

**MEDICATION SAFETY PRACTICES:
A PATIENT'S PERSPECTIVE**

TERI ANN MYHRE

B.N., University of Lethbridge, 1989

A Thesis
Submitted to the School of Graduate Studies
of the University of Lethbridge
in Partial Fulfillment of the
Requirements for the Degree

MASTER OF SCIENCE

School of Health Sciences
University of Lethbridge

LETHBRIDGE, ALBERTA, CANADA

© Teri Ann Myhre, 2007

Dedication

To my daughters, Dani and Taryn,
for their encouragement, patience and love,

and

to my dear friends, Janet and Steven,
for their enthusiasm in keeping me focused and committed to the end!

Table of Contents

| | |
|---|------|
| Dedication..... | iii |
| Table of Contents..... | iv |
| List of Figures..... | viii |
| List of Tables..... | ix |
| Abstract..... | x |
| Chapter One: Introduction..... | 1 |
| Statement of the Problem..... | 1 |
| Background and Significance of the Problem..... | 2 |
| Patient Participation in their Care..... | 2 |
| Purpose of Research and Research Questions..... | 4 |
| Overview of the Thesis..... | 5 |
| Chapter Two: Review of Relevant Literature..... | 7 |
| Historical Context..... | 7 |
| Today’s Patient Safety Movement..... | 8 |
| Prevalence of Medical Errors..... | 8 |
| Adverse Events: Overall..... | 8 |
| Adverse Events: Nursing Practice..... | 9 |
| Causes of Medication Errors..... | 10 |
| Human/System Errors..... | 10 |
| Process Errors..... | 11 |
| Personality and Error..... | 12 |
| Cognition and Error..... | 13 |

| | |
|---|----|
| Solutions | 14 |
| Nurse Level..... | 14 |
| System Level..... | 16 |
| Patient Perspectives | 18 |
| The Canadian Experience | 18 |
| Patient Accountability..... | 20 |
| Summary | 22 |
| Chapter Three: Methods and Procedures | 25 |
| Research Design..... | 25 |
| Sample and Setting | 25 |
| Inclusion/Exclusion Criteria | 26 |
| Ethical Considerations | 26 |
| Consent | 27 |
| Confidentiality | 27 |
| Methods of Measurement | 28 |
| Survey Instrument..... | 28 |
| Instrument Development..... | 28 |
| Validity testing..... | 32 |
| Reliability testing..... | 33 |
| Data Collection Process | 34 |
| Data Entry | 35 |
| Missing Data | 36 |
| Summary | 36 |

| | |
|--|----|
| Chapter Four: Results | 38 |
| Introduction..... | 38 |
| Demographics and Background of Sample Participants..... | 39 |
| Overall Descriptive Statistics for Survey Questions..... | 42 |
| Inferential Statistics | 54 |
| Research Question: Do Patients’ Perceptions and Behaviours Vary According to | |
| Nursing Unit?..... | 54 |
| Patient Behaviours | 58 |
| Patients’ Perceptions and Nurse Behaviours Regarding Pain Medicine .. | 59 |
| Patients’ Perceptions of Nursing Care | 60 |
| Patients’ Perceptions of Participation/Accountability for Care | 62 |
| Research Question: Do Patients’ Perceptions and Behaviours Vary According to | |
| Age? | 62 |
| Patient Behaviours | 66 |
| Patients’ Perceptions and Nurse Behaviours Regarding Pain Medicine .. | 67 |
| Patients’ Perceptions of Nursing Care | 68 |
| Patients’ Perceptions of Participation/Accountability for Care | 68 |
| Research Question: Do Patients’ Perceptions and Behaviours Vary According to | |
| Gender?..... | 69 |
| Patient Behaviours | 73 |
| Patients’ Perceptions and Nurse Behaviours Regarding Pain Medicine .. | 73 |
| Patients’ Perceptions of Nursing Care | 74 |
| Patients’ Perceptions of Participation/Accountability for Care | 75 |

| | |
|--|-----|
| Research Question: Do Patient’s Perceptions and Behaviours Vary According to | |
| Length of Stay (LOS)?..... | 75 |
| Patient Behaviours | 76 |
| Patients’ Perceptions and Nurse Behaviours Regarding Pain Medicine .. | 77 |
| Patients’ Perceptions of Nursing Care | 77 |
| Patients’ Perceptions of Participation/Accountability for Care | 80 |
| Research Question: How Does Wait Time for Administration of Pain Medication | |
| on Nursing Units at Chinook Regional Hospital Compare to Results | |
| Reported in Health Quality Council of Saskatchewan (2005) Survey?.... | 82 |
| Summary | 83 |
| Chapter Five: Discussion | 86 |
| Overview..... | 86 |
| Implications for Nursing Practice | 98 |
| Study Limitations..... | 103 |
| Recommendations for Future Research | 106 |
| References..... | 108 |
| Appendix A. Response from Chinook Health Region..... | 116 |
| Appendix B. Cover Letter for Survey..... | 117 |
| Appendix C. Medicine Safety Survey: A Patient’s Perspective | 119 |

List of Figures

| | |
|---|----|
| Figure 1. Reason's Swiss cheese model..... | 11 |
| Figure 2. Wait time in minutes for pain medicine by unit..... | 60 |
| Figure 3. Wait time in minutes for pain medicine by length of stay | 77 |
| Figure 4. Mean scores of patients' perceptions of safety in the nursing care | 78 |
| Figure 5. Mean scores of patients' perceptions of level of trust in nursing care..... | 79 |
| Figure 6. Mean scores of patients' perceptions of overall nursing care..... | 80 |
| Figure 7. Mean scores of patients' perceptions of who is responsible for making sure their medicine is being given safely..... | 81 |
| Figure 8. Mean scores of patients' perceptions of how often they ensure their medicine is being given correctly | 82 |

List of Tables

| | |
|--|----|
| Table 1. Patients' Perceptions of Nursing Care. Seven-Point Rating Scale..... | 31 |
| Table 2. Patients' Perceptions of Participation/Accountability in Care. | 31 |
| Table 3. Patients' Demographics and Background: Gender, Unit, Reason for Admission, Length of Stay (Questions 24, 25, 26, 27) | 41 |
| Table 4. Patients' Perceptions of Nurse Behaviours: Observations | 42 |
| Table 5. Patients' Perceptions of Nurse Behaviours: Patient Identification (Question 2) | 44 |
| Table 6. Patients' Perceptions of Nurse Behaviours: Review of Information (Question 8) | 45 |
| Table 7. Patient Behaviours: Medicine Administration (Questions 7, 9, 10, 11)..... | 46 |
| Table 8. Pain Medicine Administration (Questions 14, 15) | 48 |
| Table 9. Pain Medicine Administration: Wait Time in Minutes by Unit (Question 16) .. | 49 |
| Table 10. Patients' Perceptions of Nursing Care. Seven-Point Rating Scale (Questions 18, 19, 20)..... | 51 |
| Table 11. Patients' Perceptions of Participation/Accountability in Care. Five-Point Rating Scale (Questions 21, 22) | 53 |
| Table 12. Patients' Perceptions of Nurse Behaviours: Patient Identification by Unit..... | 55 |
| Table 13. Patients' Perceptions of Nurse Behaviours: Review of Information by Unit... | 56 |
| Table 14. Patients' Perceptions of Nurse Behaviours: Patient Identification by Age..... | 63 |
| Table 15. Patients' Perceptions of Nurse Behaviours: Review of Information by Age .. | 65 |
| Table 16. Patients' Perceptions of Nurse Behaviours: Patient Identification by Gender. | 70 |
| Table 17. Patients' Perceptions of Nurse Behaviours: Patient Information by Gender... | 71 |

Abstract

Medication administration constitutes a key element of acute care delivery, while errors in the process threaten patient safety. The purpose of the study is to explore patients' perceptions, attitudes and beliefs about the safety practices utilized by nurses when administering medications. Specifically, the study addresses patients' perceptions of nurse behaviours regarding safe medicine administration, patient behaviours, patients' perceptions and nurse behaviours regarding pain medicine, patients' perceptions of nursing care, and patients' perceptions of their participation/accountability in care. The results identify key safety issues from a patients' perspective to focus change strategies that will improve patient care.

Chapter One: Introduction

Statement of the Problem

A foundational cornerstone, upon which healthcare providers endeavour to base all care is, the medical oath “never do harm to anyone” (Hippocrates, n.d.). Nurses and physicians don’t come to work to harm patients (Reason, 2005); unfortunately, the hard reality is that errors and subsequent harm to patients do happen. To err is human! Although a rather simplistic description of human behaviour, when patient safety is at risk, “to err is human” takes on a new and serious connotation that requires immediate attention and corrective action where possible.

Baker et al. (2004) estimate the prevalence of adverse events to be approximately 7.5% in Canadian acute care hospitals. Among patients with adverse events, 36.9% were judged to be preventable. Inoue and Koizumi (2004) reported on adverse events specifically related to nursing practices in Japan, and identified three major factors contributing to the errors: violation of rules, failure of labour management, and defects in the standardization of nursing practices. The Institute of Medicine’s (IOM) (2000) landmark report entitled *To Err Is Human: Building a Safer Health System* cites medication errors as the largest subset of medical errors that occur. Adverse events and/or errors can be associated with medication administration. Medication administration constitutes a key element of acute care delivery. Physicians are responsible for ordering medications, while nurses are charged with their safe administration, the outcome of which is significant to patients.

Background and Significance of the Problem

Medication errors threaten patient safety. Baker et al. (2004) reported that the number of adverse events related to surgery and medication errors were the highest respectively in the Canadian hospitals studied, and that efforts aimed at improving surgery and medication safety practices are critical to enhancing patient safety. Senior healthcare administrators and executives are responsible for establishing, maintaining and monitoring systems to promote patient safety. One such system includes the reporting and follow-up of medication incidents involving nursing staff in acute care settings. Errors happen daily; the wrong medication or dose is given to a patient, or perhaps the correct medication or dose is given at the wrong time. The Chinook Health region in Southern Alberta reported 356 medication incidents (a rate of 0.77 incidents/1000 medications administered) for the four medical and surgical acute care units at the Chinook Regional Hospital for the fiscal year 2005/2006, (Chinook Health 2005/2006a). Although it is the best information currently available for the region, Bechtel, Vertres and Swartzberg (1993) caution that data from hospital incident reports often understate the actual prevalence of medication errors.

Patient Participation in their Care

The IOM (2000) report *To Err is Human: Building a Safer Health System* strongly recommends that patients be viewed as members of the health team and encouraged to become actively involved in their care. Vincent and Coulter (2002) report that patients are usually perceived as victims of errors and safety failures, when in fact, it is their responsibility to actively involved and partner in their care.

There has been little research focusing on patients' perceptions of safety in the healthcare setting. The Health Quality Council of Alberta (HQCA) (2005) and the Health Quality Council of Saskatchewan (HQCS) (2005) have both taken lead roles in their respective provinces in an attempt to understand this issue better. Utilizing a telephone survey of Albertans, the Alberta Patient Safety survey studied perceptions of preventable medical error in general, possible causes of preventable medical error, possible solutions for reducing preventable medical error, and opinions about confidentiality and disclosure and personal experience with preventable medical error (Northcott & Northcott, 2004). When contacting the respondents, the surveyor described preventable medical error as follows: "mistakes can be made that result in serious harm, such as death, disability or additional prolonged treatment" (p. 144). Fifty percent of the respondents reported that they believed that serious preventable medical errors do not happen very often, but when they occur that they would estimate that healthcare providers are responsible for the mistakes 57% of the time and that the institutions were responsible only 23% of the time. What is the basis for these beliefs? More information is required if we are to improve our understanding of patients' perceptions, beliefs and attitudes regarding safety applications in healthcare.

While the HQCA (2005) survey focused predominantly on preventable medical error, the HQCS (2005) evaluated perceived quality of care in 5002 discharged patients (Wohlegemuth, Chan, Koru-Sengul, & Teare, 2005). The study found that 76% of patients reported always having trust and confidence in their nurses. How does this concept of trust relate to actual safety practices? Further study is required to explore this issue.

Purpose of Research and Research Questions

A plethora of research has been published in the broad context of medical error and patient safety, yet there is a gap in the literature addressing medication safety practices in nursing and a virtually no research addressing any of these topics from the patients' perspective. The purpose of this research is to explore the safety practices employed by nurses during medication administration, specifically from the patients' perspectives. The fundamental objectives are to explore patients' perceptions, attitudes and beliefs about the safety practices utilized by nurses when administering medications, and to identify opportunities for practice improvements that will promote a safer medication administration system for nursing.

Safe administration of medication is significant to nurses, doctors, administrators, educators, patients, the public at large, and the entire healthcare system. In essence, each stakeholder is potentially impacted when errors occur. A better understanding is needed of the processes that nurses currently utilize when administering medication. Involving patients would be one way of gaining a better understanding of their perceptions of safety practices, providing valuable insights. The findings from this research are of interest to both professionals and the public, for different reasons. Nurses should particularly benefit from understanding how patients perceive the processes of medication administration, gaining opportunities for improvements. The University of Lethbridge (as a nursing program provider), and Chinook Health (as an administrator and employer) will have the opportunity to apply the findings in planning future educational and system changes. Patients and the general public will benefit from this research, given that society is dependent upon the practices of healthcare providers.

The primary research question underlying this study is the following: What are medical and surgical inpatients' perceptions, attitudes and beliefs regarding medication administration safety practices utilized by nursing staff?

The other questions addressed in the analysis will identify similarities and differences between and within groups of patients, the results of which have application within the healthcare system. These questions include the following: Do patients' perceptions and behaviours vary according to the nursing unit they are on? Do patients' perceptions and behaviours vary according to age? Do patients' perceptions and behaviours vary according to gender? Do patients' perceptions and behaviours vary according to their length of stay (LOS)? Lastly, waiting for pain medication to be administered could negatively impact patients' perceptions of their experience of medication administration. Wait time for the administration of pain medication was reported in the HQCS (2005) survey. How does the wait time for administration of pain medication on the nursing units within Chinook Health compare?

Overview of the Thesis

This thesis includes five chapters. Chapter 1 includes the statement of the problem, background and significance of the problem, statement of the purpose of the research, and the research questions. Chapter 2 comprises a review of the literature relevant to patient safety and medical errors, in the following sections: historical context, prevalence of medical errors, causes of medication errors, solutions, and patient perspectives. The methodology and survey instrument pilot are described in Chapter 3, and the results of the data analysis are presented in Chapter 4. Chapter 5 comprises a

discussion of the implications of the results and their application to clinical nursing, the study limitations, and recommendations for further research.

Chapter Two: Review of Relevant Literature

A plethora of research has been published in the broad context of medical error and patient safety. This chapter reviews the relevant literature in order to build a conceptual framework concerning medication administration safety practices employed by nurses, from the patient's perspective. Selected literature topics include the historical context, prevalence of medical errors, causes of medication errors, solutions, and patients' perspectives.

Historical Context

Patient safety issues are documented early in the literature. In 1846, Semmelweiss compared infection rates in post-natal wards in Vienna and found that mortality was three or four times higher in medical wards than in midwifery wards (Semmelweiss, Carter trans., 1983). In the late 1800s, Florence Nightingale, arguably the founder of nursing, was tireless in her campaign to promote hand washing in an effort to further prevent harm to the sick (Clancy, Farquhar, & Sharp, 2005). It appears, however, that the real impetus for changing the health system did not come about until the mid to late 20th century.

A classical study by Schimmel (2003), originally published in 1964, was among the first to report that there were "untoward" consequences of acceptable care. In this eight-month study, 20% of patients admitted to the medical unit experienced one or more untoward episodes, highlighting the magnitude of the hazards to which hospitalized patients were exposed. By today's standard, 20% of patients being exposed to an untoward episode is considered high (Baker et al., 2004; Brennan et al., 1991; Leape et al., 1991; Wilson et al., 1995). However, it appears that the concept that the healthcare environment might not be safe received little attention from either the public or other

health researchers following the original publication by Schimmel. This situation is evidenced by the apparent lack of published studies focusing on adverse events or hazards of hospitalizations in the 1970s and 1980s.

Today's Patient Safety Movement

The Institute of Medicine's (2000) landmark report, entitled *To Err Is Human: Building a Safer Health System*, has been credited with creating the awareness required to motivate change in the patient safety movement (Clancy et al., 2005; Stafford, 2000; Vincente, 2003). Patient safety, as defined by Kohn, Corrigan, and Donaldson (1999), is "freedom from accidental injury; ensuring patient safety involves the establishment of operational systems and processes that minimize the likelihood of errors and maximizes the likelihood of intercepting them when they occur" (p. 21).

Prevalence of Medical Errors

Adverse Events: Overall

Canada, the United States and Australia are among the countries that have delved deeper into the issue of patient safety by researching the concept of adverse events (AEs) (Baker et al., 2004; Brennan et al., 1991; Leape et al., 1991; Wilson et al., 1995). Adverse events, as defined by Baker et al. (2004), are "unintended injuries or complications resulting in death, disability or prolonged hospital stays that arise from health care management" (p. 1678). Therefore, depending on the outcome to the patient, process errors in medication administration could result in adverse events and would potentially be captured in these studies.

Brennan et al. (1991), Leape et al. (1991), and Baker et al. (2004) studied adverse events employing retrospective chart audits. Adverse events were reported inclusive of all

disciplines involved in care. Grounded in the theoretical framework of error theory (originating from physics and astronomy), these studies utilize probability measures for reporting outcomes. Adverse event rates were estimated to vary between 2.9% and 16.6% (Baker et al., 2004; Brennan et al., 1991; Leape et al., 1991; Wilson et al., 1995). However, one of the limitations of retrospective chart audits is that analyses is done on documented events whereas many incidents are not documented for reported for fear of censure (Polit and Beck, 2004). Thus, these above results should be considered a conservative estimate. Even with that caveat in mind, the studies by Brennan et al. (1991), Leape et al. (1991) and Baker et al. (2004) highlight that there is a significant issue concerning the safety of patient care in acute care settings.

Adverse Events: Nursing Practice

Inoue and Koizumi (2004) reported the only known published study on adverse events specifically related to nursing practice in six large tertiary hospitals in Japan. The purpose of their study was to develop a model that would facilitate error analysis in combination with quantitative risk assessment. The methodology included a retrospective review of incident reports coded by error type, direct and indirect threat, and then further scored as to the severity of harm to the patient. Inoue and Koizumi defined incidents as “errors that resulted in either no harm or harm to the patient, and excluded those that resulted in malpractices or misdiagnosis” (p. 1463). Thus medication administration errors were included in this analysis. A complicated formula was applied to determine error rates, reviewing 5,339 incident reports with a total of 63,294,144 nursing practices. The four practices that consistently gave high error rates in all six hospitals were “prevention of problematic behaviour, prevention of suicide, safeguarding against falls,

and subcutaneous injections of insulin” (p. 1466). Three organizational factors that contributed to the errors by nurses were identified: violation of rules, 826 in 10,000, failure of labour management, 661 in 10,000, and defects in the standardization of nursing practices, 495 in 10,000. These findings support the need for a close examination of safety practices used by nurses in the delivery of care, because the reported error rates are significant.

Causes of Medication Errors

Human/System Errors

Social science research from anthropology, sociology, psychology and philosophy has been instrumental in identifying theoretical constructs that support patient safety research. Rasmussen (1987) pioneered the concept of cognition errors and identified three categories of errors: skills based, rule based, and knowledge based. This perspective on errors classification provides an important distinction in understanding errors and has been influential in the development of improvements in strategies to address safety.

Building on the work of Rasmussen (1987), Reason (1990) further defined errors into two categories: “slips” or errors of action, and “rule” or knowledge-based errors, which are conscious and classified as mistakes. Another important distinction regarding the science of human error is between active and latent errors (Reason, 2000). Active errors are often associated with front-line caregivers such as nurses, and the results are seen or felt immediately, at the “sharp end.” Latent errors are most often associated with organizational factors or system issues and are removed from the patient, occurring at the “blunt end.” When the active and latent failures align without interception, like slices of Swiss cheese, accidents can occur. Reason’s (2000) Swiss cheese model (see Figure 1)

has been widely used to depict that systems contribute to errors as much as humans do, an important distinction in error management.

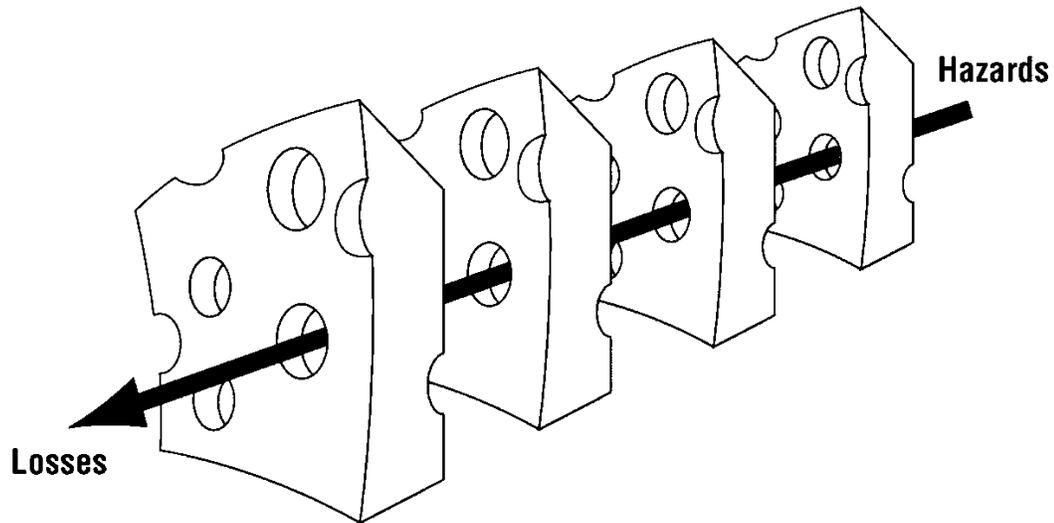


Figure 1. Reason's Swiss cheese model.

Process Errors

Few studies look specifically at nurses and the medication administration process. In an ethnographic study employing disguised observation, Taxis and Barber (2003b) studied the prevalence of errors in the preparation and administration of intravenous drugs in ten acute care settings. The medication error rates were high; at least one error occurred in 212/430 intravenous doses, a rate of 49% with a 95% confidence interval. This error rate reflects the severity of the problem. Further research is needed to determine if this rate exists in other environments and to what degree. Taxis and Barber (2003a) published a second paper from this study identifying the causes of intravenous

medication errors. They reported that 7% of errors occurred in preparation, 35% during administration, and 6% involved both preparation and administration errors.

Santell and Cousins (2005) support these findings, identifying that the wrong administration technique is the most frequently reported error rate in the MEDMARX® database. MEDMARX® is a national pharmacy database that tracks errors, facilitating benchmarking. Santell and Cousins further analysed administration technique errors and found that 45% were related to performance deficit, 30% to the procedure not being followed, and 27% to a knowledge deficit. Building on the work of Reason (2000), this classification provides direction for management on how to focus solutions to address medication administration errors.

It would be valuable to replicate Taxis and Barber's (2003a) study to identify whether different staffing models impact the results. In addition, a 35% error rate during administration indicates a need to examine the safety practices used by nurses in this phase, supporting the research question proposed in this study.

Personality and Error

Is there a relationship between personality and error? Is there such a thing as an error-prone personality? If so, can personality testing identify individuals who are prone to error? Administrators would find this valuable information to understand and apply to the recruitment of new staff. In a study on bus drivers, Shaw and Sichel (1971) found that accidents were predictive not only of future accidents but also of the type of accidents that would occur. Unfortunately, close supervision of the bus drivers in this study did not prevent the bus drivers from having future accidents. However, Shaw and Sichel were able to demonstrate that selecting bus drivers based on personality was associated with

decreasing accidents. However, these findings are confounded by the fact that measures aimed to exclude drivers with poor driving records were introduced at the same time as psychological testing.

Helmreich (2005) suggests that the concept of error-prone personalities remains controversial in the literature, although the principle of “personality” testing for specific disciplines such as medicine and aviation has been accepted in practice for years.

Helmreich suggests that persons with Type A personalities were historically often recruited to such careers because they were high achievers and detail oriented, two traits perceived to be desirable for operationalizing safety standards. Clearly the concept that Type A personalities are more desirable for medicine could be challenged, considering the evidence of medical error rates in the literature (Baker et al., 2004; Brennan et al., 1991; Leape et al., 1991; Wilson et al., 1995). Helmreich cautions that selection processes focusing on personality have significant limitations and that, in fact, self-selection of careers based on personality is the optimum. In recent years, emphasis has moved away from the culture of blame and a focus on accident-prone individuals, to an understanding that systems are complex and, when linked with individuals, opportunities for error exist (Parker & Lawton, 2003).

Cognition and Error

Critical for nursing knowledge is research focused on sleep deprivation. A meta-analysis of 19 primary studies, conducted by Pillcher and Huffcutt (1996, as cited in Maillard, Stirling, Lilford, Johal, & Gilbert, 2005), confirmed that performance of sleep-deprived people was 1.37 standard deviations lower than that of subjects who were not sleep deprived, and that sleep deprivation affects cognition more than motor function.

This finding is critical for nursing, the largest healthcare service provider delivering service 24 hours per day. What is the impact of sleep deprivation specifically on patient safety? Further research needs to be undertaken in this area.

Solutions

Nurse Level

There are large gaps in the literature specifically around medication administration processes and nursing. Considered a basic nursing function, the delivery of medication is a complex process with significant potential risk to the patient if an error occurs. Gaining a thorough understanding of the processes surrounding medication administration will help to identify opportunities for improvements.

Professional standards. Professional nursing associations such as the College and Association of Registered Nurses of Alberta (CARNA) develop standards of practice outlining expectations for safe, competent and ethical care (e.g., CARNA, 2003). In addition, CARNA (2005) developed *Medication Administration: Guidelines for Registered Nurses*. This document profiles several topics, including medication orders, medication safety, medication systems, and the five “rights” of medication administration. These include the right medication, the right dose, the right route, the right time, and the right client. Adherence to these five “rights” should be fundamental to basic nursing care. Additional “rights” are discussed in the literature, such as the right technique and the right approach (Johnson & Hannah, 1987). Omission of one or more of these in the medication administration process may result in an error. However, according to Hackel and Banister (1996) and Baker (1997), nurses often redefine what constitutes an error when reporting.

Redefining medication errors. Baker's (1997) research is particularly interesting; its findings support my personal experience with the phenomenon of error redefinition by nurses, which ultimately impacts what is reported through reporter bias. In this qualitative study, which employed participant observation in one acute care hospital in Australia, Baker (1997) concluded that nurses decide whether an error is "real" or not in accordance with six situational criteria, as follows:

- *If it's not my fault, it is not an error* (e.g., patient is having a test and not in his/her room when medication is delivered).
- *If everyone knows, it is not an error* (e.g., deliver 0800 medications at 0600 as ward routine to enhance care delivery due to workload).
- *If you can put it right, it is not an error* (e.g., rescheduling a medication that is given late).
- *If the patient has needs that are more urgent than the accurate administration of medication, it is not an error* (e.g., if a patient is having difficulty sleeping, it is all right not to wake him for medication in the middle of the night).
- *A clerical error is not a medication error* (e.g., this situation is a recording error, not a medication error).
- *If an irregularity is carried out to prevent something worse, it is not an error* (e.g., administering medications early in anticipation of workload change on the unit). (pp. 156-157)

There would be value in replicating this study to determine the impact on patient outcomes when error redefinition occurs at the point of medication administration.

Education as a solution. What is the role of education as a solution at the nursing level? Awareness of safety issues and adherence to consistent practices in basic training position nurses with a solid foundation of knowledge and tools to deliver medication safely. Participation in quality improvement initiatives can identify opportunities for ongoing learning and reinforcement of principles that are critical for safe practice. Attendance at ongoing educational offerings, as required for annual nursing registration (CARNA, 2007), reinforces the notion that lifelong learning is essential if nurses are to keep current in their field.

System Level

Technology solutions. To err is human; therefore, systems need to be designed to curtail the risk of error to the extent possible. Gosbee (2002) defines human factors engineering (HFE) as “a discipline concerned with the design of tools, machines and systems that take into account human capabilities, limitations and characteristics” (p. 352). According to Hinckley (2003), variation in process is considered an “enemy” in traditional quality control methodology; therefore, HFE operationalizes the principles of simplicity and automation as much as possible.

Critical to HFE is a thorough process analysis of each component of work. Individual steps or tasks of each process need to be clearly identified, setting the structure for HFE strategies to be introduced to accommodate for human errors such as slips or active errors. An HFE process is the foundation of “user centred design” (Gosbee, 2002, p. 352). As Reason (2002) suggests, “good reminders” can be a very effective strategy when introduced to the work environment. Nurses have intuitively adopted this strategy. On any nursing unit one can readily observe the post-it notes and “cheat sheets” with

handwritten notes as reminders. As Reason suggests, reminders can be an effective strategy by which to improve safety. Building on that principle, computer software is employed to facilitate compliance with process completion, operationalizing reminders and forcing functions (Gosbee). Physician order entry (a computer program physicians utilize to enter orders for patient care) is an example of a HFE solution.

Another example of HFE is bar coding utilized in medication administration. Designed to address provider distraction or inattention to detail, bar coding can serve not only to identify the patient, but also to document the medication administration (Brown, 2001). Technology solutions such as bar coding appear to go a long way in removing the element of human error. Research needs to be undertaken to determine the extent to which technological enhancements actually decrease medication administration errors.

Simulation-based training is another human factors solution used to address patient safety (Salas, Wilson, Burke, & Priest, 2005). Simulation affords an opportunity to create learning scenarios within a controlled environment, with no risk to a real patient. Opportunities exist for future research to explore the impact of simulation on patient safety, as this technology is relatively new in healthcare.

Dedicated medication nurses. Nurses often cite errors such as distraction and overwork during incident follow-up. In a randomized controlled study, Greengold et al. (2003) researched the impact of dedicated medication nurses on medication error rates, to see if limiting the scope of responsibility, and hence distractions, would have a positive effect. They concluded that error rates remained constant regardless of who administered the medication, whether a dedicated medication nurse or another nurse as a part of total patient care.

Patient Perspectives

The Canadian Experience

In recent years, several organizations have been established to promote research and best-evidence practices in support of the patient safety movement in Canada. These include the Canadian Patient Safety Institute (CPSI), Canadian Council on Health Services Accreditation (CCHSA), Health Quality Council of Alberta (HQCA), and the Health Quality Council of Saskatchewan (HQCS).

Canadian Patient Safety Institute. The CPSI (2005), established in October 2003 as a not-for-profit organization at arm's length from the government and stakeholders, has a mandate to improve patient safety by coordinating information across sectors and systems, promoting best practices and increasing the awareness of stakeholders and the public about patient safety issues.

Canadian Council on Health Services Accreditation. Recognizing that the need to ensure safety is a priority, the CCHSA mandated in 2004 that “safety” be integrated into all of the standards. Five required organizational practices focusing on safety must be achieved through business planning and operations in order to receive national accreditation approval. These practices address culture, communication, medication use, workforce/work life, and infection control (CCHSA, 2005). Furthermore, in 2006 the CCHSA outlined 21 Required Operational Practices (ROPs); all 21 ROPs were developed with a focus on safety practices and must be fully implemented by organizations to attain full accreditation status.

Health Quality Council of Alberta. Funded by the Alberta government and charged with the responsibility of reporting directly to Albertans on the performance of

health services, the Health Quality Council of Alberta was founded in January 2002. To date, the HQCA has conducted two satisfaction surveys of Albertans on healthcare services. Although primarily focused on satisfaction with healthcare services, the first survey, released in October 2003 and repeated in November 2004, included two questions specifically targeted at patient safety. In 2003, 30% of respondents and in 2004, 33% of respondents reported being concerned about medical mistakes. These findings precipitated the 2004-2005 survey, which focused on patients' and families' actual experiences with medical error and safety issues in the health system.

There has been little research that focuses on patients' perceptions of safety in the healthcare setting. The HQCA (2005) and the HQCS (2005) have both taken lead roles in their respective provinces. Utilizing randomized telephone surveys, the Alberta Patient Safety survey clarified perceptions of preventable medical error in general, possible causes of preventable medical error, potential solutions for reducing preventable medical error, and opinions about confidentiality and disclosure and personal experience with preventable medical error (Northcott & Northcott, 2004). For the survey, preventable medical error was described as "mistakes made that result in serious harm, such as death, disability or additional prolonged treatment" (p. 144). Fifty percent of the respondents reported believing that, although serious preventable medical errors do not happen very often, individuals (healthcare providers) are responsible 57% of the time, and institutions account for the other 20%. These findings support the paradigm of the "blame and shame culture" (Reason, 2000) and illuminate the need to engage and educate the public on the science of errors. On the same survey, when asked their perception regarding patient

responsibility in preventable errors, 43% of respondents reported “somewhat often” and 41% “not very often.”

Health Quality Council of Saskatchewan. The HQCS (2005) collected data on 5002 discharged patients, using mail surveys and in-person interviews, in an effort to evaluate the quality of care provided from the patients’ perspective (Wohlgemuth et al., 2005). Seventy-six percent reported always having trust and confidence in their nurses. However, the authors did not explore how the concept of trust is related to safety practice.

Patient Accountability

The Institute of Medicine’s (2000) report *To Err is Human: Building a Safer Health System* strongly recommends that patients be viewed as members of the health team and encouraged to become actively involved in their own care. Vincent and Coulter (2002) report that patients are usually perceived as victims of errors and safety failures, when in fact active involvement or partnering in their care is their responsibility. Safety promotion can be enhanced when patients participate in the various stages of their care: reaching an accurate diagnosis; determining an appropriate treatment plan; choosing experienced providers; ensuring treatment is appropriately administered, monitored and followed; and identifying side effects or adverse events quickly (Vincent & Coulter, 2002). It would be important to explore patients’ perceptions regarding their active participation and accountability as health care consumers; the results would be useful in filling a gap in the current body of literature.

In an attempt to increase public awareness of the Institute of Medicine’s (2000) mandate, several organizations have disseminated patient advisories promoting active

patient participation in the safety movement (Agency for Healthcare Research and Quality, 2005; Institute of Safe Medication Practices, 2005; National Patient Safety Foundation, 2005). In 2007, the Health Quality Council of Alberta sent out a newspaper mailer entitled “Playing it Safe: You and Your Medication.” This included information under various topics: are you an advocate for your medication safety?, what you can do about medication safety, how to read a label, using non-prescription medications correctly, mixing it up: the dangers of medication interactions, medication safety at home, medication safety in the hospital, medication safety at the doctor’s office or pharmacy, check the checks, and my medication checklist.

In an attempt to better understand the impact of patient advisories on safety, Entwistle, Mello and Brennan (2005) studied five leading American safety advisories created specifically for patients and families. They critiqued the development process, content and impact against published literature and interviews. Entwistle et al. note that little is known about the effectiveness of the advisories and that more research is needed to assess their effectiveness. The fact that patients’ perspectives are not sought in the development phase of these tools can be problematic. Entwistle et al. conclude that some advisories appear to shift the primary responsibility of safety onto the patient, inappropriately. Some advisories recommend that patients and families challenge the behaviour of healthcare providers when safety is at risk. However, this advice might be considered problematic for some patients, depending on their age and previous experience within the healthcare environment. Partnering with patients is another useful strategy for enhancing the safety movement in healthcare. Considerable work needs to be done to break down hierarchical barriers between healthcare providers and patients and

families, to facilitate open communication and teamwork. One strategy is to employ Wagner's (2000) self-care model; adopted more frequently in ambulatory settings that focus on chronic disease management, Wagner's self-care model moves away from the traditional medical model to a patient-centered approach that encourages patient participation and accountability.

Summary

There is limited research specific to the topics of medication safety and nursing. Inoue and Koizumi (2004) report the only nursing study on adverse events, while Taxis and Barber (2003a, 2003b) document the prevalence of medication administration process errors as high, with a rate of 49%. Baker's (1997) research highlights the phenomenon of error redefinition by nurses as significant, while Greengold et al. (2003) found that medication error rates were not impacted when dedicated medication nurses were operationalized. Given these limited but important findings, it is clear that further research needs to be undertaken if we are to improve our understanding of medication safety practices and reduce medication errors.

Researching and informing the public of safety issues in healthcare is a relatively new concept (Baker et al., 2004; Brennan et al., 1991; Leape et al., 1991; Wilson et al., 1995). In fact, the study by Baker et al. (2004) was the first major Canadian study to highlight the prevalence of adverse events among hospital patients. Of interest, the release of the Baker et al. (2004) study did not appear to influence the respondents to the HQCA's patient survey in 2004. Thirty percent of respondents in 2003 and 33% of respondents in 2004 reported being concerned about medical mistakes (Northcott & Northcott, 2004).

The IOM's (2000) report, *To Err is Human: Building a Safer Health System*, strongly recommends that patients become active participants in the delivery of their care. Significant gaps exist in the literature related to patient participation and accountability for care delivery. This study will explore how patients cared for in the Chinook Health region perceive their role as active participants in their healthcare.

The HQCA (2007) introduced a patient advisory "Playing it Safe: You and Your Medication," in an effort to actively engage patients in care. Strategies such as this are targeted to change patient and care provider behaviour. Further research is required to understand the effectiveness of such an initiative.

In an attempt to ascertain the patients' perspective, the HQCA (2005) and the HQCS (2005) have researched patient perceptions about safety in the healthcare setting, only to find that 50% of respondents do not believe that serious preventable medical errors happen very often (Northcott & Northcott, 2004). Seventy-six percent of patients reported having trust and confidence in their nurses (Wolgemuth et al., 2005). Understanding this issue from a local perspective will provide nurses with valuable information to inform their care.

As highlighted, there are significant gaps in the literature specific to nursing practice and medication safety practices. Nursing comprises the largest provider of "hands on patient care." Medication administration constitutes a key element of acute care delivery. Researching nursing practices related to medication administration will provide opportunities to inform practice and improve patient safety at the "sharp end."

Engaging the patient in providing their perspective on safety practices and their participation/accountability in care is a vastly under-researched topic. The safety

literature recommends that patients become active participants in the delivery of their care. Understanding the patients' perspective on this issue will guide healthcare providers and administrators in evolving the system to support the shift to active patient participation.

Therefore the main research question of this study is: What are medical and surgical inpatients' perceptions, attitudes and beliefs regarding their experiences of medication administration safety practices utilized by nursing staff? Medical and surgical patients constitute a large portion of the acute care population; therefore surveying this population will provide insights that may enlighten care processes that will ultimately benefit patients across various program areas.

No studies have been done looking at patients' perceptions and behaviours of medication safety practices according to nursing unit, age, gender or LOS. Therefore the five sub-questions addressed in the analysis will elucidate similarities and differences between and within groups of patients, the results of which have application within the healthcare system providing information for nursing educators and administrators.

The research design for this study is described in the Chapter 3. In addition a detailed description of the methods and procedures used to develop and administer the survey instrument utilized in this research study is provided.

Chapter Three: Methods and Procedures

Research Design

This study was undertaken from a positivist paradigm, employing a quantitative survey instrument as the methodology, in an attempt to better understand patients' perceptions, attitudes and beliefs regarding safety practices utilized by nursing staff during medication administration. A non-experimental, survey research design is supported in the literature as an appropriate methodology by which to obtain descriptive, explanatory or exploratory data in human subjects research (Babbie, 1983; Polit & Hungler, 1999). As a cost-effective method of collecting data, a self-administered survey design is convenient and affords the opportunity to generalize responses from the sample population to the population as a whole.

Sample and Setting

The sample was obtained from the two 64-bed medical and two 64-bed surgical in-patient units at the Chinook Regional Hospital (CRH) in Southern Alberta by way of random, convenience sampling techniques using a single-stage procedure (Creswell, 2003). A total of 201 male/female participants (101 medical and 100 surgical) comprised the sample. Medical patients are defined as any patients admitted to Units 3C, 4A, 4B, or 4C at the CRH not having a surgical procedure, and not having an Alternate Level of Care, Psychiatric, Pediatric, or Obstetrical service designation. Surgical patients are defined as any patients admitted to Units 3C, 4A, 4B, or 4C at the CRH having a surgical procedure and not having an Alternate Level of Care, Psychiatric, Pediatric or an Obstetrical service designation.

Inclusion/Exclusion Criteria

Inclusion criteria include the following: 18 years or older, cognitively intact (able to complete the survey), English speaking/reading, and being an in-patient on one of the medical units (4B/4C) or one of the surgical units (3C/4A) at the CRH. To meet the surgical criteria, the patient must have had a surgical procedure completed. Exclusion criteria were patients with a service designation of Psychiatry, Obstetrics, Pediatrics or Alternate Level of Care, and patients receiving surgery on the day the survey was administered, as the accompanying anaesthesia and/or pain may have impacted their ability to complete the survey tool.

Ethical Considerations

Ethical and administrative approval for this study was received from the University of Lethbridge Human Subjects Research Committee on May 16, 2006, and from the Chinook Health Region Research and Ethics Committee on June 1, 2006 (see Appendix A). Both committees observe the Tri-Council Policies for ethical conduct for human subject research.

Legislative Requirements

To meet the requirements of the Health Information Act (HIA) and Freedom of Information and Protection of Privacy (FOIPP) Act, only data relevant to the study were collected. These included gender, date of birth, surgical admission (yes/no), the CRH unit to which the patient was admitted (unit 3C, 4A, 4B, or 4C), and length of stay in the hospital (number of days from admission). No identifiable personal data were captured.

To facilitate the processes of dissemination and collection of the surveys, a research assistant was employed. As the author of this thesis (the ‘researcher’) is

employed as a Director of Nursing at the Chinook Regional Hospital, the research assistant provided a quasi arms-length approach to data collection. Data entry was completed by a University of Lethbridge student employed specifically for this study. Both the research assistant and the data entry assistant signed an oath of confidentiality prior to collecting and entering data.

Consent

A cover letter accompanied the survey instrument and included the following information: an invitation to participate, a brief overview of the study, expected time to complete the survey, assurance of anonymity and confidentiality, explanation of no benefit for participation, a non-coercive disclaimer, description of anticipated use of data, instructions for accessing survey results, and contact information for the researcher, the Office of Research services at the University of Lethbridge, and Chinook Health. Consent was implied by participants' completion of the survey; hence there was no specific consent form. Completion of the survey questionnaire was considered consent to participate in the study, as was explained in the study information provided to participants (see Appendix B).

Confidentiality

Data collected and maintained by the research assistant (for the purposes of identifying patients eligible to participate in the study weekly and to ensure patients were not approached more than once to participate) was kept secure in a locked filing cabinet that was accessible only to her and the researcher until the sample was obtained. Upon completion, this information was then placed in a secure CRH confidential waste receptacle for disposal to ensure that no breach of security would occur.

All survey data collected from patients for this study were secured in a locked filing cabinet in the researcher's office, to which only the researcher had access. In addition, once data were entered into a database, only the researcher had access to the data files by way of security access to the computer software. In accordance with research policies at the University of Lethbridge and Chinook Health, data will be maintained in a secured cabinet for seven years following completion of the study.

All data are reported in an aggregate form to ensure anonymity of study participants, as specified in the letter of invitation to participate in this research.

Methods of Measurement

Survey Instrument

In the literature review, no research instrument was identified that focused specifically on patients' perceptions of safety practices employed by nursing during medication administration. Therefore, this researcher developed a survey instrument for data collection (see Appendix C).

Instrument Development

The indicators for measurement were drawn from nursing standards identified in the literature, other research previously done, and gaps in literature regarding safety practices and medication administration. Standards of practice and guidelines for medication administration for nurses (CARNA, 2003, 2005) form the basis of the measurement indicators: five rights of medication administration, medication teaching, allergy assessment, observation by nurse that oral medications have been taken by the patient, patient accountability and patient involvement in safety. The measures assessing general safety practices originate from basic principles of nursing care. The perceptions

of safety in nursing, trust in nurses, wait time for medication administration, and general satisfaction constructs are principles researched by HQCS (2005). An open-ended comment field allows for respondents to provide additional comments not included in the measures.

Nardi (2003) suggests that self-administered surveys are best designed for measuring attitudes and opinions that are not observable. According to Woodward and Chambers (1991), perceptions are best measured with choices or scales. Continuous and categorical scales were utilized in the survey instrument, and items were categorized as factual, behavioural, beliefs, and attitudinal. During question development, attention was given to details such as avoiding the use of double-barrelled items, leading and loading questions, and terminology such as “always” or “never” (Nardi, 2003). In addition, closed-ended questions were formulated to be exhaustive and mutually exclusive, continuous rating scales were always an odd number to allow for a neutral mid-point, and formatting was designed to assist with filter questions (Polit & Hungler, 1999). Filter questions are designed to direct the respondent to answer only the questions pertinent to their responses (e.g., if you answered yes to question 10, go to question 14). To address issues of response bias and social desirability, the response options were counterbalanced (i.e. positive options were on the left half the time and on the right the second half the time) and false response options were introduced throughout the instrument (i.e. asking mother’s name for patient identification). Questions 2, 8 and 10 incorporated the false response options.

The final survey instrument was comprised of 28 questions constructed to evaluate the following five constructs: patients’ perceptions of nurse behaviours

regarding safe medicine administration, patient behaviours, patients' perceptions and nurse behaviours regarding pain medicine, patients' perceptions of nursing care, and patients' perceptions of their participation/accountability in care (see Appendix C).

Eleven questions were constructed with a yes/no format (questions 1, 3, 4, 5, 9, 11, 13, 14, 15, 17, and 25); these address the criterion for patients' perceptions of nurse behaviours regarding safe medicine administration, patient behaviours, and patients' perceptions and nurse behaviours regarding pain medicine. Four questions required the participant to check all that applied (questions 2, 8, 10, and 12). These address the criterion for patients' perceptions of nurse behaviours regarding safe medicine administration, and patient behaviours. There were four open-ended questions for patient responses (questions 6, 7, 16, and 28). These relate to patient behaviours, and patients' perceptions and nurse behaviours regarding pain medicine. Four questions gathered demographic information specific to gender, date of birth, length of stay, and unit the patient was on (questions 23, 24, 26, and 27). Five questions utilized continuous rating scales; three of the continuous rating scales involved seven-point scales and were developed to address the constructs of patients' perceptions of nursing care (questions 18, 19, 20). Patients' perceptions of their participation/accountability in care were measured with two questions, using a five-point continuous rating scale (questions 21, 22).

The seven-point continuous rating scales for the questions regarding safety of care trust in care and general rating of overall nursing care are included in Table 1.

Table 1. Patients' Perceptions of Nursing Care. Seven-Point Rating Scale

| Safety of Care | Trust in Care | General Overall Care |
|----------------------------|-------------------------------|--------------------------|
| 1. Very safe | 1. No trust at all | 1. Excellent |
| 2. Safe | 2. Very distrustful | 2. Very good |
| 3. Somewhat safe | 3. Somewhat distrustful | 3. Good |
| 4. Neither safe nor unsafe | 4. Neither trust nor distrust | 4. Neither good nor poor |
| 5. Somewhat unsafe | 5. Somewhat trustful | 5. Poor |
| 6. Unsafe | 6. Trust very much | 6. Very poor |
| 7. Very unsafe | 7. Completely trust | 7. Terrible |

A five-point continuous rating scale was used for the questions clarifying patients' perceptions of their participation/accountability in care, as presented in Table 2.

Table 2. Patients' Perceptions of Participation/Accountability in Care.

Five-Point Rating Scale

| Who is responsible for making sure your medicine is given safely? | How often do you check to ensure your medicine is given safely? |
|---|---|
| 1. I am not responsible at all | 1. Rarely |
| 2. I am a little responsible | 2. Some of the time |
| 3. Shared responsibility with nurses, doctors and me | 3. About half of the time |
| 4. I am mostly responsible | 4. Majority of the time |
| 5. I am entirely responsible | 5. All of the time |

Lastly, an indicator for measurement was developed to identify the patients' perception of their wait time to receive pain medicine; question 16, addressing the construct of patients' perceptions and nurse behaviours regarding pain medication.

Ease of readability of the survey instrument was critical for participation. The reading level of the survey was determined by requesting readability statistics for the *Flesch-Kincaid Grade Level* in *Word* documents. A reading level of grade 5.9 was achieved for the survey instrument, and grade 9.7 for the letter of introduction. New Times Roman font type, size 16, was applied for easy readability. Reading level, font type and size were tested during the pilot phase of the survey instrument and were found to be appropriate for easy readability. Clear instructions for completing the survey were provided at the beginning, directing participants to reflect on the last time they received medicine from their nurse (the day the instrument was completed) when responding (see Appendix C).

Validity testing

In an effort to ensure quality data collection, a pilot of the survey instrument was conducted to assist in determining its internal consistency, construct and content validity and reliability (Black, 1999).

To address content validity, experts were approached to review the survey instrument and provide feedback. These included a geriatrician, the director responsible for the Post Acute Rehabilitation unit, the rural director of acute care facilities with expertise in medicine and surgery, the regional information specialist with expertise in research, and an independent consultant with research experience. Revisions were made to the survey instrument prior to the pilot test.

The next step was to engage patients in the pilot test of the survey instrument. A sample of 20 in-patients (10 medical in-patients and 10 surgical in-patients) was selected from the Post Acute Rehabilitation unit at the Chinook Regional Hospital (CRH), identified by the unit charge nurse in accordance with the inclusion/exclusion criteria. The research assistant then administered the pilot survey to these patients. Patient demographics and diagnoses from this unit closely resemble those of patients from the in-patient medical and surgical units at the CRH.

Construct validity was measured by having the research assistant meet with the patients following completion of the pilot survey to clarify their interpretations of the questions and to validate if congruency existed between their interpretations of the questions and the purpose for which they were written. Two questions were changed to address clarity issues raised by patients during the pilot test of the instrument.

Reliability testing

The research assistant conducted a two-hour test-retest of the survey instrument with the sample population as a measure of reliability testing (Black, 1999). A two-hour time frame was used for the retest in order to minimize the chance that patients would have a medication encounter before being surveyed again. Several patients declined participation in the pilot. They cited the test-retest process as the reason, as it would interfere with rehabilitation sessions scheduled throughout the day. In addition, the average length of stay for patients on the Post Acute Rehabilitation unit was approximately 30 days; therefore, the turnover rate of patients for the 24 beds on this unit was much slower than on the acute care medical and surgical units. As a result of the

slower patient turnover rate, data collection for the pilot survey took longer than projected, approximately three weeks.

Analysis of the pilot tool data was completed using *Statistical Package for the Social Sciences* (SPSS) version 14.0. Assessment of the test-retest reliability for all the yes/no and scale response questions was completed using the Spearman-Brown test. A very high coefficient of .940 was obtained (questions 1, 3, 4, 5, 9, 11, 13, 14, 15, 17, 18, 19, 20, 21, 22, and 25). In addition, Cronbach's Alpha was applied to check the internal consistency of these questions. Acceptable levels of internal consistency were obtained as evidenced by a Cronbach's Alpha coefficient of .802 for the five scale questions (questions 18, 19, 20, 21 and 22) and .619 when applied to the yes/no and scale responses (questions 1, 3, 4, 5, 9, 11, 13, 14, 15, 17, 18, 19, 20, 21, 22, and 25).

In discussion with the researchers' advisory committee members, it was agreed that the reliability and validity of the instrument were sufficient to proceed with data collection for the proposed research project.

Data Collection Process

The research assistant identified the sample population from the daily in-patient lists in accordance with inclusion/exclusion criteria (defined previously) and distributed the survey to the selected patients on the four in-patient medical and surgical units. Sampling occurred one or two days a week, Monday through Saturday, alternating the days of the week until the sample size was achieved. This sampling process permitted a larger cross-section of surgical patients by surgical speciality to be surveyed. Since different surgeons operate on different days, their block time for surgery varies from day

to day. This sampling technique had no impact for the medical population. Data collection was completed in four weeks.

To ensure that patients were approached only once to participate in this study, a cumulative list of patients (by name, admission number, medical or surgical service, and room number) was maintained and reviewed prior to each distribution of surveys. To protect confidentiality, this list was locked in the researcher's office until the study was completed, then placed in a secure CRH confidential waste receptacle for disposal.

To enable a double check for the data provided by the patients, specific to tracking the number of respondents from each of the four in-patient units, a system was employed for distribution of the surveys; the system included attaching one of four different coloured coded stickers to each envelope, each colour delineating a particular unit. Unfortunately, when the research assistant gathered the completed surveys, many of the coloured stickers had fallen off. Since this was not identified at that time, the planned double check of data was not possible. However, the research assistant did keep a manual tally of the number of medical and surgical patients approached on each unit. This was ultimately used as a comparison of the data entered and found to be congruent.

Data Entry

Data were entered into *Statistical Package for the Social Sciences* (SPSS) software, version 14.0, by a data entry assistant who was sworn to confidentiality. To ensure the integrity of the data, the researcher checked 20% of the surveys before commencing data analysis; no data entry errors were observed at this time. Minimal data entry errors were noted during the initial analysis with descriptive statistics. Data cleaning was completed prior to further analysis being conducted.

Missing Data

To some extent, missing data is unavoidable in any survey study. Missing data not completed by the survey participants were coded as *user-missing*, while data missing because the question did not pertain to the participant or resulted from a filter question were originally coded as *system-missing* (George & Mallery, 2005). As a result, all survey participants were included in the analysis whether they responded to all or just some of the survey questions. Subsequently during analysis, all *system-missing* data were recoded as *user-missing*. In essence all the *system-missing* data were missing data therefore this recoding provided clarity in the interpretation of results as there is only one category for missing data in the SPSS software. This recoding resulted in a reduced sample size for analysis of some questions.

Summary

No research instrument was available in the literature that focuses on safety practices employed by nursing during medication administration from the perspective of patients. Therefore a survey instrument was developed and pilot tested by this researcher prior to administration for this research study. The indicators for measurement on the survey instrument were drawn from standards of nursing practice, the current literature, and gaps in the literature. The indicators included: guidelines for medication administration for nurses, general safety practices, patient accountability/participation, trust in care and a general rating of overall care. In an attempt to compare to results reported in the HQCS (2005) survey, a specific question regarding wait time for pain medication was added to the survey instrument. The survey instrument was administered to medical and surgical in-patients (meeting specified inclusion/exclusion criteria) at the

Chinook Regional Hospital during November 2006. Chapter 4 contains the results of the survey administration.

Chapter Four: Results

Introduction

The results are presented according to the five sub-questions posed in this study:

- Do patients' perceptions and behaviours vary according to the nursing unit they were on?
- Do patients' perceptions and behaviours vary according to age?
- Do patients' perceptions and behaviours vary according to gender?
- Do patients' perceptions and behaviours vary according to their length of stay (LOS)?
- How does the wait time for administration of pain medication on the nursing units at the Chinook Regional Hospital compare to the results reported in the Health Quality Council Saskatchewan (2005) survey?

Data were further grouped and presented in five categories: patients' perceptions of nurse behaviours regarding safe medicine administration, patient behaviours, patients' perceptions and nurse behaviours regarding pain medicine, patients' perceptions of nursing care, and patients' perceptions of their participation/accountability in care. These groupings support the constructs for measurement on the survey instrument previously discussed in Chapter 3.

Data were analysed by the five independent variables: unit (two categories, medical or surgical), age (in years), gender (male and female), length of stay (LOS) (today, 1-3 days ago, 4 -7 days ago, 8 -10 days ago and longer than 10 days ago), and wait time for pain medication (actual time in minutes). Descriptive statistics (frequencies,

means, medians and standard deviations) were computed to summarize data. In addition, reliabilities, correlations and inferential statistics were calculated.

Demographics and Background of Sample Participants

The respondents consisted of 201 medical and surgical in-patients receiving care at the Chinook Regional Hospital between November 1 and November 29, 2006 who met the study inclusion criteria. Demographically, Chinook Health has the third highest elderly population in Alberta (AHW, 2007) with 18.5% of the population aged 60 or older. The age of the participants ranged from 19 to 93 years, with a mean age of 64.

Nearly 82% of respondents reported on the survey that they were in hospital from one to seven days. This is congruent with Chinook Health utilization data for the four in-patient medical and surgical units compiled for fiscal year 2005/2006. The average length of stay (ALOS) was reported as 6.5 days for the combined medical and surgical units utilized in this study (Chinook Health, 2005/06b). The demographics of the catchment area of the southern Alberta health region and utilization statistics presented suggest that the population studied is similar to the population of those who access services generally. Statistical calculations or procedures were not computed to estimate whether the sample used in this study was representative of Chinook Health patients.

The surgical inclusion criteria required that a patient must have had a surgical procedure completed to participate in the study. A surgical procedure could include either a procedure performed in the surgical suite (classified as major/minor surgery) or an endoscopic procedure performed by a surgeon. A total of 75 participants (39.5%) responded “yes” to Question 25, “I was admitted to the hospital to have surgery” and 115 (60.5%) responded “no.” One hundred (49.8%) patients reported that they were on a

surgical unit (Unit 3C or 4A), and 87 (43.2%) reported being on a medical unit (Unit 4B or 4C). Fourteen (7%) cases were missing for Question 26 concerning the patient's unit.

During the administration of the survey, the research assistant tracked the responses of surgical and medical patients to ensure sufficient numbers of each group were obtained; there were 100 surgical and 101 medical patients participating in the study. The patient responses for Question 26 were compared with data collected by the research assistant and a discrepancy was noted. Only 87 patients identified themselves as being medical patients. As a result, the researcher decided to recode the 14 missing cases as medical patients. It appears there was a discrepancy between the patients' perception of a "surgical procedure" (as identified when responding to Question 25) and the researcher's definition. Table 3 summarizes the demographic data.

Table 3. Patients' Demographics and Background: Gender, Unit, Reason for Admission, Length of Stay (Questions 24, 25, 26, 27)

| Question | | N | Percent |
|----------|---|-------------|---------|
| 23. | Gender | | |
| | Male | 96 | 49.7% |
| | Female | 97 | 50.3% |
| 26. | CHR Nursing Unit | | |
| | Unit 3C – Surgery | 47 | 25.1% |
| | Unit 4A – Surgery | 53 | 28.3% |
| | Unit 4B – Medicine | 36 | 19.3% |
| | Unit 4C – Medicine | 51 | 27.3% |
| 25. | Admission to hospital for surgery (self-reported) | | |
| | Yes | 75 | 39.5% |
| | No | 115 | 60.5% |
| 27. | Length of Stay – At time of Survey Administration (self-reported) | | |
| | Today | 5 | 2.6% |
| | 1 – 3 Days | 83 | 43.2% |
| | 4 – 7 Days | 74 | 38.5% |
| | 8 – 10 Days | 12 | 6.3% |
| | Longer than 10 Days | 18 | 9.4% |
| 24. | Mean Age | 64.2 Years | 182 |
| | Range – Age (years) | 19-93 Years | 182 |
| | | | N/A |
| | | | N/A |

Notes: 1. Missing cases were reported for the following: Gender = 8 (4.0%), Nursing Unit = 14 (7.0%), Admission for surgery = 11 (5.4%), Length of Stay = 9 (4.5%), Age = 19 (9.5%) 2. Admission to hospital for surgery is self-reported and relates to perceived reason for admission into hospital 3. Length of stay information is self-reported and relates to length of stay at the time of survey administration.

Overall Descriptive Statistics for Survey Questions

Table 4 presents the data on the patients' perceptions of nurse behaviours. The majority of these perceptions were elicited by asking patients what they saw nurses do.

Table 4. Patients' Perceptions of Nurse Behaviours: Observations
(Questions 1, 3, 4, 5, 12, 13, 17)

| Question | N (% Yes) | N (% No) | N (% Missing) |
|---|-------------|-------------|---------------|
| 1. Before giving my medicine, I saw the nurse wash his/her hands. | 81 (43.8%) | 104 (56.2%) | 16 (8.0%) |
| 3. The medicine the nurse gave me today was NEW. | 29 (15.2%) | 162 (84.8%) | 10 (5.0%) |
| 4. Before giving my medicine, the nurse asked if I had allergies. | 99 (51.8%) | 92 (48.2%) | 10 (5.0%) |
| 5. Self-Reported Allergies | 56 (30.1%) | 130 (69.9%) | 15 (7.5%) |
| 12. Last medicine given by the nurse was | | | |
| A. A pill | 156 (81.7%) | 35 (18.3%) | 10 (5.0%) |
| B. A liquid | 7 (3.7%) | 184 (96.3%) | 10 (5.0%) |
| C. A cream | 2 (1.0%) | 189 (99.0%) | 10 (5.0%) |
| D. A needle | 36 (18.8%) | 155 (81.2%) | 10 (5.0%) |
| E. Intravenous | 50 (26.2%) | 141 (73.8%) | 10 (5.0%) |
| F. Eye Drop(s) | 2 (1.0%) | 189 (99.0%) | 10 (5.0%) |

| Question | N (% Yes) | N (% No) | N (% Missing) |
|--|-------------|------------|---------------|
| 13. The nurse watched me take my pills or liquid medicine before he/she left the room. | 135 (82.8%) | 28 (17.2%) | 38 (18.9%) |
| 17. My nurse raised the side rails on my bed after giving me my pain medicine. | 46 (50.0%) | 46 (50.0%) | 109 (54.2%) |

Notes: 1. Missing cases were not included in the calculation of the percentages. 2. The percentage of missing cases was calculated as a proportion of the total sample responding to that question. 3. Totals for medicine given by the nurse will not equal 100% as respondents could check all that apply.

More than 56% of respondents indicated that they did not see the nurse wash his or her hands. The majority of respondents (nearly 85%) indicated that the medicine the nurse had given them was not new to them. Approximately 51% of respondents indicated that the nursing staff had asked if they had any allergies. More than 30% of those responding reported that they did in fact have an allergy of some sort. Of those that did receive medicine, just over 80% indicated that they received this medicine in the form of a pill. Approximately 26% had received intravenous medicine, while more than 18% had received medicine via a needle. Very few respondents (< 6%) had received medicine as a liquid, cream or eye drop.

Table 5 presents the patients' perceptions of nurse behaviours relating to the method that nursing staff used to identify the patient prior to medicine administration.

Respondents could check all that applied when answering this question.

Table 5. Patients' Perceptions of Nurse Behaviours: Patient Identification (Question 2)

| | N (% Yes) | N (% No) | N (% Missing) |
|-------------------------------|-------------|-------------|---------------|
| Nurse identification by: | | | |
| A. Checking my name band | 121 (61.4%) | 76 (38.6%) | 4 (2.0%) |
| B. Asking me to state my name | 64 (32.5%) | 133 (67.5%) | 4 (2.0%) |
| C. Asking my mother's name | 8 (4.1%) | 189 (95.9%) | 4 (2.0%) |
| D. Calling me by name | 149 (75.6%) | 48 (24.4%) | 4 (2.0%) |
| E. None of the above | 17 (8.5%) | 180 (91.5%) | 4 (2.0%) |

Notes: 1. Respondents were provided an option to "Check all that apply." 2. Missing cases were not included in the calculation of the percentages. 3. The percentage of missing cases was calculated as a proportion of the total sample responding to that question. 4. Totals for responses to nurse identification will not equal 100% as respondents could check all that apply. 5. Question 2C was introduced as a false response option to test for acquiescence and or random responding

Respondents indicated that nursing staff utilized a variety of methods when identifying them. More than three-quarters noted that the nurse identified them by name, while slightly less than one-third indicated that the nurse asked them to state their name. Only 4% of the respondents answered the false response option (i.e. indicates some acquiescence and or random responding). This very low response rate to the false point option instils confidence in the results.

Table 6 presents the patients' perceptions of nurse behaviours relating to the provision of information as a result of providing the patient with the medicine.

Respondents were able to check all that applied, and the patient responses were variable.

Table 6. Patients' Perceptions of Nurse Behaviours: Review of Information (Question 8)

| The nurse reviewed the following information with me before giving me my medicine. | | | |
|--|-------------|-------------|---------------|
| | N (% Yes) | N (% No) | N (% Missing) |
| A. Name of medicine | 109 (59.6%) | 74 (40.4%) | 18 (9.0%) |
| B. Amount or dose ordered | 54 (29.5%) | 129 (70.5%) | 18 (9.0%) |
| C. How often I will get the medicine | 58 (31.7%) | 125 (62.2%) | 18 (9.0%) |
| D. <i>What the medicine will taste like</i> | 11 (6.0%) | 172 (94.0%) | 18 (9.0%) |
| E. Why I am taking the medicine | 67 (36.6%) | 116 (63.4%) | 18 (9.0%) |
| F. Side effects I should watch for | 27 (14.8%) | 156 (85.6%) | 18 (9.0%) |
| G. Have I ever taken medicine before | 65 (35.5%) | 118 (64.5%) | 18 (9.0%) |
| H. None of the above | 61 (30.3%) | 121 (66.5%) | 19 (9.5%) |

Notes: 1. Respondents were provided an option to “check all that apply.” 2. Missing cases were not included in the calculation of the percentages. 3. The percentage of missing cases was calculated as a proportion of the total sample responding to that question. 4. Totals for responses regarding what the nurse reviewed will not equal 100% as respondents could check all that apply. 5. Question 8D was introduced as a false response option.

Nearly 60% of respondents indicated that the nurse told them the name of the medication. Approximately 36% of patients reported that nurses told them why they were taking the medicine and/or that they have taken the medicine before. Over 30% of the

respondents indicated that the nurse told them how often the medicine was to be administered and/or the amount or dose of the medicine.

Question 8 allowed patients to provide narrative comments regarding the information provided by nursing throughout the medicine administration process. Seventeen patients provided comments. Although no consistent themes emerged, some patients did comment on the need for medicine information from nursing staff, while others commented that the medicine was known to them already. One noted, “I’ve been here a long time and the nurses know me.” There appeared to be less of a perceived need for nursing staff to review information for each instance of medication administration.

Table 7 describes patient behaviours as they relate to medicine administration. A mean value is presented for the number of different types of medicine given, while frequency counts are presented for the types of medicine administered.

Table 7. Patient Behaviours: Medicine Administration (Questions 7, 9, 10, 11)

| Question | N | Range | Mean |
|---|-------------|-------------|---------------|
| 7. The last time your nurse gave you medicine, how many different types of medicine were you given? | 152 | 0-13 | 3.1 |
| Question | N (% Yes) | N (% No) | N (% Missing) |
| 9. Can you recall what type of medicine your nurse last gave to you? | 153 (87.4%) | 22 (12.6%) | 26 (12.9%) |
| 10. Types of Medicine | | | |
| A. Pain medicine | 94 (52.8%) | 84 (47.2%) | 23 (11.4%) |
| B. Antibiotic | 50 (28.1%) | 128 (71.9%) | 23 (11.4%) |
| C. Blood thinner | 40 (22.5%) | 138 (77.5%) | 23 (11.4%) |

| | | | |
|--|------------|-------------|------------|
| D. Hormone replacement | 6 (3.4%) | 172 (96.6%) | 23 (11.4%) |
| E. Blood Pressure Pill | 57 (32.0%) | 121 (68.0%) | 23 (11.4%) |
| F. Heart Pill | 31 (17.4%) | 147 (82.6%) | 23 (11.4%) |
| G. Water Pill | 30 (16.9%) | 148 (83.1%) | 23 (11.4%) |
| H. <i>Peppermint</i> | 1 (0.6%) | 177 (99.4%) | 23 (11.4%) |
| I. Sleeping Pill | 14 (7.9%) | 164 (92.1%) | 23 (11.4%) |
| J. Other | 76 (42.9%) | 101 (57.1%) | 10 (5.0%) |
| 11. I have a list of medicine I am currently taking. | 95 (49.7%) | 96 (50.3%) | 10 (5.0%) |

Notes: 1. Missing cases were not included in the calculation of the percentages. 2. The percentage of missing cases was calculated as a proportion of the total sample responding to that question. 3. Total for types of medicines reported will not equal 100% as respondents could “check all that apply.” 4. Question 10H was introduced as a false response option.

The mean value for the number of medicines provided the last time the nurse gave medicine was 3.1. The range reported was 0 to 13. Nearly 90% of those responding indicated that they could recall the medicine the nurse provided to them. Understandably, there was tremendous variability in terms of the different types of medicine that nurses provided. Of the respondents, 52.8% noted that they were given pain medicine, 32% indicated that the nurse had provided blood pressure medicine, and 28% reported receiving antibiotics.

A large proportion (42.9%) of respondents indicated having received “other” types of medicine. These included anti-inflammatory medicine such as aspirin or acetaminophen and prednisone (N=10), calcium and vitamins (N=8), diabetes medicine

(N=10), and anti-medic medicine (N=4). A few patients responded “other” but did not state what medicine they received, or they stated that their significant other knew (N=8).

Table 8 indicates issues relating to the administration of pain medicine. This presentation is consistent with Table 7. As many patients would neither require nor ask for pain medication, the number of respondents to these questions is reduced.

Table 8. Pain Medicine Administration (Questions 14, 15)

| Question | N (% Yes) | N (% No) | N (% Missing) |
|--|------------|------------|---------------|
| 14. The last medicine my nurse gave me was for pain? | 86 (47.5%) | 95 (52.5%) | 20 (10.0%) |
| 15. If yes to Q 14, did you ask for pain medicine? | 64 (60.4%) | 42 (39.6%) | 95 (47.3%) |

Notes: 1. All questions were coded as a dichotomous variable, Yes/ No. 2. Missing cases were not included in the calculation of the percentages. 3. The percentage of missing cases was calculated as a proportion of the total sample responding to that question.

Just fewer than 50% of respondents indicated that the nurse had given them pain medicine the last time they were provided medicine. This was consistent with Table 7, where slightly more than 50% of respondents indicated having received pain medicine. Of those who responded “yes” as to the nurse providing them pain medicine, more than 60% indicated that they had asked for this type of medicine.

Table 9 presents a cross-tabulation relating to requesting pain medicine, showing the unit where the patient received the service. Measures of central tendency were presented in order to describe the wait for medicine by nursing unit. Although there was some variation across the four units, there was more similarity than difference between the wait times to receive pain medicine.

Table 9. Pain Medicine Administration: Wait Time in Minutes by Unit (Question 16)

After you asked for the pain medicine, how long did you have to wait before the nurse gave it you?

| | N | Range | Mean | Median | SD |
|------------------|----|-------|------|--------|------|
| Unit 3C Surgery | 15 | 0-60 | 15.3 | 10.0 | 15.6 |
| Unit 4A Surgery | 28 | 0-30 | 7.8 | 5.0 | 8.4 |
| Unit 4B Medicine | 8 | 1-45 | 13.6 | 8.0 | 15.6 |
| Unit 4C Medicine | 12 | 0-60 | 13.8 | 10.0 | 15.5 |

Notes: 1. Sample size is impacted and related to those patients who self-reported use/request of pain medicine while in-hospital. 2. Mean times reported were in minutes. 3. SD refers to Standard Deviation.

The reported wait time for requested pain medicine across all units ranged from 0 to 60 minutes. The average wait time ranged from 7.8 minutes on Unit 4A to 15.3 minutes on Unit 3C. The median values reported for all units ranged from 5 to 10 minutes. The variability (Standard Deviation) across all service areas was consistent for the most part, although less variability was reported for Unit 4A. It is important to view these results cautiously, as the cell sizes within each area were relatively small.

Responses to questions 18, 19, 20, 21 and 22 are summarized in Tables 10 and 11. These questions directly assess patients' perception within seven- and five-point likert scales respectively. The percentages within each category are presented, as well as the median value for each question.

Table 10 displays the patients' perceptions regarding the safety of nursing care received (Question 18). 87.6 % of respondents reported feeling safe or very safe, and only one patient reported feeling unsafe. Table 10 also shows the level of trust that

patients reported having in the nursing staff. More than 80% of those responding indicated that they “completely trust” or “trust very much” the nursing staff. Only eight respondents, less than 5% of the total, reported their level of trust in the bottom three anchors.

In addition, Table 10 indicates the overall rating of nursing care during the current stay of the respondents. More than 95% of respondents indicated that they perceive the nursing care as “excellent,” “very good,” or “good.” More than one-third of those responding reported that they perceived the nursing care as “excellent.” No one reported viewing the nursing care as “terrible” or “very poor,” and only three respondents indicated feeling that the nursing care was “poor.”

Table 10. Patients' Perceptions of Nursing Care. Seven-Point Rating Scale (Questions 18, 19, 20)

| Question 18 – I feel the care I receive from the nurses is: | | Question 19 – The level of trust I have in the nursing care I receive is: | | Question 20 – Overall, I would rate the nursing care during this hospital stay as: | |
|---|-----------------|---|-----------------|--|-----------------|
| 1. Very Safe | N=86 (44.6%) | 1. No Trust at all | N=3 (1.6%) | 1. Excellent | N=69 (35.8%) |
| 2. Safe | N=83 (43.0%) | 2. Very Distrustful | N=1 (0.5%) | 2. Very Good | N=72 (37.3%) |
| 3. Somewhat Safe | N=19 (9.8%) | 3. Somewhat Distrustful | N=4 (2.1%) | 3. Good | N=45 (23.3%) |
| 4. Neither Safe nor Unsafe | N=2 (1.0%) | 4. Neither Trust nor Trust | N=5 (2.6%) | 4. Neither Good nor Poor | N=4 (2.1%) |
| 5. Somewhat Unsafe | N=2 (1.0%) | 5. Somewhat Trustful | N=25 (13.1%) | 5. Poor | N=3 (1.6%) |
| 6. Unsafe | N=0 (0) | 6. Trust Very Much | N=81 (42.4%) | 6. Very Poor | N=0 (0) |
| 7. Very Unsafe | N=1 (0.5%) | 7. Completely Trust | N=72 (37.7%) | 7. Terrible | N=0 (0) |
| Median | 2.0 | Median | 6.0 | Median | 2.0 |

Notes: 1. Missing cases were observed: Question 18 = 8 (4.0%), Question 19 = 10 (5.0%), Question 20 = 8 (4.0%); 2. Scale questions for Questions 18, 19, and 20 utilized a 7 point scale, where 1 = Very Safe and 7 = Very Unsafe (Question 18), 1 = No trust at all and 7 = Completely Trust (Question 19) and 1 = Excellent and 7 = Terrible (Question 20).

Table 11 presents the patients' perceptions of their accountability/participation in their care. The majority (62%) indicated that they perceive that there is a shared responsibility between the doctor, nurse and patient for the safe administration of medicine. Table 11 also displays patients' responses regarding how often they ensured that the medicine they were given was correct. Of the respondents, 42% indicated that they "rarely" or "some of the time" check to ensure their medicine was correct; 51% reported checking "the majority or all of the time."

Table 11. Patients' Perceptions of Participation/Accountability in Care. Five-Point Rating Scale (Questions 21, 22)

| Question 21 – In your opinion, who is responsible for making sure your medicine is given safely? | | Question 22 – How often do you check to ensure the medicine you are being given is correct (correct dose, correct medicine given at the correct time)? | |
|--|------------------|--|-----------------|
| 1. I am not responsible at all | N=24 (12.8%) | 1. Rarely | N=35 (18.9%) |
| 2. I am a little responsible | N=32 (17.1%) | 2. Some of the time | N=43 (23.2%) |
| 3. Shared responsibility with nurses, doctors and me. | N=116 (62.0%) | 3. About half of the time | N=13 (7.0%) |
| 4. I am mostly responsible. | N=11 (5.9%) | 4. Majority of the time | N=51 (27.6%) |
| 5. I am entirely responsible. | N=4 (2.1%) | 5. All of the time | N=43 (23.2%) |
| Median | 3.0 | Median | 4.0 |

Notes: 1. Missing cases were observed: Question 21 = 14 (7.0%), Question 22 = 16 (8.0%); 2. Scale questions for Questions 21 and 22 utilized a 5 -point scale, where 1 = I am not responsible at all, and 7 = I am entirely responsible (Question 21), and 1 = Rarely and 7 = All of the time (Question 22).

Inferential Statistics

The following section presents the inferential statistics analyzed by each research question. Both parametric and nonparametric tests were used in analysis. Parametric tests such as one-way ANOVA, *t*-test and Pearson's *r* were used when analyzing interval level data. The nominal and ordinal level data were analyzed using nonparametric tests such as Chi-Square, Mann-Whitney U, Kendall tau-b, and Kruskal Wallis.

Research Question: Do Patients' Perceptions and Behaviours Vary According to Nursing Unit?

During the administration of the survey, the research assistant tracked the responses of surgical and medical patients to ensure sufficient numbers of each group were obtained; 100 surgical and 101 medical patients participated in the study. In Question 26, 100 patients identified themselves as surgical patients, and 87 patients as medical patients. There were 14 missing cases for Question 26. As a result, the researcher decided to recode the 14 missing cases as medical patients. It appears there was a discrepancy between the patients' perception of a "surgical procedure" (as identified when responding to Question 25) and the definition utilized by this researcher. The recoded variable was utilized for the analysis in this section: medical or surgical unit.

Question 1: Before giving my medicine to me today, I saw the nurse wash his/her hands. A Pearson chi-square test was conducted to detect significant differences between the 55.4 % (56) medical and 65.0% (65) surgical in-patients who responded yes specific to observing their nurse wash his/her hands prior to dispensing medicine. There were 16 missing cases in total, 4.9% (10) medical and 2.9% (6) surgical. The results of the test were not significant, $\chi^2 (2, N = 201) = 1.161, p = .560, (2\text{-sided})$.

Question 2: Before giving me my medicine today, the nurse identified me by.

Question two was divided into five sub-questions, A to E. Participants were instructed to identify all responses that applied. Ninety-nine medical patients and 98 surgical patients responded to this question. A Pearson chi-square test was conducted to detect significant differences between the responses of the medical and surgical in-patients specific to each sub-question. The results for the Pearson chi-square for the five sub-questions are presented in Table 12. No significant results were reported for question 2.

Table 12. Patients' Perceptions of Nurse Behaviours: Patient Identification
(Question 2) by Unit

| Question | % Med | % Surg | χ^2 | df | Sig. (2-sided) |
|--------------------------------|------------|------------|----------|----|----------------|
| A. Checking name band | 55.4% (56) | 65.0% (65) | 1.98 | 2 | .372 |
| B. Asking to state my name | 37.6% (38) | 26.0% (26) | 3.155 | 2 | .207 |
| C. <i>Asking mother's name</i> | 5.0% (5) | 3.0% (3) | .500 | 2 | .779 |
| D. Calling me by name | 74.3% (75) | 74.0% (74) | .002 | 2 | .999 |
| E. None of the above | 7.9% (8) | 9.0% (9) | .076 | 2 | .963 |

Notes: 1. 99 medical respondents and 98 surgical respondents; 2. Pearson chi-square was computed for responses between medical and surgical in-patients. 3. Question 2c, the nurse identified me by asking me my mother's name, was introduced as a false option response to address issues of social desirability and response bias. Eight participants (4%) responded "yes" to this question. These responses remained in the analysis. A decision was made to keep these questions in as they comprised < 5% the total respondents completing the survey. 4. Question 2e, seventeen participants (8.5%) responded "yes" to this question (8 medical and 9 surgical inpatients) indicating that the nurse "did none of the above" to identify the patient prior to medication administration. 5. Missing data were reported for the following questions: 2a – 2e, 2(.09%) medical and 2 (.09%) surgical in-patients.

Question 4: Before giving my medicine to me, the nurse asked if I had any allergies. A Pearson chi-square test was conducted to detect significant differences between the 44.6 % (45) medical and 54.5% (54) surgical in-patients who responded yes specific to their recall as to whether the nurse asked if they had allergies prior to dispensing their medicine. There were nine missing cases in total, 3.5% (7) medical and 1% (2) surgical. The results of the test were not significant, $\chi^2 (2, N = 200) = 5.754$, $p = .124$, (2-sided).

Question 8: For each medicine, the nurse reviewed the following information with me before giving me my medicine. Question 8 was divided into nine sub-questions, A to I. Participants were instructed to identify all responses that applied. A Pearson chi-square test was conducted to detect significant differences between the responses of medical and surgical in-patients specific to each sub-question. The results of the Pearson chi-square tests for the nine sub-questions are presented in Table 13. There were two significant results for this question: surgical patients recalled that the nurse reviewed the name of the medicine before administering the medicine and medical patients recalled that the nurse reviewed “none of the above” before administering the medication.

Table 13. Patients’ Perceptions of Nurse Behaviours: Review of Information

(Question 8) by Unit

| Question | % Med | % Surg | χ^2 | df | Sig (2-sided) |
|--------------------------------------|------------|------------|----------|----|---------------|
| A. Name of medicine | 43.6% (44) | 65.0% (65) | 9.949 | 2 | .019 |
| B. Amt or dose ordered | 27.7% (28) | 26.0% (26) | 1.152 | 3 | .562 |
| C. How often I will get the medicine | 29.7% (30) | 28.0% (28) | 1.153 | 2 | .562 |

| Question | % Med | % Surg | χ^2 | df | Sig (2-sided) |
|---|------------|------------|----------|----|---------------|
| D. <i>What the medicine will taste like</i> | 6.9% (7) | 3.0% (3) | 3.856 | 3 | .277 |
| E. Why I am taking the medicine | 28.7% (29) | 37.0% (37) | 2.992 | 3 | .393 |
| F. Side effects I should watch for | 13.9% (14) | 12.0% (12) | 2.269 | 3 | .519 |
| G. Have I ever taken medicine before | 28.7% (29) | 36.0% (36) | 2.414 | 3 | .491 |
| H. None of the above | 39.0% (39) | 22.0% (22) | 9.271 | 2 | .010 |

Notes: 1. Pearson chi-square was computed for responses between medical and surgical in-patients. 2. Question 8d, the nurse reviewed what the medicine will taste like was introduced as a false response option to address issues of social desirability and response bias. Ten participants (5.4%), seven medical and three surgical in-patients, responded “yes” to this question. 3. Question 8h, the nurse reviewed “none of the above,” 39 (21%) medical and 22 (12%) surgical in-patients responded “yes” to this question. 4. Missing data were reported for the following questions: 8a – 8h, 11 (5.5%) medical and 7 (3.5%) surgical in-patients. 5. 8I was an opened ended question.

Question 13: The nurse watched me take my pills or liquid medicine before he/she left the room. A Pearson chi-square test was conducted to determine if there were significant differences between the 66.3% (67) medical and 67.0% (67) surgical in-patients who indicated the nurse did watch them taking their pills or liquid medicine prior to leaving the room. There were 38 missing cases in total, 18.8% (19) medical and 19.0% (19) surgical. The results of the test were not significant, $\chi^2 (3, N = 201) = .995, p = .802$, (2-sided).

Question 17: My nurse raised the side rails on my bed after giving me my pain medicine. A Pearson chi-square test was conducted to determine if there were significant

differences between the 16.8% (17) medical and 29.0% (29) surgical in-patients who indicated the nurse did raise their side rails following the administration of pain medicine. There were 109 missing cases in total, 62.4% (63) medical and 46.0% (46) surgical. The results of the test were significant, $\chi^2 (2, N = 201) = 6.125, p = .047$, (2-sided) indicating surgical patients recalled more frequently than medical patients that the nurse raised the side rails on the bed following administering pain medicine.

Patient Behaviours

Question 7: The last time your nurse gave you medicine, how many different types of medicine were you given? A one-way analysis of variance was conducted to evaluate the relationship between the means of the self-reported number of medicines administered by each unit (medical/surgical). The ANOVA was significant, $F(3,143) = 3.53, p = .016$ indicating there was a significant difference between the mean responses of the medical versus surgical units. Medical patients recalled receiving more medicines than did the surgical patients.

Question 9: Can you recall what type of medicine your nurse last gave you? A Pearson chi-square test was conducted to determine if there were significant differences between the 69.3% (70) medical and 83.0% (83) surgical in-patients who identified they could recall the last medicine they received. Twenty-six cases were missing cases, 15.8% (16) medical and 10.0% (10) surgical patients. The results of the test were not significant, $\chi^2 (2, N = 201) = 5.39, p = .067$, (2-sided).

Question 11: I have a list of all the medicine I am currently taking. A Pearson chi-square test was conducted to determine if there were significant differences between the 40.6% (41) medical and 54.0% (54) surgical in-patients who indicated that they had a list

of their current medications. Ten cases were missing, 6.9% (7) medical and 3.0% (3) surgical. The test results were not significant, $\chi^2 (2, N = 201) = 4.416, p = .110$, (2-sided).

Patients' Perceptions and Nurse Behaviours Regarding Pain Medicine

Question 14: The last medicine my nurse gave me was for pain. A Pearson chi-square test was conducted to determine if there were significant differences between the 32.7% (33) medical and 53.0% (53) surgical in-patients who indicated that the last medicine they received was for pain. Eighty-six respondents answered "yes," and 95 answered "no." There were 20 missing cases in total, 13.9% (14) medical and 6.0% (6) surgical (see Table 8, pg 48). The results of the test were significant, $\chi^2 (2, N = 201) = 9.625, p = .008$, (2-sided), indicating surgical patients recalled more frequently than the medical patients that the last medicine they received was for pain.

Question 15: Did you ask for pain medicine? A Pearson chi-square test was conducted to determine if there were significant differences between the 23.8% (24) medical and 40.0% (40) surgical in-patients responding yes to this question. There were 95 missing cases in total, 56.4% (57) medical and 38.0% (38) surgical. The results of the test were significant, $\chi^2 (2, N = 201) = 7.890, p = .019$, (2-sided), indicating the surgical patients recalled asking for pain medicine more frequently than did the medical patients.

Question 16: After you asked for the pain medicine, how long did you have to wait before the nurse gave it to you? A one-way analysis of variance was conducted to evaluate the relationship between the mean wait times reported as a function of the four nursing units. The time reported was patients' perception of the actual wait time to receive pain medicine (see Table 9). The ANOVA was nonsignificant, $F(3,59) = .443, p = .724$.

Figure 2 indicates the mean wait times for administration of pain medicine by nursing unit.

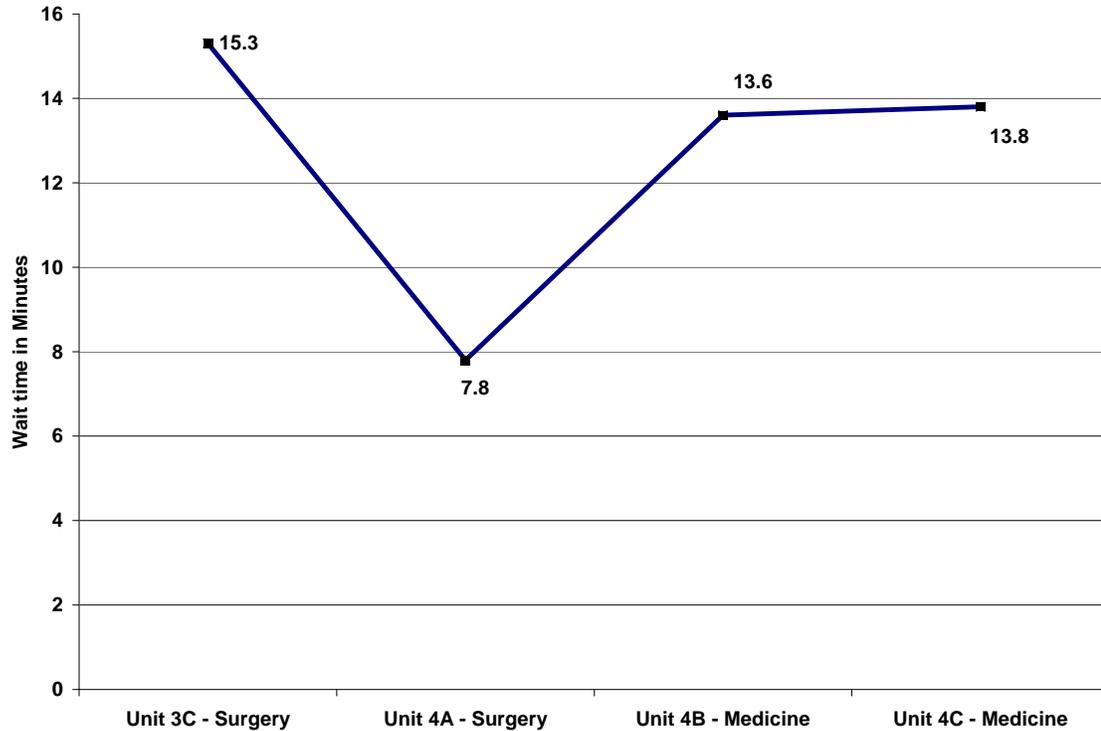


Figure 2. Wait time in minutes for pain medicine by unit.

Patients' Perceptions of Nursing Care

Using a seven-point rating scale, participants were asked to rate their perceptions about their care, specifically regarding the safety of their care, their level of trust in their care, and an overall care rating. A Mann-Whitney U test was applied to the ratings as a function of the unit they were on (medical or surgical).

Question 18: I feel the care I receive from nurses is... A Mann-Whitney U test was conducted to test whether the responses (seven-point rating scale of patients' perceptions of safety in their nursing care) of the medical patients (n=100) differed

significantly from the responses (seven-point rating scale of patients' perceptions of safety in their nursing care) of the surgical patients (n= 99). There were two cases of missing data, 1 medical and 1 surgical. The mean rank of the medical patients was found to be higher, but the differences between the groups were not statistically significant, $z = -1.389, p = .165$ (2-tailed).

Question 19: The level of trust I have in the nursing care I receive is... A Mann-Whitney U test was conducted to test whether the responses (seven-point rating scale of patients' perceptions of their level of trust in their care) of the medical patients (n= 99) differed significantly from responses of (seven-point rating scale of patients' perceptions of their level of trust in their care) of the surgical patients (n=99). There were three cases of missing data, 2 medical and 1 surgical. The mean rank of the medical patients was found to be higher, but the differences between the groups were not found to be statistically significant, $z = -1.428, p = .153$ (2-tailed).

Question 20: Overall, I would rate the nursing care during this hospital stay as. A Mann-Whitney U test was conducted to test whether the responses (seven point rating scale of patients' perceptions of their overall rating of care) of the medical patients (n=100) differed significantly from the responses (seven point rating scale of patients' perceptions of their overall rating of care) of the surgical patients (n=99). There were two cases of missing data, 1 medical and 1 surgical. The mean rank of the medical patients was found to be higher, and the differences between the groups were found to be statistically significant, $z = -2.014, p = .044$ (2-tailed), indicating that the medical patients rated their overall care lower than did the surgical patients.

Patients' Perceptions of Participation/Accountability for Care

Question 21: In your opinion, who is responsible for making sure your medicine is given safely? A Mann-Whitney U test was conducted to test whether the responses (five-point rating scale of patients' perceptions concerning who was responsible for making sure medicine was given safely) of the medical patients (n=101) differed significantly from the responses (five-point rating scale of patients' perceptions concerning who was responsible for making sure medicine was given safely) of the surgical patients (n=99). There was one case missing from surgery. The mean ranks of the medical (100.53) and surgical (100.47) patients were virtually equal, therefore the differences between the groups were not found to be statistically significant, $z = -.007$, $p = .994$ (2-tailed).

Question 22: How often do you check to ensure that the medicine you are being given is correct (correct dose, correct medicine, given at correct time)? All of the respondents completed this question, including 101 (50%) medical and 100 (50%) surgical in-patients. A Mann-Whitney U test was conducted to test whether the responses (five-point rating scale of patients' perceptions of how often they checked to ensure their medicine was being given correctly) differed significantly between the medical and surgical patients. The mean rank of the medical patients was found to be higher, but the differences between the groups were not found to be statistically significant, $z = -.589$, $p = .556$ (2-tailed).

Research Question: Do Patients' Perceptions and Behaviours Vary According to Age?

Question 1: Before giving my medicine to me today, I saw the nurse wash his/her hands. A *t*-test was conducted to determine whether the chronological age of patients

who responded yes to seeing their nurse wash her/his hands ($M=65.7$; $SD=16.2$) was significantly different from the chronological age of patients who responded no to seeing their nurse wash her/his hands ($M=63.1$; $SD=18.2$). There were 34 missing cases. The t statistic was nonsignificant, $t(165)=.96$, $p=.336$ (2 tailed, equal variances assumed).

Question 2: Before giving me my medicine today, the nurse identified me by.

Question two was divided into five sub-questions, A to E. Participants were instructed to identify all responses that applied. One hundred and seventy eight patients responded to this question. A t - test was conducted to determine if the chronological age of patients who responded yes was significantly different than the chronological age of patients who responded no to question 2. The results for the t -test for the five sub-questions are presented in Table 14. No significant results were reported for question 2.

Table 14. Patients' Perceptions of Nurse Behaviours: Patient Identification
(Question 2) by AGE

| Question | N | Mean | S.D. | Sig.(2-tailed) |
|--------------------------------|-----|-------|-------|----------------|
| A. Checking name band | | | | |
| Yes | 111 | 64.05 | 16.82 | .997 |
| No | 67 | 64.04 | 18.70 | |
| B. Asking to state my | | | | |
| Yes | 59 | 64.22 | 17.62 | .927 |
| No | 119 | 63.97 | 17.02 | |
| C. <i>Asking mother's name</i> | | | | |
| Yes | 8 | 68.88 | 20.10 | .421 |
| No | 170 | 63.82 | 17.18 | |
| D. Calling me by name | | | | |
| Yes | 135 | 63.17 | 17.85 | .230 |
| No | 43 | 66.81 | 15.24 | |
| E. None of the above | | | | |
| Yes | 16 | 69.75 | 14.43 | .168 |
| No | 162 | 63.49 | 17.48 | |

Notes: 1. Question 2c, the nurse identified me by asking me my mother's name, was introduced as a false option response to address issues of social desirability and response bias. Eight participants responded "yes" to this question.

Question 3: The medicine the nurse gave me today was NEW. Today was the first time I received it. A *t*-test was conducted to determine whether the chronological age of patients who responded yes to the medicine they received was new ($M=66.4$; $SD=18.4$) was significantly different from the chronological age of patients who responded no that the medicine they received was new ($M=63.6$; $SD=17.4$). There were 28 missing cases. The *t* statistic was nonsignificant, $t(171) = -.697$, $p = .487$ (2 tailed, equal variances assumed).

Question 4: Before giving my medicine to me, the nurse asked if I had any Allergies? A *t*-test was conducted to determine whether the chronological age of patients who responded yes that the nurse asked them about allergies before giving them medicine ($M=65.6$; $SD=15.6$) was significantly different from the chronological age of patients who responded no that the nurse asked them about allergies before giving them medicine ($M=62.7$; $SD=18.5$). There were 31 missing cases. The *t* statistic was nonsignificant, $t(168) = 1.10$, $p = .272$ (2 tailed, equal variances assumed).

Question 8: For each medicine, the nurse reviewed the following information with me before giving me my medicine. Question 8 was divided into nine sub-questions, A to I. Participants were instructed to identify all responses that applied. A *t*-test was conducted to determine if the chronological age of patients who responded yes was significantly different than the chronological age of patients who responded no to question 2. The results for the *t*-test for the five sub-questions are presented in Table 15. There was one significant result: the average age of patients indicating the nurse reviewed why they were taking the medicine was older (68.5 yrs) than the average age of the patients who indicated that the nurse did not review why they were taking the medicine (60.6 yrs).

Table15. Patients' Perceptions of Nurse Behaviours: Review of Information
(Question 8) by Age

| Question | N | Mean | S.D. | Sig (2-sided) |
|---|-----|-------|-------|---------------|
| A. Name of medicine | | | | |
| Yes | 101 | 63.03 | 17.05 | .754 |
| No | 63 | 63.90 | 17.82 | |
| B. Amt or dose ordered | | | | |
| Yes | 50 | 66.20 | 15.69 | .165 |
| No | 114 | 62.12 | 17.80 | |
| C. How often I will get the medicine | | | | |
| Yes | 55 | 65.73 | 15.79 | .215 |
| No | 109 | 62.17 | 17.94 | |
| D. <i>What the medicine will taste like</i> | | | | |
| Yes | 9 | 74.00 | 18.25 | .060 |
| No | 154 | 62.90 | 17.01 | |
| E. Why I am taking the medicine | | | | |
| Yes | 60 | 68.50 | 14.34 | .012 |
| No | 103 | 60.63 | 18.13 | |
| F. Side effects I should watch for | | | | |
| Yes | 25 | 69.16 | 14.48 | .075 |
| No | 138 | 62.51 | 17.52 | |
| G. Have I ever taken medicine before | | | | |
| Yes | 60 | 65.48 | 15.07 | .235 |
| No | 104 | 62.14 | 18.40 | |
| H. None of the above | | | | |
| Yes | 53 | 63.04 | 17.87 | .802 |
| No | 110 | 63.76 | 16.97 | |

Notes: 1. Question 8d, the nurse reviewed what the medicine will taste like was introduced as a false response option to address issues of social desirability and response bias. Nine participants responded “yes” to this question.

Patient Behaviours

Question 7: The last time your nurse gave you medicine, how many different types of medicine were you given? A Pearson's r correlation test was applied to examine the relationship between the age of respondents and the number of types of medicines the patients reported receiving. One hundred and fifty-two in-patients responded to this question (see Table 7, pg. 47). There were 49 missing cases. A significant positive correlation was obtained, $r = .179$, $p = .034$ (2-tailed), indicating that the older the age of the patients, the more different types of medicine given.

Question 9: Can you recall what type of medicine your nurse last gave to you? A t -test was conducted to determine whether the chronological age of patients who responded yes that they could recall the last medicine they were given ($M=63.8$; $SD=17.3$) was significantly different from the chronological age of patients who responded no that they could recall the last medicine they were given ($M=71.3$; $SD=9.9$). There were 44 missing cases. The t statistic was significant, $t(29.6) = 2.7$, $p = .012$ (2-tailed, equal variances not assumed), indicating the chronological age of patients who could recall the last medicine they were given was younger than those patients who could not recall the last medicine they were given.

Question 11: I have a list of all the medicine I am currently taking. A t -test was conducted to determine whether the chronological age of patients who responded yes that they had a list of their current medicine ($M=62.6$; $SD=18.1$) was significantly different from the chronological age of patients who responded no that they had a list of their current medicines ($M=65.5$; $SD=16.0$). There were 29 missing cases.

The t statistic was nonsignificant, $t(170) = -1.10$, $p = .272$ (2 tailed, equal variances assumed).

Patients' Perceptions and Nurse Behaviours Regarding Pain Medicine

Question 13: The nurse watched me take my pills or liquid medicine before he/she left the room. A t -test was conducted to determine whether the chronological age of patients who responded yes that the nurse watched them take their pills prior to leaving the room ($M=63.6$; $SD=17.7$) was significantly different from the chronological age of patients who responded no that the nurse watched them take their pills prior to leaving the room ($M=66.8$; $SD=13.2$). There were 54 missing cases. The t statistic was nonsignificant, $t(145) = .882$, $p = .379$ (2 tailed, equal variances assumed).

Question 16: After you were asked for the pain medicine, how long did you have to wait before the nurse gave it to you? A Pearson's r correlation was applied to examine the relationship between the age of respondents and the patients' perceptions of length of time in minutes they waited until they received the pain medicine as requested. Eighty-six in-patients responded to this question (see Table 9, pg. 62). There were 133 missing cases. A weak nonsignificant negative correlation was obtained, $r = -.119$, $p = .369$, (2-tailed).

Question 17: My nurse raised the side rails on my bed after giving me my pain medicine. A t -test was conducted to determine whether the chronological age of patients who responded yes that the nurse raised the side rails on the bed following administration of pain medicine ($M=63.6$; $SD=17.7$) was significantly different from the chronological age of patients who responded no that the nurse raised the side rails on the bed following

administration of pain medicine ($M=66.4$; $SD=15.4$). There were 116 missing cases. The t statistic was nonsignificant, $t(83)=1.07$, $p=.285$ (2-tailed, equal variances assumed).

Patients' Perceptions of Nursing Care

Question 18: I feel the care I receive from nurses is. A Kendall's tau-b test was used to assess the strength of the relationship between chronological age and patients' perceptions of the safety of nursing care of 178 respondents. A weak nonsignificant negative correlation was obtained, $\tau = -.092$, $p = .120$ (2-tailed).

Question 19: The level of trust I have in the nursing care I receive is. A Kendall's tau-b test was used to assess the strength of the relationship between chronological age and the patients' perceptions of their level of trust in the nursing care they had received for 175 respondents. A weak nonsignificant negative correlation was obtained, $\tau = -.096$, $p = .104$ (2-tailed).

Question 20: Overall, I would rate the nursing care during this hospital stay as. A Kendall's tau-b test was used to assess the strength of relationship between chronological age and patients' perceptions regarding the overall rating of nursing care, for 178 respondents. A weak nonsignificant negative correlation was obtained, $\tau = -.029$, $p = .620$ (2-tailed).

Patients' Perceptions of Participation/Accountability for Care

Question 21: In your opinion, who is responsible for making sure your medicine is given safely? A Kendall's tau-b test was used to assess the strength of the relationship between chronological age and patients' perceptions concerning who was responsible for making sure their medicine was administered safely for 176 respondents. A significant negative correlation was obtained, $\tau = -.151$, $p = .010$ (2-tailed), indicating the younger

age is associated with patient responses indicating they are more responsible for ensuring their medicine is given safely, and older age is associated with a belief that they are less responsible.

Question 22: How often do you check to ensure that the medicine you are being given is correct (correct dose, correct medicine, given at correct time)? A Kendall's tau-b test was used to assess the strength of relationship between chronological age and the patients' perceptions of how often they ensured their medicine was correct, with 173 respondents. A weak nonsignificant negative correlation was obtained, $\tau = -.091$, $p = .108$ (2-tailed).

Research Question: Do Patients' Perceptions and Behaviours Vary According to Gender?

Question 1: Before giving my medicine to me today, I saw the nurse wash his/her hands. A Pearson chi-square test was conducted to detect significant differences between the responses of the 47% (42) male and 39% (35) female in-patients responding "yes" to observing their nurse wash his/her hands prior to dispensing medicine. There were 23 missing cases. The results of the test were not significant, $\chi^2 (1, N = 178) = 1.122$, $p = .290$ (2-sided).

Question 2: Before giving me my medicine today, the nurse identified me by. Question two was divided into five sub-questions, A to E. Participants were instructed to identify all responses that applied. Of the 189 participants who answered this sub-group of questions, 49.7% (94) were male and 50.3% (95) female. A Pearson chi-square test was conducted to detect significant differences between the responses of the male and female in-patients specific to each sub-question. The results of the Pearson chi-square

tests for the five sub-questions are presented in Table 14. One significant result was obtained: male patients recalled more frequently than female patients that the nurse asked them to state their name when identifying them prior to medicine administration.

Table 16. Patients' Perceptions of Nurse Behaviours: Patient Identification
(Question 2) by Gender

| Question | %Male | %Female | χ^2 | df | Sig (2- sided) |
|--------------------------------|------------|------------|----------|----|----------------|
| A. Checking name band | 68.0% (64) | 55.7% (53) | 3.029 | 1 | .082 |
| B. Asking to state my name | 41.1% (39) | 24.2% (23) | 6.400 | 1 | .011 |
| C. <i>Asking mother's name</i> | 4.2% (4) | 3.1% (3) | .160 | 1 | .690 |
| D. Calling me by name | 70.2% (66) | 81.0% (77) | 3.015 | 1 | .083 |
| E. None of the above | 7.4% (7) | 8.4% (8) | .061 | 1 | .804 |

Notes: 1. 94 male and 95 female respondents; 2. Pearson chi-square was computed for responses of male and female in-patients. 3. Question 2c, the nurse identified me by asking me my mother's name, was introduced as a false response option to address issues of social desirability and response bias. Seven participants (3.7%), 4 male and 3 female, responded "yes" to this question. These responses remained in the analysis. It was decided to keep these questions in as they comprised < 5% of the total respondents. 4. Question 2e, 15 participants (7.9%) responded "yes" to this question, 7 (3.7%) males and 8 (4.2%) females, indicating the nurse "did none of the above" to identify the patient before medication administration. 5. There were 12 cases of missing data.

Question 4: Before giving my medicine to me, the nurse asked if I had any allergies. A Pearson chi-square test was conducted to detect significant differences between the responses of the 64.1% (59) male and 38.5% (35) female in-patients responding yes concerning whether they recall the nurse asking if they had allergies before dispensing the medicine. A total of 18 cases were missing. The test results were

significant, $\chi^2 (2, N = 183) = 12.203 p = .002$, (2-sided), indicating that male patients recalled more frequently than female patients that the nurse asked them about allergies.

Question 8: For each medicine, the nurse reviewed the following information with me before giving me my medicine. Question 8 was divided into nine sub-questions, A to I. Participants were instructed to identify all responses that applied. A Pearson chi-square test was conducted to examine whether there were significant differences between the responses of male and female in-patients specific to each sub-question. In total, 178 respondents answered this grouping of sub-questions. Results are presented in Table 15. There were two significant results for this question: male patients recalled more frequently than female patients that the nurse reviewed how often they would get the medicine and what side effects to watch for.

Table 17. Patients' Perceptions of Nurse Behaviours: Review of Information
(Question 8) by Gender

| Question | %Male | %Female | χ^2 | df | Sig. (2-sided) |
|---|------------|------------|----------|----|----------------|
| A. Name of medicine | 63.2% (55) | 57.1% (52) | .685 | 1 | .408 |
| B. Amt or dose of medicine | 34.4% (30) | 25.2% (23) | 1.804 | 1 | .179 |
| C. How often I will get the medicine | 41.2% (36) | 24.1% (22) | 5.992 | 1 | .014 |
| D. <i>What the medicine will taste like</i> | 8.0% (7) | 4.3% (4) | 1.022 | 1 | .312 |
| E. Why I am taking the medicine | 40.2% (35) | 34.0% (31) | .724 | 1 | .395 |
| F. Side effects to watch for | 20.6% (18) | 9.8% (9) | 4.031 | 1 | .045 |

| | | | | | | |
|----|-----------------------------------|------------|------------|-------|---|------|
| G. | Have I ever taken medicine before | 41.3% (36) | 29.6% (27) | 2.667 | 1 | .102 |
| H. | None of the above | 30.2% (26) | 35.1% (32) | .488 | 1 | .485 |

Notes: 1. Pearson chi-square was computed for responses between male and female in-patients. 2. Question 8d, the nurse reviewed what the medicine will taste like, was introduced as a false response option to address issues of social desirability and response bias. Eleven participants (6.2%), seven males and four females, responded “yes” to this question. 3. Question 8h, the nurse reviewed “none of the above”; 26 (14.6%) males and 32 (18%) females responded “yes” to this question. 4. There were 23 missing cases reported for questions 8a – 8h. 5. Respondents were instructed to “check all that apply.” 6. 8I was an opened ended question.

Question 13: The nurse watched me take my pills or liquid medicine before he/she left the room. A Pearson chi-square test was conducted to examine for significant differences between the 86.4% (70) male and 79.2% (61) female in-patients responding yes specific to their recall as to whether the nurse watched them taking their pills or liquid medicine prior to leaving the room. There were 43 missing cases. The results of the test were not significant, $\chi^2 (1, N = 158) = 1.44, p = .230$, (2-sided).

Question 17: My nurse raised the side rails on my bed after giving me my pain medicine. A Pearson chi-square test was conducted to examine for significant differences between the 38.1% (16) male and 60.0% (27) female in-patients who responded yes specific to their recall as to whether the nurse raised their side rails following the administration of pain medicine. There were 114 missing cases in total. The results of the test were significant, $\chi^2 (1, N = 87) = 4.170, p = .041$, (2-sided), indicating that female patients recalled more frequently than male patients that the nurse raised the side rails following medicine administration.

Patient Behaviours

Question 9: Can you recall what type of medicine your nurse last gave to you? A Pearson chi-square test was conducted to examine for significant differences between the 84.5% (71) male and 91.0% (81) female in-patients who responded yes that they could recall the type of medicine the nurse last administered. There were 28 missing cases in total. The results of the test were not significant, $\chi^2 (1, N = 173) = 1.705, p = .192$, (2-sided).

Question 11: I have a list of all the medicine I am currently on. A Pearson chi-square test was conducted to examine for significant differences between the 51.5% (47) male and 46.8% (45) female in-patients who responded yes to having a list of their current medicines. There were 14 missing cases in total. The results of the test were not significant, $\chi^2 (1, N = 187) = .426, p = .514$, (2-sided).

Patients' Perceptions and Nurse Behaviours Regarding Pain Medicine

Question 14: The last medicine my nurse gave me was for pain. A Pearson chi-square test was conducted to examine for significant differences between the 39.5% (38) male and 46.3% (45) female in-patients responding yes to this question. Ninety-four respondents answered "no." There were 24 missing cases in total. The results of the test were significant, $\chi^2 (4, N = 201) = 18.067, p = .001$, (2-sided), indicating that female patients recalled more frequently than male patients the last medicine they were administered was for pain.

Question 15: Did you ask for pain medicine? A Pearson chi-square test was conducted to examine for significant differences between the 32.2% (31) male and 31.9% (31) female in-patients responding yes to this question. Forty-two respondents answered

“no.” There were 97 missing cases in total. The results of the test were not significant, $\chi^2(4, N = 201) = 3.323, p = .505$, (2-sided).

Patients' Perceptions of Nursing Care

Question 18: I feel the care I receive from nurses is... A Mann-Whitney U test was conducted to test whether the responses of a seven-point rating scale (patients' perceptions of safety in nursing care) differed by gender. There were 92 male and 96 female respondents. Thirteen cases were missing. The mean ranks scores were virtually equal for both the groups, therefore there were no differences between the groups and the test was nonsignificant, $z = -.071, p = .944$ (2-tailed).

Question 19: The level of trust I have in the nursing care I receive is... A Mann-Whitney U test was conducted to test whether the responses of a seven-point rating scale (patients' perceptions of the level of trust they have in nursing care) differed by gender. The respondents included 91 male and 95 female in-patients. There were 15 missing cases in total. The mean rank of the male patients was higher, but the differences between groups was not found to be significant, $z = -.447, p = .655$, (2-tailed).

Question 20: Overall, I would rate the nursing care during this hospital stay as... A Mann-Whitney U test was conducted to test whether the responses of a seven-point rating scale (patients' perceptions regarding the overall rating of nursing care) differed by gender. There were 92 male and 96 female respondents. Thirteen cases were missing. The mean rank of the female patients was found to be higher, but the differences between the groups was not found to be significant, $z = -.578, p = .563$ (2-tailed).

Patients' Perceptions of Participation/Accountability for Care

Question 21: In your opinion, who is responsible for making sure your medicine is given safely? A Mann-Whitney U test was conducted to test whether the responses of a five-point rating scale (patients' perceptions of their participation/accountability for their care) differed by gender. There were 92 male and 93 female respondents. Sixteen cases were missing. The mean rank of the female patients was found to be higher, but the differences between groups was not found to be significant, $z = -.391$, $p = .696$ (2-tailed).

Question 22: How often do you check to ensure that the medicine you are being given is correct (correct dose, correct medicine, given at the correct time)? A Mann-Whitney U test was conducted to test whether the responses of a five-point rating scale (patients' recall as to how often they ensured that their medicine was given correctly) differed by gender. The respondents included 90 male and 93 female in-patients. There were 18 missing cases. The mean rank of the female patients was slightly higher, but the differences between the groups were not found to be significant, $z = -.172$, $p = .863$ (2-tailed).

Research Question: Do Patient's Perceptions and Behaviours Vary According to Length of Stay (LOS)?

Tests of significance were completed only on selected questions, due to the structure and level of data and the primary purpose of this project. For example, the independent variable (LOS) is nominal level data, while some of the dependent variables are ordinal level data. No tests of significance were found with this structure of data.

Patient Behaviours

Question 7: The last time your nurse gave you medicine how many different types of medicine were you given? A one-way analysis of variance was conducted to evaluate the relationship between the mean responses of the number of medicines administered and length of stay. The ANOVA was non significant, $F(4,144) = 2.05$, $p = .09$, indicating no significant differences between groups.

Question 9: Can you recall what type of medicine your nurse last gave you? A Pearson-chi square test was conducted to detect significant differences in the respondents' recall (yes/no) of the last medicine that nursing gave to them and their self-reported length of stay (in days). One case was missing. The test results were significant, $\chi^2 (10, N = 200) = 29.616$, $p = .001$, indicating patients with a self-reported LOS of 1-3 days reported most frequently they could recall the last medicine they were given. However, these results must be interpreted with caution, as an assumption of the test (the % of cell counts with expected counts less than 5) was violated.

Question 11: I have a list of all the medicine I am currently taking. A Pearson-chi square test was conducted to detect significant differences in responses to "I have a list of my current medicine" and self-reported length of stay (in days). There was one missing case. The test results were significant, $\chi^2 (10, N = 200) = 33.119$, $p = .000$, indicating patients with a self-reported LOS of 1-3 days reported most frequently they had a current list of their medicines. However, these results must be interpreted with caution, as an assumption of the test (the % of cell counts with expected counts less than 5) was violated.

Patients' Perceptions and Nurse Behaviours Regarding Pain Medicine

Question 16: After you asked for pain medicine, how long did you have to wait before the nurse gave it to you? A one-way analysis of variance was conducted to evaluate the relationship between the responses of the wait time for medicines to be administered and self-reported length of stay (in days). The ANOVA was nonsignificant, $F(4,59)=.60, p = .661$, indicating no differences between the groups. Figure 3 displays the wait time by length of stay.

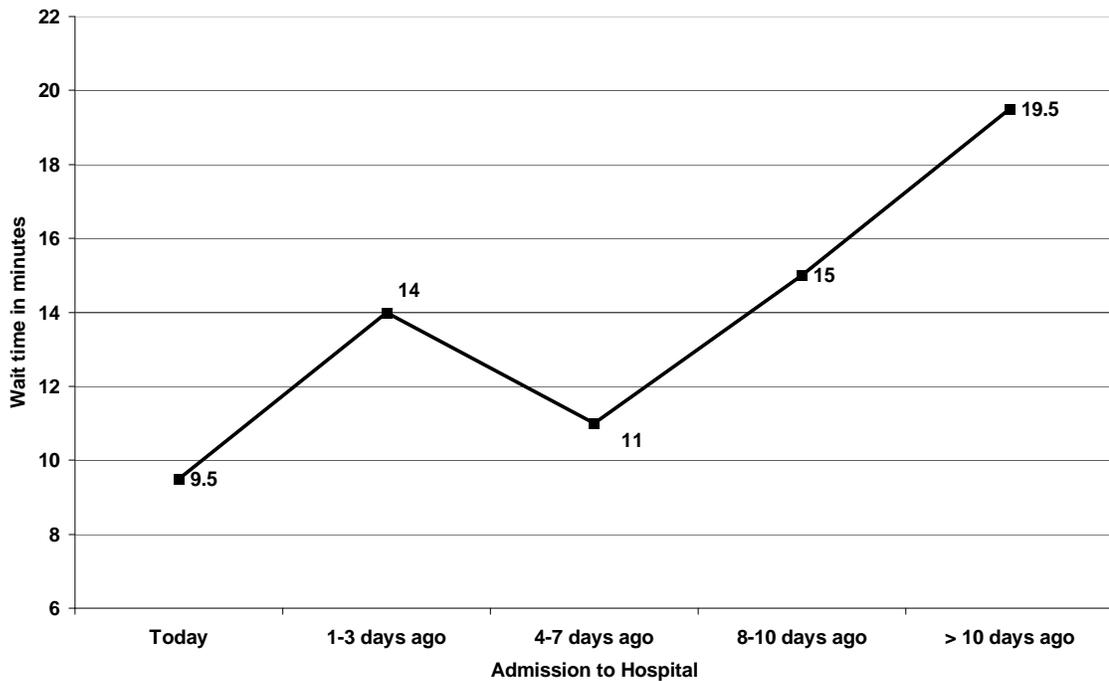


Figure 3. Wait time in minutes for pain medicine by length of stay.

Patients' Perceptions of Nursing Care

Question 18: I feel the care I receive from nurses is... A Kruskal-Wallis test was conducted to evaluate whether there were significant differences in the responses of a seven-point rating scale (patients' perceptions concerning safety in their nursing care)

depending on their length of stay. There were a total of 10 missing cases. The test found significant differences in the mean ranks of the groups, $\chi^2 (4, N=191) = 12.650, p = .013$.

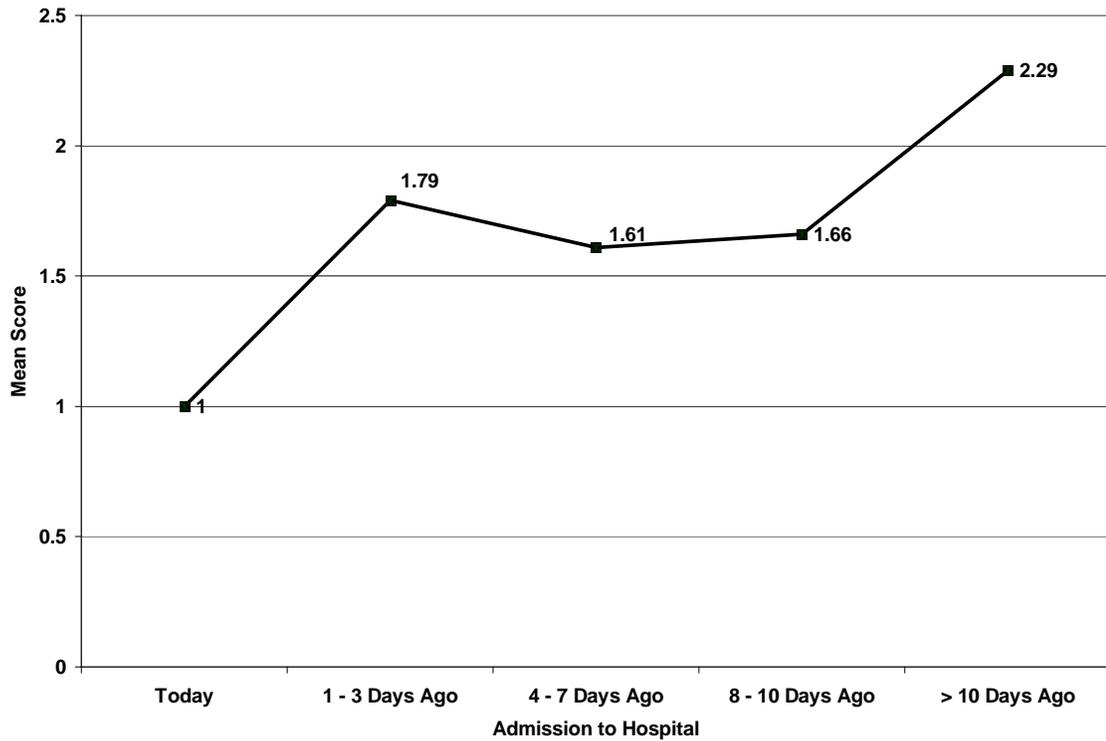


Figure 4. Mean scores of patients' perceptions of safety in the nursing care (Question 18).

Question 19: The level of trust I have in the nursing care I receive is... A Kruskal-Wallis test was conducted to evaluate whether there were significant differences the mean responses of a seven-point rating scale (patients' perceptions of their level of trust in their care) depending on their length of stay. There were 11 missing cases in total. The test found no significant differences in the mean ranks of the groups, $\chi^2 (4, N=190) = 2.606, p = .626$.

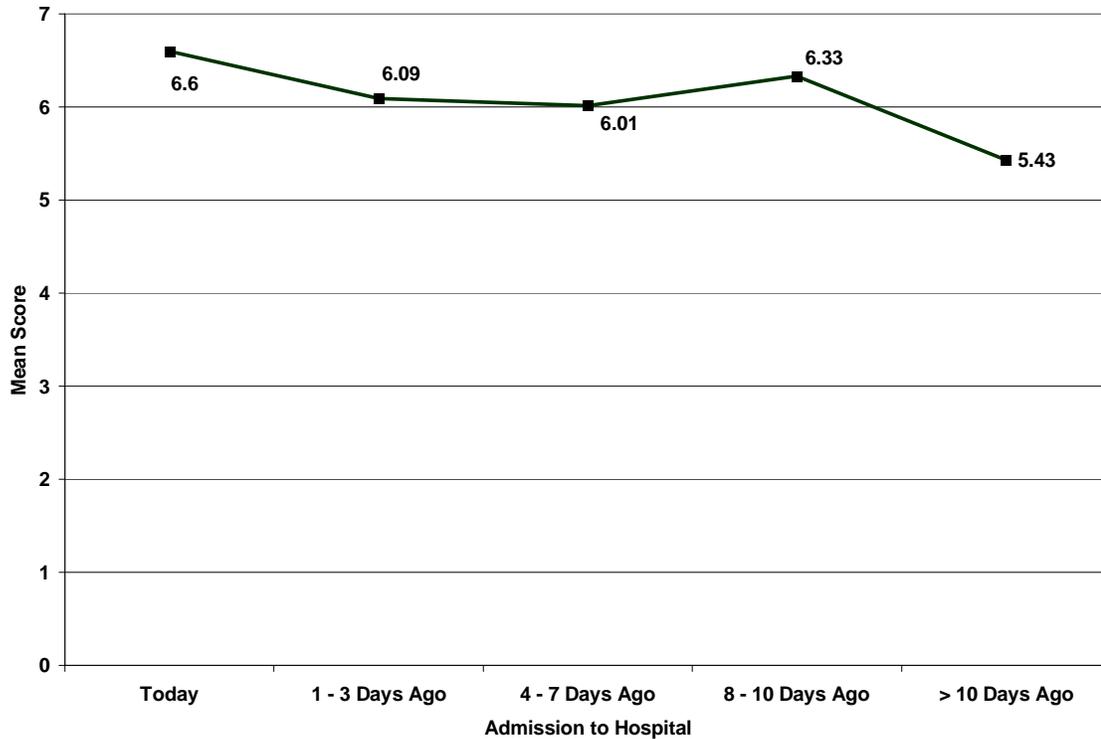


Figure 5. Mean score of patients' perceptions of level of trust in nursing care (Question 19).

Question 20: Overall, I would rate the nursing care during this hospital stay as...

A Kruskal-Wallis test was conducted to evaluate whether there were significant differences in the responses of a seven-point rating scale (patients' perceptions of the overall level of nursing care) depending on their length of stay. There were 10 missing cases in total. The test found no significant differences in the mean ranks of the groups, $\chi^2(4, N=191) = 7.933, p = .094$.

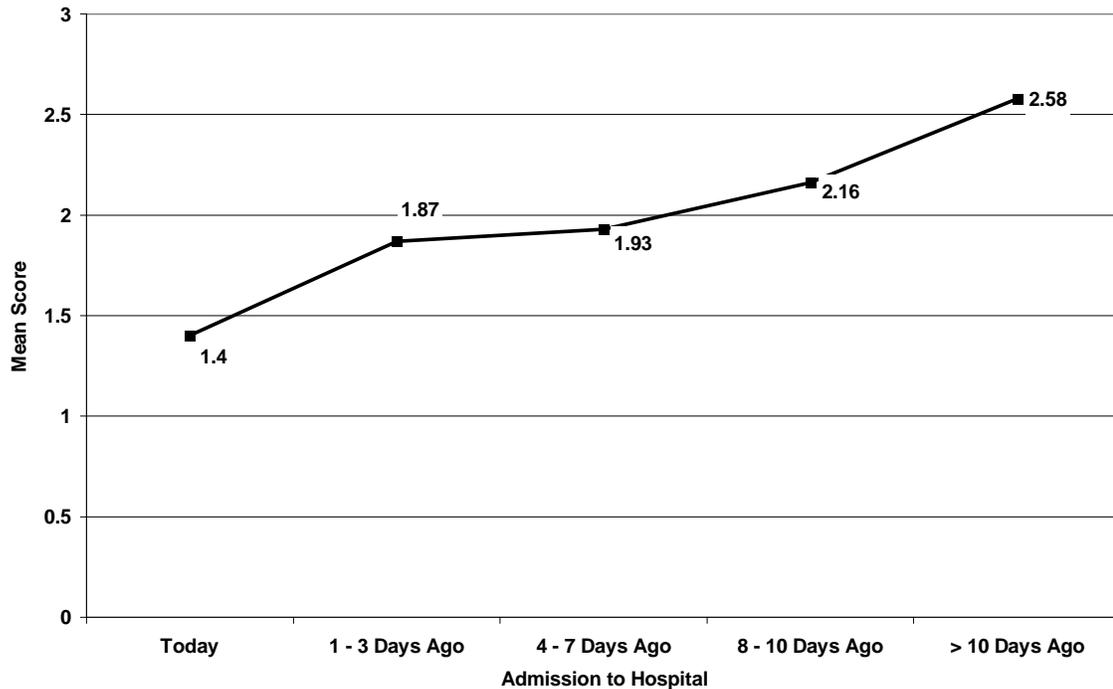


Figure 6. Mean score of patients' perceptions of overall nursing care (Question 20).

Patients' Perceptions of Participation/Accountability for Care

Question 21: In your opinion, who is responsible for making sure your medicine is given safely? A Kruskal-Wallis test was conducted to evaluate whether the responses of a five-point rating scale (patients' perceptions of their level of responsibility for the safe administration of their medicine) differ depending on their length of stay. There were 9 missing cases in total. The test found no significant differences between the groups, $\chi^2(4, N=192) = 6.758, p = .149$.

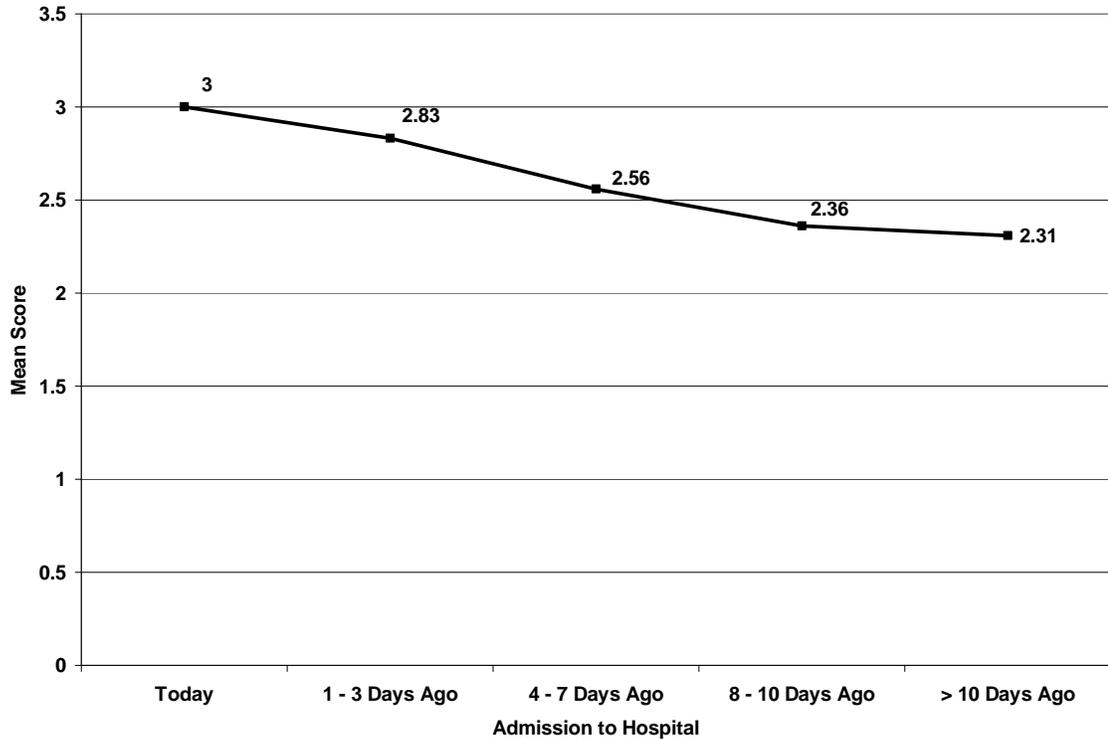


Figure 7. Mean score of patients' perceptions of who is responsible for making sure their medicine is being given safely (Question 21).

Question 22: How often do you check to ensure the medicine you are being given is correct (correct dose, correct medicine, given at the correct time)? A Kruskal-Wallis test was conducted to evaluate whether there were significant differences in the responses of a five-point rating scale (patients' perceptions of how often they ensured that their medication was given correctly) depending on their length of stay. There were 10 missing cases in total. The test found no significant differences between the groups, $\chi^2(4, N=191) = 4.578, p = .333$.

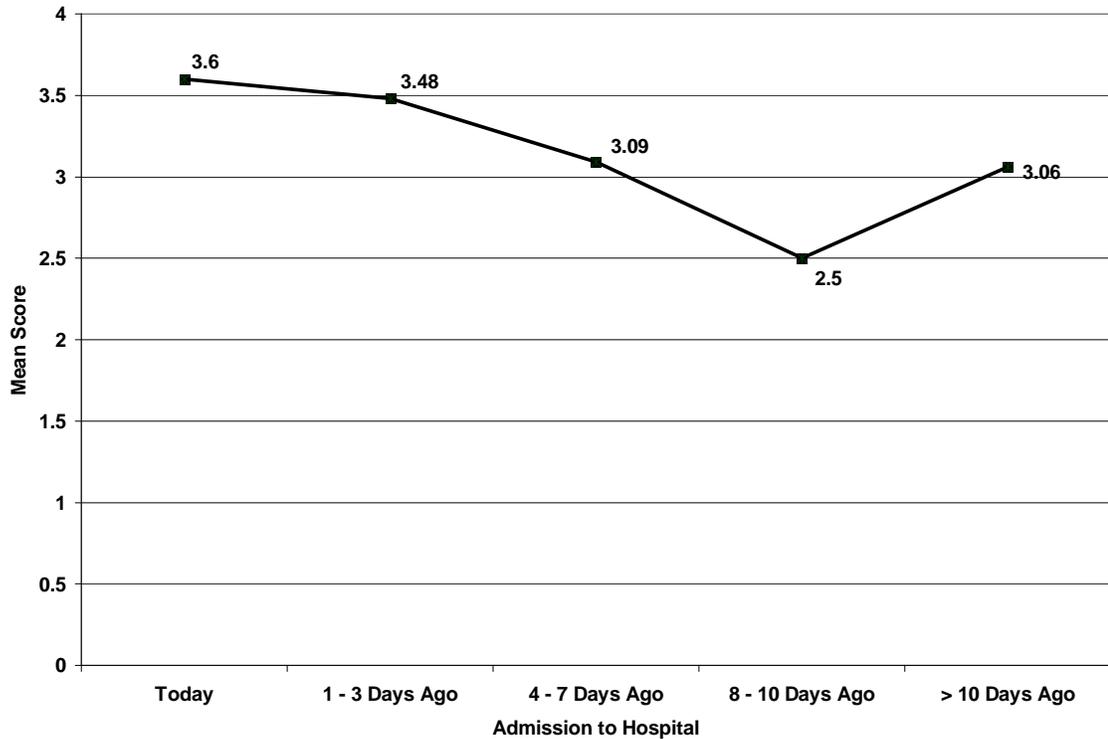


Figure 8. Mean score of patients' perceptions of how often they ensure their medicine is being given correctly (Question 22).

Research Question: How Does Wait Time for Administration of Pain Medication on Nursing Units at Chinook Regional Hospital Compare to Results Reported in Health Quality Council of Saskatchewan (2005) Survey?

Question 16: After you asked for pain medicine, how long did you have to wait before the nurse gave it to you? Sixty-eight patients responded to this question. The reported wait time ranged from 0 to 60 minutes; with the mean wait time being 12.4 minutes (see Table 9). For a visual display of the mean wait times presented by nursing units, refer to Figure 2. This mean wait time of 12.4 minutes compares favourably to the wait time reported in the HQCS (2005), where less than 13% of patients indicated

receiving their medication within 10 minutes of requesting it, while greater than 20% of patients indicated they waited longer than 30 minutes.

Summary

Data were analysed by the five independent variables: unit, age, gender, length of stay, and wait time for pain medication. Tests of significance were performed, and results were presented in the following groupings: patients' perceptions of nurse behaviours regarding safe medicine administration, patient behaviours, patients' perceptions and nurse behaviours regarding pain medicine, patients' perceptions of nursing care, and patients' perceptions of their participation/accountability in their care. The following differences between groups were found to be statistically significant:

- Question 7 – On average medical patients received more medicines than did the surgical patients.
- Question 8 –Surgical patients recalled that the nurse reviewed the name of the medicine prior to giving the medicine more frequently than did the medical patients.
- Question 8 –Surgical patients recalled receiving more information prior to the delivery of their medicine than did the medical patients.
- Question 14 – Surgical patients recalled more frequently than the medical patients that the last medicine they received was for pain.
- Question 15 – Surgical patients recalled asking for pain medicine more frequently than the medical patients.

- Question 17 – Surgical patients recalled more frequently than medical patients that the nurse raised the side rails on the bed following administering pain medicine.
- Question 20 - Medical patients rated their overall care lower than did the surgical patients.
- Question 7 – There was a positive relationship between age and the number of medicines received.
- Question 21 –There was a negative relationship between age and the extent to which patients felt they were responsible for the safe administration of their medicine.
- Question 8 - The average age of patients indicating the nurse reviewed why they were taking their medicines was older (68.5) than the average age of patients indicating the nurse did not review why they were taking their medicine (60.6).
- Question 9 – The average age of patients who could recall the type of medicine the nurse last gave them was younger (63.8) than the average age of patients who not recall the type of medicine the nurse last gave them (71.4).
- Question 2 –Male patients recalled more frequently than female patients that the nurse asked them to state their name when identifying them prior to medicine administration.
- Question 4 – Male patients recalled more frequently than female patients that the nurse asked about allergies.
- Question 8 – Male patients recalled more frequently than female patients that the nurse reviewed how often they will get the medicine.

- Question 8 –Male patients recalled more frequently than female patients that the nurse reviewed side effects to watch for.
- Question 14 – Female patients recalled more frequently than male patients the last medicine administered was for pain.
- Question 17 –Female patients recalled more frequently than male patients that the nurse raised the side rails following medicine administration.
- Question 9 – Differences were reported by LOS in whether the patient could recall the last medicine given. Patients with LOS 1-3 days reported most frequently that they could recall their last medicine.
- Question 11 – Differences were reported by LOS in whether the patient had a current list of medicines. Patients with LOS 1-3 days reported most frequently that they had a current list of their medicines.
- Question 18 – Differences were reported by LOS in overall rating of care indicating the longer the length of stay the less safe the patients reported feeling.

Chapter 5 includes a discussion of the implications of the results and their application to clinical nursing, the study limitations, and recommendations for future research.

Chapter Five: Discussion

Overview

This chapter summarizes the findings of the study as they relate to the perceptions, attitudes and beliefs of medical and surgical in-patients at the Chinook Regional Hospital regarding medication administration safety practices employed by nurses. In addition, this chapter also includes a discussion of the implications of the results and their application to clinical nursing practice. Lastly, study limitations and recommendations are suggested for future nursing research.

The conclusions are summarized by each of the five sub-questions posed in this study. The salient findings will be compared and contrasted to both theoretical and empirical literature throughout this section.

Discussion

Do patients' perceptions and behaviours vary according to the nursing unit they were on? Twenty-eight tests were conducted to detect if there were differences between the medical and surgical patients' perceptions and behaviours of medication safety practices. Seven of the tests yielded significant results indicating there are differences between medical and surgical patients' perceptions and behaviours according to the nursing unit they were on. These findings are linked to an emerging body of literature where there is a dearth of research.

Patient advisories that promote active patient participation in the safety movement have been disseminated by several organizations (Agency for Healthcare Research and Quality, 2005; American Hospital Association, 2005; Institute of Safe Medication Practices, 2005; National Patient Safety Foundation, 2005). Most recently in

Canada, the HQCA (2007) issued a newspaper mailer entitled *Playing it Safe: You and Your Medication*. These advisories focus on encouraging patients to take an active role in their care by questioning, paying attention and being informed.

In an effort to ascertain patient awareness and participation in their care, question 7 was included in the survey. Of the respondents, 152 (76%) recalled the number of medicines they had last received, reporting an average of three medicines, (see Table 7). Clinically, this is a positive finding supporting the notion that patients are actively participating in their medication administration process by observing what medications they are receiving.

A statistically significant difference was found between the responses of the medical and surgical patients, $p = .016$, indicating a positive relationship between medical patients and an increased number of medicines administered. This is supported in the literature. Chronic diseases are more common in the older population as aging causes alterations in metabolism, (Fulton & Allen, 2005). Further, patients requiring acute medical interventions versus surgical interventions are often experiencing an exacerbation of a chronic illness, therefore supporting the need for increased medication use.

In 2005, the College and Association of Registered Nurses of Alberta (CARNA) developed *Medication Administration Guidelines for Registered Nurses*, outlining the competencies for safe medication administration. Included in this document, are the five rights of medication administration: the right medication, the right dose, the right route, the right time, and the right client. Adherence to these five rights should be fundamental

to basic nursing care. Medication administration is more than a technical skill; it requires the synthesis of knowledge and skills.

Patient teaching is a fundamental nursing skill that is critical to the medication administration process. Question 8 offered respondents nine choices regarding their recall of what information the nurse reviewed prior to medicine administration. Statistically significant results were obtained indicating that surgical patients responded more frequently than did the medical patients that nurses reviewed the name of the medication they were taking and that nurses reviewed “none of the above.”

Since effective pain management is a priority in patient care, it has been recognized by the Canadian Council on Health Services Accreditation (2005) as a required standard. The Canadian Pain Society has developed a manual, *Accreditation Pain Standard: Making it Happen* (2005), to assist care providers with assessment and management of pain. Although no specific time parameters or benchmarks are identified regarding response for pain medicine administration, the manual notes a key condition: “Unnecessary delays in treating pain should be avoided as neural plasticity may result in unrelieved acute pain becoming persistent” (p. 16).

Less than half of the patients (86, or 47.5%) reported that the last medicine they were administered was for pain. Of those, 64 (60.4%) recalled asking for pain medicine. Responses relating to administration of pain medicine on this survey are decreased since many patients would neither require nor ask for this type of medication. Statistically significant results were obtained for questions 14 and 15. More surgical patients than medical patients indicated that the last medicine they received was for pain $p = .008$, while more surgical patients than medical patients asked for pain medication $p = .019$.

These findings support the clinical practice that surgical patients receive pain medication routinely post – operatively.

Patient safety is a fundamental principle of nursing care; therefore nurses should strive to ensure all aspects of their care are safe. The raising of side rails post medication administration might be viewed as an appropriate strategy to promote patient safety depending on the type of medication administered.

The survey did not inquire as to the type of pain medication administered (e.g., opioids and non-opioids). Nursing practice could vary according to the class of pain medication administered; this limitation of the survey instrument is noted. Raising the side rails to promote patient safety would be appropriate when patients have received an opioid pain medication. In my clinical experience, the majority of surgical in-patients receive opioid pain medicine post-operatively, therefore lending support to the finding of this study that more surgical patients than medical patients indicated their nurse raised their side rail following pain medicine administration, $p = .047$. No other studies were found to support these findings.

Three questions were introduced in this study to address the construct related to patients' perceptions of nursing care; specifically regarding safety, level of trust in care, and overall rating of care. In 2005, the Health Quality Council of Saskatchewan (HQCS) surveyed 5002 discharged patients. Of these, 76% reported always having trust and confidence in their nurses, and 75% of patients reported the overall quality of care they received as very good or excellent (Wohlgemuth et al., 2005). What were the Chinook Health patients' perceptions of nursing care reported in this study, and how do they compare with the results reported in the HQCS (2005) study?

Table 10 describes the respondents' overall rating of nursing care during their current stay. Approximately 73% of respondents indicated that they perceive the nursing care as "excellent" or "very good." More than one-third of those responding reported that they perceived the nursing care as "excellent." Clinically, this is a positive finding and is consistent with the outcome reported in the HQCS (2005) report.

In this study, medical patients rated the overall nursing care higher than did the surgical patients, $p = .044$, lending support to the finding regarding variability in wait time for pain medication on the surgical unit. This will be discussed later in this chapter.

Do patients' perceptions and behaviours vary according to age? Twenty-seven tests were conducted to detect if there were differences between the mean age of respondents and their perceptions and behaviours of medication safety practices. Four of the tests yielded significant results indicating there are difference between patients' perceptions and behaviours according to age. Understanding the impacts of age as a variable is increasing important as the demographics shift to an older population.

The number of medications patients reported receiving in this study was positively correlated with age and statistically significant, $p = .034$. The mean age of the study participants was 64 years and the average number of medicines they reported receiving was three. This is consistent with the work of Meadows, (2006), reporting "the average 75 year old patient has three chronic conditions and uses five prescription drugs" (pg.21), and further to work by Fulton & Allen (2005) who report that "61% of individuals older than age 65 take least one prescription medication, with most taking an average of three to five medications" (pg. 123).

The IOM report (2000), *To Err is Human*, strongly recommends that patients be viewed as members of the health team and encouraged to become actively involved in their care. Vincent and Coulter (2002) report that patients are usually perceived as victims of errors and safety failures, when in fact, active involvement or partnering in their care is their responsibility. Current patient safety initiatives focus on engaging the patient, but what do patients believe is their responsibility, and how actively are they participating in their care? This study attempted to inform the literature by exploring this issue.

Table 11 presents the patients' perceptions concerning their accountability/participation in care. The majority of respondents (62%) indicated that they perceive there is a shared responsibility between the doctor, nurse and patient for the safe administration of medicine; interestingly, 2.1% indicated that they were entirely responsible. How does age impact these perceptions?

Traditional care models were predominantly paternalistic, in the sense that the physician was the leader of the team and the patient assumed a passive role. Today's care models espouse patient autonomy and rights, requiring active patient participation (Vincent & Coulter, 2002). Older patients may not feel comfortable with or desire to assume this role based on their cumulative experience within the healthcare setting. In support, a statistically significant negative correlation was obtained in this study when inquiring "in your opinion, who is responsible for making sure your medicine is given safely?" (Question 21). This finding supports my personal observation that elderly patients often assume a more passive role in their care. Again interesting, but other research is needed here.

Do patients' perceptions and behaviours vary according to gender? Twenty-seven tests were conducted to detect if there were differences between the respondents perceptions and behaviours of medication safety practices according to gender. Six of the tests yielded significant results indicating there are difference in patients' perceptions and behaviours according to gender. These results are linked to theoretical and empirical literature in this section.

Correct patient identification and assessing for allergies are two of the five rights of medication administration (CARNA, 2005). There are several ways to correctly identify a patient when delivering care. Examples include checking their name band, asking them to state their name, or calling them by name. Only one method is required to have completed the task correctly. A statistically significant finding was observed for gender when inquiring regarding patient identification. Male patients reported more often than female patients that nurses most frequently identified them by asking them to state their name $p = .011$.

The Health Quality Council of Alberta is a proponent for patients becoming advocates for their own medication safety. In *Playing it Safe: You and Your Medication* (2007), HQCA encourages patients to remind healthcare providers about any allergies they may have to medications.

Just over half of the respondents (51.8%) recalled their nurse asking if they had any allergies prior to medicine administration, while 30.1% of the respondents self-reported that they do indeed have allergies to medicine. Male patients responded more often than female patients that nurses asked them if they had any allergies, $p = .002$. Information specific to patient reporting of allergies was not collected on this survey;

however, it would be interesting to know how many patients actually disclose their allergies to nurses when they are not asked directly, future research could assist in answering this question.

The American Hospital Association (AHA) (2005) and Health Quality Council of Alberta (HQCA) (2007) developed patient checklists to assist individuals with the information elements essential to understand regarding their medication. Both checklists include all of the indicators for question 8 (with the exception of the false point inserted to address issues of social desirability and response bias).

Nurses have a responsibility to teach patients regarding their medicines; however, multiple factors can impact this step in the medication administration process. Question 8 included an option for patients to provide narrative comments regarding the information provided by nursing throughout the medicine administration process. Seventeen patients provided comments. Although no consistent themes emerged among these comments, some patients did comment on the need for more medicine information from nursing staff, while others commented that the medicine they received was known to them already. One noted, "I've been here a long time and the nurses know me." Nursing staff may have perceived less need to review information for each instance of medication administration.

In this study, male patients reported more often than female patients that nurses reviewed information with them about how often they would get their medicine, $p = .019$, and about any side effects to watch for, $p = .045$ (see Table 15). Gender issues and their potential impact on results are beyond the scope of this study.

Do patients' perceptions and behaviours vary according to LOS? Nine tests were conducted to detect if there were differences between the mean LOS of respondents and their perceptions and behaviours of medication safety practices. Three of the tests yielded significant results indicating there are difference between patients' perceptions and behaviours according to LOS. These findings have good application for front line nurses to understand and incorporate into clinical practice.

Vincent and Coulter (2002) report that patients are usually perceived as victims of errors and safety failures, when in fact active involvement or partnering in their care is their responsibility. Safety promotion can be enhanced when patients participate in the various stages of their care: reaching an accurate diagnosis; determining an appropriate treatment plan; choosing experienced providers; ensuring treatment is appropriately administered, monitored and followed; and identifying side effects or adverse events quickly (Vincent & Coulter, 2002). More research is needed to tease out relationships between types of services provided (medical/surgical) and patients' perception of their involvement in care. Use of provincial databases and provincial wait time information would be required to conduct a systematic review of this. Self-reported information has limitations and biases that could be clarified using larger datasets.

Promoting active patient participation in the safety movement is the new mantra in healthcare. Several organizations have disseminated patient advisories (Agency for Healthcare Research and Quality, 2005; Institute of Safe Medication Practices, 2005; National Patient Safety Foundation, 2005) encouraging patients to get involved in their care. Are patients participating in their care? The results of this study indicate that patients are in fact actively participating in their care as evidenced next.

Statistically significant results were obtained in this study between patient recall of the number of medicines the nurse last gave them and their self-reported LOS, the number of medicines administered the last time they were given medicine and their self-reported LOS and those patients who reported having a list of their current medicines and their self-reported LOS. These are clinically positive findings that support patients' active participation in their care. No other studies were found in the literature to compare/contrast these findings. More research is needed to discern the relationship between types of services (medical/surgical) provided and patients' perception of their involvement in care.

How does the wait time for administration of pain medication on the nursing units at the Chinook Regional Hospital compare to results reported in the Health Quality Council Saskatchewan (2005) Survey? One test was conducted to determine if there were significant differences in wait times for pain medication between nursing units. No significant results were found. Further exploration of wait times in other settings would provide valuable insights and assist in setting benchmarks for measurement.

The self-reported wait time for patient-requested pain medicine across the four nursing units ranged from 0 to 60 minutes, with the average being 12.6 minutes (see Table 9). The survey did not inquire if patients were receiving pain medicine via a pain pump; this is noted as a limitation and could account for the reported zero wait time to receive pain medicine. One medical patient (Unit 4C) and six surgical patients (five in Unit 4A and one in Unit 3C) recall a zero wait time for pain medicine. It is important to note that this was the patients' perception of wait time and may not reflect the actual wait

time, since there are no clocks in patient rooms at the Chinook Regional Hospital. It should be noted that self-report wait time is fraught with bias and is a limitation.

The average wait time ranged from 7.8 minutes on Unit 4A to 15.3 minutes on Unit 3C. The greatest variability in wait times was reported from the surgical units providing post-operative pain control. The median values reported for all units range from 5 to 10 minutes, while the mean wait time for all the units was 12.6 minutes.

Comparing the responses of self-reported wait times for pain medication in this study and those reported in the Health Quality Council Saskatchewan (HQCS) (2005) report, overall a higher percentage of Chinook Health respondents waited less time to receive pain medication. Almost half (47%) of respondents waited less than 10 minutes, while approximately 9% waited longer than 30 minutes to receive pain medicine in this study. By comparison, the HQCS study reported that, “fewer than 13% of patients indicated that they received pain medication within 10 minutes of requesting it, and that more than 20% of patients indicated they waited longer than 30 minutes” (p. 15).

The variability across all service areas was consistent for the most part, although Unit 4A (surgery) does reflect the shortest wait time. The test results were not significant ($p = .724$); however, there was almost double the mean wait time (7.8 and 15.3 minutes) between the two surgical units.

Why such a difference in wait time for administration of pain medication between the two surgical units? Patient population might impact wait time. Unit 4A has a patient focus of orthopaedic surgery, while Unit 3C primarily focus is on the general surgery population. Another potential reason could be the difference in care delivery systems. Unit 4A (surgery), operationalizes team nursing where patients waited the shortest

amount of time to receive their pain medicine. In this model, each member of the team is assigned tasks. One nurse is responsible for the administration of medicine for approximately 16 patients. While Units 3C (surgery), 4B and 4C (medicine) all deliver nursing care using a modified primary nurse approach. This model is team based as well. A registered nurse/licensed practical nurse team are responsible for the total care of eight patients and share the workload. Does a dedicated medication nurse decrease the wait time for medication by almost half? Interestingly, Greengold et al. (2003) found that medication error rates were not impacted when dedicated medication nurses were in place. Further study is required to demonstrate the impact of nursing care models on wait time for pain medication.

Patient wait times are a complex issue impacted by many variables including patient characteristics and perceived need. Currently there are many initiatives addressing access and wait times provincially, such as wait time for cataract or total joint surgery. More systematic investigations directly addressing wait times are warranted. It should be noted that patients' perspectives are often very different than healthcare providers, thus there is value in understanding care from the patients' view.

As illustrated through the discussion, the five sub-questions elucidate responses of the medical and surgical in-patients and provide an overall answer to the primary research question posed in this study: What are medical and surgical in-patients' perceptions, attitudes and beliefs regarding their experiences of medication administration safety practices utilized by nursing staff?

Implications for Nursing Practice

Several of the results obtained in this study were not statistically significant, yet the implications for nursing practice are worthy of discussion from a clinical perspective.

For instance, no significant results were obtained between the medical and surgical patients or by gender as to the patient recall of observing their nurse wash their hands prior to administering medicine. Yet from a clinical perspective it is worth noting that 43.8% of the respondents recalled seeing their nurse wash his/her hands. Current evidence suggests that hand washing is the single most important factor in preventing nosocomial infections; it is considered a key patient safety initiative in acute care settings (Boyce & Pittet, 2002). As an infection control standard, Boyce and Pittet suggest that hand washing should supersede the preparation of medicine for administration; either an anti-microbial soap or an alcohol-based hand rub are recommended to decontaminate the hands. The recent issues of Methicillin Resistant Staphylococcus Aureus (MRSA) in the media reinforce the importance of good hand washing for patients and healthcare providers alike.

In this study, medications were prepared by nursing staff at a medication cart, often centrally located at the nursing station or occasionally positioned outside the patient's room. Hand washing sinks and alcohol-based hand rub dispensers were available at both the nursing station and within the patient rooms. The fact that 56.2% of respondents did not recall observing their nurse wash his/her hands prior to medication administration does not necessarily indicate that this task was not completed at the beginning of the medication administration process, only that the patient did not observe

it. An ethnographic or observational study observing nursing practice throughout their shift would best inform questions relating to hand washing.

According to patients' perceptions reported in this study, there were a number of inconsistencies noted in the seven rights of medication administration delivered by nurses, specifically patient identification, allergy assessment and patient teaching. This research did not focus on medication administration errors but rather on the patients' perceptions, attitudes and beliefs about medication safety practices. However, opportunities clearly exist to develop practice improvement initiatives targeted at improving medication administration processes.

Ideally, the goal of 100% adherence to the seven rights of medication administration should be promoted; however, it must be recognized that systems need to change to support individuals in delivering improved care. System changes that simplify processes and focus on patient safety will have the greatest impact on achieving consistency in care processes. In addition, strategies that encourage patients to be active participants in their care will help to reduce errors in medication administration.

Of importance, yet not statistically significant, are the 17 responses to question 2, indicating that 8 medical and 9 surgical patients do not recall that the nurse identified them prior to medicine administration. This is a very important clinical finding. Omission of one or more of the rights in the medication administration process may result in an error occurring. Reason (1990) reports that in general, violations of policy or procedures are unsafe acts, and can result in errors. Unsafe acts can also be referred to as active errors that have the potential to impact the patient immediately (Reason, 2000). Standards of nursing practice should be applied consistently, whether the nurse is engaged in the

first encounter with a patient or after multiple encounters. Unfortunately, human behaviour often changes with familiarity, as may be the case with the omission of patient identification with these 17 patients. Reason (2002) suggests that reminders can be an effective strategy by which to improve patient safety, while Hinckley (2003) promotes human factors engineering (HFE) principles of simplicity and automation as much as possible to decrease the risk of variation. Technical solutions such as bar coding for patient identification and documentation of medication administration are an HFE solution. Nonetheless, correct patient identification is critical for patient safety and adherence to this standard is necessary at all times. The consequence of incorrect patient identification could be devastating or life threatening in the medication administration process.

As a part of professional practice, nurses have a responsibility to actively observe patients taking their medicines (prescribed orally) before documenting that they have done so. Oral medicines include pills or liquid; in this study, 163 patients responded that their last medicine was in this form. Of those, 135 (82.8%) reported that the nurse watched them take their medicine before leaving the room. Clinically, this is a positive finding supporting excellence in care provided by nursing staff by adherence to professional standards.

Little research has been done to focus on patients' perceptions of safety and trust in the healthcare setting. The majority of respondents in this study (169, or 88%) reported feeling safe or very safe (see Table 10). Only one person indicated feeling unsafe. Clinically, this is a very positive response rating; it infers that patients perceive nursing staff deliver safe, quality care. Of interest and importance for front line nurses to

understand, are the results of patient perceptions of safety depending on their length of stay. A statistically significant result was obtained $p = .013$ when testing for differences in the mean responses (seven-point rating scale) of patients' perceptions of safety in nursing care, depending on their length of stay. The implications for nursing practice are important to understand that patient perceptions of safety decrease as length of stay increases. Nursing practice can be guided by this information.

What is the relationship between the patients' perception of safety and their perception of trust? In this study, overall, patients reported having trust in the nursing care they receive. Of the respondents, 153 (80%) indicated that they "completely trust" or "trust very much" the nursing care (see Table 10). No significant results were found, yet clinically it was a very important finding that the majority of patients responding in this survey trust their nurses. Further to this, testing was conducted to assess the relationship between the mean responses for safety and the mean responses for trust. As expected, a significant result was obtained $\tau = -.492$, $p < .001$, indicating that there was a negative correlation between the responses. Those patients who perceived that their care was less safe also reported having less trust in the level of nursing care. This finding demonstrates consistency in patient responses on the study survey.

Although not directly comparable to the indicator surveyed in the HQCS (2005) study (percentage of patients indicating they always had trust and confidence in their nurses, p. 12), conceptually the intent of this inquiry was the same. The findings were relatively consistent between these two studies.

Further testing was conducted to measure the relationship in the mean responses of trust and the overall rating of nursing care. Statistically significant results were

obtained that indicate those patients who reported having a higher level of trust also reported having a higher level of nursing care. Once again this finding demonstrates consistency in patient responses and provides insights into the original research question posed in this study, what are medical and surgical in-patients' perceptions, attitudes and beliefs regarding their experiences of medication administration safety practices utilized by nursing staff?

The IOM (2000) report entitled *To Err Is Human: Building a Safer Health System* cites medication errors as the largest subset of errors that occur, while Inoue and Koizumi (2004) report that organizational factors such as violations of rules and defects in the standardization of nursing practices contribute to errors by nursing. The studies by Taxis and Barber (2003a, 2003b) document the incidence of medication administration process errors as high, with a rate of 49% with a confidence interval of 95%. With this knowledge in hand, the new strategy in healthcare is to actively engage patients in their care (IOM, 2000; HQCA, 2007; Vincent & Coulter, 2002). How effectively are we meeting this strategy? I would suggest a shift is underway to engage patients, but considerable work is needed to meet this strategy and evidenced by the results below.

In an attempt to better understand patient participation in care, respondents of this study were asked: How often do you check to ensure the medicine you are being given is correct (correct dose, correct medicine, given at correct time)? Table 11 describes the patients' responses regarding their perceptions of how often they ensure that the medicine they are being given is correct. The responses were divided into two groups: 42% of the respondents indicated they check "rarely" or "some of the time" to ensure their medicine is correct, while 51% indicated that they do so the "majority or all of the time." These

findings lend support to the results observed for Question 11, where 49.7% of respondents reported that they had a current list of their medications. Active participation in checking their medications would require patients to know the specifics of the medicine they receive.

The finding that only 42% of the respondents indicated they check “rarely” or “some of the time” to ensure that their medicine is given correctly is of great clinical significance. Clearly, opportunities exist to engage patients more actively in this process, a potential practice improvement strategy for frontline nurses.

Study Limitations

A project that focused on increasing the scope of practice for Practical nurses to include the administration of medications was implemented on the in-patient medical and surgical units at the CRH between January and June 2006. As a result, mandatory theory and clinical education on the seven rights of medication administration was presented to the Practical nurses. Although registered nurses were not required to undergo the mandatory education, enhanced prompts and clinical supports were made available on the nursing units and medication carts to promote best practices for medication administration. It can be assumed that some nurses would also learn vicariously through the other nursing staff. A current review of medication administration theory and the focus paid to the newly applied skills for the Practical nurses may have positively impacted the attention paid to the processes of medication administration.

Furthermore, there was potential for the “Hawthorne effect” among nursing staff resulting from their awareness of this study (Polit & Hungler, 1999). To mitigate this possibility, nurses on the medical and surgical in-patient units at the CRH were informed

of the study in July 2006, once Regional Ethics Board approval had been granted. No additional information was provided to nursing staff about the start date of the study, in an effort to decrease conscious changes in behaviour resulting from their awareness of the study. The sampling protocol described in Chapter 3 was structured so as to lessen the Hawthorne effect by utilizing a research assistant (less familiar than the researcher to staff on the units) and by rotating the days of data collection over an extended period of time.

Age may have influenced the responses of the participants based on their prior experience with the healthcare system and their comfort with engaging as an active participant in the healthcare team. Traditional care models were predominantly paternalistic, in the sense that the physician was the leader of the team and the patient assumed a passive role. Today's care models espouse patient autonomy and rights, requiring active patient participation (Vincent & Coulter, 2002). Older patients may not feel comfortable with or desire to assume this role.

There was a discrepancy between the patients' perceptions of a "surgical procedure" (question 25, "I was admitted to the hospital to have surgery") and the definition utilized by the researcher, as discussed in Chapter 4. A clearer explanation of the definition of "surgical procedure" operationalized by the researcher could have been provided on the survey. The clarity of definition may in fact have resulted in different patient responses to question 25, therefore eliminating the need for the researcher to recode 14 missing cases as medical patients.

Since many patients would neither require nor ask for pain medication, the number of respondents answering questions related to pain medication was decreased.

The survey did not inquire if patients were receiving pain medicine via a pain pump; this was noted as a limitation and could account for the reported wait time of zero minutes to receive pain medication. In addition, the wait time reported for medication administration was the patients' perception of wait time; there were no clocks in the patient rooms at the Chinook Regional Hospital to validate times reported. Self-reported wait times are fraught with bias (recall) therefore noted as a limitation.

The survey did not inquire as to the type of pain medication administered as it relates to question 17: "The nurse raised the side rails on my bed after giving me my pain medicine." Nurse behaviour would potentially vary according to the classification of pain medication administered, opioid and non-opioid, as discussed previously.

As a method of inquiry, survey formats present limitations such as: the need to recall information or past experiences, limited response options, self-selection of responses and lack of ability to probe into responses.

Other limitations include the sample size. This is a relatively small sample and relatively small study period which impacts the generalizability. Study location may in fact be viewed as a limitation. The Chinook Regional Hospital is a mid size, secondary level care site with speciality services in a rural setting. The study location can only be comparable to other like sized, service oriented sites.

Lastly, ninety-two tests of significance were performed in this exploratory analysis and the *p*-value of .05 was reported as significant. To ensure that the overall chance of making a Type I error was still less than .05; a statistical adjustment was performed using the Bonferroni correction. The adjusted *p*-value = .001. Three tests achieved a *p*<.001. These included: female patients recalled more frequently than male

patients the last medicine they were administered was for pain, differences were reported by LOS in whether the patients could recall the last medicine they were given. Patients with a LOS of 1-3 days reported most frequently they could recall the last medicine they were given and lastly, differences were reported by LOS in whether the patient had a current list of medicines they were on. Patients with a LOS of 1-3 days reported most frequently they had a current list of their medicines.

Recommendations for Future Research

Medication administration is a complex nursing task that requires a balance of critical thinking, judgment and technical skills. The outcome for patients includes potential risk or safe care, reinforcing the need for further research to inform administrators, educators and the public of the opportunities on ways to improve this process. As discussed there has been very little research in the area of patient safety and medication administration. Future research should include studies on system changes to support safer medication administration, such as dedicated medication nurses and bar coding name bands. How might these changes impact safety? There is a need to understand how to better change the system to encourage closer partnerships with patients. Once this is accomplished research can explore the impact of safety practices on patients and care providers. Further study is needed observing active and latent system failures and their impact on medication safety processes, especially for nurses working in busy acute care settings.

A shift is underway towards active engagement of patients in their care, promoting safety. What is the effectiveness of patient advisories on this strategy? Is there a difference in knowledge uptake and participation with varying age groups? As

demographics change and the population ages, understanding and supporting older patients within healthcare settings has large implications.

Medication administration is a very complex process. There are new and emerging studies on a variety of topics in this area including medication reconciliation and abbreviations in medication ordering. Synthesizing these and other studies will help to inform all stakeholders on how to improve the medication administration process.

The findings of this study inform the reader of medical and surgical patients' perceptions and behaviours regarding medication safety practices. Knowledge gained has the potential to assist with the development of system changes targeted at decreasing human error and ultimately assisting healthcare providers in fulfilling the medical oath, "Never do harm to anyone" (Hippocrates, n.d.).

References

- Agency for Healthcare Research and Quality (AHRQ). (2005). *20 Tips to help prevent medical errors*. Patient fact sheet. Retrieved November 29, 2005, from <http://www.ahrq.gov/consumer/20tips.htm>
- Alberta Health and Wellness (AHW). (2007). *Alberta Health Data Bases/Population Demographics 2005/06 Population Data*. Created Feb 20, 2007. Edmonton, AB: Author.
- American Hospital Association (AHA). (2005). *Improving medication safety by partnering with patients*. Retrieved November 11, 2005 from <http://www.hospitalconnect.com>
- Babbie, E. (1983). *The practice of social research* (3rded.). Belmont, CA: Wadsworth.
- Baker, G. R., Norton, P. G., Flintoft, V., Blais, R., Brown, A., Cox, J., et al. (2004). The Canadian Adverse Events Study: The incidence of adverse events among hospital patients in Canada. *Canadian Medical Association Journal*, 170(11), 1678-1686.
- Baker, H. M. (1997). Rules outside the rules for administration of medication: A study in New South Wales, Australia. *Image: Journal of Nursing Scholarship*, 29(2), 155–158.
- Bechtel, G. A., Vertres, J. L., & Swartzberg, B. (1993). A continuous quality improvement approach to medication administration. *Journal of Nursing Care Quality*, 7(4), 28-34.
- Black, T. R. (1999). *Doing quantitative research in the social sciences: An integrated approach to research design, measurement and statistics*. London, UK: Sage.

- Boyce, J. M., & Pittet, D. (2002). Guideline for hand hygiene in health-care settings: Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. *Infection Control and Hospital Epidemiology*, 23(12), S3- S31.
- Brennan, T. A., Leape, L. L., Laird, N. M., Hebert, L., Localio, A. R., Lawthers, A. G., et al. (1991). Incidence of adverse events and negligence in hospitalized patients: Results of the Harvard Medical Practice Study. *New England Journal of Medicine*, 324(6), 370-376.
- Brown, M. (2001). Managing medication errors by design. *Critical Care Nursing Quarterly*, 24(3), 77-97.
- Canadian Council on Health Services Accreditation (CCHSA). (2005). *CCHSA patient safety goals and required organization practices communiqué #2: December 2004*. Retrieved December 2, 2005 from <http://www.cchsa.ca>
- Canadian Council on Health Services Accreditation (CCHSA). (2006). *CCHSA patient/client safety goals and required organizational practices*. Ottawa, ON: Author.
- Canadian Pain Society (CPS). (2005). *Accreditation pain standard: Making it happen*. Retrieved February 20, 2007, from http://www.canadianpainsociety.ca/accrediation_manual.pdf
- Canadian Patient Safety Institute (CPSI). (2005). *Overview: Building a safer health system*. Retrieved November 27, 2005, from <http://www.cpsi-icsp.ca/about.htm>
- Carlton, G., & Blegen, M. A. (2006). Medication-related errors: A literature review of incidence and antecedents. *Annual Review of Nursing Research*, 24, 19-38.

- Chinook Health. (2005/2006a). *Medication incidents, Units 3C, 4A, 4B, and 4C*. Incident report. Lethbridge, AB: Author.
- Chinook Health. (2005/2006b). *Utilization indicators, Units 3C, 4A, 4B, and 4C*. Utilization indicator report. Lethbridge, AB: Author.
- Clancy, C. M., Farquhar, M. B., & Sharp, B. A. (2005). Patient safety in nursing practice [Review]. *Journal of Nursing Care Quality, 20*(3), 193-197.
- College and Association of Registered Nurses of Alberta (CARNA). (2003). *Nursing practice standards*. Edmonton, AB: Author.
- College and Association of Registered Nurses of Alberta (CARNA). (2005). *Medication administration: Guidelines for registered nurses*. Edmonton, AB: Author.
- College and Association of Registered Nurses of Alberta (CARNA). (2007). *Continuing Competence program*. Retrieved March 5, 2007 from http://www.nurses.ab.ca/pdf/01_CC_ContCompProgram.pdf
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative and mixed approaches* (2nd ed.). Lincoln, NE: Sage.
- Entwistle, V. A., Mello, M. M., & Brennan, T. A. (2005). Advising patients about patient safety: Current initiatives risk shifting responsibility. *Joint Commission Journal on Quality and Patient Safety, 31*(9), 483-494.
- Fulton, M. M., & Allen, E. R. (2005). Polypharmacy in the Elderly: A Literature Review. *Journal of the American Academy of Nurse Practitioners, 17*(4), 123-132.
- George, D., & Mallery, P. (2005). *SPSS for Windows step by step* (5th ed.). Boston, MA: Pearson.

- Gosbee, J. (2002). Human factors engineering and patient safety. *Quality and Safety in Health Care*, 11(4), 352-354.
- Greengold, N. L., Shane, R., Schneider, P., Flynn, E., Elashoff, J., & Hoying, C. L. (2003). The impact of dedicated medication nurses on the medication administration error rate: A randomized controlled trial. *Archives of Internal Medicine*, 163(19), 2359-2367.
- Hackel, R. L. B., & Banister, G. (1996). How nurses perceive medication errors. *Nursing Management*, 27(1), 31-34.
- Health Quality Council of Alberta. (2005). *Mandate*. Retrieved November 27, 2005, from <http://www.hqca.ca/index>
- Health Quality Council of Alberta. (2007, January). *Playing it safe: You and your medication*. Retrieved March 6, 2007, from http://www.hqca.ca/phpBB2/files/hqca_health_report_2007_202.pdf
- Health Quality Council of Saskatchewan. (2005). *About the Health Quality Council*. Retrieved January 16, 2006, from <http://www.hqc.sk.ca/portal>
- Helmreich, R. (2005, October). *Selecting for personality*. Paper presented at the Canadian Healthcare Safety Symposium, Advancing the Culture of Safety, Calgary, Alberta.
- Hinckley, C. M. (2003). Make no mistake: Errors can be controlled. *Quality and Safety in Health Care*, 12(5), 359-365.
- Hippocrates. (n.d.). *Hippocratic Oath*. Retrieved November 16, 2005, from http://en.wikipedia.org/wiki/Hippocratic_Oath#Modern_Alternatives.

- Inoue, K., & Koizumi, A. (2004). Application of human reliability analysis to nursing errors in hospitals. *Risk analysis*, 24(6), 1459-1473.
- Institute of Medicine (IOM). (2000). *To err is human: Building a safer health system*. Washington, DC: National Academy Press.
- Institute of Safe Medication Practices. (2005). *How to prevent medication errors: Recommendations and safety tips*. Retrieved October 26, 2005, from http://www.ismp.org/PDF/Patient_Broc.pdf
- Johnson, G. E., & Hannah, K. J. (1987). *Pharmacology and the nursing process* (2nd ed.). Toronto: B. Saunders.
- Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (1999). *To err is human: Building a safer health system*. Executive summary. Washington, DC: National Academy Press.
- Kovner, C., Menezes, J., & Goldberg, J. D. (2005). Examining nurses' decision process for medication management in home care. *Journal on Quality and Patient Safety*, 31(7), 379-385.
- Leape, L. L., Brennan, T. A., Laird, N., Lawthers, A. G., Localio, A. R., Barnes, B. A., et al. (1991). The nature of adverse events in hospitalized patients: Results of the Harvard Medical Practice Study II. *New England Journal of Medicine*, 324(6), 370-377.
- Maillard, N., Stirling, S., Lilford, R., Johal, A., & Gilbert, N. (2005). *Patient safety: An unsystematic review and bibliography*. University of Birmingham, UK. Retrieved March 13, 2007, from

http://www.pcpoh.bham.ac.uk/publichealth/psrp/Pdf/patientsafetybibliography_02SEPT.pdf

Meadows, M. (2006). Medication Use and Older Adults. *FDA Consumer*, July/August, 20-26.

Nardi, P. M. (2003). *Doing survey research: A guide to quantitative methods*. Boston, MA: Pearson

National Patient Safety Foundation (NPSF). (2005). *Online fact sheets and brochures in patient safety*. Retrieved November 29, 2005 from

http://www.npsf.org/html/online_resources.html

Northcott, H. C., & Northcott, J. L. (2004). *Alberta Patient Safety Survey 2004-2005*.

Prepared for the Health Quality Council of Alberta, by Population Research

Laboratory, Department of Sociology, University of Alberta. Retrieved March 7, 2007, from

http://www.hqca.ca/templates/HQCA5/pdf/Alberta%20Patient_Safety_Survey_PartA_Quantitative_Analysis.pdf

Parker, D., & Lawton, R. (2003). Psychological contributions to the understanding of adverse events in health care. *Quality and Safety in Health Care*, 12(6), 453-457.

Polit, D. F., & Beck, C. T. (2004). *Nursing research: Principles and methods* (7th ed.). Philadelphia, PA: Lippincott.

Polit, D. F., & Hungler, B. P. (1999). *Nursing research: Principles and methods* (6th ed.). Philadelphia, PA: Lippincott.

- Rasmussen, J. (1987). The definition of human error and a taxonomy for technical system design. In J. Rasmussen, K. Duncan, & J. Leplat (Eds.), *New technology and human error* (pp. 23-30). Chichester, UK: Wiley.
- Reason, J. (1990). *Human error*. New York: Cambridge University Press.
- Reason, J. (2000). Human error: Models and management. *British Medical Journal*, 320(7237), 768-770.
- Reason, J. (2002). Combating omission errors through task analysis and good reminders. *Quality and Safety in Health Care*, 11(1), 40-44.
- Reason, J. (2005, October). *Advancing the culture of safety*, Keynote presentation at Advancing the Culture of Safety, Canadian Healthcare Safety Symposium, Calgary, Alberta.
- Salas, E., Wilson, K. A., Burke, C. S., & Priest, H. A. (2005). Using simulation-based training to improve patient safety: What does it take? *Journal on Quality and Patient Safety*, 31(7), 363-371.
- Santell, J. P., & Cousins, D. D. (2005). Medication errors involving wrong administration technique. *Journal on Quality and Patient Safety*, 31(9), 528-532.
- Schimmel, E. M. (2003). The hazards of hospitalization. 1964. *Quality and Safety in Health Care*, 12(1), 58-63.
- Simmelweiss, I. (1983). *The etiology, concept and prophylaxis of childbed fever*. (K. C. Carter, Trans.). Madison, WI: University of Wisconsin Press.
- Shaw, L., & Sichel, H. S. (1971). *Accident proneness: Research in the occurrence, causation and prevention of road accidents*. New York: Pergamon Press.

- Stafford, M. (2000). To err is human: Building a safer health system. Nursing's response to IOM Report on Medical Errors. *CHART*, 97(7), 1, 6-9.
- Taxis, K., & Barber, N. (2003a). Causes of intravenous medication errors: An ethnographic study. *Quality and Safety in Health Care*, 12(5), 343-347.
- Taxis, K., & Barber, N. (2003b). Ethnographic study of incidence and severity of intravenous drug errors. *British Medical Journal*, 326(7391), 684-687.
- Vincent, C. A., & Coulter, A. (2002). Patient safety: What about the patient? *Quality and Safety in Health Care*, 11(1), 76-80.
- Vincente, K. J. (2003). Less is (sometimes) more in cognitive engineering: The role of automation technology in improving patient safety. *Quality and Safety in Health Care*, 12, 291-294.
- Wagner, E. H. (2000). The role of patient care teams in chronic disease management. *British Medical Journal*, 320, 569-572.
- Wilson, R. M., Runciman, W. B., Gibberd, R. W., Harrison, B. T., Newby, L., & Hamilton, J. D. (1995). The Quality in Australian Health Care Study. *Medical Journal of Australia*, 163(9), 458-471.
- Wohlgemuth, N., Chan, B. T., Koru-Sengul, T., & Teare, G. (2005). *Improving the Saskatchewan acute care hospital experience: A survey of Saskatchewan in-patients*. Health Quality Council of Saskatchewan. Retrieved March 7, 2007, from <http://www.hqc.sk.ca/download.jsp?ZNgFV5IGQ5AuG554rvUx/+/jxqNQVtQU77MfdMZ+xWIMMNcW/soFoA>
- Woodward, C. A., & Chambers, L. W. (1991). *Guide to questionnaire construction and question writing* (2nd ed.). Ottawa: Canadian Public Health Association.

Appendix A. Response from Chinook Health Region



Corporate Office

Phone: 403 / 388-6009
Fax: 403 / 388-6011

1 June 2006

Ms. Teri Myhre
124 Riverdale Terrace West
Lethbridge, AB
T1K 7S9

tmyhre@chr.ab.ca

Dear Ms. Myhre:

**Re: Research Proposal 2006-03
Medication Safety Practices – A Patients' Perspective**

The above-noted proposal was presented to the Chinook Health Region Regional Research Committee on 31 May 2006. The following concerns were identified:

1. The questionnaire should be reviewed/corrected for clerical errors.
2. Validity Testing – in the interest of the researcher, a suggestion was made that the Research Assistant be the liaison with the LRH medical and surgical educators

The Chinook Health Region Regional Research Committee approved your study, with the above-noted recommendations.

Yours truly,

Paul A. Easton, MD, PhD, FACP, FCCP, FRCPC, ABSM
Chairman - Chinook Health Region Regional Research Committee

PE/dl

cc: file

The best of health for everyone.

CORPORATE OFFICE: 960-19th Street South • Lethbridge, Alberta • T1J 1W5 • Phone: 403/388-6009 • Fax: 403/388-6011 • info@chr.ab.ca • www.chr.ab.ca

Appendix B. Cover Letter for Survey

November, 2006

Dear Patient,

Hello. My name is Teri Myhre, and I am a nurse completing my Master's degree in Health Sciences at the University of Lethbridge. I am studying patient safety, which is a primary goal of nurses. As a patient, you can offer valuable feedback. Your responses will help us better understand if improvements can be made in providing care for you.

As a part of my studies, I am surveying medical and surgical patients in this hospital to assess your attitudes, perceptions and beliefs about safety practices used by nurses when giving medicine to you. It will take you about 15 - 20 minutes to complete. Completing the survey is completely **voluntary**. Your answers will help us to identify and understand important safety issues. You will not benefit directly from participation in this research. Your care will not be affected if you choose not to participate. You may withdraw at anytime.

By completing the survey it is understood that you are consenting to participate in this study. No separate consent is needed.

No personal information is required from you on the survey. Your responses will be completely confidential. The results of the survey will be kept in a locked filing cabinet. I will be the only person who will have access to this information. Your answers will be grouped with those of other patients when presented and reported, so you cannot be identified. You will remain anonymous. The results of the survey will be written and presented as a part of my Master of Health Sciences thesis and may be published. The nurses caring for you will not have access to your answers.

If you feel able, please complete the survey today. Place the completed survey in the attached envelope. Seal it and leave it at your bedside. My research assistant will pick it up later today. If for any reason you do not want to fill out the survey, please leave it blank and it will be picked up.

If you have any **questions or concerns** regarding this survey, please ask your nurse to call me at 403-388-6172. Questions regarding your rights as a participant in this research may be addressed to the Office of Research Services, University of Lethbridge (Phone: 403-329-2747), and/or by contacting the Director of Issues Management, Chinook Health Region (Phone: 403-388-6003).

If you would like a copy of the survey results, please complete the attached post card, and the results will be mailed to you.

Thank you very much for your co-operation.

Yours truly,

A handwritten signature in black ink that reads "Teri Myhre". The signature is written in a cursive, flowing style.

Teri Myhre RN, BN

Graduate Student, University of Lethbridge

Appendix C. Medicine Safety Survey: A Patient's Perspective

| Section 1 | |
|---|--|
| <p>I would like to ask you some questions about your views on safety. The following questions represent statements about safety practices nurses should use when giving you medicine. When you answer this survey, please think of the last time your nurse gave you medicine today.</p> | |
| <p>1. Before giving my medicine to me today, I saw the nurse wash his/her hands.</p> <p>1. <input type="checkbox"/> Yes 2. <input type="checkbox"/> No</p> | |
| <p>2. Before giving my medicine to me today, the nurse identified me by:</p> <p>Please check (√) all that apply.</p> <p>1. <input type="checkbox"/> checking my name band</p> <p>2. <input type="checkbox"/> asking me to state my name</p> <p>3. <input type="checkbox"/> asking me my mother's name</p> <p>4. <input type="checkbox"/> calling me by my name</p> <p>5. <input type="checkbox"/> did none of the above</p> | |
| <p>3. The medicine the nurse gave me today was NEW. Today was the first time I received it.</p> <p>1. <input type="checkbox"/> No 2. <input type="checkbox"/> Yes</p> | |
| <p>4. Before giving my medicine to me, the nurse asked me if I had any allergies.</p> <p>1. <input type="checkbox"/> Yes 2. <input type="checkbox"/> No</p> | |
| <p>5. Do you have allergies to any medicine?</p> <p>1. <input type="checkbox"/> Yes - If you answered Yes, go to question 6. 2. <input type="checkbox"/> No – If you answered No, go to question 7.</p> <p style="text-align: center;">↓</p> | |

6. What medicine are you allergic to?

7. The last time your nurse gave you medicine, how many different types (number) of medicine were you given?

8. For each medicine, the nurse reviewed the following information with me before giving me my medicine. Please check (✓) all that apply.

1. name of the medicine
2. amount or dose of medicine ordered
3. how often I will get the medicine
4. what the medicine will taste like
5. why I am taking the medicine
6. side effects I should watch for
7. asked if I have ever taken the medicine before
8. none of the above
9. other information (give example) _____

9. Can you recall what type of medicine your nurse last gave to you?

1. No - If you answered No, go to question 11. 2. Yes – If you answered Yes, go to question 10.

10. What type of medicines were they? Please check (✓) all that apply.

1. pain medicine
2. antibiotic

- 3. blood thinner (anticoagulant)
- 4. hormone replacement
- 5. blood pressure pill
- 6. heart pill
- 7. water pill
- 8. peppermint
- 9. sleeping pill
- 10. other type of medicine (please state) _____

11. I have a list of all the medicine I am currently taking.

1. Yes 2. No

12. The last time my nurse gave me my medicine it was: Please check (√) all that apply.

- 1. a pill
- 2. a liquid
- 3. a cream
- 4. needle
- 5. I.V. – intravenous
- 6. an eye drop

} If you answered 1-3, go to question 13.

} If you answered 3-6, go to question 14.

13. The nurse watched me take my pills or liquid medicine before he/she left the room.

1. No 2. Yes

14. The last medicine my nurse gave me was for pain.

1. Yes – If you answered Yes, go to question 15. 2. No – If you answered No, go to question 18.

15. Did you ask for the pain medicine?

1. No – If you answered No, go to question 18. 2. Yes – If you answered Yes, go to question 16.

16. After you asked for the *pain medicine*, how long did you have to wait before the nurse gave it to you?

1. _____ minutes

17. My nurse *raised* the side rails on my bed after giving me my pain medicine.

1. Yes 2. No

Section 2

Next, I would like to know how you are feeling about your nursing care. When answering questions 18 - 20, please circle the number along the scale that reflects how you feel about your nursing care during this admission to the hospital.

18. I feel the care I receive from nurses is:

- | | | | | | | |
|-----------|------|---------------|-------------------------|-----------------|--------|-------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Very safe | Safe | Somewhat safe | Neither safe nor unsafe | Somewhat unsafe | Unsafe | Very unsafe |

19. The level of trust I have in the nursing care I receive is:

- | | | | | | | |
|-----------------|------------------|----------------------|----------------------------|-------------------|-----------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| No trust at all | Very distrustful | Somewhat distrustful | Neither trust nor distrust | Somewhat trustful | Trust very much | Completely trust |

20. Overall, I would rate the nursing care during this hospital stay as:

- | | | | | | | |
|-----------|-----------|------|-----------------------|------|-----------|----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Excellent | Very good | Good | Neither good nor poor | Poor | Very poor | Terrible |

Section 3

Now, I would like to know how you feel about your participation when medicine is given to you.

21. In your opinion, who is responsible for making sure your medicine is given safely?

| | | | | |
|-----------------------------|---------------------------|--|-------------------------|---------------------------|
| 1 | 2 | 3 | 4 | 5 |
| I am not responsible at all | I am a little responsible | Shared responsibility with nurses, doctors, and me | I am mostly responsible | I am entirely responsible |

22. How often do you check to ensure the medicine you are being given is correct (correct dose, correct medicine, given at correct time)?

| | | | | |
|--------|------------------|------------------------|----------------------|-----------------|
| 1 | 2 | 3 | 4 | 5 |
| Rarely | Some of the time | About half of the time | Majority of the time | All of the time |

Section 4

Lastly, I would like to ask you a few questions about yourself. Please complete the following information by placing a \checkmark in the box that applies.

23. Gender: 1. Male 2. Female

24. My date of birth is:
Day Month Year

25. I was admitted to the hospital to have surgery:

1. No 2. Yes

26. I am on unit:

1. Unit 3C Surgery room 332 – 350
2. Unit 4A Surgery room 400 – 418
3. Unit 4B Medicine room 419 – 437
4. Unit 4C Medicine room 438 – 450

27. I was admitted to the hospital:

1. Today
2. 1 – 3 days ago
3. 4 – 7 days ago
4. 8 – 10 days ago
5. longer than 10 days ago

28. Please leave other comments you would like to make about medicine safety:

Thank you for taking time to complete this survey. If you would like a copy of the results sent to you, please complete the attached postcard.

If you would like to talk with someone about your experiences in the hospital, please ask to speak to the charge nurse on your unit.

Yes – I would like to be notified about the results of the study when they are completed in about six months. Please mail me a summary of the study when it is completed at the address below.

Mailing address: _____

City/Town: _____

Province: _____

Postal Code: _____