task.

Alternatively, the individual may continue performing their role without the knowledge that they do not possess all of the relevant information. These two examples of situations in which protocols are incorrectly followed illustrate that common ground must exist between team members for the effective use of protocols. When these protocols are followed correctly and people have access to the information and resources that they need when they need it, the unit as a whole runs more smoothly.

The quote below is an example of team members not having protocol common ground around the goals of care for a patient. Without clear goals of care and a similar focus it becomes difficult for the members of the healthcare team to perform their role because precisely what that role should entail becomes difficult to determine.

To try to effectively communicate is difficult if people aren't looking at the same outcomes; [for example] if one group is [seeing that] this patient is in a lot of pain and needs to be comfortable and relaxed, and [the other group is looking at the patient and thinking that] we are sending them for [treatments]. – Nurse

The importance of protocol common ground to the palliative care unit is demonstrated through their use of a practical support nurse, whose role is to provide support to the nursing staff – frequently the floating nursing staff who are unfamiliar with the routine protocols and practices of a palliative care unit.

Document Common Ground

In order to make communication actionable a document or artifact of some type is typically necessary. Without a shared understanding of the documentation used on the unit and what the purpose behind that documentation is, there would be no cohesion and team ability to rely on the accuracy of documents. There are two components to document common ground: team members must understand why the documentation is relevant/important in order for them to value its use in their routine practice, and they must also understand how to use these resources in order to serve their purpose on the palliative care unit.

An allied health team member asked what the purpose of a document was, and whether anyone ever goes to this document for information. The attending physician likes it because it prevents the team from forgetting things that should be discussed at Team Rounds.

In the situation described above, the allied health team member was unfamiliar with why this particular document was useful on the unit – document common ground around this particular document had not been established.

Language Common Ground

Finally, once an individual has an understanding of the uses for documents and artifacts on the unit, the individual still needs to be able to execute that usage. During communication the ability to translate information into a language understood by the recipient is vital. The wording used in documentation and conversations has been identified as an area that creates the potential for errors because of misunderstandings. Clarity in written language has been emphasized repeatedly when senior staff is working with more junior staff. The importance of being able to clearly understand the information that your team members are sharing is another type of common ground – a common understanding of language and the uses of not only particular words, but the methods in which scenarios are described so that whoever needs that information has access to it. In the quote below, a physician describes the importance of the whole team ‘speaking the same language’ and assigning the same meaning

to words. As suggested by this physician, a formal tool may assist in providing the means to ensure this language common ground when discussing the practice of PST.

So that even between physicians and nurses, when we're talking, my moderate sedation is the same as your moderate sedation. If we can actually use a formal tool to assess the level of sedation, to document it, and monitor it then hopefully that improves the kind of discussions between the team. – Physician

Sometimes it is a question of the wording choices that are used by various team members being unclear because the underlying assumptions or knowledge base of those team members are not the same, as is illustrated by the quote below.

The doctor kept saying, "sedation is not the goal, sedation is not the goal", but [the nurses] all knew this patient was doing really poorly... The medications we gave to relax and calm the patient eventually did sedate the patient. – Nurse

In this situation, the nurse and physician did not have language common ground around why sedation should not be the goal of care. They were not in agreement on the current status of their patient and what the treatment goals should be. Although the physician may have thought their progress note was clear, the nurse did not understand it given the context of the patient's current condition.

Relationship between Common Ground & Awareness

The three identified types of common ground have been described above and are summarized below in Table 10. Without common ground, the ability of the different team members to work together would be seriously compromised. Without protocol common ground, they would be unable to provide information to each other in a timely manner or follow established protocols on the unit. Without document common ground, they would not understand the purpose of the communication/ information exchange tools and other resources on the unit that they use to carry out these protocols. Without language common ground they would not be able to use these documents and other resources to effectively communicate or share information. And yet there is another piece of this equation that has been touched on when individual versus group awareness and utility were discussed in section 4.1.2 and throughout this results chapter but has not yet been highlighted. This

missing piece is integral to the success of common ground in maintaining the workflow of the palliative care unit: it is awareness.

Protocol Common Ground	Document Common Ground	Language Common Ground
The rules for the communication act, which govern which communication practice to follow.	The structure for how you are going to transmit information. This includes usage of technology.	The actual information that goes into the document/communication act.
Awareness		
The understanding of the context in which an individual and team are situated – knowledge about your role within the team provides context for your actions and ensures their relevance. (Dourish & Bellotti, 1992)		

Table 13. Summary of common ground and awareness

Awareness was previously described as the ability to understand the context in which your team members work and therefore how your work relates to theirs and impacts their work. Without this overarching shared vision, common ground would not serve its larger purpose of creating effective workflow. And without common ground, awareness exists simply as a conceptual idea that cannot be put into practice. These two concepts are closely linked and inter-related, as demonstrated by Figure 13.

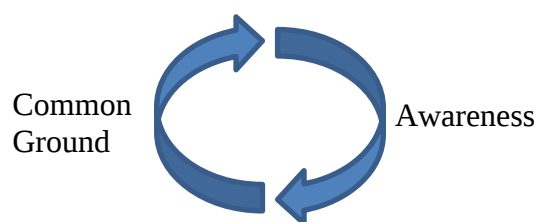


Figure 13. Awareness and common ground do not function independently

The importance of awareness is further illustrated by this quote from a nurse, in which the nurse identifies that physician's awareness of the nurse's abilities and the shared common ground between the two individuals permits a higher level of trust and ultimately a more effective workflow.

If the doctors are comfortable with the nurse and they think the nurse does good assessments of her patients, I think it is easier to [decide to begin sedation]. – Nurse

When team members are familiar with each other and trust the judgement of their colleagues, they are more readily able to rely on the judgement of others. This awareness of the capabilities of team members creates the potential for improved team effectiveness and ultimately better patient care.

4.2.3 Summation of Findings

A demonstration of the model of a communication act (Figure 5) in practice occurs through the use of the case study – palliative sedation therapy. Figure 14 below summarizes the earlier-introduced descriptive workflow model of PST (Figure 4). Added to the original model are identified points during the practice of PST when different components of the communication model are regularly evident, and when the choices made to use particular methods of communication or information sharing are informed by not only the implicit norms on the unit but also by the currently still informal protocols that exist for the effective use of PST on this palliative care unit.



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CHAPTER V: Discussion

This chapter discusses the results of this study according to how they meet the objectives identified in the introduction. We also discuss how we extended existing research. The limitations of this study and suggested future work will also be described.

5.1 Review of Objectives

The goal of this thesis was to use a qualitative case study approach to understand how an interdisciplinary team communicates in order to gain an understanding of the role that communication acts play in creating situations that may promote medical error. Further to this, understanding the components of the communication process was identified as an important factor, as previous literature has identified that different types of medical errors may occur at different points in a person's actions and therefore possibly different points during the act of communication or information exchange (Reason, 1990).

The overarching objective for this thesis was as follows: Understand how an interdisciplinary team communicates in order to identify methods of enhancing communication and reducing errors. The overarching objective was broken down into three specific objectives:

1. Use PST as a case study to identify communication precursors to medical error through the creation of a communication model that addresses interdisciplinary communication, and the factors that influence that communication.
2. Identify the aspects of communication involved in coordinating individuals and processes, and their influencing factors, in order to create a clearer picture of the role each plays in understanding communication.
3. Identify implications of this communication model on future research in the areas of communication and medical errors and the potential for process redesign to better support communication.

Table 11 represents a summary of the findings from this thesis in the form of the decisions that must be made when a communication or information exchange act is going to occur. This table can be viewed as a ‘step by step’ guide to the decisions that are involved in determining how to go about communicating information. The component of communication that best fits your needs should be selected in accordance with the previously made decisions working your way down the table. For example, if the information you need to convey is urgent and you need to speak to someone, your best option would be to choose a closed-loop communication and therefore a group activity. This group activity will likely occur verbally, so depending on the availability of resources, you may need to use a communication tool in order to share your information to the intended person.

<u>Component of Communication</u>	<u>Possible Options</u>	<u>Explanation of Choice</u>
Once the decision to engage in a communication or information sharing/seeking act has occurred, the decision must be made of what your communication requirements are.		
Type of Communication	• Open Loop • Closed Loop • Open & then Closed Loop (i.e. Mixed)	Does information need to be obtained from a particular source or shared in a particular manner that requires immediate feedback? If so, a closed-loop communication is needed. If not, open-loop communication that will remain open or may be closed a future time can be used.
Type of Activity	• Individual • Group	Does the activity in question require involving anyone other than yourself? If so, it becomes a group activity. If not, it remains an individual activity.
The decision about how to go about this communication must then be made.		
Type of Communication Channel	• Verbal: Face-to-Face • Verbal: Other • Text-based	Should this communication or information exchange occur through verbal means or text-based ones? Is there a need for face-to-face communication if the decision is to use a verbal medium?
Type of Document	• Group Info Documents • Formal Info Documents • Informal Info Documents	If a written medium is chosen, what type of document is needed?
Type of Tool	• Information tool • Communication tool • Collaboration tool	In what manner is the document intended to be used? Is it solely to impart information, or should it be used to communicate or collaborate?
What process must be undergone in order to achieve the desired communication or information exchange?		
Information Pushing/ Pulling	• Info Sharing (to people/ document/ other) • Info Seeking (from people/ document/ other)	Is the individual looking to obtain information or to impart it to another individual? In what manner have they decided to do this? What is the content of the information they are interested in?
What other factors must you take into consideration to ensure an effective communication or information exchange? (these factors may influence different steps throughout the entire communication act)		
Current norms		
Availability of resources		
Physical layout of the unit		
Individual factors	• Personal views/believes	

Table 14. Decision making process for a communication or information sharing act

5.2 Modelling Communication in Palliative Care

The complexity of communicating in a palliative care environment is due in part to the fact that there are a wide variety of interdisciplinary healthcare providers involved in decision making and patient care, which means that individuals with a variety of backgrounds and training must work together to provide cohesive and effective care to patients (Lindqvist et al., 2012). The practice of PST was an effective case study because it has the potential to involve all members of the healthcare team, making it an interdisciplinary practice, and encompasses several different steps, making it a multi-levelled process where there is considerable need to communication among the healthcare team members, as well as with the patient's family. The process that members of the healthcare team go through, from the first idea that PST may be necessary for a patient to the full implementation of the practice was clearly described by participants, and the researcher's on-unit observations provided context and information about the smaller components of this practice. These data sources permitted the creation of a detailed workflow for PST, as shown in Figure 4 (Chapter IV). This PST workflow provided the foundation for the model of the communication act (Figure 5) and the identification of communication issues and medical errors on the unit.

Many other studies have discussed the importance of good communication in promoting patient safety and preventing medical errors (Manser, 2009) and many even identify specific actions that resulted in communication issues and propose solutions to these issues. Yet without understanding these issues for what they are – errors or issues with distinct root causes within the communication act itself, it is very difficult to identify solutions to these issues that will be effective in the long term. Figure 5, shown in Chapter IV, proposes a communication model that identifies these sub-components of the communication act. These communication components highlighted in this model, such as open- and closed-loop communication, have previously been insufficiently detailed in the literature.

Further breakdown of the communication act identified how different types of common ground are required at each point during a communication act and how different errors can result from incorrect choices at each of these typically unconscious steps along the way. The

communication model developed in this thesis will allow future researchers and healthcare workers to more effectively assess the situations in which errors are occurring as a result of communication because the model provides the means to identify the components of the communication act where issues may occur. The fact that these issues are identified within the overall communication act provides researchers and healthcare workers with empirical factors that they can look to in order to improve communication acts, rather than a loosely understood abstract concept such as ‘you need to communicate better’ (Kuziemy et al., 2009).

Each individual communication act has the potential to involve a variety of different individuals, backgrounds, contexts, and goals. It is this complexity that can make improving communication difficult, especially if the source of the problem is not clearly understood. Using Figure 14, once the identification of where the communication process has gone wrong has occurred, it is possible to identify the ‘missing link’ – the component of common ground that was not present and therefore prevented the communication act from being successfully completed.

5.2.1 Types of Common Ground

As described in Chapter IV, three different types of common ground were identified during this study. *Protocol common ground* refers to the knowledge of an individual about the regular practices and protocols used on the unit in question – an understanding of the setting in which the communication act is occurring. *Document common ground* involves understanding the resources that can be used for a communication act. *Language common ground* is then the understanding of what is needed to make use of that document in a manner that will be understood by the intended party – it can be described as the recognition of a shared understanding of terminology. Research into this area has previously identified some of these types of common ground; however they have not been fully articulated. McHugh et al. (2006) identified communication issues between physicians and nurses as resulting from differences in understanding of the same terminology – essentially an error in language common ground. This same study further identified the need for new members of a

healthcare team to ‘get up to speed quickly’ in a fast-paced healthcare environment – a reference to both awareness of the unit and protocol common ground, and possibly even document common ground if ‘getting up to speed’ included understanding documentation and resource use on the unit.

Articulating the differences between these types of common ground is an important step in improving communication among health professionals. It is a big thing to say that ‘communication needs to be fixed’ as previous studies have identified (Alvarez & Coiera, 2006; Safran et al., 1998), but communication is not one unchanging unit; there are components to this act (Hargie & Dickson, 2003). By not only identifying the components of a communication act on this palliative care unit, but also tying them to the different types of common ground, it becomes possible to more specifically identify what in the communication act needs to be ‘fixed’ and more importantly ‘how to fix it’. An awareness of both the environment in which an individual is working and that which their colleagues are working in informs the method of communication that the healthcare professional will choose. In this manner, awareness facilitates the initiation of an effective communication act and common ground provides the framework in which the communication act is carried out.

Perhaps education around the protocols on the unit is required, or a list of commonly used documents and their locations need to be kept at each nursing station. Discussion among the healthcare team to standardize language used in the charting documents could reduce confusion over language issues and prevent miscommunications due to misunderstandings. These different approaches all have the potential to improve communication, but they will be most effective if they are targeted towards actual weaknesses that have been identified in the communication acts occurring between members of the healthcare team.

5.3 Communication Model & Precursors to Medical Error

The communication model developed in this thesis indicated the importance of effective communication in promoting patient safety and effective care delivery. Communication has been identified in the literature as one of the leading root causes of medical error, and is one of the causes of preventable medical errors (Alvarez & Coiera, 2006; Manser, 2009;

Timmons, 2005). In order to find effective methods of reducing these errors, we need to identify how and why they are occurring. The communication model outlined in Figure 5 in Chapter IV identified the different components of the communication act and the decisions that are made during this act. At each of these steps during an act of communication, there is the potential for error. The type of error is dependent on the type of decision that is being made. As Zhang et al. (2004) identified the variety of methods in which overarching types of medical errors can occur; this communication model identifies specific points at which errors caused by a lack of different types of common ground can occur. The identification of errors at different points in the communication act is relevant for determining measures for preventing these errors from occurring – the solution must address the point in the communication act at which that error occurs.

Ultimately, when an error is noticed is when a process/action has resulted in an incorrect event. However, the error could have occurred earlier in the communication act, leading to this final incorrect action that is recognized. Following that logic, there is a variety of overarching communication precursors to medical error. They can be viewed as (1) not understanding the context in which an event is taking place – i.e. lacking an awareness of the clinical environment; (2) choosing the incorrect workflow for your purposes; (3) using an incorrect channel/medium for conveying your information; and finally (4) the visibly incorrect process/action that is taken to complete this communication act. Possibly the final precursor to medical error, which is more likely to result in wasted time than anything else, would be to incorrectly assume that the process/action undertaken resulted in an unsatisfactory conclusion, which would result in a repetition of the communication act when in fact it was correct the first time.

5.3.1 Precursors & Medical Error

Frequent errors identified in this study related to issues in quality of information. These could relate to unclear documentation, such as poor wording choices, illegible handwriting, or insufficient explanations being provided. Or they could also be due to a lack of clarity around which documentation is the most up-to-date and should therefore be taken as

accurate. Related to this issue, the slow receipt of updated information was identified as an issue. While this was something that was difficult to see on the unit during the average day, during the Team Rounds meetings it was clear that the medical team would make updates to patient's medication and treatment orders, and that information would not necessarily have been transferred to the nursing staff by the time the Team Rounds meeting began. While the exact amount of delay was not determined by the researcher any delay in the receipt of needed information should be avoided if possible.

However, in order to avoid this information delay, many individuals will cause duplication of effort by seeking out their colleague to verbally inform the other person of the updates to a patient's care that are going to occur. These situations require time and create the potential for interrupting team members in their work, a noted cause of medical error (L. M. Hall, Pedersen, & Fairley, 2010). Other researchers suggest that the implementation of an effective electronic health record (EHR) system can prevent many of these issues (Jirjis, Weiss, Guise, & Rosenbloom, 2005).

CHAPTER VI: Conclusions

Research into the area of medical error in healthcare over the past decade has demonstrated the important role that communication plays in both promoting and preventing medical errors. It is therefore extremely important for decision makers and healthcare teams to understand how increasingly interdisciplinary healthcare teams function and what changes may be needed to improve communication and information exchange among team members with an eye to reducing the number of medical errors that occur.

This research has identified a model of the communication act which permits users to identify where within an act of communication different medical errors may occur through a lack of common ground, thereby leading to increased potential to prevent these errors through targeted approaches to improving these communication acts. As healthcare is increasingly provided by interdisciplinary teams there will be an increased need for research into these areas and for the development of tools for supporting this type of care delivery. This thesis has provided the foundational basis for doing this.

The importance of rich case studies for studying complex clinical environments was also highlighted. Using a qualitative approach in a palliative care environment permitted the researcher to gain an in-depth understanding of her subject matter and contributed to a richer picture of the overall functioning of the healthcare unit under study.

6.1 Implications for Research

This research has further analyzed the conceptual models of communication provided by (Alvarez & Coiera, 2006; Clarke & Brennan, 1991; Malhotra, Jordan, Shortliffe, & Patel, 2007) through segmenting the communication act into its components and tying these components to specific decisions and actions that contribute to the overall effectiveness of the communication act. It has identified that common ground is not simply an overarching concept, but that different types of common ground can be identified and are relevant at different points in the communication act. Through this identification, understanding more specifically how errors or issues in common ground can result in medical errors is possible.

This provides the foundation for identifying improvements to communication that will reduce medical errors at their source, rather than providing ‘Band-Aid’ solutions that are ineffective in the long terms because they do not solve the potential errors at their root cause. Communication issues identified on this unit are unlikely to be specific only to palliative care, as instances of interruptions and unclear documentation have been reported in many other studies (L. M. Hall, Pedersen, & Fairley, 2010; Khairat & Gong, 2010). The results therefore have the potential to impact other areas of healthcare, particularly those where interdisciplinary teams are the norm.

6.1.1 Health Information System Design Implications

Several of the points identified in Chapter IV, particularly those issues identified as resulting from influencing factors on the palliative care unit, could be ameliorated through the use of information technology solutions. As proposed at the end of section 5.3.1, the effective use of an EHR system can facilitate team communication and reduce the need for face-to-face communication and duplications of effort. An EHR provides more immediate non-verbal information exchange and if the EHR system is mobile and allows for alerts to indicate when information is received and processed, the feedback loops that most health professionals try to close in a verbal manner is managed electronically without creating added work or interruptions to workflow. Individuals would receive the information that they need in a timely manner without the person sending the information having to find them to verbally recount what has already been written down.

An additional benefit to an EHR would be the ability of multiple team members to access the same documentation at once. This was a noted issue on the unit, as access to information was problematic during the Day shift when a variety of staff members needed access to information and during shift transitions when the outgoing shift of nurses had not always completed their notes when the oncoming nurses required the same documentation to prepare themselves for their shift.

Overall, the potential for improved documentation exists with a carefully implemented EHR. This improvement in documentation would result in fewer instances of team members needing to seek out a colleague to obtain clarification on something that they are reading.

6.2 Limitations of Study

This study has several limitations that should be noted. This study was conducted on one palliative care unit which is also a teaching unit. As such, the results may not be fully transferable to other palliative care settings or other hospital units that are either non-teaching units or non-palliative care. A limitation of the study in terms of recruitment for participation in interviews was the failure to involve any fellows, residents or medical students. Although the researcher did approach residents/fellows to participate via email, the invitation to current residents and fellows to participate in this research did not result in any interested participants.

Data collection for this study was largely conducted through non-individual specific observations. The researcher could not be everywhere, so it is possible some information was not documented. This issue may also have resulted in the results being biased in favour of verbal communication, as verbal communication was easier to both observe and document. Written communication could be observed, but it was difficult to determine the accuracy of that communication as well as the details of what was being written and the precise location of the written material (what tab within a patient medical chart for example) without actually reading the documents. This was not done due to concerns about privacy of patient information and concerns on the part of the researcher that the palliative care team members may not have been comfortable with this action.

6.3 Future Work Recommended

Future work should build on the results of this thesis to look at validating the results of this study in other environments and expanding upon them. Validating the model of the communication act identified through this research in non-palliative care environments should be undertaken, as well as in non-teaching palliative care environments. Additionally,

a more formal hypothesis testing of this model – possibly using quantitative methods – should be done. Using the metrics suggested in this study to measure common ground among interdisciplinary teams should be reviewed, as this type of research would allow future researchers to validate the types of common ground identified in this study, and possibly expand upon these types through research in other areas of the healthcare system.

On the unit in question, a post-implementation study should be conducted to determine what the knowledge of PST on the unit is after the formal guidelines have been implemented and educational efforts have occurred. It is possible that these actions will influence the manners in which communication occurs, thereby leading to adjustments in the communication model for explicit versus implicit purposes. As this palliative care unit may be implementing some of these recommendations in the future through the planned implementation of an EHR, any follow-up study conducted on this unit should also examine how this new system has changed communication patterns.

The use of this communication model for designing information technology solutions in healthcare that better support the formation of common ground among team members should also be explored. This model provides a foundation for understanding the role that common ground plays in effective communication, which permits the development of information technology solutions to ineffective communication to be tailored to the specific ‘problem areas’ identified.

Other factors that influence communication that were not the focus of this thesis should also be investigated further to better understand the impact that they have on communication. For example, although briefly mentioned in this thesis, it is possible that the physical layout of the unit played a larger role in the communication strategies used by members of the healthcare team that was noted in this thesis. A more detailed review of these physical factors that impact communication would be valuable.

6.4 Contributions to Knowledge

This thesis study provided additional knowledge in several relevant areas, including both scientific literature and practical applicability of the results to the palliative care unit under study. This thesis provided insight into how communication in palliative care is used in order to understand the role of communication in medical errors in this environment. It also contributed to literature regarding identifying types of medical errors through communication-based precursors to medical errors that can be incorporated into the research of others in these areas.

In terms of hands-on contributions to knowledge, this thesis provided the members of the palliative care unit with a broader view of the knowledge of PST on the unit and how that knowledge is put into practice through communication among team members. The insight into how team members communicate and share information in general is valuable information that can be used to tailor the implementation of the PST Guidelines and other guidelines and documents on this unit in the future.

This thesis has illustrated that although data and data requirements receive a lot of attention when implementing new electronic systems, what should really be a primary focus of these systems is the coordination component of care provision, especially in an interdisciplinary environment. The ability to share data is important – the ability to have information available at the points in time when it is needed, in a coordinated manner, is essential to effective healthcare provision.

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APPENDIX A: Literature Search Strategy

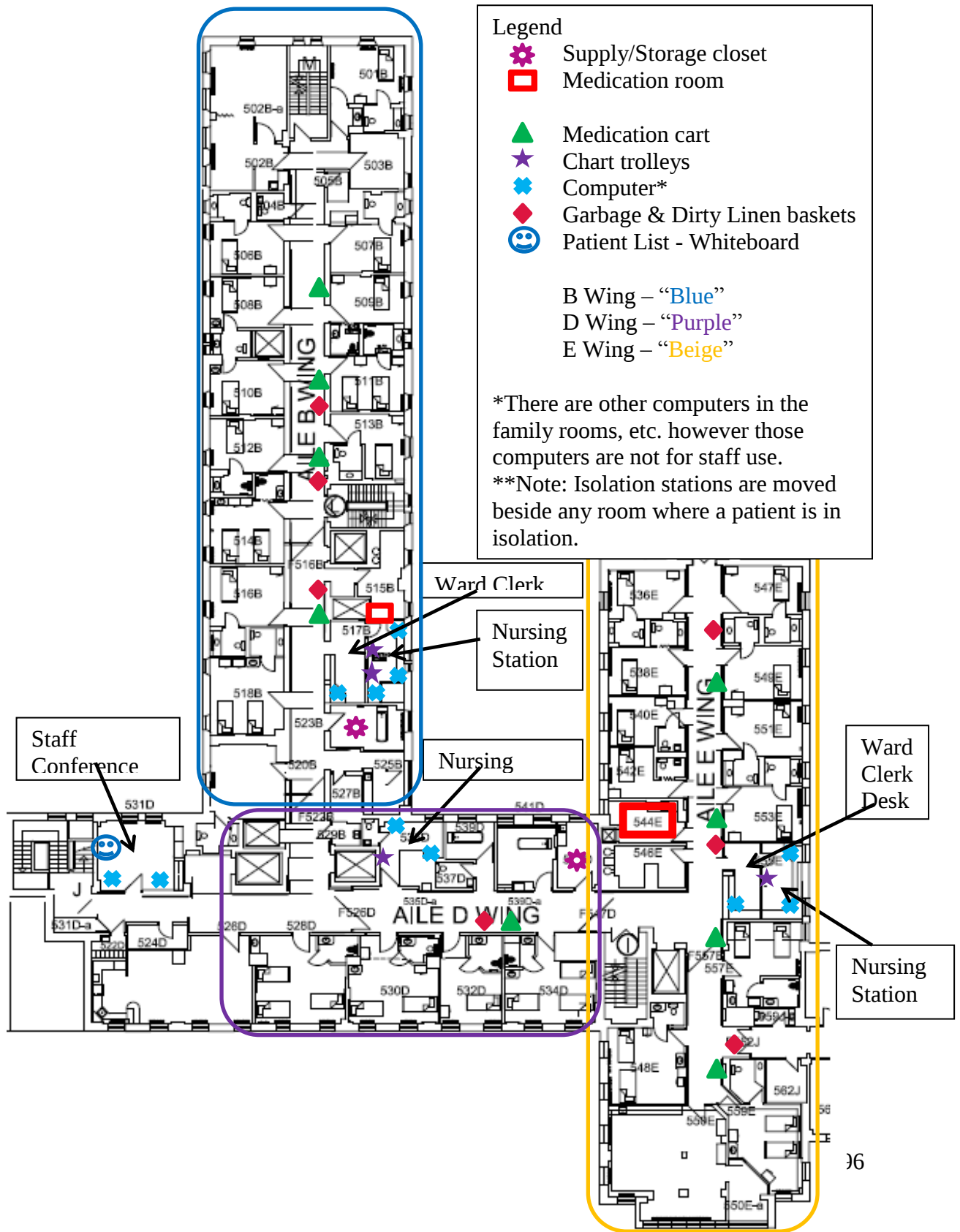
1. Palliative Care/
2. Hospice Care/
3. Terminal Care/
4. Hospices/
5. Terminally Ill/
6. palliat\$.ab,ti.
7. (hospic\$ not home).ab,ti.
8. (terminal\$ adj4 care).ab,ti.
9. (terminal\$ adj4 caring).ab,ti.
10. "end of life care".ab,ti.
11. (dying adj3 Care).ab,ti.
12. (terminal\$ adj ill\$).ab,ti.
13. (terminal\$ adj4 disease).ab,ti.
14. (end-stage adj3 disease).ab,ti.
15. or/1-14
16. Medical Errors/
17. exp Medication Errors/
18. (medic\$ adj3 error\$).ab,ti.
19. (drug\$ adj3 error\$).ab,ti.
20. (pharmac\$ adj3 error\$).ab,ti.
21. (medic\$ adj3 management).ab,ti.
22. (drug\$ adj3 management).ab,ti.
23. Observer Variation/
24. (error\$ adj3 reduc\$).ab,ti.
25. "patient safety".mp. [mp=tx, bt, ti, ab, ct, hw, sh, tn, ot, dm, mf, dv, kw, nm, ps, rs, ui, tc, id, tm]
26. or/16-25
27. Communication/
28. communication barriers/ or interdisciplinary communication/
29. "quality of health care"/ or guideline adherence/ or "outcome and process assessment (health care)"/
30. Risk Management/
31. "communication space".ab,ti.
32. "common ground".ab,ti.
33. (team adj3 communication\$).ab,ti.
34. prognostication.ab,ti.
35. communication.ab,ti.
36. or/27-35
37. 15 and 26 and 36
38. limit 37 to (english or french)

APPENDIX B: Key Concepts from the Literature

Concept	Key Points	References
Common Ground	• Shared understanding needs to exist to coordinate processes, and share content (i.e. communicate). • There must be a purpose to the communication. • Use of different mediums requires different methods of ensuring that the communication was understood, as there are different constraints placed around each. • When a purpose is established for a conversation, that context of that conversation becomes easier to understand. • Different purposes are suited to different mediums. • People communicate most easily with those who have a similar background. Additionally, the more you work with someone, the more 'similar' you become so that it is easier to communicate with people you are familiar with, even if their background is different from your own • Common ground is needed for not only holding conversations, but carrying out complex actions and processes and planning workflows • Trust in the abilities and knowledge of coworkers in a very important component to establishing effective common ground	Clark & Brennan, 1991 Coiera, 2000 Kuziemytsky & Vapir, 2010
Awareness	• Team members will work to maximize their 'utility' or 'effectiveness' and may not always consider the burden it places on other members of the team. • Awareness of oneself & one's teammates facilitates care coordination (Reddy et al., 2008) • One needs to understand how one works and exists within the larger context	Coiera, 2000 Reddy et al, 2008 Dourish, 1992

Medical Error	• Errors caused by communication breakdowns are more likely to occur when communication is between team members who come from different backgrounds • Complexity of a system contributes to the likelihood of errors occurring • Individuals who are not as familiar with their environment are more likely to make errors •	Alvarez & Coiera, 2006
Information Issues/ Inaccuracies	• When individuals are communicating face-to-face, you can receive instant feedback about whether your information was understood. Outside of this scenario, that is not the case. • Work-arounds and errors both occur as a result of weak common ground	Clark & Brennan, 1991 Kuziemsky & Vapiro, 2010

APPENDIX C: Palliative Care Unit Floor Plan



APPENDIX D: Recruitment Materials

Recruitment Poster

Identifying communication strategies and knowledge sharing in order to enhance the use of palliative sedation therapy

Researcher: Alex Cornett, MSc Candidate, University of Ottawa

What is this study about?

This study has two parts:

- (1) It will look at communication on the palliative care unit, to understand the strengths and weaknesses of interdisciplinary communication in palliative care.
- (2) It will look specifically at communication within the practice of palliative sedation therapy to understand how this therapy is understood and how it is carried out on the unit.

There will be two types of data collected:

- (1) Observation of meetings and care delivery, through general observation and shadowing individuals will, provide insight into the day-to-day workings of the unit.
- (2) Interviews will ask questions about palliative sedation therapy and how communication occurs on the unit.

What are the benefits of this study?

- (1) *Provide feedback to the unit about the practice of palliative sedation therapy.*
- (2) *You will also be contributing to the understanding of the processes of communication in palliative care.*

How do you become involved in this research?

Please contact Alex Cornett if you are interested in participating in this research. In order to obtain input from as many different professions as possible, not everyone who contacts the researcher will be contacted to participate in an interview. If you are working on the unit when the researcher is doing observations, you will be informed that observations are taking place. You may request to be excluded if you wish.

You are under no obligation to participate in this research. If you have any questions about this research, please contact Alex Cornett.

Recruitment Email

Hello,

I am contacting you with regard to a new study that is beginning on the palliative care unit. Alex Cornett, a master's student at the University of Ottawa, is working with the Palliative Care Service to complete her thesis project. This project will look at the knowledge of staff members about the practice of palliative sedation therapy and how members of the palliative care team communicate information about the practice of (PST) among each other. This research will also be used to provide suggestions for areas to target education when formal guidelines for this practice (the Champlain Palliative Sedation Therapy Guidelines & Protocols) are implemented in the coming months.

You are being contacted to ask you to participate in an interview, which will last approximately 30 minutes. The interview will involve answering questions about both communication among health professionals and the practice of PST on your unit. Subject to your workload and availability, this interview can be conducted during your regular work hours.

Your participation in this research is completely voluntary. You may withdraw at any point. At no time will your name be disclosed to your department or your colleagues, nor will information provided by you that has the potential to identify you. This study is looking to obtain the views of all different professions involved in the practice of PST. Therefore, not everyone who responds to this email will be contacted to participate in an interview if there are a high number of responses. However, all staff will have the opportunity to participate in the study through involvement in non-participant observations which will be conducted on the unit.

Your decision about whether or not to participate in this research will have no impact the status of your employment at [hospital], at this time or in the future.

If you are interested in being involved in this research, or if you would like more information, please contact Alex. Alex will also be presenting this research at an upcoming staff meeting and will be available to answer any questions you may have.

When responding, please provide Alex with the following information:

- Your profession (please indicate nursing category)
- Shift worked in the palliative care unit (day/evening/night)

Thank you for considering to participate in this research study.

Shadowing Consent Form & Information

Information Sheet for Participants: Shadowing

Study: Identifying communication strategies and knowledge sharing in order to enhance the use of palliative sedation therapy

This study is intended to develop a deeper understanding of the overall understanding of palliative sedation therapy on the palliative care unit, and to understand how this information is communicated among members of the health care team. The study will be based upon observation of clinical staff carrying out their routine duties, as well as interviews with interested staff members.

The shadowing component of this study will involve one researcher shadowing a participant for a period of approximately 2 hours. Shadowing involves a researcher observing your activities from a distance, and should not directly interfere with the completion of your duties. The technique will involve audio recording your conversation with minimal or no questioning by the shadowing researcher. You will have the opportunity to exclude the researcher from observing any events that you feel are inappropriate. In addition, you may at any time decide to temporarily cease recording if you feel that sensitive information is to be discussed.

Data collected during this study will not be publicly available and will be rendered non-identifiable prior to any information being shared with the palliative care service. During shadowing, the participant will be asked to wear a small microphone or carry a small recording device (if you are comfortable doing so). Audio recording will also be made of brief interviews before and after the shadowing. The participant will be asked to describe their expected duties during the observation period, and afterwards the researcher may ask some questions to clarify what took place during the shadowing period. These interviews should only last about 5-10 minutes.

You may be contacted once after this shadowing to request your input in verifying the study's results. You are under no obligation to participate in this review of the results if you participate in shadowing, and will be asked at the time that the consent form is signed whether you consent to allow this follow-up to occur.

For further information about the study please contact Alex Cornett or Prof. Craig Kuziemsky.

Consent from patients

During the study, you should interact as normally as possible with other staff.

Patient interactions are not the focus of this study, and therefore no direct patient care will be observed. While speaking with a patient, please turn off the microphone. Any patient information that is recorded during this study will be transcribed so that it is non-identifiable.

Study Consent Form: Shadowing

Title of the study: Identifying communication strategies and knowledge sharing in order to enhance the use of palliative sedation therapy

Name of researcher: J. Alex Cornett, Telfer School of Management, Faculty of Graduate and Postdoctoral Studies, University of Ottawa

Researcher supervisor : Professor Craig Kuziemy, Telfer School of Management, Faculty of Graduate and Postdoctoral Studies, University of Ottawa

Invitation to Participate: You are being asked to participate in the above-mentioned research study conducted by *Alex Cornett* and *Craig Kuziemy*. This project is partially funded by the Telfer School of Management Research Fund. This shadowing will occur during your regular work hours.

Purpose of the Study: The purpose of the study is to gain an understanding of (1) knowledge about the practice of palliative sedation therapy (PST) on the palliative care unit, and (2) how communication in the palliative care unit affects adherence to best practices.

Participation: Your participation will consist of one episode of job shadowing, during which your regular activities will be observed, and two brief interviews – one before the shadowing and one afterwards – in order to better understand the activities which are observed. This shadowing has been scheduled for _____, and will last approximately 3 hours. It will be audio-recorded. No patient observation will occur. You may also be contacted once in the future to provide your view on the study's results in order to ensure the accuracy of the information collected (Yes / No).

Risks: Your participation in this study will entail that you be observed performing your regular work at your place of employment, and this may cause you to feel uncomfortable if you are discussing sensitive or confidential information. You have received assurance from the researcher that every effort will be made to minimize these risks by maintaining confidentiality of what is discussed (transcripts will be shared only with the researcher's supervisor) and that any patient identifying information will be rendered unidentifiable. For example, you may discuss difficult cases or sensitive patient information with members of your team. You may also reveal information of a sensitive nature. The researcher has assured you that confidentiality and anonymity will be protected as described below.

Benefits: Your participation in this study will provide insight into the way that PST is practiced on the palliative care unit, which will help coordinate educational activities when new Guidelines are formally rolled out on the unit. This research will also provide insight into how communication affects patient care.

Confidentiality and anonymity: You have received assurance from the researcher that the information obtained during this period of observation will remain strictly confidential

unless release is required by the law. You understand that the contents will be used only for (1) the researcher's Master's thesis and publication of thesis results, and (2) providing advice to the palliative care unit about how to target their educational activities surrounding the PST Guideline implementation. Your confidentiality will be protected through removing identifying information from all information that is used for the researcher's study and only presenting non-identifiable summary information to the palliative care unit. **Anonymity** will be protected in the following manner: the organization will not be identified in publications without permission, nor will individual participants. Any direct quotes in publications will be identified by an independent study ID number.

Conservation of data: The data collected, consisting of transcripts and field notes, will be kept at a secure location with the researcher's supervisor at the University of Ottawa for the duration of the researcher's Master's thesis and for 15 years after the researcher's program has been completed. Digital recordings will be deleted immediately after verification of the transcription.

Compensation: There is no compensation for participating in shadowing.

Voluntary Participation: You are under no obligation to participate and if you choose to participate, you can withdraw from the study at any time without suffering any negative consequences. If you choose to withdraw, all data gathered until the time of withdrawal will be included in the study analysis unless you request otherwise.

Consent: I, _____, consent to participate in the above research study conducted by Alex Cornett of the Telfer School of Management, Faculty of Graduate and Postdoctoral Studies at the University of Ottawa, whose research is under the supervision of Professor Craig Kuziemsky.

If you have any questions about the study, you may contact the researcher or her supervisor.

If you have any questions regarding the ethical conduct of this study, you may contact:
The Protocol Officer for Ethics in Research, University of Ottawa

or

[hospital ethics board]

or

[hospital ethics board]

There are two copies of the consent form, one of which is yours to keep.

_____ Participant's name (please print)	_____ Participant's signature	_____ Date
_____ Researcher's name (please print)	_____ Researcher's signature	_____ Date

Information Sheet for Participants: Interviews

Study: Identifying communication strategies and knowledge sharing in order to enhance the use of palliative sedation therapy

This study is intended to develop a deeper understanding of the overall understanding of palliative sedation therapy (PST) on the palliative care unit, and to understand how this information is communicated among members of the health care team. So don't worry if you don't know everything about PST!

The study will be based upon interviews with interested staff members, as well as observations of staff carrying out their routine duties. The interview will be approximately 30 minutes in length, and will be audio-recorded. Based on your workload and availability, it can be conducted during your work hours.

The interview will involve the researcher asking you a series of questions and using a tape recorder to record your answers. There are no right or wrong responses, and you can choose not to answer any questions that you do not feel comfortable answering.

You may be contacted once after this interview to request your input in verifying the study's results. You are under no obligation to participate in this review of the results if you participate in an interview, and will be asked at the time that the consent form is signed whether you consent to allow this follow-up to occur.

Data collected during this study will not be publicly available and will be rendered non-identifiable prior to any information being shared with the palliative care service. Participation in this study will in no way affect your employment with the Palliative Care Service.

For further information about the study please contact Alex Cornett or Prof. Craig Kuziemsky.

Study Consent Form: Interview

Title of the study: Identifying communication strategies and knowledge sharing in order to enhance the use of palliative sedation therapy

Name of researcher: J. Alex Cornett, Telfer School of Management, Faculty of Graduate and Postdoctoral Studies, University of Ottawa

Researcher supervisor : Professor Craig Kuziemy, Telfer School of Management, Faculty of Graduate and Postdoctoral Studies, University of Ottawa

Invitation to Participate: You are being asked to participate in the above-mentioned research study conducted by *Alex Cornett* and *Craig Kuziemy*. This project is partially funded by the Telfer School of Management Research Fund. Based on your workload and availability, you may participate in this interview during your regular work hours.

Purpose of the Study: The purpose of the study is to gain an understanding of (1) knowledge about the practice of palliative sedation therapy (PST) on the palliative care unit, and (2) how communication in the palliative care unit affects adherence to best practices.

Participation: Your participation will consist of one 30 minute interview, during which you will be asked to provide your views on how PST is practiced at your place of work. This interview has been scheduled for ____, and will last approximately 30 minutes. This interview will be audio-recorded. You may also be contacted once in the future to provide your view on the study's results in order to ensure the accuracy of the information collected (Yes / No).

Risks: Your participation in this study will entail that you volunteer work related information and opinions on processes at your place of employment, and this may cause you to feel uncomfortable if you are discussing sensitive or confidential information or case examples. You have received assurance from the researcher that every effort will be made to minimize these risks by maintaining confidentiality of what is discussed (interview transcripts will be shared only with the researcher's supervisor and the transcriber). For example, you may discuss possible tensions or disagreements that you have with members of your team or how your department operates. You may also reveal information of a sensitive nature. The researcher has assured you that confidentiality and anonymity will be protected as mentioned below.

Benefits: Your participation in this study will provide insight into the way that PST is practiced on the palliative care unit, which will help coordinate educational activities when new Guidelines are formally rolled out on the unit. This research will also provide insight into how communication affects patient care.

Confidentiality and anonymity: You have received assurance from the researcher that the information you will share will remain strictly confidential unless release is required by the

law. You understand that the contents will be used only for (1) the researcher's Master's thesis and publication of thesis results, and (2) providing advice to the palliative care unit about how to target their educational activities surrounding the PST Guideline implementation. Your confidentiality will be protected through removing identifying information from all information that is used for the researcher's study and only presenting non-identifiable summary information to the palliative care unit. **Anonymity** will be protected in the following manner: the organization will not be identified in publications without permission, nor will individual participants. Any direct quotes in publications will be identified by an independent study ID number.

Conservation of data: The data collected, consisting of transcripts and field notes, will be kept in a secure location with the researcher's supervisor at the University of Ottawa for the duration of the researcher's Master's thesis and for 15 years after the researcher's program has been completed. Digital recordings will be deleted immediately after verification of the transcription.

Compensation: As a thank you for your participation in this interview, you will receive one \$15 gift certificate to Bridgehead Coffee.

Voluntary Participation: You are under no obligation to participate and if you choose to participate, you can withdraw from the study at any time and/or refuse to answer any questions without suffering any negative consequences. If you choose to withdraw, all data gathered until the time of withdrawal will be included in the study analysis unless you request otherwise.

Consent: I, _____, consent to participate in the above research study conducted by Alex Cornett of the Telfer School of Management, Faculty of Graduate and Postdoctoral Studies at the University of Ottawa, whose research is under the supervision of Professor Craig Kuziemsky.

If you have any questions about the study, you may contact the researcher or her supervisor.

If you have any questions regarding the ethical conduct of this study, you may contact:
The Protocol Officer for Ethics in Research, University of Ottawa
or
[hospital ethics board] or [hospital ethics board]

There are two copies of the consent form, one of which is yours to keep.

_____ Participant's name (please print)	_____ Participant's signature	_____ Date
_____ Researcher's name (please print)	_____ Researcher's signature	_____ Date

APPENDIX E: General Observation Template

General Observation Notes

Date: _____ Obs. start time: _____ Obs. stop time: _____

What is being observed: _____

Start & End Time (min:sec)	People	Information Communicated Purpose & Process	Channels Used	Convo Locat ⁿ	Other Notes - contextual - logistics	Interruption? (type)	Error occurred? (describe)	Caught on tape?

General Notes:

APPENDIX F: Team Rounds Observation Template

Team Rounds: Observation Notes

Date: _____ What is being observed: _____

Obs. start time: _____ Obs. stop time: _____

Start & End Time (min:sec)	Patient Discussed (use #)	People Involved	Information Communicated	Other Notes • contextual • logistics	Interruption? (type)	Tests Done OR Error occurred? (describe)

General Notes:

APPENDIX G: Observation Transcription Template Observation Summary Form

What: TYPE OF OBSERVATION **Where:** LOCATION, PCU

When: DATE, TIME Total Length of Meeting: XXminXXsec

People Present (for all or part of time):

Nurses			Physicians			Allied Health		

Summary Notes:

General overview of the meeting/observation.

Main Observations:

Key points that are noticed by the researcher. May be written things that are observed, not necessarily part of the observation transcript.

Researcher's Post Observation Notes:

Notes that have been written post-observation by the researcher.

Observation Key Points – Case Stories

Key case vignettes – describing why they are relevant & what they describe.

Time (min:sec)	People Involved	Description of Event • Event description • List documents used • List communication methods/tools used • Indicate why this event is significant
		Documents Used: • Communication Methods/Tools: • Why is the event significant: •
		Documents Used: • Communication Methods/Tools: • Why is the event significant: •

APPENDIX H: Interview Guide

Questions asked varied based on the profession of the individual being interviewed. Below is an aggregate of all of the questions that were asked of all of the individuals interviewed.

Understanding of PST

1. In your words, define PST.
 - a. How would you describe PST to someone (a family member)?
2. When should PST be used?
 - a. Spiritual vs. physical symptoms?
3. Do you have any concerns about PST?
 - a. Ethical concerns or religious concerns
 - Distinction between PST & euthanasia
 - b. Are there risks associated with this practice?
4. How do you know when to suggest PST?
5. What information do you need to begin PST?
 - i. Do you have this information? (are there specific people/places)

Practice of PST (on this unit)

1. How is the decision to begin PST made?
 - a. Who is involved in making the decision making (to begin PST or change medication or adjust dosage)?
 - i. Are you involved?
 1. Why/Why not? (examples)
 2. How should you be involved? What should your role be?
 - b. How do you think these decisions should be made?
2. Who are the main people involved in the practice of PST?
 - a. Should anyone else be involved? (physio, social worker, chaplain, psychologist, etc.)
 - i. Why/why not? (examples)
 - c. What are the roles of the different professions in PST?
 - i. Are you involved?
 1. Why/Why not? (examples)
 2. How should you be involved? What should your role be?
3. How is PST typically administered on this unit? (what processes are involved, what meds are used, what are routes of administration, who is responsible for carrying this out, etc?)

- a. Medications used?
 - b. Is there a regular method?
 - i. Please describe them
 - i. Should there be?
 - Why/Why not?
4. Compared to the other interventions you use on this unit, do you consider PST to be a serious intervention? (Do you think that PST is a “high risk” intervention?)

Communication/Information Transfer

- 5. If patients are receiving palliative sedation, how well is this information communicated to other members of the healthcare team?
 - d. Who/what provides you with this information?
 - e. What can be done to improve this communication of this information?
 - i. Please provide an example
- 6. How do you communicate information about PST across shifts?
 - f. Can you provide an example?
 - g. What would be a better way to do this?
- 7. How do you communicate information about PST to different groups?
(other professions, your profession, families, patients. etc. - already asking this Q and I think it's working ok)

Communication Failures (errors)

- 8. Are there specific times when PST is discussed?
 - h. What specifically is discussed? (please provide examples)
- 9. Have you ever been involved in PST when it has **not gone properly**?
 - a. Please describe the situation (provide an example)
- 10. If you were looking to learn more about PST, where would you go to obtain this information? (resources, etc.)
- 11. There are local guidelines for the Champlain Region that have been developed for PST. Have you read them?
 - a. What would be the best way of informing you about the new guidelines & their content? (If you could decide how they were implemented, what would you do to educate everyone?)
 - Online modules or Courses/workshops/etc.

Final Question

1. Thank you for your time. At this point, I have asked all of the main questions that I have prepared for this interview and have just a few routine questions left. Before I get to those, can you tell me if there were any questions that I have not asked that you think I should have asked?
 - a. Is there any information that I should know that you have not yet told me?

Demographic Questions

1. What is your position within the organization?
2. What is your professional designation?
3. What shift do you typically work? (day/evening/night)
4. Gender: Female or Male (don't need to ask – will just circle answer)
5. Number of years practicing your profession?
6. Number of years working at this organization in any capacity?
7. Number of years working in your current capacity within this organization?
8. Have you received training specific to working in palliative care?

Again, thank you for your time. If you have any questions about anything we have discussed, my contact information is on the top of the consent form that you have been given. **May I contact you for clarification of what we have discussed today if I have any questions while transcribing this conversation or while performing the analysis?**

APPENDIX I: Identification of when Saturation was Reached

Codes						Date Created	Date Last Modified
Comm. & Info. Sharing						29/06/2012 8:54 AM	29/06/2012 8:54 AM
	Comm. Type					06/07/2012 5:32 PM	08/07/2012 5:20 PM
		Close-Looped Comm.				29/06/2012 8:55 AM	09/08/2012 9:44 PM
		Open- & Closed-Loop Comm.				08/08/2012 3:46 PM	10/08/2012 12:02 PM
		Open-Loop Comm.				29/06/2012 8:55 AM	09/08/2012 11:01 PM
	Group Task-Activity					29/06/2012 4:18 PM	27/08/2012 11:38 PM
		activity - neither correct nor incorrect				24/08/2012 10:39 AM	28/08/2012 12:22 PM
		Correct usage				02/07/2012 11:51 AM	28/08/2012 2:15 PM
		Unnecessary or incorrect usage				02/07/2012 11:51 AM	28/08/2012 2:15 PM
	Individual Task-Activity					29/06/2012 4:17 PM	19/08/2012 4:00 PM
	Information Documents					29/06/2012 8:58 AM	29/07/2012 12:35 PM
		Formal Information Documents				11/08/2012 12:53 PM	11/08/2012 12:54 PM
		Kardex				05/07/2012 10:41 PM	29/07/2012 3:55 PM
		Lap Report				29/06/2012 9:04 AM	29/07/2012 3:03 PM
		MAR				29/06/2012 8:59 AM	08/08/2012 2:13 PM

			medication administration record - document		29/06/2012 9:00 AM	29/07/2012 3:03 PM
		Narcotics Sheets (white & orange)			29/06/2012 9:05 AM	29/07/2012 3:33 PM
		Nursing Assignment sheet			30/06/2012 4:05 PM	29/07/2012 3:43 PM
		Patient Medical Chart			29/06/2012 9:01 AM	13/08/2012 4:44 PM
			Admission documents		29/06/2012 9:02 AM	29/07/2012 3:55 PM
			Flow Sheet		10/07/2012 6:58 PM	29/07/2012 3:43 PM
			Interdisciplina ry care plan (ICP)		29/06/2012 9:02 AM	26/07/2012 6:31 PM
			Interdisciplina ry progress notes		29/06/2012 9:01 AM	29/07/2012 3:43 PM
			Physician orders (medication or treatment)		29/06/2012 9:03 AM	29/07/2012 3:55 PM
			Physician progress notes		29/06/2012 9:01 AM	29/07/2012 3:03 PM
			Transfer documents		29/06/2012 9:03 AM	29/07/2012 3:03 PM
		Pictograms			02/07/2012 12:37 PM	29/07/2012 3:03 PM
		Policies & Procedures Information			12/07/2012 10:22 AM	12/07/2012 11:09 AM
		Group Information Documents			11/08/2012 12:55 PM	11/08/2012 1:05 PM
		Consultation - Professional			05/07/2012 10:30 PM	29/07/2012 3:55 PM
		Oasis			06/07/2012 1:22 PM	18/07/2012 7:24 PM
		Priority Board			29/06/2012 9:04 AM	29/07/2012 3:03 PM
		Team Rounds Board			29/06/2012 9:05 AM	18/07/2012 10:27 PM

			Whiteboard of patient names			06/07/2012 3:14 PM	29/07/2012 3:33 PM
		Informal Information Documents				11/08/2012 12:53 PM	11/08/2012 12:53 PM
			Note left for someone			12/07/2012 10:33 AM	20/07/2012 2:44 PM
			Other			12/07/2012 3:15 PM	21/07/2012 1:12 PM
			Personal patient list			05/07/2012 11:12 AM	29/07/2012 3:55 PM
	Info. or Comm. Inaccuracies					02/07/2012 12:13 PM	06/07/2012 1:35 PM
		Access to Information- People - Issues				11/08/2012 3:26 PM	11/08/2012 3:29 PM
			Missing MAR			05/07/2012 9:56 AM	29/07/2012 12:35 PM
			Missing or Unavailable Resources			05/07/2012 11:58 AM	10/08/2012 11:51 PM
				Availability of Information		10/07/2012 6:23 PM	29/07/2012 3:33 PM
				Availability of Staff members		18/07/2012 1:00 PM	20/07/2012 1:34 PM
				Cannot find or Cannot access staff member		06/07/2012 7:57 AM	29/07/2012 3:33 PM
			Missing patient medical chart			05/07/2012 9:57 AM	29/07/2012 3:55 PM
		Awareness of Unit Practices – Issues				11/08/2012 4:04 PM	11/08/2012 4:04 PM
			Forgot to perform a task			13/07/2012 10:07 AM	10/08/2012 11:18 PM
			Knowledge			10/07/2012 7:03 PM	22/07/2012 4:02 PM
				Lack of Knowledge of Process		10/07/2012 5:57 PM	29/07/2012 3:43 PM

				Lack of Knowledge of where to find resources-information		10/07/2012 7:04 PM	21/07/2012 12:23 PM
				Shared Knowledge		22/07/2012 4:52 PM	22/07/2012 4:54 PM
		Quality of Information - Issues				11/08/2012 3:23 PM	11/08/2012 3:23 PM
			Language or Wording Issues			05/07/2012 11:18 AM	16/08/2012 2:09 PM
			Missing or Incorrect Information			02/07/2012 11:48 AM	29/07/2012 3:43 PM
			Questioning Information			02/07/2012 11:46 AM	29/07/2012 3:55 PM
	Information Seeking					29/06/2012 3:58 PM	11/07/2012 3:24 PM
		From documents				29/06/2012 3:59 PM	29/07/2012 3:55 PM
		From other resources				29/06/2012 4:00 PM	29/07/2012 11:02 AM
		From people				29/06/2012 4:00 PM	29/07/2012 3:55 PM
		Types of Information Sought				06/07/2012 11:14 AM	12/07/2012 4:23 PM
			Medication Information			06/07/2012 11:14 AM	29/07/2012 3:40 PM
			Patient Information			06/07/2012 11:14 AM	29/07/2012 3:43 PM
			Process information			10/07/2012 6:15 PM	29/07/2012 3:43 PM
			Staff Information			06/07/2012 11:14 AM	29/07/2012 3:03 PM
	Information Sharing					29/06/2012 4:00 PM	29/07/2012 12:29 PM
		Delegating Tasks or Actions				29/06/2012 4:13 PM	29/07/2012 3:55 PM
		Method of sharing information				29/06/2012 4:06 PM	29/06/2012 5:01 PM
			Information pulling			29/06/2012 4:05 PM	29/07/2012 3:55 PM

			Information pushing			29/06/2012 4:05 PM	29/07/2012 3:55 PM
			Structured information sharing			29/06/2012 4:06 PM	29/07/2012 12:35 PM
				Introduction of new admission patient		29/06/2012 4:07 PM	29/07/2012 3:03 PM
				Telephone calls by nurses to medical team		29/06/2012 4:08 PM	06/07/2012 3:25 PM
				Verification of medications		05/07/2012 10:22 AM	29/07/2012 3:03 PM
			Un-structured information sharing			29/06/2012 4:09 PM	29/07/2012 3:55 PM
		To documents-resources				29/06/2012 4:01 PM	29/07/2012 3:55 PM
		To-From other people				29/06/2012 4:04 PM	29/07/2012 3:55 PM
		Types of Information Shared				29/06/2012 4:04 PM	29/06/2012 5:01 PM
			Medication information			29/06/2012 4:07 PM	29/07/2012 3:55 PM
			Patient information			29/06/2012 4:07 PM	29/07/2012 3:55 PM
			Process information			10/07/2012 6:10 PM	29/07/2012 3:43 PM
			Staff information			29/06/2012 4:07 PM	29/07/2012 3:55 PM
		Validating Information				29/06/2012 4:10 PM	29/07/2012 3:55 PM
			Checking medication at shift transition			29/06/2012 4:11 PM	29/07/2012 3:43 PM
			Counting keys at shift transition			29/06/2012 4:11 PM	29/07/2012 3:43 PM
			Reading off white board of patient names			29/06/2012 4:11 PM	18/07/2012 11:51 AM
	Interruptions					29/06/2012 4:14 PM	29/07/2012 3:03 PM

		Emergency or Urgency				29/06/2012 4:15 PM	21/07/2012 1:50 PM
		for medication verification				06/07/2012 4:18 PM	29/07/2012 3:03 PM
		Looking for other staff member				10/07/2012 11:52 PM	29/07/2012 11:02 AM
		Multi-tasking				20/07/2012 9:24 AM	21/07/2012 12:07 PM
		No Reason				29/06/2012 4:15 PM	29/07/2012 12:29 PM
	Methods of Comm. or Info. Exchange	To request a new task be done or request assistance				07/07/2012 11:04 AM	29/07/2012 3:33 PM
		Update or For-Your-Information				29/06/2012 4:17 PM	29/07/2012 3:55 PM
	Methods of Comm. or Info. Exchange					29/06/2012 4:18 PM	29/07/2012 11:02 AM
		Text-based comm.				11/08/2012 5:51 PM	11/08/2012 5:51 PM
			By Action			11/07/2012 10:22 PM	11/07/2012 10:22 PM
			Computer - other			29/06/2012 4:20 PM	12/07/2012 3:37 PM
			Email			29/06/2012 4:19 PM	12/07/2012 11:01 AM
			Fax			06/07/2012 10:31 AM	20/07/2012 3:41 PM
			Oasis			29/06/2012 4:19 PM	06/07/2012 1:23 PM
			Written			29/06/2012 4:21 PM	29/07/2012 3:33 PM
				Reading		02/07/2012 12:01 PM	29/07/2012 3:55 PM
				Writing in MAR		29/06/2012 4:21 PM	29/07/2012 3:03 PM
				Writing in Patient Medical Chart		29/06/2012 4:21 PM	29/07/2012 3:55 PM
				Writing on Priority Board		06/07/2012 9:59 AM	29/07/2012 3:03 PM

		Verbal Comm. - F2F				11/08/2012 5:56 PM	11/08/2012 5:56 PM
			Face-to-Face			29/06/2012 4:18 PM	29/07/2012 3:55 PM
		Verbal Comm. – Other				11/08/2012 5:57 PM	11/08/2012 5:57 PM
			PA System			29/06/2012 4:19 PM	25/07/2012 3:35 PM
			Pager			29/06/2012 4:18 PM	29/07/2012 3:40 PM
			Telephone			29/06/2012 4:19 PM	25/07/2012 3:33 PM
			Walkie- Talkie				
	Prioritization Information					29/06/2012 8:56 AM	20/07/2012 2:11 PM
		Priority Board				29/06/2012 8:57 AM	29/07/2012 3:03 PM
		Seeking out MD, nurse, other HP to inform of priorities				29/06/2012 8:58 AM	29/07/2012 3:03 PM
	Purpose of Comm.					11/07/2012 4:11 PM	11/07/2012 4:11 PM
		Formal Processes				12/08/2012 12:45 PM	12/08/2012 12:52 PM
			Comm. regarding Formal Procedures- Protocols			11/08/2012 7:21 PM	12/08/2012 12:45 PM
				Change to Procedure		12/07/2012 11:02 AM	11/08/2012 7:23 PM
				Counting Keys, Medications, Verify Patient rooms		12/07/2012 1:33 PM	29/07/2012 3:44 PM
				Reminder to do something		11/07/2012 10:13 PM	29/07/2012 3:10 PM
				Updating Documentatio n-Resources		12/07/2012 12:04 PM	29/07/2012 3:58 PM

			Verifying, Co-Signing Medication		12/07/2012 10:02 AM	29/07/2012 3:39 PM
		Informal Processes			12/08/2012 12:47 PM	12/08/2012 12:52 PM
		Actions that Impact Workflow			12/08/2012 12:51 PM	12/08/2012 12:51 PM
			Clarify Confusion-Error-Misunderstanding		12/07/2012 9:35 AM	12/08/2012 12:52 PM
			Looking for People		11/07/2012 4:16 PM	29/07/2012 3:35 PM
			Looking for Resources-Equipment		11/07/2012 4:15 PM	29/07/2012 4:01 PM
			Request for Assistance		12/07/2012 1:10 PM	29/07/2012 3:57 PM
			Suggesting Future Actions		12/07/2012 12:38 PM	11/08/2012 7:24 PM
		Comm. regarding Informal Procedures-Protocols			12/08/2012 12:49 PM	12/08/2012 12:49 PM
			Decision Making		11/07/2012 4:13 PM	29/07/2012 4:01 PM
				Change to Meds, Treatment, etc.	12/07/2012 1:07 PM	29/07/2012 4:00 PM
			Patient Hand-Off		11/07/2012 4:14 PM	30/08/2012 9:31 AM
		Education-Instruction Related			12/07/2012 12:46 PM	29/07/2012 4:01 PM
		Info. Exchange & Transfer among Team Members			12/08/2012 12:47 PM	12/08/2012 12:47 PM
			Coordinating Care		18/07/2012 4:36 PM	11/08/2012 7:16 PM
			Obtaining Information		11/07/2012 10:00 PM	29/07/2012 3:59 PM

				Sharing- Providing Information		11/07/2012 10:02 PM	11/08/2012 7:23 PM
				Update or For- Your- Information		11/07/2012 4:12 PM	29/07/2012 4:00 PM
	Type of Tool					30/06/2012 2:55 PM	30/06/2012 2:55 PM
		Collab. tool				30/06/2012 2:57 PM	29/07/2012 3:03 PM
		Comm. tool				30/06/2012 2:56 PM	29/07/2012 3:55 PM
		Info. tool				30/06/2012 2:56 PM	29/07/2012 3:59 PM
Medical Errors						05/07/2012 10:18 AM	25/07/2012 4:04 PM
	Document. error					05/07/2012 10:19 AM	29/07/2012 3:59 PM
	Medication error					05/07/2012 10:19 AM	29/07/2012 3:55 PM
	Potential for error					05/07/2012 10:45 AM	27/08/2012 9:34 PM
	Process Error					10/07/2012 7:06 PM	29/07/2012 3:43 PM
Palliative Sedation Therapy						29/06/2012 4:22 PM	29/06/2012 4:22 PM
	Medication Administrati on and-or Knowledge					29/06/2012 4:22 PM	22/07/2012 1:35 PM
		Definition of PST				29/06/2012 4:35 PM	09/09/2012 7:45 PM
			How Sedation is Described by Staff			21/07/2012 2:58 PM	09/09/2012 7:48 PM
			Refractory or Intractable Symptoms			29/06/2012 4:44 PM	29/08/2012 10:58 AM
				Anxiety, Agitation, Distress		29/06/2012 4:44 PM	29/08/2012 9:51 PM
				Congestion		29/06/2012 4:45 PM	30/08/2012 9:31 AM
				Delirium		29/06/2012 4:44 PM	29/08/2012 9:51 PM
				Depression		29/06/2012 4:44 PM	09/09/2012 8:48 PM

			Dyspnea		29/06/2012 4:45 PM	30/08/2012 9:32 AM
			Emotional, Existential Suffering		21/07/2012 2:38 PM	29/08/2012 11:00 AM
			nausea		25/07/2012 4:33 PM	25/07/2012 5:04 PM
			Pain		29/06/2012 4:44 PM	09/09/2012 8:59 PM
			Seizures		22/08/2012 10:37 PM	22/08/2012 10:37 PM
		Implement. of PST			29/06/2012 4:24 PM	27/07/2012 1:36 PM
			Discussion with patient or family		29/06/2012 4:26 PM	09/09/2012 8:22 PM
			Discussion with Team		29/06/2012 4:26 PM	09/09/2012 8:21 PM
			Identif. of procedure as PST		10/07/2012 6:54 PM	22/08/2012 10:58 PM
			Identified as PST		10/07/2012 6:55 PM	27/07/2012 12:46 PM
			Not identified as PST		10/07/2012 6:55 PM	29/07/2012 3:43 PM
			Verbal Information- Sharing		22/07/2012 3:49 PM	30/08/2012 9:31 AM
			Written Orders		29/06/2012 4:26 PM	29/06/2012 4:26 PM
			Charting of Medications		29/06/2012 4:26 PM	29/08/2012 10:37 PM
			Charting of terms PST		29/06/2012 4:27 PM	27/07/2012 12:49 PM
			Explanation of Why PST is occurring		19/07/2012 6:10 PM	29/08/2012 10:37 PM
			Location of Written Information		21/07/2012 2:45 PM	21/07/2012 2:45 PM
				Interdiscipl inary Progress Notes	21/07/2012 2:46 PM	30/08/2012 9:31 AM
				Kardex	21/07/2012 2:46 PM	30/08/2012 9:31 AM
				MAR	21/07/2012 2:46 PM	30/08/2012 9:31 AM

				Medication , Treatment Orders	21/07/2012 2:48 PM	29/08/2012 9:55 PM
				Other	26/07/2012 10:13 PM	30/08/2012 9:31 AM
				Physician Progress Notes	21/07/2012 2:45 PM	30/08/2012 12:22 AM
				Priority Board	22/08/2012 11:10 PM	22/08/2012 11:12 PM
				Whiteboard of patient names	22/07/2012 2:11 PM	30/08/2012 9:31 AM
				Recommendat ion on Priority Board	25/07/2012 5:05 PM	27/07/2012 4:29 PM
		Medications Used			29/06/2012 4:28 PM	27/07/2012 12:48 PM
			Identif. of Medications		29/06/2012 4:32 PM	29/08/2012 9:21 PM
			Knowledge of Medications where sedation is a side-effect		29/06/2012 4:34 PM	29/08/2012 10:58 AM
			Method of Administerin g PST		29/06/2012 4:32 PM	30/08/2012 9:31 AM
		Types of Sedation			29/06/2012 4:23 PM	27/07/2012 8:50 AM
			End-of-Life Sedation		29/06/2012 4:24 PM	22/08/2012 10:25 PM
			Sedation due to a catastrophic event		29/06/2012 4:24 PM	29/08/2012 10:59 AM
			Sedation for short duration		29/06/2012 4:25 PM	29/08/2012 9:50 PM
		Use of PST			29/06/2012 4:27 PM	29/06/2012 4:27 PM
			Frequently Used		29/06/2012 4:28 PM	22/08/2012 10:56 PM
			Infrequently Used		29/06/2012 4:28 PM	27/07/2012 2:59 PM
	Errors in Understand.				21/07/2012 2:40 PM	27/07/2012 5:06 PM

	Individual Factors (culture, ethics, knowledge)					29/06/2012 4:46 PM	22/07/2012 1:36 PM
		Concerns about PST use				29/06/2012 4:47 PM	27/07/2012 1:01 PM
			Believes PST does not shorten life			21/07/2012 2:23 PM	26/07/2012 6:14 PM
			Believes PST is a form of Euthanasia			29/06/2012 4:47 PM	09/09/2012 8:56 PM
			Believes PST is not a form of Euthanasia			29/06/2012 4:47 PM	29/08/2012 10:45 PM
			Believes PST shortens life			29/06/2012 4:49 PM	09/09/2012 8:58 PM
			PST is Appropriately Used on the Unit			29/06/2012 4:49 PM	21/07/2012 2:34 PM
			PST is Not Appropriately Used on the Unit			29/06/2012 4:49 PM	09/09/2012 7:52 PM
			Speed of Implementation of PST			29/06/2012 4:53 PM	30/08/2012 9:31 AM
		Seriousness of PST as an intervention				29/06/2012 4:51 PM	29/06/2012 4:51 PM
			Not Serious			29/06/2012 4:47 PM	29/06/2012 4:47 PM
			Serious			29/06/2012 4:46 PM	09/09/2012 8:21 PM
		Views of Families, Patients				21/07/2012 2:26 PM	27/07/2012 4:15 PM
			Concerns, Questions Asked			21/07/2012 2:27 PM	30/08/2012 9:31 AM
			Terminology			21/07/2012 2:27 PM	21/07/2012 2:28 PM

	Team Dynamics					29/06/2012 4:57 PM	22/07/2012 1:36 PM
		Diff. between shifts				26/07/2012 7:28 PM	09/09/2012 8:03 PM
		Experience Level of Team Members				21/07/2012 3:05 PM	30/08/2012 12:22 AM
		Involvement of Team Members				29/06/2012 5:00 PM	29/08/2012 10:24 PM
		Roles of Health Profs.				29/06/2012 4:57 PM	26/07/2012 7:13 PM
			Nurse role			29/06/2012 4:58 PM	30/08/2012 9:31 AM
			Other			25/07/2012 3:31 PM	25/07/2012 3:32 PM
			Patient, Family Role			22/07/2012 1:42 PM	30/08/2012 9:31 AM
			Pharmacist role			29/06/2012 4:59 PM	30/08/2012 9:31 AM
			Physician role			29/06/2012 4:58 PM	30/08/2012 9:31 AM
				Medical Resident role		29/06/2012 4:58 PM	29/08/2012 10:00 PM
			Spiritual Care, Social Work, Psych. role			29/06/2012 4:59 PM	30/08/2012 9:31 AM
	Education					29/06/2012 4:55 PM	27/07/2012 4:35 PM
		Education for PST				29/06/2012 4:56 PM	29/08/2012 10:39 PM
			Method of Education for Guidelines			29/06/2012 4:57 PM	22/08/2012 11:23 PM
		Education Opps. for Staff				21/07/2012 3:08 PM	24/07/2012 11:49 PM
		Where to go to find information				21/07/2012 3:00 PM	27/07/2012 4:33 PM
	Personal Views about PST					29/06/2012 4:53 PM	27/07/2012 3:01 PM

		Comfort of patient over personal views, values, beliefs				29/06/2012 4:54 PM	27/07/2012 3:46 PM
		Cultural views, values, beliefs				29/06/2012 4:54 PM	09/09/2012 8:56 PM
	Other Comments by Staff					22/07/2012 2:29 PM	09/09/2012 8:06 PM

APPENDIX J: Coding Trees

Codes – Communication

Communication & Information Sharing/Exchange: The method in which knowledge is passed from one member of the healthcare team to another.

Open-looped Communication: Any instance where knowledge is exchanged in such a way that the individual sharing the knowledge cannot be certain that that information has reached its intended audience.

E.g. Writing in a patient's progress notes in their medical chart.

Close-looped Communication: Any instance where knowledge is exchanged in such a way that the individual sharing the knowledge is certain that the information has reached its intended audience. Information Exchange could be open-looped initially and then the loop is later closed, such as when a tab is put down in a medical chart after a nurse reviews a new medication/treatment order.

E.g. Verbal communication such as face-to-face interactions or telephone interactions where confirmation of the knowledge transfer can be confirmed.

Prioritization information: any information or method of sharing this information that assists the team member in determining how to prioritize their time/efforts.

- Priority board/list
- Seeking out MD/nurse/other HP to inform of priorities: an individual looking for another individual to inform them of something that should become a priority for that person

Information Documents: any resource used by members of the healthcare team on the unit

- Formal Information Documents: Documents that exist due to a protocol that requires their use. E.g. MAR, Patient med chart
 - Kardex
 - MAR
 - medication administration record
 - Patient Medical Chart
 - Interdisciplinary progress notes
 - Physician progress notes
 - Interdisciplinary care plan (ICP)
 - Admission documents
 - Transfer documents
 - Flow Sheet
 - Physician orders (medication or treatment)
 - Lab Report
 - Narcotics Sheets (orange and white)

- Policies & Procedures Information
- Pictograms
- Nursing Assignment – [shift]
- Informal Information Documents: board Documents that are created for personal use, making things easier etc. that are not associated with a formal protocol. E.g. personal patient lists
 - Notes left for someone
 - Personal Patient List
 - Other
- Group Information Documents: Documents that are designed to facilitate team communication and discussion. E.g. ICP, priority
 - Consultants-Professional
 - Priority Board
 - Team Rounds Board: used by the attending physician at their Team Rounds meeting
 - Whiteboard of patient names
 - Oasis

Type of Tool: Whether a resource needs to be for sharing information, for communicating with others, or for collaborating with others.

- Information tool: tool that provides/allows for the sharing of information only
- Communication tool: tool that permits/allows for communication between multiple parties
- Collaboration tool: some type of joint work is required and this tool facilitates that, it may also be a communication strategy that facilitates collaboration

Purpose of Communication:

Explicit Purpose

- Communication regarding **Formal Procedures/Protocols**: Any communication that is occurring specifically because there is a formal process in place that needs to occur.
 - Counting Keys/Medications/Verify Patient Rooms
 - Verifying/Co-Signing Medications
 - Updating Documentation/Resources
 - Reminder to Do Something
 - Change to Procedure

Implicit Purpose

- Communication regarding **Informal Procedures/Protocols**: Any communication that, while there is no specific protocol in place to facilitate it, occurs as a direct result of the need for communication to provide care to patients.
 - Patient Hand-Off

- Decision Making
 - Change to Medication, Treatment, etc.
- **Information Exchange & Transfer among Team Members:** Communication intended to share/obtain information to improve the ability of the team members to function as a team.
 - Update or For-Your-Information
 - Sharing/Providing Information
 - Obtaining Information
 - Coordinating Care
- Education/Instruction Related
- Actions that Impact Workflow
 - Clarify Confusion/Error/Misunderstanding
 - Looking for People
 - Looking for Resources/Equipment
 - Request for Assistance: *also includes when someone Offers Assistance*
 - Suggesting Future Actions: *also includes things that someone says they are going to do.*

Information Seeking: an individual actively looking to obtain information

- From documents
- From people
- From other resources
- Types of Information Sought
 - Medication Information
 - Patient Information
 - Process Information
 - Staff Information

Information Sharing: an individual actively looking to provide their information to others

- To documents/resources
- To/from other people
- Types of information shared
 - Patient information
 - Medication information
 - Process information: Information about specific processes or procedures or documentation
 - Staff information: information about staff in any capacity
- Method of sharing information
 - Information pushing: providing information to another individual
 - Information pulling: obtaining information from another individual
 - Structured information sharing: information being shared in a manner that is consistent, so that the individuals involved in the interaction are aware of what information the other needs and can provide that information

- Introduction of newly admitted patients at Team Rounds
- Telephone calls to by nurses medical team
- Nurses telling each other when they are leaving or returning to the unit – they seem to be consistent in this, which is why it is classified as ‘structured’
 - Un-structured information sharing: there is no particular method of providing or obtaining information that is consistent across the healthcare team on the unit
- Validating Information: any methods used to ensure the accuracy of information on the unit
 - Reading off white board of patient names
 - Checking medications at each shift transition
 - Counting keys at each shift transition
- Delegating Tasks/Actions: determining who will perform a task.

Interruptions: any instance when an individual was interrupted in the task that they had been performing

- Emergency or Urgency: The interruption occurred because there is an emergency or some urgent matter that someone needs to be made aware of.
- For Medication Verification
- Looking for Other Staff Member
- No Reason: There is no reason for why the information shared needed to be done in an interruption.
- Update/For-Your-Information: The information being shared is relevant to the person and while it is useful that it is provided in a timely manner, it is not necessary that it is provided through an interruption.
- To Request a New Task be Done or Request Assistance
- Multi-tasking: performing more than one task at the same time

Individual Task: tasks that do not involve more than one individual – they can be completed effectively without interaction with other members of the healthcare team.

E.g. Giving medications to patients, reviewing patient medical charts or MARs

- Correct usage: This event should require only one individual.
- Incorrect usage: Incorrectly performing a task.
- Unnecessary usage: Incorrectly doing something as an individual task when it should be a group task OR performing a task that you should not need to be performing at all.

Group Task: tasks that require the involvement of more than one individual – they cannot be completed effectively without the interaction of at least two members of the healthcare team.

E.g. Team Rounds, patient hand-overs, medication co-signatures

- Correct usage: This event should require the involvement of more than one individual.

- Unnecessary or Incorrect usage: something that is a group task but should not be, either because the task should not have required more than one person or because although the task required more than one person the task itself should not have been necessary.

Methods of Communication &/or Information Exchange: whatever medium is used to communicate information between members of the healthcare team

- Text-Based Communication: Any form of communication that involves reading or writing to share or obtain information.
 - Written
 - Writing on Priority Board
 - Writing in MAR
 - Writing in Patient Medical Chart
 - Reading
 - Fax
 - Email
 - Oasis: online EHR.[Hospital] staff have access to this.
 - Computer – other
 - PA system
 - By Action: no verbal or written interaction, but performing an action that indicates to someone that they should do something. Ex. Placing a “LAB” bag on the ward clerk’s desk tells the Porter that he needs to take this sample down to the lab.
- Verbal Communication – Face-to-Face: *All face to face verbal conversations.*
 - Face-to-Face
- Verbal Communication – Other
 - Telephone
 - Pager
 - Walkie-Talkie

Communication or Information Issues:

- Quality of Information – Issues: Any information/communication issues due to issues surrounding the quality of the information available.
 - Language/Wording Issues: Any miscommunications or confusion resulting from differences in word usage among staff etc.
 - Missing or Incorrect Information: When a member of the healthcare team requires information and does not have access to it or it does not exist.
 - Questioning Information: Any member of the team questioning the accuracy/validity of information, whether they ask these questions of another team member or are talking to themselves.
- Access to Information/People - Issues: An instance of an individual needing to have access to information or another person and that access is not possible.
 - Missing MAR
 - Missing patient medical chart

- Missing or Unavailable Resources: When a MAR or patient medical chart cannot be found or is unavailable for whatever reason, or if an individual is unavailable and cannot be found.
 - Availability of Information
 - Availability of Staff Members
 - Cannot find or Cannot access Staff Member
- Awareness of Unit Practices – Issues: Variations from typical practice on the unit due to a lack of knowledge/awareness of an individual(s) working on the unit.
 - Forgot to perform a task: Forgot to send information, forgot to write something down, etc. and the person who has forgotten or someone else is remembering/discovering this.
 - Knowledge:
 - Lack of Knowledge of Process
 - Lack of Knowledge of where to find resources/information
 - Shared Knowledge – people being “on the same page”

Coding Tree – Medication Error

Medical Error

Medication Error

Documentation Error

Potential for Error

Process Error

Coding Tree - Palliative Sedation Therapy

Medication Administration/Knowledge: knowledge regarding what PST is and how it is administered/delivered on the unit. This includes understanding when PST is appropriate as a treatment option.

Types of Sedation: recognition that there are multiple reasons for using sedation, and that not all of them are PST

- End-of-life sedation
 - Planned sedation
- Sedation due to a catastrophic event
 - Unplanned sedation
- Sedation for short duration

Implementation of PST: knowledge of the components of the process required to initiate PST for a patient

- Identification of procedure as PST: Whether when sedation is occurring it is actually classified as PST or not.
 - Identified as PST
 - Not identified as PST
- Discussion with Team
- Discussion with Patient/Family
- Written Orders
 - Charting of Medications
 - Charting of “PST”
 - Explanation of why PST: rationale for why PST is needed explained in Progress Note and/or Treatment/Med order
 - Location of Written Orders: Where do team members write notes about PST.
 - Physician Progress notes
 - Interdisciplinary progress notes
 - Kardex
 - MAR
 - Medication/Treatment Orders
 - Other
 - Recommendation on Priority Board
- Verbal Information Sharing

Use of PST: opinions of individuals regarding the frequency of use of PST on the unit

- Frequently Used
- Infrequently Used

Medications Used: identification of which medications are used for PST on this unit, and how these medications are administered

- Identification of Medications: Whether the medications identified are correct or incorrect, these are the medications that have been identified.
- Method of Administering PST: Whether the medications identified are correct or incorrect, these are the methods of administering PST that have been identified.
- Medications where sedation is a side-effect

Definition of PST: how each individual on the healthcare team defines PST and identifies when it should be used.

- Refractory/Intractable Symptoms
 - Anxiety/Agitation/Distress (patient or family)
 - Delirium
 - Depression
 - Pain
 - Dyspnea
 - Congestion
 - Emotional/Existential Suffering
 - Nausea

- How Sedation is Described by Staff: Whether it is called PST or other things

Errors in Understanding: Anything stated that someone believes that is either (1) incorrect, or (2) while it may be correct according to what is happening, it should be incorrect because it should not be happening.

Individual Factors (culture, ethics, knowledge)

Seriousness of PST as an Intervention: whether interviewee considers PST to be ‘a big deal’ – obtained through comments made, will not be directly stated in interviews

- Not Serious
- Serious

Concerns about PST Use: any concerns that someone may have about using PST in general or specifically how PST is used on this unit

- Believes PST is a form of Euthanasia
- Believes PST is not a form of Euthanasia
- Believes PST shortens life
- Believes PST does not shorten life
- PST is Appropriately Used on the Unit
- PST is Not Appropriately Used on the Unit
- Speed of Implementation of PST

Personal Views about PST: the personal factors involved in how an individual views PST

- Cultural views/values/beliefs
- Comfort of Patient Over Personal Views/Values/Beliefs

Views of Patients/Families

- Terminology/Understanding
- Concerns/Questions Asked

Education: any identified knowledge gaps among the healthcare team

Education for PST: any additional knowledge that members of the healthcare team feel is needed

- Education for PST
 - Method of Education for Guidelines: methods of providing this additional knowledge regarding the implementation of the Guidelines specifically
- Where to find information for yourself
- Education Opportunities for Staff

Team Dynamics: understanding how the healthcare team works together on the practice of PST

Roles of Health Professionals: the role of each health professional in the practice of PST

- Nurse Role
- Physician Role
 - Medical resident role: as there may be some distinctions between the attending physician's role and the medical resident's role.
- Pharmacist Role
- Spiritual Care/Social Work/Psychology Role
- Patient/Family Role: Do they suggest PST, etc.

Difference between shifts

Involvement of Team Members: identification of which team members are involved when and in which components of the practice of PST

Experience Level of Team Members

Other Comments by Staff

APPENDIX K: Example of Analysis Comparisons

Information Sharing According to Type of Information

	Type of Information Sought or Shared			
	Medication Information	Patient Information	Process Information	Staff Information
Information Sharing				
• To Documents	10	43	4	11
• To People	107	306	105	111

Most information is shared with people. When sharing to people or documents/resources, patient information is the information that is most frequently shared.

WHAT Info?	TO where?	WHO is pushing the info?	Location Info is pushed TO? (docs/people)	Findings
Medication Information	To Documents	1. Physicians 2. Nurses	1. Writing medication orders and consulting with each other about medication orders. 2. Counting medications @ shift transition. Medication verification & co-sign.	Written information that is pushed regarding medications is fairly specific – writing medication orders on the part of physicians or verifying medications/ counting medications on the part of nurses.
	To People	Physicians Allied Health Nurses	1. Discussion about best medications to provide based on current conditions. 1 & 3. Medication changes 2. Patient hand-overs. Discussion of unclear medication orders. Requests for co-signatures. 3. Medication orders sent to pharmacy.	A number of discussions about medications – which medications are most appropriate/ should there be changes to medications, and unclear medication orders were common. Routine tasks such as patient handovers and requests for co-signatures also occur among nurses.
Patient Information	To Documents	Physicians Allied Health Nurses	Document changes in patient condition, potential future treatments (nurses, MDs). Charting at end of shift (nurses) and during shift (physicians). Writing on priority board (nurses) and updating whiteboard (ward clerk).	Document updates on patient condition can occur at any time by anyone who has interacted with that patient or who has information about them.
	To People	Physicians Allied Health Nurses Other HPs	Sharing information gained from discussion with patient/family. Patient handovers (nurses). Announcements about patient call bells (nurses, WCs). Updating one another on patients/	There are a large number of conversations that are mostly ‘updates’ and used to coordinate care for patients.

			coordinating care and planning care.	
Process Information	To Documents	Nurses	Updating documentation in accordance with processes (whiteboard, Nursing Assignment sheet, etc.)	Documents are updated in accordance with processes that are in place to ensure that these documents are updated.
	To People	Nurses Physicians Allied Health Other HPs	Organizing @ shift transition (Nurses). Organize in prep for & during Team Rounds (nurses, AH, MDs). Ppl indicating where they are going in case they're needed. Assisting each other w/ processes (nurses). Confirming updating of documents (MDs, nurses, OHPs). Discussing availability of resources (AHs). Reminder about priority board completion (nurses).	When processes are not correctly followed work-arounds have be created, which created additional discussions. There are many different processes in place on this unit, some formal and some informal. The informal seem to be frequently verbal in nature, such as letting ppl know where you are going. Formal are a mixture of both, such as accurate documentation in the correct & timely manner but then followed up with verbal confirmation, and verbal actions such as reminders about priority boards.
Staff Information	To Documents	Nurses Physicians Allied Health Other HPs	Writing notes to staff (phone call received, etc.) (all staff). Organizing which MD sees which patient (MDs). Adjusting staffing assignments (nurses).	Largely people organizing themselves. Also some instances of non-routine tasks using notes, such as someone off-unit calling and leaving a message for someone else.
	To People	Nurses Physicians Allied Health Other HPs	Looking for nurses assigned to a particular patient, or looking for other staff in general (all staff). Ppl telling each other where they are going when they go on break. PA announcements looking for staff, informing ppl about telephone calls or room #s for patient call bells, etc.	A lot of looking for people. This could be: 1. Because the person needs information from them or to have them perform a task. 2. Confirmation that the person received information that was left for them. 3. Routine part of work – e.g. announcing patient call bells

			Verbal discussion about whether staff should go home if they are overstaffed (nurses). Verbal discussions about ensuring that the person a note was meant for see the note (all staff).	Also people organizing themselves and discussing patient assignments.
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