

DEVELOPING RESILIENCE, FORESIGHT & INTUITION DURING CLINICAL HANDOVERS

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ABSTRACT

Over the past number of years, there has been an international focus on improving communication amongst clinicians during transition points in care. Although clinicians achieve successes in bridging gaps during clinical handovers the focus of research continues to be on communication problems amongst team members and its association to healthcare errors. As such, there are a limited number of studies relating to how clinicians are demonstrating expertise and bridging gaps to mitigate foreseeable risks and improving patient safety. This qualitative-based study explored the techniques that rural intensive care nurses use to develop their foresight and intuition during clinical handovers. Clinical handover refers to “the transfer of information and professional responsibility and accountability between individuals and teams, within the overall system of care” (Australian Medical Association, 2006, p. 10).

Twelve rural intensive care nurses were individually interviewed in addition to forty-four observations during handovers at change of shift or during other transitions in care (e.g. clinical handovers in the unit or transfer of care to another clinical area). There were a variety of techniques identified that nurses knowingly (or unknowingly) use to develop their foresight and intuition abilities. Specifically, these nurses seek to understand and scrutinize clinical data and measures; they identify with an and develop their own ‘gut/sixth’ sense by asking their colleagues anticipatory questions about what do they sense is happening with a patient; they strategize courses of action with colleagues; and lastly they incorporate the lessons that have been learned at a local level into their own practice.

TABLE OF CONTENTS

Abstract	3
Table of Contents.....	4
List of Figures, Tables & Appendices.....	5
Introduction	6
Scope of the Problem.....	8
Theoretical Foundations.....	10
Resilience.....	10
Dynamic Safety Model.....	13
Flirting with the Margin & Marginal Creep.....	14
Research Study Methodology	15
Qualitative Research Design.....	15
Participant Recruitment & Selection Process.....	18
Ethical Considerations	21
Qualitative Data Analysis.....	22
Results & Analysis	23
Putting Pieces of the Puzzle Together.....	25
Identifying with Abstract Senses.....	27
Strategizing Courses of Action	32
Utilizing Local Learning	35
Answers to Perplexing Questions	38
Discussion	39
Dilemmas with Discussing Foresight, Intuition & the ‘Gut/Sixth Sense’	39
Methodological Discussion	40
Clinical Relevance of Findings.....	42
Face-to-Face Communications for Handovers	42
Sharing Lessons Learned from Provincial, Regional & National Levels.....	43
Evaluating the Use of the SBAR Unit to Unit Communication Sheet	44
Strengths and Limitations of Study.....	44
Relating the Research Findings to Similar Studies.....	45
Conclusion	49
References.....	51
Appendices	55
Appendix A: Semi-Structured Interview Questions.....	55
Appendix B: Participant Information & Consent Form	60
Appendix C: Swedish Research Ethics Board Response Letter (Translated Version).....	63
Appendix D: Southern Health-Santé Sud Research Letter	64
Appendix E: SBAR Unit-to-Unit Communication Handoff Sheet	65

LIST OF FIGURES, TABLES & APPENDICES

Figure 1: The Four Cornerstones of Resilience.....	11
Figure 2: Dynamic Safety Model.....	13
Figure 3: Flirting with the Margin & Marginal Creep.....	14
Table 1: Years of Experience Working as a Registered Nurse and with ICU Experience	19
Appendix A: Semi-Structured Interview Questions.....	55
Appendix B: Participant Information & Consent Form.....	60
Appendix C: Swedish Research Ethics Board Response Letter (Translated Version).....	63
Appendix D: Southern Health-Santé Sud Research Approval Letter.....	64
Appendix E: SBAR Unit-to-Unit Communication Handoff Sheet.....	65

INTRODUCTION

Throughout our lives it is inevitable that we will become or are currently a recipient of health care services. As a patient, we expect or at the minimum assume that health care providers communicate effectively amongst each other when services are transferred to another clinician or interdisciplinary team so that the best possible care can be delivered to us. These views are akin to clinicians' actions that focus on identifying and nullifying gaps to prevent adverse outcomes to patients during transitions of care (Cook, Render, Woods, 2000).

In spite of the successes that practitioners have achieved in bridging gaps during clinical handovers the focus of the research has been on communication problems amongst team members and its association to healthcare errors (Schaefer et al, as cited by the World Health Organization, 2009; Lingard, Espin et al, 2004; Cook, Render, Woods, 2000). As such, the majority of literature on clinical handovers continues to recommend strategies to improve communication such as using checklists and standardized techniques such as the SBAR mnemonic (Situation, Background, Assessment, Recommendation) in spite of their unproven effectiveness to strengthen communiqué (Hill, 2010; Hill & Nyce, 2010).

Improving communication during transition points has taken on an international focus in Australia, Europe, United States and Canada (Moore, 2012; World Health Organization, 2009; Jeffcott, Evans et al, 2009; Australian Medical Association, 2006; Hill & Nyce, 2010).

In Canada, Accreditation Canada (2012) has established the following tests for compliance to measure the effectiveness of communication during clinical handovers:

- The team has established mechanisms for timely and accurate transfer of information at transition points.
- The team uses the established mechanism to transfer information.

Although there are increasing compliance rates with these criteria across the nation there are no outcome measures published by Accreditation Canada to evaluate whether these interventions are improving patient care and safety. Accreditation Canada (2011) has indicated that from 2008 to 2010 compliance rates for these criteria have increased from 74% to 92% across the nation.

However, further research is needed to determine if there is an association between communication practices, system processes and health outcomes (Lingard, Espin et al, 2004).

These types of research studies are longitudinal in nature and focus on whether efforts to improve team communication are making a difference to the delivery of patient care and safety.

Beyond traditional research studies that aim to make correlations between interventions and outcomes and accreditation bodies that focus on the conformance to standards, there is a need to study how practitioners are demonstrating expertise and bridging gaps to improve patient safety during clinical handovers. Hill (2010) and Jeffcott & Ibrahim et al (2009) support the need for further research in the area of clinical handovers and identify the importance of studying how clinicians contribute to organizational resilience and patient safety.

Given the limited timeframe to conduct fieldwork for this thesis, the research study is narrowed and focuses on the following question:

What techniques do rural intensive care (ICU) nurses use to develop their foresight and intuition during clinical handovers?

Scope of the Problem

Although there are a variety of conceptual models and definitions of clinical handovers within healthcare (Jeffcott, Evans et al, 2009) the one most frequently cited is by the Australian Medical Association (2006) which states: “Clinical handover refers to the transfer of information and professional responsibility and accountability between individuals and teams, within the overall system of care” (p. 10).

The latest research in this area demonstrates a need to understand how failure is avoided and how success is achieved through means of clinical handovers (Jeffcott, Ibrahim, et al, 2009). This view is tantamount to claiming that clinicians create safety in environments which are fraught with hazards, gaps and competing priorities which require multiple trade-off decisions to achieve both efficiency and safety (Cook, Render, Woods, 2000). Or, in other words, “to understand how failure sometimes happens one must first understand how success is obtained...” (Cook et al, 2000 as cited in Woods & Hollnagel, 2006, p.3).

This research aligns with Hollnagel’s (2011) views which sees ‘the things that go wrong’ as the flip side of the ‘things that go right’, and therefore assumes that they are the result of the same underlying processes” (p. xxxiii). From this perspective, there are no hidden ‘error producing’ processes that suddenly begin to work when an incident is about to happen but which otherwise remain dormant in the system (Hollnagel, 2011).

While there is a movement to shift our paradigm towards understanding how a system operates under normal conditions, rather than limiting our attention to adverse events, there is a paucity of research relating to how clinicians create safety through advancing their foresight and intuition abilities (Hill & Nyce, 2010). Woods (2009) describes foresight as an ability to “estimate what can happen in the future based on data or patterns that are available from the immediate past” (p. 500). From this stance, foresight affects how nurses successfully bridge gaps so they can deliver patient care in a safer manner.

Westrum (2006) indicates that foresight may arise from learning lessons from experience or it may be associated with the processing of “faint signals” such as “gut feelings, suspected trends and intelligent speculation” (p. 59). He asserts that foresight capabilities allow for hidden events to be detected and encourages proactive responses to dangers that have not yet materialized.

Hollnagel & Woods (2006) similarly discuss how knowledge extends beyond the acquisition of information as it relates to knowing what to expect (anticipation), what to look for (monitoring) and where to focus one’s attention and it relates to a capacity “...to expect the unexpected and to look for more than just the obvious” (p. 349). Adamski & Westrum (as cited in Hollnagel & Woods, 2006) refer to this as requisite imagination as it relates to an ability to anticipate when and how calamity may arise. These authors’ views are important to reflect upon as they establish the foundation that foresight is more than concrete knowledge and relates to an ability to interpret and respond to signs or symptoms that may not be readily present. From a clinical perspective, foresight is beneficial as it allows clinicians to intervene and mitigate any foreseeable risks and negative outcomes to patients. Intuition, on the other hand, implies an automatic sympathetic response to what may be occurring or emerging in a patient’s health condition. Klein (1999) proclaims, “intuition grows out of experience” (p.33). That is, intuition allows

people to recognize things without knowing how they are recognizing (Klein, 1999). Bechara, Damasio, et al (1997) also discovered that in ‘normal’ individuals (e.g. without pre-frontal brain damage) non-conscious bias guided behaviour before conscious knowledge. In other words, previous experience influenced how participants initially responded to situations rather than knowledge being at the forefront of decision-making.

In discussing these viewpoints, it is rather apparent that foresight and intuition abilities are necessary for clinicians to acquire and continuously build upon as these skills positively contribute to safety (Hollnagel, 2010). Yet, in spite of this deductive thinking there are a limited number of research studies that examine how clinicians develop their foresight and intuition abilities.

THEORETICAL FOUNDATIONS

The underpinnings of this research are founded on the ideologies of resilience, as defined by Hollnagel (2011), and what are termed the ‘dynamic safety model’ and ‘flirting with the margin and marginal creep’ (Cook & Rasmussen, 2005).

Resilience

Hollnagel (2011) defines resilience as: “the intrinsic ability of a system to adjust its functioning prior to, during, or following changes and disturbances, so that it can sustain required operations under both expected and unexpected conditions” (p.xxxvi). This definition is founded on the

principles of resilience engineering (RE) that provides an understanding of how people in complex and high-risk industries learn to anticipate and create safety under variable conditions.

The quest for how resilient or fragile an organization is leads us to look beyond conformance to standards and norms which often management believes governs behaviour to show how people actually demonstrate expertise beyond these standards and how they are able to anticipate and respond to situations or risks should they arise (Woods, 2009). Hollnagel (2009, 2011) describes these factors as the cornerstones of a resilient system. These factors are figuratively described below:

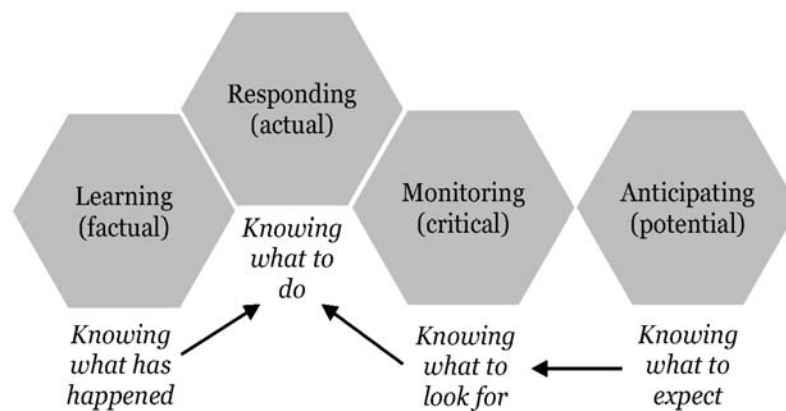


Figure 1: The Four Cornerstones of Resilience (Hollnagel, 2011; 2010, 2009)

In reviewing these factors there is a noticeable association between what brings about resilience in a system to what constitutes as people having well-developed foresight and intuition abilities that work in that system. That is, when people know what to expect, what to monitor, how to respond and what lessons to decipher from their experiences they are able to advance their foresight and intuition abilities which in turn contributes to organizational resilience. Therefore, it is important to understand what techniques people in a system are utilizing to develop their

foresight and intuition abilities, as this will offer insight as to how probable an organization is able to succeed under varying conditions.

In considering the measurement of an organization's resilience, it is important to keep in mind that resilience refers to quality rather than quantity (e.g. something a system does rather than something it has such as numbers of incidents) and it is highly unlikely that it can be evaluated through a simple measurement (Hollnagel, 2011).

Hollnagel (2011) describes a method as to how organizations can construct a resilience profile through a 'Resilience Analysis Grid'. The analysis consists of qualitative ratings and assesses how people are able to anticipate, monitor, respond and learn within an organization. In applying this framework to the clinical setting, we can conclude that foresight and intuition are developed when nurses are able to anticipate, monitor and respond to changes in patients' health status while incorporating the 'lessons learned' from the healthcare community into their own practice (e.g. such as evidence-informed practices or lessons from adverse events).

In short, RE focuses on increasing the number of things that go right rather than decreasing the number of things that go wrong as this is the end result of the former (Hollnagel, 2011).

Resilience provides a perspective of how people are able to successfully adjust and achieve acceptable performance in spite of operating near the edge of boundaries.

In addition to the resilience perspective, the research is founded on Cook & Rasmussen's (2005) models, which are known as: 'Dynamic Safety Model' and 'Flirting With the Margin and Marginal Creep'. These models are briefly described below.

Dynamic Safety Model

This model describes the relative operating space and boundaries of a sociotechnical system.

These boundaries are defined by Cook & Rasmussen (2005) as:

- Acceptable performance boundary
- Unacceptable workload boundary
- Economic failure boundary
- Marginal boundary

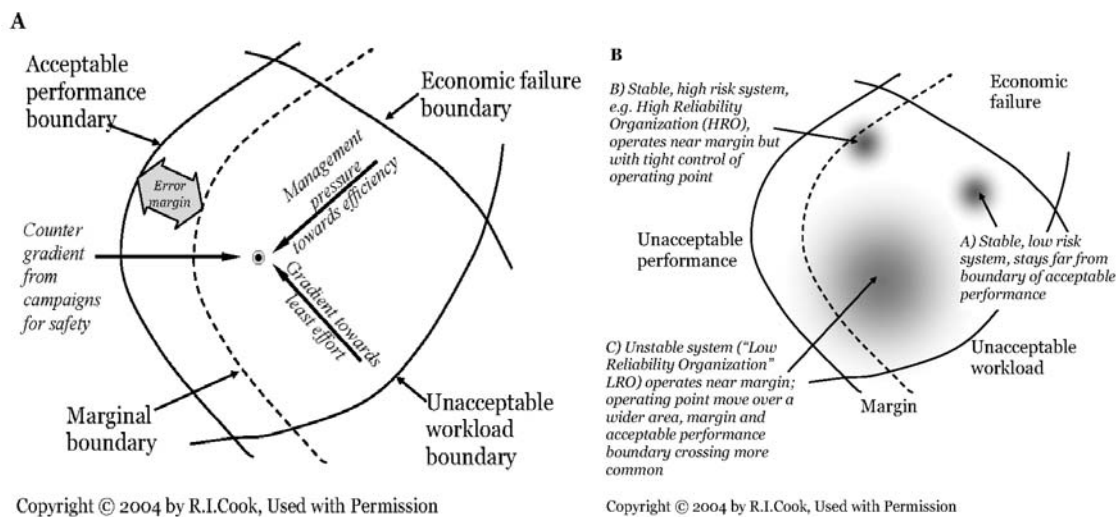


Figure 2: Dynamic Safety Model

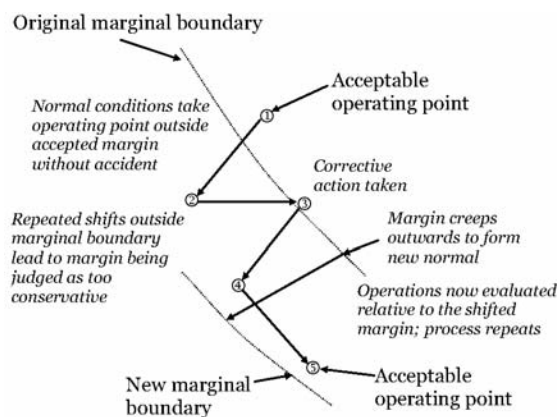
(A) Gradients push the system operating point away from the boundaries of economic failure and work overload and towards the unacceptable performance (accident) boundary.

(B) Stable low risk systems (A) operate far from this boundary; stable high risk systems (B) operate nearer the acceptable margin but the operating point moves in small increments and remains largely inside the marginal boundary; unstable systems (C) have large rapid shifts in the operating point.

There are a variety of factors that influence whether people in a system are operating near the edges of any one of these boundaries. For instance, people who work in high-risk industries, such as healthcare, generally work under increased economic pressures and this may result in increased workload and produce incremental effects of operating near the edge of what is considered acceptable performance (Cook & Rasmussen, 2005).

Flirting with the Margin & Marginal Creep

In this model, Cook & Rasmussen (2005) discusses how there is a gradual movement away from what is initially considered to be acceptable performance.



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“The location of the marginal boundary is determined by sociotechnical processes. Over time, excursions of the operating point beyond the marginal boundary (“flirting with the margin”) that are not accompanied by overt accidents may lead to outward creep of the marginal boundary and regular operation of the system in what used to be the marginal region” (Cook & Rasmussen, 2005, p. 131).

Figure 3: Flirting with the Margin & Marginal Creep

This model examines how people are monitoring their performance and in turn successfully adjusting their practices. Or, in other words, creating safety in their work environments.

From examining Hollnagel’s (2011; 2010, 2009) resilience perspective and Cook and Rasmussen (2005) safety models, we can deduce that they share analogous views of how safety is achieved in

organizations. That is, safety is attained when people adjust their actions prior to, during or following changes so that they can continue to operate within the boundaries of what is considered acceptable performance (Hollnagel, 2011; Cook & Rasmussen, 2005). In some respects, resilience describes how people and organizations are able to function within these parameters. That is, those who are able to anticipate, monitor and learn from past experience are more likely to modify their actions and practice within the realm of what is considered reasonable performance.

The next section discusses the methodology that was undertaken for this study.

RESEARCH STUDY METHODOLOGY

This study undertook a qualitative approach as the focus is on understanding how rural intensive care nurses are able to develop their foresight and intuition during clinical handovers. Qualitative research focuses on exploring small numbers or sample sizes and seeks as much depth or detail as possible versus aiming to have a large-scale research study (Blaxter, Hughes, Tight, 2010). The methodology utilizes semi-structured open-ended interview questions as well as observational participant studies.

Qualitative Research Design

Semi-structured open-ended interview questions were utilized for the interviews (Appendix A: Semi-Structured Interview Questions).

Semi-structured questions are to be based on six to twelve well-phrased questions and are to be delivered for the most part in a set order whilst having some flexibility in how the questions are asked and the extent of probing (Rowley, 2012). Interviewing is useful as it helps a researcher gain an understanding of participants' experiences, opinions, attitudes, values and processes or when there is insufficient information known about the subject as in this case of this research study (Rowley, 2012). Rowley indicates that interviews for qualitative research studies are to be an average of forty-five minutes in duration when the sample size consists of a dozen participants.

With regards to this research, twelve nurses voluntarily agreed to participate in this study and signed a Participant Information and Consent Form (Appendix B). Each interview was an average of fifty minutes in duration, with a range of 30 minutes to 1.5 hours in length. Ten out of the twelve nurses agreed to have their interviews audio recorded. Each participant reviewed the transcription or notes following the interviews to ensure accuracy of the information. The audio recording allowed for more of a free flow of information, as the participants were not pre-occupied with the researcher taking notes during the discussions. Each nurse was informed that the audio recording could be stopped at any point in time, if so wished. None of the nurses requested to have the recording stopped throughout the discussions. The nurses were also given the opportunity to add any additional remarks at the conclusion of the interview when the recorder was stopped however none did so.

Observational studies were also undertaken to gain further understanding of how nurses are able to develop their foresight and intuition during clinical handovers. This allowed the researcher the ability to further assess and validate the information gained through the interview process. The nurses that were interviewed were, for the most part, the same ones that were observed in the

clinical setting during transitions of care (e.g. during shift change, clinical handovers in the unit or transfer of care to another clinical area). In making a comparison between interviews and participant observation, Becker & Geer (1970) state:

Participant observation provides the opportunity for avoiding errors...[and provides] a rich experiential context which causes. [a researcher]....to become aware of incongruous or unexplained facts, makes him sensitive to ...possible implications and connections with observed facts, and thus pushes him continually to revise and adapt his theoretical orientation and specific problems in the direction of greater relevance to the phenomena under study (p. 32).

The initial intention was to observe clinical handovers taking place over the course of one to two shifts during transfers of care and/or at change of shift for each participant enrolled in the study. Given the limited number of admissions and transfers out of the unit during the course of this study, the nursing manager and the researcher agreed that it would be best for the nurses to call when it was anticipated that a clinical handover was about to take place. Since admissions to the unit are not scheduled, the researcher was generally given about fifteen to twenty minutes lead-time to be on-site at the hospital when it could be anticipated that an admission or discharge was about to take place. The nurses were also given the researcher's availability of when it would be possible to come on short notice.

In total, forty-four clinical handovers were observed with an average of four observations per nurse. At times, both nurses who were enrolled in the study were being observed at the same time (e.g. one nurse was giving report and the other nurse was receiving the report). The majority of

observations took place at change of shift, which occurred at 0730, 1930, or 2330 hours. The breakdown of observations is as follows:

At Change of Shift:	N=35
From Emergency to ICU:	N=2
From Surgery to ICU:	N=2
From ICU to Ward:	N=4
From ICU to Nurse on EMS Transfer:	N=1

Participant Recruitment & Selection Process

Twelve registered nurses working in a four-bed intensive care unit agreed to participate in this study. Eleven of these nurses were employees of Southern Health-Santé Sud, a rural health region in the province of Manitoba, Canada, and one nurse was an agency nurse providing contract services. At the time of the study, fifteen nurses worked in the intensive care unit where this study was undertaken plus any additional agency nurses providing contract services on a casual basis (T. Asham, personal communication, January 7, 2014). Or, in other words, approximately 73.3% (N=11) of the registered nurses working in the intensive care unit at this site participated in this study. These nurses also worked in the emergency department at the healthcare facility where the study was conducted. The years of experience of the nurses are outlined in the table below:

Years of Experience	Number of Participants with Years of Experience Working as a R.N. (N=12)	Number of Participants with Years of ICU Experience Working as a R.N. (N=12)
1 to 5 years	1	3
5 to 10 years	5	5
10 to 15 years	1	0
15 to 20 years	1	1
20 to 25 years	1	2
25 to 30 years	1	0
30 to 35 years	2	1

Table 1: Years of Experience Working as a Registered Nurse and with ICU Experience

Fifty-nine percent (N=7) of the participants held a Bachelor of Nursing degree in addition to being a Registered Nurse. Interviews and observations were held during the months of July to September 2013.

Participants were selected through a convenience sampling process as the nursing manager of the unit asked registered nurses who worked in the intensive care unit to voluntarily participate in the research study. Given the large sample size there is a decreased likelihood of a selection bias with the recruitment of participants. The Participant Information & Consent Form (Appendix B) was posted so nurses could read what the study entailed. Specifically, the form included the following information:

- background and purpose of the study (e.g. to develop an understanding of what techniques rural ICU nurses use to develop their foresight and intuition during clinical handovers);
- how participant recruitment is being undertaken;
- outline of how the study is to be conducted (e.g. through participant interviews and clinical observation, duration of interviews);
- discussion on any inherent risks and advantages in participating in the study;
- indication that participation in the study is voluntary and consent may be withdrawn at any moment without giving an explanation. The participant's explicit request not to use any information that was gathered would be honoured;
- a statement that participants' names are anonymous in the data analysis and findings;
- a statement that information would be audio recorded providing there is agreement and a stipulation that audio recording is not a requirement to participate in the study;
- information regarding access to and storage of data and audiotapes, as well as, how long the recordings will be kept. An assertion that audio-recordings would be confidentially discarded at the end of the thesis project;
- a statement that each participant will be asked to review and validate the accuracy of the transcribed or interview notes following the interviews;
- a statement that the Swedish research ethics board (REB) reviewed the research study and the participating health region in the province of Manitoba gave approval;
- a declaration that all patient health information is to be kept confidential in accordance with the Personal Health Information Act in the province of Manitoba.;
- the researcher's contact information was provided should the participant have questions or comments about the research study;

- contact person should the participant have concerns about the research study;
- a designated area for participants to provide their consent

Ethical Considerations

A research application was submitted to the Swedish Research Ethics Board (REB) with the assistance from Lund University in Sweden. The Board provided the following response (Appendix C):

The board finds that the project according to the application does not include handling [of] sensitive personal data or any other of the measures stated in the The Law (2003:460) concerning the Ethical Review of Research Involving Humans. The board therefore finds that the project according the application not is of the kind that it falls under this law. In accordance with the provisions in the second paragraph in the The Statue (2003:616) with instructions for regional ethics review boards the board instead give the following:

Advisory Statement:

In the light of the small risks for involved research people the board sees no hinders for the project from an ethical point of view.

In addition, an application was submitted to conduct research in the healthcare organization where this research study took place. Southern Health-Santé Sud granted approval for this study to be conducted (Appendix D).

At the outset of the study, the researcher considered the possible implications that may be encountered by being the principle investigator of this study in addition to holding a role in the region. The participants had no direct or in-direct reporting relationship to the researcher so there were no potential conflicts of interests. Given the rapport and transparent discussion with the nurses, the principle investigator was given both the privilege and opportunity to understand the nurses' views and how they are creating safety for patients.

Qualitative Data Analysis

In an effort to bring meaning to the data codes were assigned to key statements made by each participant. The codes were categorized into possible themes and the data was evaluated to determine whether it could support each theme. Blaxter, Hughes et al (2010) and Rowley (2012) refer to this process as thematic analysis as key themes emerged from the results into a coherent narrative. The process involved the following steps (Rowley, 2012; Braun & Clarke, as cited in Blaxter, Hughes et al, 2010):

- Familiarizing oneself with the data: This involves transcribing interviews and reviewing notes taken in the interview and observational studies;
- Generating codes: Codes are assigned to interesting features of the data in a systematic manner across the entire data set;
- Identifying themes: The codes are categorized into potential themes;
- Reviewing the themes: This is to assess whether the codes support the themes and involves generating a summary of the themes;

- Defining and naming the themes: This involves generating clear definitions for each theme and provides a framework for the report writing;
- Producing the report: This is the final opportunity for analysis and the findings are related back to the initial research question and literature to produce a scholarly report.

The identified themes are discussed in detail in the next section of this report.

RESULTS & ANALYSIS

Clinical handovers at change of shift or during patient admissions or on discharge (for the most part) are conducted through face-to-face communications with nurses who work in the intensive care unit at the facility where this study was undertaken. Handovers at change of shift are primarily held between two nurses (one nurse that is receiving the report and one nurse that is giving the report), as it is a four-bed intensive care unit. There is generally one nurse that works in the intensive care unit and if the acuity or number of patients exceeds the workload capacity of one nurse then the nurse that works in the observation area is called to provide assistance with intensive care patients. The observation area (OU) is within the intensive care unit and so the environmental design allows the OU nurse to assist in the intensive care unit when needed.

During the course of this study, the OU beds were not occupied the majority of time so the nurse assigned to work in the observation area would frequently listen to the change of shift report in the intensive care unit (ICU). When the OU beds are empty the nurse assigned to the observation areas works in either the emergency department or provides assistance in the ICU as needed.

The nurses discussed the importance of face-to-face communication during handovers as it allows for questions to be answered, clarification to be sought and for standardized information to be shared in a succinct manner. Standardized information about a patient's medical and family history, entrance complaint and systems (such as cardiovascular, respiratory, genitourinary systems) are conveyed to the nurse accepting responsibility for the patient. Face-to-face reports are valuable to the nurses as they offer up to date and comprehensive clinical data as compared to reports that are audio-recorded in advance of change of shift. A number of nurses shared that they observe their colleagues facial expressions during handovers and/or pay particular attention to the questions that the other nurse(s) asks of him/her during the handover. This is beneficial as it offers a signal to the nurse giving the report as to whether the information has been understood by the nurse who is accepting responsibility for the patients. The questions asked are an indicator to the nurse giving the report if their colleague has perceived what are the priorities and what needs to be monitored. The handover also allows for a two-way conversation about what else could be monitored, implemented or changed in their patients' plans of care

During handovers nurses frequently compare a patient's clinical signs and symptoms from one time period to the next or highlight trends in patients' blood or other test results. For instance, nurses giving report frequently review the critical care record, which includes information such as the patient's vital signs (e.g. blood pressure, pulse and respirations). In some situations (e.g. such as when giving multiple units of packed red blood cells) the nurses may use a graph to plot a patient's lab results (e.g. such as haemoglobin). This is advantageous as the nurses report it helps them gain an understanding of their patients' health status and what actions that they need to (or may need to take) in response to the information.

Even though the handover discussion is focused on providing an overview of each patient's health system and incorporates a comparative component, what is intriguing is the variability in the amount of the detail that is sought out by the nurse accepting responsibility for the patient. Some nurses are interested in knowing minute details about their patients' medical history or clinical presentation whereas others are less focused on the finer points. As an observer to the process, this peaked my interest and questions arose in my mind such as:

Is there a deeper meaning as to why some nurses seem to be more inquisitive than others when they are accepting responsibility for a patient?

Do face-to-face communication serve a greater purpose than simply the obvious value of being able to ask or clarify information?

Putting Pieces of the Puzzle Together

An innate curiosity led me to explore the preceding questions in more depth, primarily during the one to one discussions with the nurses. A number of the nurses discussed how the interaction allows them to develop a clinical picture of their patient (particularly when the patient's history is shared in a chronological manner) and if the image is not clear they will continue to ask questions and/or seek their colleagues' opinion on what is happening with the patient. Some nurses expressed that they want to know as much detail as possible about a patient's clinical situation and health history as the more information they receive then the more apparent the picture becomes in their mind. Conversely, when they perceive that there are gaps in information then questions are more likely to be posed as they are looking for pieces of data or information, which enables them to comprehend what is happening with a patient.

Some nurses describe the process as “putting a puzzle together by fitting in the pieces” or “filling in gaps in patient information”. This suggests that there is meaningful dialogue as the nurses who are asking more questions are either trying to gain a clearer picture of what is happening with a patient or they are attempting to validate what they think may be occurring with a patient. Forming a clinical picture is valuable as it offers guidance on what to monitor, what to expect and how to foresee what is clinically transpiring with a patient. Below are a couple of statements that reflect how handovers help to advance nurses’ foresight and intuition abilities:

Handovers enable me to develop a picture in my head of the disease process. It reminds me of that old saying to know where you are going you have to know where you’ve been. I need to know what my picture looks like to know what I am going to do. It’s like fishing. You start looking for a differential diagnosis to try to gain insight on what’s your potential plan of action and what the plan is. (Nurse # 11)

Clinical handovers start your day as we have the prioritization of what was said. We have the problem identification so you can foresee and know what is going on with this patient. You will know the plan and the different plans that you are going to have for this day. If you identify four problems you can prioritize which patients you should check on first. (Nurse # 6)

Clinical handovers give you an idea of what patients are here for, what the history has been and what their treatment has been. It gives you an idea of where things are headed or how stable or unstable patients are and what the plan of care is. (Nurse # 7)

From this discussion, we can see that ‘putting the pieces of the puzzle’ together is an important part of the handover process as it helps to establish priorities through the synthesis of objective measures and information such as vital signs, physical assessments and lab and diagnostic results. Through discussions and observing the nurse-to-nurse handovers, it became readily apparent how these measures guide and influence decision-making regarding care and treatment modalities. From this vantage point, it may be logical to conclude that foresight and intuition are developed by the gathering of clinical data and measures. Yet, in spite of the appeal to this deductive thinking, we are left wondering: ‘is forethought and intuition developed through any other means?’

Identifying with Abstract Senses

Though discussion with the nurses it became apparent that the majority of them have learned to rely on more than just objective data and measures. For the most part, the nurses identified with their own intuitive or “gut sense” and they discussed how they seek to understand their colleagues’ “gut sense” or “sixth sense”. Below are statements that reflect what is meant by the ‘gut sense’:

I do offer guidance to other nurses. Sometimes you pass on your gut feeling like ‘I know this person is going to go down the tubes today.’ It’s that gut instinct that you have to rely on. I give my subjective interpretation, as it can look great on the screen. You can look at the numbers but you know that person just doesn’t look good and feel good. You have that feeling and usually 90% of the time my colleagues are right. It is always in the back of your head going ‘ok, it could be

happening and it is that extra little thing that you are thinking and looking for. It is like your sixth sense that you are looking for. (Nurse # 12)

The nurses that have more experience than I do can give you a lot of insight even though it is not on paper. That kind of 'spidey' sense that something is in the back of their head that tweaks 'I got a bad feeling about this and you better keep an eye on this patient'. Often enough they are right. I still want perhaps not what they think is going on and maybe they don't know what is going on but I want to know how their feeling is about this assessment. You want their clinical insight to what is happening in addition to their assessment of things. You want 'now what do you think? Now what? You want the so what factor. What do you think is really happening?' (Nurse # 11).

I do pass on a 'gut feeling'. I will say I got a gut feeling maybe it's just me but there is something that is just not sitting right about this patient. Usually, if you have someone who is a little bit more intuitive it can even be somebody that is just a new grad or a new nurse but if they have worked in that area for a while and they are around others who are picking things up they might say: 'I think something is odd but I am unsure' then you need to listen to it. (Nurse # 9)

For the most part the nurses try to ascertain what is their colleagues 'gut sense' as this helps to provide guidance in knowing what to anticipate or what to look for in their assessments.

Although the nurses may not frame questions to their colleague as overtly as 'what is your gut sense?' they do seek their colleagues' 'gut sense' or 'sixth sense' which can help them in planning or forecasting what may transpire during a shift. For instance, during a handover a nurse with less intensive care experience invited the 'gut feeling' of a more experienced nurse when stating:

I have no idea of what is happening with this patient. Why is the patient continuing to be dizzy even though we have focused on managing the dizziness for the past week? What do you think or sense is happening here?

The questions that are asked during a handover may be an attempt to ascertain what is a colleague's 'gut/sixth sense' and/or it may also relate to efforts to develop one's own 'gut/sixth sense' by listening to what is being communicated during the handover. From a resilience perspective, these actions are important as it offers insights about how to address potential situations that may jeopardize a patient's health status or outcome.

One nurse did not identify with the word intuition as it was felt that 'gut feelings' are not based upon evidence-based practice where there is an integration of knowledge and experience with one's professional view of what may transpire for a patient. The nurse's reluctance to understand the 'gut feeling' may be based upon a personal bias that intuition implies a clinician is not able to say why she/he thinks the way she/he does. Regardless of this viewpoint, this nurse shared a belief that colleagues do share calculated assessments and provide rationale as to what is happening or emerging in a patient's plan of care. In other words, nurses have the ability to anticipate what may be happening to patients and are able to alert colleagues to clinical signs and symptoms and what to look for in their assessments and evaluation of the plan of care.

The majority of nurses also recognize the importance of sharing their 'gut sense' in addition to communicating what needs to be monitored and discussed about a patient's plan of care when discharging a patient from the intensive care unit. A number of the nurses conveyed that they would like to see more opportunity to provide their written recommendations on the SBAR

(Situation, Background, Assessment and Recommendation) Unit-to-Unit Communication Handoff form (Appendix E) that is utilized when a patient is discharged from (or admitted to) the intensive care unit at the site where this study took place. Some nurses mentioned that the SBAR communication form was implemented as a way to improve communication however it is being utilized as more of an 'accountability tool' as the nurses giving and receiving the handover need to sign their names on the form. It was shared that the focus tends to be on the task of filling out the form, which has information that is already documented in the health record, rather than the dialogue about their recommendations on what to monitor and the overall plan of care for a patient. In looking at the form, there is limited space to document recommendations and the patient's plan of care. The accountability mechanisms that are in place are distracting to the nurses and this may in turn jeopardize patient safety as there is minimal or no time for the 'gut sense' to be discussed amongst the nurses or for in-depth discussions to take place which allow for the scrutiny of data such as reviewing trends in vital signs and lab values.

Below are key statements reflecting some of the nurses' views on the SBAR Unit-to-Unit Communication Handoff sheet (Appendix E):

The SBAR form is double work for us. We fill it out and then we given an oral report anyways and what is on the SBAR is not really what you want to tell them. We fill it out and the ward does not come for two hours so it is out-dated information. Some of the basics stuff is there but the social history is not on it. There are a lot of important details that are not conveyed on the SBAR.

(Nurse # 12)

It's a good tool in theory but we are not using it correctly. We are double charting because all of that information is in the chart. You just have to look for it, know where to look for it. It's all the lab values, vitals signs but why are we filling it out again to just hand a piece of paper to a person? And tell them orally on top of it? (Nurse # 12)

The SBAR sheet is just to show others that we have given or received report on a patient. It's not helpful. (Nurse # 6)

The SBAR sheet is not useful and does not contain information that we need. It's just more work. (Nurse # 11)

The SBAR sheet does not contain the information we need. It is more of a tool for emergency nurses to use when patients are going to the ward. (Comment made to Nurse # 6 during a handover)

I think the SBAR form is to make people more accountable because we are putting them on the chart when the patient is admitted and if you are the primary nurse you fill it out. It started as the wards were complaining that they weren't getting much of a report from patients coming from emergency to the ward. (Nurse # 7)

Given the preceding comments about how the SBAR Unit-to-Unit Communication form is being utilized in this clinical setting, it is recommended that further review occur regarding the usefulness of it as there are varying thoughts on its' ability to enhance patient safety. A number of the nurses discussed how they would like to spend more time discussing their recommendations on what to monitor and what is the plan of care for a patient as this would

make the handover even more meaningful rather than focusing on documenting repetitive information which is already captured in the health record. This discussion is rather insightful as it demonstrates how the nurses want to enhance patient safety by concentrating on what to monitor and what they can anticipate with a patient's plan of care.

Through observation and conversing with the nurses it became readily apparent that face-to-face communication are an integral part in helping them understand how to respond when ambiguous situations arise in their day to day work. The next section addresses how handovers help nurses to strategize courses of action.

Strategizing Courses of Action

During handovers nurses strategize how to approach situations when they are unclear about courses of actions such as when patients have rare health conditions. The following comments were discussed, during the clinical handovers, amongst the nurses who have a range of intensive care experience:

I don't deal with surgery patients often. How many hours post-op should a patient be passing gas?

What needs to be done with the patient's dressings? When do I call the doctor if their urine output is low?

The patient's blood sugar is low and insulin 30/70 is ordered. What do you recommend that I do during my shift with the patient's low blood sugar?

The patient missed a medication dosage. When do you recommend that I give the next dose?

The patient's blood pressure has been unstable. What should we do? If the patient's blood pressure is low, should the Nitro-glycerine be reassessed?

We have had a couple of patients admitted to the unit with Wellens' Syndrome. What does it look like on the monitor? What do we do if we notice these changes?

(Discussions with Nurses # 3, # 4, # 8, #10)

The preceding comments describe the courses of actions to take when certain criteria are met and are beneficial as they prepare nurses in how to respond to situations. These conversations can be thought of as a collective 'what-if?' analysis as they offer anticipatory guidance.

Handovers may also be a time where nurses offer suggestions on how to approach a situation such as when there are no policies or when a policy conflicts with how their work is actually to be performed. Below are a couple of statements that reflect how nurses are offering their recommendations and modifying their work under variable conditions.

I am trying to be a resourceful nurse and trying to do something that might not be in a protocol and I hope that I am doing the right thing. For example, there is no policy or equipment on how to connect a j-tube to gravity. It is like trying to experiment. Another example is with wound dressings, as every wound is different. I will say this is what I did and so far it is working. I hope we can have something better with that kind of experimentation. (Nurse # 2)

For somebody that has more in-depth knowledge you will give them much more detailed things such as 'I think this might be causing this...this might be...if this happens you might want to watch for another hour or two and determine whether it has gotten better or worse and re-evaluate the therapies to see if you really need to call the doctor. (Nurse # 5)

Our current protocol says we are to calculate the rate of infusion/per hour based on a patient's weight and enter it into the infusion pump. However, with the new Colleague Guardian IV pumps all you do is enter the dosage and it automatically calculates the rate of infusion per hour. It can be confusing to some nurses, like we saw today, as they want to refer to the protocol that is not relevant. When I was transferring the patient's care to the nurse, I indicated that only the dosage needs to be entered and not the rate/per hour. (Nurse # 5)

The preceding comments demonstrate how nurses are working in changing environments and adjusting their practice in order to operate within the boundaries of what is considered acceptable performance. In doing so, they offer advice to colleagues by strategizing how to adapt and respond to situations by drawing upon their own experience. In short, the nurses act as compasses by pointing their colleagues in the direction of how to provide safer care.

During the course of this discussion, we have explored how these nurses are advancing their foresight and intuition through their interactions that influence patient safety in a proactive manner. We have discussed how clinical data and objective measures are valuable in gaining an understanding of what may be emerging for a patient and in turn how this advances nurses' forethought and intuition. Moreover, we have gained an understanding of what the 'gut/sixth sense' is, how it is developed, and how nurses advance their own foresight and intuition abilities by strategizing courses of actions with colleagues who are knowledgeable and/or experienced in

the field. These approaches positively contribute to patient safety as nurses gain greater awareness about what to anticipate, monitor and how to respond to changes in patients' health status.

At this juncture, what remains to be seen is whether foresight and intuition are progressively developed through means other than those that proactively influence patient safety. The next chapter explores the impact of system failures and how the lessons learned at a local level contribute to the advancement of nurses' forethought and intuition.

Utilizing Local Learning

Given that healthcare is a high-risk industry it is prudent to consider how nurses' foresight and intuition are advanced through system failures in the industry. Hollnagel (2011; 2009) discusses that in order for a system to be resilient the people that are a part of it need to understand what has happened with both organizational successes and failures.

In discussing adverse events with the nurses, they readily described the reporting mechanisms and process that happen when an occurrence or critical incident has taken place (e.g. the report is sent to the manager who reviews the incident and follows-up accordingly). During the interviews the nurses shared that they would expect that their colleagues would disclose an incident during a handover as there may be implications to the patient that experienced it such as the need to monitor blood work or vitals signs more frequently. Although no significant incidents were discussed during the handovers, there were a couple of interactions relating to missed medications and recommendations of when to give the next dosage(s). This suggests that handovers serve as a time to discuss what to do when situations arise outside of normal functioning.

Below are statements that reflect how nurses are discussing adverse events that happened in the unit during clinical handovers:

Sometimes errors do come up that could have been prevented. For instance, in mixing a medication for infusion pumps sometimes there is more than one mixing instruction in the manuals for different concentrations for different lines of access. These can be occasionally mixed wrong so we will often bring to attention any concerns about mixing protocols to make sure care is maintained safely. Our manuals are designed to provide information but sometimes are not clear in their instruction, which adds to the confusion in mixing wrong concentrations. We have to make sure the next person and those after do not repeat the mistake. We make a point to share this information [during handovers] to avoid further problems and to ensure as a team we provide safe care. (Nurse # 8)

[When I hear about an adverse event during a handover], I always think....did I do it? And then I think 'ok why did it happen? Was it a systems breakdown? Was it really busy? How come the person got the wrong medication? Or, how did person 'A' and person 'B' get mixed-up? Or what wasn't taken down to pharmacy?'. Always look at the cause of it and if we can take out that cause and fix it so it won't happen to the next person. (Nurse # 12)

Generally adverse events are shared during report to the next oncoming nurse so that other people can learn too. You try to be more aware and are checking especially for medications being missed or orders being missed or misread or another nurse double-checking the orders. (Nurse # 7)

In reviewing the aforementioned statements, we can see that adverse outcomes that occurred in this unit are discussed during handovers. Incidents serve as a time for reflection, whether or not nurses are directly involved in an event and appeal to their forward-looking sense of how to improve patient safety. From this context, incidents are beneficial as there is a focus on identifying ways to address potential problems. By doing so, this helps the nurses to see what may arise and enables them to mitigate future risks and thereby develop their own foresight and intuition abilities. Having said this though it is important to keep in mind that not all risks are foreseeable. We need to remember that it is the concurrences of events that generally lead to adverse outcomes rather than specific root causes (Hollnagel, 2006). At times, this may lead to the conclusion that even though an incident happened nothing really went wrong, in the sense that nothing was out of the ordinary (Hollnagel, 2006). Rather, it is the concurrence of a number of events, just on the border of ordinary, that constitutes an explanation for an incident (Hollnagel, 2006).

As we reflect upon the techniques that the nurses use to advance their foresight and intuition, we can see that there is a relatively close alignment with a resilience engineering view as well as with Cook and Rasmussen's (2005) perspective of how safety emerges in an organization. That is, when people know what to anticipate, what to monitor, and how to respond then they are more likely to operate within the realm of what is considered acceptable performance (Hollnagel, 2011; 2009). From a resilience viewpoint, it is important that the nurses understand what has been learned in their area of practice as this is what contributes to safety within an organization (Hollnagel, 2011; 2009).

Through this discussion, we have examined the themes that have emerged from the qualitative data. The next section discusses how these themes address the researcher's inquiries that were outlined at the beginning of this chapter.

Answers to Perplexing Questions

In returning to the questions that were posed earlier in this analysis, it is apparent that there is a deeper meaning as to why some nurses are more inquisitive than others when accepting responsibility for patients and what the inherent value is of face-to-face communications. The significance is not related to something that is readily visible or measurable in the nurses' interactions. However, what it is connected to is something that is quite abstract and yet influential in creating safety. Specifically, it relates to how nurses knowingly (or unknowingly) develop their own foresight and intuition abilities. Face-to-face communications are an integral part of the handover process as nurses scrutinize data such as vitals signs or electrocardiogram (EKG) strips in a collaborative manner. Looking at clinical data together is an important aspect of forming a picture of what is (or what is emerging) in a patient's health status. The interaction is also integral in developing their 'gut/sixth' sense as they are able to ask their colleagues anticipatory questions about what do they sense is happening with a patient. Nurses strategize courses of actions with colleagues during face-to-face handovers and they discuss how they can integrate the lessons that have been learned at a local level into their practice.

From this discussion, we understand how the interactions are serving a greater purpose than simply the communication of information, as what is arising is the presence of something through the advancement of both their foresight and intuition. The presence of 'this something'

is how safety is being created in this intensive care setting. In discussing foresight and intuition, Dekker, Hollnagel et al (2008) would likely validate the importance it as they purport that: “People, at all levels of an organization, create safety through practice. So, safety is not about the absence of something. It is about the presence of something” (p. 2).

The next section provides a discussion regarding the dilemmas that may be encountered when discussing foresight, intuition and the ‘gut/sixth’ sense. There is a commentary on whether data saturation was reached with the current study and whether the research question could be addressed. There is also a discussion regarding the clinical relevance of these findings, the strengths and limitations of this research and how it relates to similar studies in the literature.

DISCUSSION

Dilemmas with Discussing Foresight, Intuition & the ‘Gut/Sixth Sense’

In discussing the results and analysis of this study, questions may arise as to whether the ‘gut/sixth’ sense is instinctual or whether it is based upon the application of nurses’ clinical knowledge and experience. Given that nurses have an understanding of disease processes and are trained in how to interpret monitoring devices such as ventilators and cardiac and vital sign machines, there may be a question relating to: ‘how do we differentiate between a ‘gut/sixth’ sense and professional knowledge and experience?’. There is no distinct answer to this question however what is important is to gain an understanding of the participants’ points of view in a qualitative research study. During this study the majority of nurses readily identified with a ‘gut/sixth’ sense and how it is influential in guiding clinical decision-making. These nurses readily described what the ‘gut/sixth’ sense is, how it is developed and how it advances their own

foresight and intuition. The participants' identification with the 'gut/sixth' sense is what matters in this study rather than an academia debate as to whether clinical knowledge and experience are the drivers of what defines the 'gut/sixth' sense.

In considering the definition of terms, the words foresight and intuition were not defined when the discussions took place with the nurses, as it was thought that these terms were self-explanatory in nature. This proved to be beneficial as it allowed the nurses the ability to interpret what he/she felt was meant by these terms rather than defining foresight as the ability to process "faint signals" such as gut feelings, suspected trends and intelligent speculation" (Westrum, p. 59). It was advantageous to not provide these definitions to the nurses, as they did not have to be caught in the dilemma of thinking that foresight is developed through having a 'gut sense'. If these terms were given to the nurses there could have been the potential for the participants to think that he/she must have an automatic 'gut sense' in order to have foresight. This would have limited the value of this research, as the discussion would have been tautological in nature. That is, foresight would be readily associated with nurses having a 'gut/sixth' sense and a 'gut/sixth' sense would be equated to mean that a participant has foresight. Instead, this study has shown how the 'gut sense' is developed through face-to-face interactions and how it offers guidance in knowing what may transpire during a shift versus something that just miraculously appears in practice and is correlated to mean that foresight exists.

Methodological Discussion

As previously discussed, the majority of nurses identify with and develop their own 'gut/sixth' sense by inviting their colleague to share their 'gut feeling' about what is happening with a patient. It is evident that the handover processes serves as a time to gather information or to 'fill in the gaps in patient information'. Through interviewing the nurses and observing numerous

clinical handovers, it became apparent that consistent information is shared utilizing a systems approach to report on each patient's health status. Moreover, during or at the end of the report the nurses frequently strategize courses of action. In addition, the majority of nurses discussed how the lessons that had been learned at a local level are valuable in advancing their foresight and intuition abilities. The repetitive responses to the interview questions and the patterns observed in the handover processes were a reflection that the sample size was adequate and data saturation had been reached through this study. Data saturation is referred to the "...point in data collection when no new additional data are found that develop aspects of a conceptual category" (Francis, Johnston et al, 2009, p. 1229). The appropriate sample size is based upon the purpose of the study, the complexity, range and distribution of experiences or views of interest rather than statistical methodologies that are associated with quantitative studies (Francis, Johnston et al, 2009).

At the outset of this study, the goal was to interview and observe between six to twelve nurses working in one or two rural intensive care units. When the minimum numbers of nurses were enrolled in the study, there was a preliminary review of the data to evaluate whether there would be merit in enlisting additional participants. Although themes were starting to emerge in the data, a decision was made to enrol further participants at one hospital as a number of the nurses were willing to participate in the study and it was felt that a larger sample size would either validate or debunk whether patterns existed. As a result, twelve nurses were enrolled in this study and the qualitative measures discussed above, as well as the large sample size, were an indication that data saturation had been attained and that the research question was narrow enough in scope to be addressed by this study.

Clinical Relevance of Findings

The findings of this study are discussed below in relation to the clinical practice environment.

Face-to-Face Communications for Handovers

Given that data saturation was reached in this study, we need to consider the generalizability of these research results to other intensive care or clinical settings. This study demonstrates that we need to evaluate how handovers are taking place in the clinical setting. The clinicians in this study have offered meaningful insight about the value of face-to-face communications.

Communication that is conducted utilizing audio-recordings or solely through written communiqué are known to be less effective (Weick, 1987) and in doing so are likely to hamper clinicians' abilities to develop their foresight and intuition. Weick argues that face-to-face communications are the most advantageous as the richness of information declines steadily as people move to interactions by telephone, written personal communiqué (e.g. letters), written formal communication (e.g. bulletins) and to numeric communication methods (e.g. computer print outs). The results of this research study and Hill's (2010) validate the importance of face-to-face communications during clinical handovers and align with Weick's views. As such, we can conclude that face-to-face communications during handovers are valuable in clinical environments other than the intensive care setting. For this reason, it is recommended that clinical practice environments that are using audio-recordings for handovers transition to report mechanisms that use face-to-face communication methods.

Sharing Lessons Learned from Provincial, Regional & National Levels

Although the nurses in the study engage in discussions amongst themselves about what they have learned through their experiences, most of the nurses indicated that they are not aware of any adverse events, such as critical incidents, that have taken place in other sites in the organization or across the province. This was evident when the nurses were asked if they are familiar with what was learnt through any of the ‘Safety Learning Summaries’ (SLSs)¹, which briefly summarize what happened, any findings and recommendations following a critical incident review. The nurses shared that the focus during a handover is on the current patients that they are accepting responsibility for as there is limited or nil time to discuss adverse events that have taken place in other healthcare sites.

This research study validates the importance of having mechanisms in place so discussions can occur with nurses about the successes and failures in the intensive care setting that have occurred at a regional, provincial or national level, as this is what contributes to resilience in the healthcare system. For this reason, it is recommended that consultations occur with nurses and other clinicians about what is the best way to share this information so we can infiltrate and spread this learning from hierarchical levels to clinicians at the point of care. In thinking about ways to improve safety, Hollnagel (2009) reminds us that even though learning from events is essential it is important to keep in mind that “lessons learned are never facts; they are interpretations that

¹ In the province of Manitoba, Canada each regional health authority submits Safety Learning Summaries to a centralized body, namely the Regional Health Authorities of Manitoba. Twice per year the summaries are compiled and distributed to each health region to share within their organization. In the organization that was studied these are posted on an internal portal site for all staff to access. Managers are to share the SLSs in a guided learning format with staff and physicians in their areas.

may have been valid when they were made, but where the validity is not guaranteed to last forever” (p.130).

Evaluating the Use of the SBAR Unit to Unit Communication Sheet

Lastly, we need to evaluate how handover tools such as SBAR are being utilized in the clinical setting. A number of the nurses in this study openly disclosed that the SBAR ‘Unit to Unit Communication Handoff Sheet’ (See Appendix E) is inhibiting their ability to effectively communicate as there is a tendency to focus on the multiple areas that need to be filled out on the form rather than articulating (or emphasizing) what is the overall plan of care for a patient and their recommendations on what to look for and how to respond should there be changes in a patient’s health status. In the interest of patient safety, we need to re-examine the usefulness of the SBAR tool and how it is being utilized in this clinical setting.

Strengths and Limitations of Study

Although this research is a small-scale qualitative study it has provided an in-depth review and analysis of the techniques that registered nurses use to develop their foresight and intuition abilities. The majority of participants have five to ten years of experience working in an intensive care / emergency room setting with a vast range of experience of upwards of thirty-five years. The findings of this study are for the most part limited to the population studied with the exception of implementing face-to-face communication during handovers, as previously discussed. The results of this study relate to registered nurses and care must be taken to not extrapolate the results to other professional disciplines.

The next section discusses the results of similar studies or literature relating to how gaps are bridged by clinicians in the healthcare field.

Relating the Research Findings to Similar Studies

Given there are limited studies that have explored how nurses or clinicians are developing their foresight or intuition during clinical handovers, there is a paucity of information to compare these research results to in the literature. The studies that have been embarked upon in this area have recommended a variety of methodologies such as narrative inquiry interviews, non-participant observational audits, task analysis, process mapping, as well as, focus groups, interviews and simulation studies to name a few (Hill 2010; Jeffcott, Ibrahim et al (2009); Jeffcott, Evans et al (2009)). The findings of these research studies are elaborated on below and are discussed in relation to this qualitative based study.

In his research, Hill (2010; Hill & Nyce, 2010) conducted a qualitative study on resilience and techniques that ICU clinicians indicate they use to develop anticipation, intuition and foresight at change of shift report. Hill's research utilized narrative inquiry interviews that were conducted by a single researcher with a sampling of thirteen participants who worked in ICU (four physicians, three patient-care coordinator-supervisory nurses, four respiratory therapist and two general duty critical care nurses). Hill (2010) concluded that clinicians and particularly critical care nurses use resilience principles and techniques to develop their own foresight and intuition. By doing so, he concluded that clinicians experience success far more frequently than failures while using the same tactics throughout their workday (Hill & Nyce, 2010).

The results of this current study validated Hill's (2010) research where he concluded that face-to-face communications are invaluable at change of shift. Face to face communications during handovers were deemed crucial, in Hill's study, as clinicians already shared similar mental models of what a shift report should entail. Hill discussed the importance of face-to-face handovers as the dialogue enables clinicians to learn how to perceive like an expert in the field. He concluded that foresight and intuition are developed by asking anticipatory questions (e.g. "who are you worried about?; what else is on the radar?", Hill, 2010, p. 45) and through monitoring critical information in addition to responding to situations and learning from adverse events. The nurses in the study discussed the importance of face-to-face communication as it allows them to: formulate a clinical picture through scrutinizing clinical data in a collaborative manner; develop their 'gut/sixth' sense; strategize courses of actions; and discuss the lessons that have been learned within the unit in which they work. This current study has shown how nurses develop their foresight and intuition abilities through these methods as they gain new knowledge, experience and understanding of how their colleagues' perceive a clinical situation. Whereas, there is a gap in Hill's study as the research does not clearly show how the monitoring of information helps to advance clinicians' foresight and intuition and nor does it outline how responding and learning from events is influential in developing clinicians' forethought and intuition. The discussion appears to be more theoretical in nature versus showing how each resilience principle is operationalized in the healthcare setting. Never the less, Hill does share that further research is needed in order to learn how clinicians create foresight, as well as, coping and recovery strategies.

When thinking about how clinicians develop their foresight and intuition, we may be drawn to the previous chapter that addresses how nurses create foresight during handovers. This current study addressed the gap identified by Hill (2010) as it describes how nurses knowingly (or

unknowingly) develop their foresight and intuition abilities. Moreover, we also discussed the importance of implementing additional mechanisms other than at handovers so nurses have the opportunity to learn from both the successes and failures in the healthcare community that are relevant to their practice. From a resilience perspective, we know that learning is invaluable as it advances clinicians' foresight abilities, which in turn contributes to resilience within an organization (Hollnagel, 2011; 2009).

The next article that is found in the literature discusses the importance of researching how staff bridge gaps during clinical handovers. Specifically, Jeffcott, Ibrahim et al (2009) encourage further research in healthcare relating to resilience and clinical handovers in an effort to develop an understanding of how "...front line staff 'fix' mistakes" (p. 256). These researchers state: "resilience in healthcare needs to focus on developing measurement, improvement and prediction tools." (p. 256). Suggested research methods to understand how experts bridge gaps are: non-participant observational audits, task analysis and process mapping, focus groups, interviews and simulation studies. The researchers provide guidance on 'how to' research resilience, as adopted from the work by Cook, Render et al (2000). These five steps are as follows:

- Characterise the gaps in the process
- Learn how the gaps develop
- Understand how particular contexts affect the development of gaps
- Understand how gaps impact care
- Understand how experts successfully bridge gaps

In reflecting upon the results of this current study, we can see how nurses are bridging gaps by utilizing face-to-face communication as it provides an opportunity to collectively scrutinize data, in addition to asking questions in order to seek out further information or validate what they think may be occurring with a patient. Strategizing courses of actions and utilizing the lessons that have been learned at a local level are also valuable as it enables them to adapt and respond to situations. Moreover, we can understand how the 'gut/sixth' sense is developed and how it offers insights about what may jeopardize a patient's health status or outcome. The 'gut sense' is valuable as it helps novice or expert nurses bridge potential gaps in care.

A third article that is in literature is by Jeffcott, Evans et al (2009). This article introduces a conceptual framework to analyze knowledge gaps in the measurement of clinical handovers and how to best address these gaps with the use of policy, practice and evaluation guidance. Action research is recommended to study clinical handovers as it employs qualitative interviews and observations. It is also seen to bridge the gap between theory and practice in clinical settings by drawing upon clinicians' intuition and expertise rather than randomised controlled studies.

With regards to this qualitative study, we can see the benefit of it as it has shown how nurses bridge gaps in the clinical setting by utilizing various mechanisms to develop their foresight and intuition. We have also seen how a number of these nurses have reflected upon their own practice and have brought forward suggestions on how to improve the handover process that occurs from unit to unit in the hospital where this study was undertaken. These recommendations are valuable as it demonstrates how the nurses want to decrease the likelihood of any gaps in care by focusing more on what to monitor and what is the plan of care for a patient

rather than concentrating on documenting repetitive information that is already in the health record.

Given there are a scarce number of studies in the literature relating to how nurses and other clinicians develop their foresight and intuition during handovers, it is recommended that further research be undertaken in this regard. It is hoped that additional studies focus on the successes that clinicians are achieving during handovers so we can spread this learning by increasing the number of things that go right in the healthcare system. Furthermore, there is a need for longitudinal studies to explore whether there is a correlation between effective interdisciplinary team communication and health outcomes for patient care and safety (Lingard, Espin et al, 2004).

CONCLUSION

As we return to the research question for this study, we begin to understand that there are a variety of techniques that nurses knowingly (or unknowingly) use to develop their foresight and intuition abilities during clinical handovers. That is, they use face-to-face communication to scrutinize clinical data and in doing so they ask questions to fill in 'pieces of the puzzle' for which they perceive are missing or to validate what they think may be occurring with patients.

Secondly, nurses rely on more than objective data and measures as they develop their 'gut/sixth' sense by asking anticipatory questions (e.g. what do you sense is happening here?), which provide guidance in knowing what to expect or what to look for in their assessments.

Thirdly, nurses strategize courses of action through a 'what-if' analysis or by offering recommendations on how to respond to situations that are unclear (e.g. when policies conflict

with how work is to be performed). These actions develop colleagues' foresight and intuition abilities, which in turn enables them to operate within the boundaries of acceptable performance. Lastly, nurses utilize the lessons that have been learned at a local level to guide their practice. By doing so, this enables them to see what may arise and allows them to mitigate foreseeable risks.

In closing, it is apparent that nurses use a variety of techniques to develop their foresight and intuition abilities during clinical handovers. We have seen how these nurses' actions and 'gut/sixth' sense are creating safety during handovers and how safety is ascending from the presence of something in their practice.

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APPENDICES

Appendix A: Semi-Structured Interview Questions

Below are the questions used for interviews in this research study.

Demographic Information

My understanding is that you are a nurse currently working in the ICU at (hospital name). How long have you been working in the ICU at this hospital? Do you currently or have you worked in any other ICU settings? If so, what are your approximate years of working in the ICU?

Relevancy of Question: The responses will provide the researcher with background information on participants' demographics without identifying anyone individually.

Clinical Handover Discussion

As you are aware, this study is focusing on clinical handovers and the techniques that ICU nurses use to develop their foresight and intuition abilities during transitions of care. Through discussions and observation of nurses involved in clinical handovers it hoped that the research is able to identify ways that rural ICU nurses are positively contributing to patient safety. When referring to clinical handovers this means the transfer of information and professional responsibility and accountability between you and a member of the ICU interdisciplinary team, to another colleague or professional within the healthcare system (Australian Medical Association, 2006).

1. As an ICU nurse, you are involved in closely monitoring and caring for patients that are acutely ill. When coming on shift or accepting a patient to the unit, what information is important for you to know about the patient? (Hill, 2010). What makes the information important? What information is not important to know when coming on shift or accepting a patient to the unit? (Hill, 2010). Why is the information not of importance?.

Relevancy of Question: The question is significant as it provides insights as to how rural ICU nurses are developing foresight and intuition during clinical handovers. The responses allow the researcher to understand what information is perceived to be of value and what is insignificant.

2. In what ways do clinical handovers help you in your work? (Hill, 2010)

Relevancy of Question: The question allows the researcher to gain an understanding of the participants' perception of clinical handovers. It also sheds light on what specific aspect of the handover are beneficial. For instance, is it the dialogue regarding what is happening about patients? Or is simply the communication of clinical information that is of value?

3. Provide one or more examples of where you received an excellent clinical handover. In your view, what made it an excellent clinical handover? (Hill, 2010).

Relevancy of Question: The response provides a concrete example of 'what' rural ICU nurses consider as an excellent handover and the rationale as to why it is important. The

researcher gained a further understanding of the nurses' perceptions about clinical handover and how it has helped a nurse in his/her daily work.

4. While providing report during a clinical handover, how do you balance the need to be thorough in what information you provide while at the same time being efficient?

Relevancy of Question: The question provides insights about what techniques nurses use to balance efficiency-thoroughness trade-offs in order to nullify gaps and prevent adverse outcomes to patients. Foresight and intuition are attributes that are needed in order to determine what is the 'right amount of information' to give within a limited timeframe.

5. When a preventable adverse outcome has happened to a patient how is this information shared in the unit? How does the information influence your clinical decision-making?

Relevancy of Question: The researcher is able to understand whether previous adverse outcomes, that were considered to be preventable, had any influence on the nurses' clinical decision-making. That is, 'did a preventable adverse outcome in the organization (or another organization) result in learning and contribute to enhanced foresight and intuition abilities?'. Safety Learning Summaries (SLSs) are shared in a de-identified manner across the province of Manitoba and summarize particular situations considered to be preventable, the findings and any relevant recommendations. The intent of SLSs is to decrease the probability of a similar-like incident from happening again. It is acknowledged that every situation is unique however the information is shared to foster an environment of learning with hopes of enhancing clinicians' foresight and intuition abilities.

6. How do you participate in clinical handovers during transfers or at the end of your shift? (Hill, 2010).

Relevancy of Question: The responses allow the researcher to understand how each participant is involved in the clinical handover process.

7. When sharing information about a patient during a clinical handover, do you change your approach depending on the person who is receiving the information? If so, how and what is this based upon? (Hill, 2010).

Relevancy of Question: The information that is gleaned provide insight as to how ICU nurses are providing guidance to colleagues and this may demonstrate whether clinical handovers can help others to learn ‘how to perceive’ what may or may not happen to a patient. It may also demonstrate how nurses change their approach during clinical handovers depending on what he/she feels would be important to be explicit about to the colleague who is accepting responsibility for the patient. For instance, if the nurse accepting the patient is a new graduate, does the nurse providing the report provide more detailed information than he/she would provide to a more experienced nurse? In other words, how does a nurse create foresight for other clinicians?

8. How important is it to plan for clinical handovers at change of shift or during times of transition? Do you offer advice? How are your offers of advice generally received? (Hill, 2010).

Relevancy of Question: The researcher is able to determine how and whether nurses purposefully plan for change of shift and/or transitions of care. This provides insights as to how nurses are utilizing foresight and intuition in attempts to help others to learn 'how to perceive' what may or may not happen on the unit or to a patient.

9. Share with me a time when you wished you had passed on a clinical 'gut feeling' and later heard that your feeling was validated? (Hill, 2010).

Relevancy of Question: This response sheds light in regards to how nurses are able to develop intuition abilities.

10. Is there anything else that about giving or receiving information during clinical handovers that you would like to describe? (Hill, 2010).

Relevancy of Question: This allows the participant the opportunity to provide any additional information that he/she may consider to be relevant to the research study.

Appendix B: Participant Information & Consent Form

Developing Resilience, Foresight & Intuition during Clinical Handovers

Principle Investigator: Kristine Hannah, RN, BN
MSc Human Factors & System Safety (candidate), Lund University

Supervisor: Dr. Johan Bergström, Lund University, Sweden
Assessor: Dr. Isis Amer-Wählin, Lund University, Sweden

Background and purpose of study

Clinical handovers are universally accepted as an important element in providing safe and quality care to patients during transition points (e.g. transfer of care to another person and/or team or during change of shift). In spite of the risks associated with clinical handovers and the frequency with which they take place the skill is rarely taught or even evaluated amongst healthcare professionals (Hill, 2010). Through reviewing the literature it is still unclear what techniques healthcare professionals use to bridge gaps and nullify gaps to prevent adverse outcomes to patients during transitions of care. This small-scale qualitative research study is designed to explore what techniques rural ICU nurses use to develop foresight and intuition during transitions of care. Foresight and intuition are skills that positively contribute to patient safety.

The research is being completed as part of the fulfillment to complete a Masters of Sciences in Human Factors and System Safety with Lund University in Sweden.

Who can participate in this research study?

Professional nursing staff working in an intensive care unit in one to two hospitals in Southern Health-Santé Sud are being asked to voluntarily participate in this research study. The goal is to achieve a convenience sample size in the range of eight to twelve ICU nurses (n=8 to 12) with the assistance of the Nursing Manager and/or Clinical Resource Nurse in the area of study.

What does this research study involve?

The study involves face-to-face semi-structured interviews and observations in the clinical setting of when handovers are taking place (e.g. during transfer of care and/or change of shift). The interviews will be conducted away from the bedside and there will be a series of open-ended questions to inquire about your experiences during clinical handovers. The interview is about one to one and half hours in duration and is audio-recorded, if you are in agreement, for transcription and analysis purposes. If you do not wish to be audio-recorded then this does not have to occur and nor do you have to provide a reason as to why you do not want to be audio-recorded. The nurses that are interviewed are the same ones that will be observed in the clinical setting during transitions of care (e.g. during shift change, clinical handovers in the unit or transfer of care to another clinical area). You will be asked to review the content of the interview notes and/or transcriptions for accuracy following completion of the interviews.

Participation will also include observation in the clinical setting when you are transferring or receiving information during a handover. The observation will be over the course of one to two shifts and will take place only during transfers of care and/or at change of shift. Observation will not take place when you are providing direct patient care. Observation will allow the researcher the opportunity to further assess and validate how rural ICU nurses conduct handovers and in turn how they are able to



develop foresight and intuition during transitions of care.

As a participant in the study, your name and anything that you say in the interview or during the observation is kept in confidence. Only aggregate and de-identified information will be used in the analysis and results. That is, anything that you say will not be able to identify you or anyone else to determine 'who said what'.

What are the risks in participating in this study?

The Ethics Research Board in Sweden has endorsed this research study and approval has been granted by Southern Health-Santé Sud. There are no risks if you choose to participate in this research study or not. The aggregate results will only be shared with Lund University and Southern Health-Santé Sud.

The Principle Investigator of this study also holds the position as the Regional Director Quality, Patient Safety & Risk and is the Regional Ethics Chair with Southern Health-Santé Sud. Given the researcher's role as Ethics Chairperson in Southern Health-Santé Sud, an application for this research study has been made to a Senior Leader who made a determination that the research can be conducted in the region.

What are the benefits / advantages in participating in this research study?

There are a couple of benefits of participating in this research study. That is, you are able to gain deeper insight about your communication style and how it has the potential to impact patient safety. You will also be contributing to broader knowledge about how rural nurses are able to positively influence safety and avert potential adverse outcomes.

How will confidentiality be maintained?

There are a variety of ways that your identity will be kept confidential. Any notes, printed transcripts and/or audio recordings will be kept in

a locked cabinet in the researcher's home office. The audio recordings will be deleted upon completion of the thesis project. The transcripts will be electronically stored under a password-protected format and backed up to a hard drive in the researcher's home for a standard period of seven years. In 2021, the researcher will permanently delete all notes and printed transcripts. Paper copies will be shredded and electronic files will be double deleted from electronic databases at that time. All documents will be identified by a code number and kept in a locked filing cabinet in the researcher's home. The codebook will be kept in a separate locked drawer in a desk in the researcher's home office. Your responses will be dealt with in such a way that no unauthorized person will have access to them.

The analysis of the data (rather than the data itself) will be shared with others who study and work in human factors and/or healthcare. The information will be communicated in papers or presentations. Your permission is being sought to communicate your information in this way without personally identifying you. It is anticipated that the results will be useful in guiding future research in human factors and/or healthcare. You will be provided a copy of his signed consent form, at your request.

The researcher will maintain confidentiality of all patient health information. Patient information will not be shared as part of this research study and the confidentiality will be adhered to during and following this research study. The researcher has signed a 'Health Research Agreement' with the region to provide written confirmation that confidentiality will be adhered to in accordance with the Personal Health Information Act in Manitoba.



Who can I contact to obtain further information about this research study?

If you have further questions or concerns that you would like to discuss about the study, please contact Kristine Hannah at 204.856.3394. Should you wish to receive a copy of the research findings, please include your e-mail and mailing addresses in the space provided at the end of this form.

Who can I contact if I have concerns about the rights of research subjects?

Should you have concerns about your treatment or rights as a research subject, you may contact Jane Curtis, Vice President Planning/Innovation, Quality, Patient Safety & Risk at 204.745.7871.

Can I withdraw from this research study?

Your participation in this study is voluntary and you may refuse to participate or withdrawn at anytime during the course of this study. There are no implications to you if you choose to withdraw from the study. Should you choose to withdraw from the study you may request that information gathered from you through interviews or observation is not used as part of this study. Your request to the researcher to not use any of the information that was gathered will be honoured.

Consent

Your signature at right confirms that you have read this "Participant Information and Consent Form" in its entirety and you are voluntarily agreeing to participate in this research study.

Participant Name

Date

Email/mailling address if you wish to receive a copy of the final results of the research study

Permission to record interviews (please initial box)

Yes

No

Signature



Appendix C: Swedish Research Ethics Board Response Letter (Translated Version)



LUND
UNIVERSITY

Centre for Risk Assessment and Management
Johan Bergström, PhD, Associate Professor

Translation of the central parts from the
Swedish ethical review board decision
concerning Kristine Hannah's thesis proposal.

2013-06-25

1

To whom it may concern

The following is a translation of the central parts of the decision, *Protokoll 2013/6*, made by the Swedish Ethics Review Board. The decision concerns the application for an ethical approval for Kristine Hannah's MSc thesis project in her studies at Lund University's MSc Program in Human Factors and Systems Safety.

The decision (in summary) states the following:

The first topic (*Närvarande*) is a declaration of the board members present at the meeting on June 12 2013.

The following decision is formulated under the topic *Beslut* (decision):

Decision

The board finds that the project according to the application does not include handling of sensitive personal data or any other of the measures stated in The Law (2003:460) concerning the Ethical Review of Research Involving Humans. The board therefore finds that the project according to the application not is of the kind that it falls under this law. In accordance with the provisions in the second paragraph in The Statute (2003:616) with instructions for regional ethics review boards the board instead give the following:

Advisory statement

In the light of the small risks for involved research people the board sees no hinders for the project from an ethical point of view.

According to how to appeal, see appendix 1; only applies to the board's decision that the project does not fall under the law concerning ethical review of research involving humans.

Finally Ann-Marie Kellner, administrative secretary certifies that the copy is in accordance with the original. The pages following is first one for the representatives of the project to sign and return to the board in order to certify that the decision was received, and then the appendix explaining how to appeal against the decision.

Best regards

A handwritten signature in black ink, appearing to be 'J. Bergström'.

Johan Bergström

Appendix D: Southern Health-Santé Sud Research Letter



La Broquerie Regional Office/Bureau régional La Broquerie
Box/CP 470, 94 Principale St. /94, rue Principale | La Broquerie, MB R0A 0W0
T 204-424-5880 | F 204-424-5888
www.southernhealth.ca
Email/Courriel: info@southernhealth.ca

July 11, 2013

Kristine Hannah RN BN
38 Brookside Crescent
Portage la Prairie MB R1N 3W8

Dear Ms. Hannah,

Thank you for your request to conduct research in Southern Health-Santé Sud. Your research proposal titled "Developing Resilience, Foresight & Intuition during Clinical Handovers" has been reviewed by the region.

After careful consideration, it has been determined that your proposal meets the requirements to conduct research in the region until the expiry of your Research Ethics Board approval.

On behalf of Southern Health-Santé Sud we wish you all the best in your study.

Kindest regards,

A handwritten signature in black ink that reads "Jane Curtis".

Jane Curtis
Vice President – Planning/Innovation, Quality, Patient Safety and Risk

c.c. Noreen Shirliff

*Ensemble vers un avenir plus sain.
Together leading the way for a healthier tomorrow.*

Appendix E: SBAR Unit-to-Unit Communication Handoff Sheet



UNIT TO UNIT COMMUNICATION HANDOFF SHEET

S Situation	Entrance complaint: _____ Diagnosis: _____ ER Physician: _____ Family Physician: _____	
B Background	Allergies: _____ History: HTN DM CHF Asthma COPD CVA Seizures MI CABG Alzheimer's / Dementia Pacemaker / ICD Dialysis Code Status: ACP Yes No Infection: MRSA VRE C-diff TB Other: _____	
A Assessment	V/S Time: _____ Temp: _____ Pulse: _____ RR: _____ B/P: _____ O ₂ : _____ on+/- _____ at _____ LPM VIA _____ Last Pain Med: _____ Time Given: _____ Relieved Decreased Unchanged Recent Pain Scale _____ IV Site: _____ Size: _____ Established at: _____ Solution ordered in ER: _____ Rate _____ New IV Ward Orders: Yes No Started in ER: Yes No Blood Transfusion Orders: Yes No RH if known: _____	
	Neuro: Alert Drowsy Unresponsive GCS at: _____ (if applicable) Oriented Confused Combative Other: _____ Respiratory: Trach Cough Sputum Crackles Wheezing SOB Last Resp Tx given: _____ Route: _____ Chest Tube: Yes No Size: _____ Suction: Yes No Drainage: _____ Other: _____ Cardiac: EKG Changes: Yes No New / Old _____ Rhythm: _____ Chest Pain _____ Bleeding _____ Other: _____ GI: Nausea Vomiting NPO: _____ Diet Orders: Yes No Antiemetic Given: _____ at: _____ Relieved: Yes No BM: _____ Diarrhea: _____ Melena: _____ Colostomy: _____ Diet _____ Other: _____	GU: Last Voiding: _____ Foley at: _____ Size: _____ Other: _____ Skin Integrity (if applicable): _____ Decubitus Location: _____ Dressings: Yes No Location: _____ Other: _____ Ortho/Mobility: Bedrest Ambulatory w/Assistance Other: _____ Psych/Social: On Admission: Accompanied Alone Deaf Blind Non-English Speaking Family notified of admission: Yes No Homecare: Yes No Lab: Abnormal Values: Yes No Pertinent Labs _____ Last Accucheck: _____ at: _____ Pending Labwork _____ Physician Aware _____ Results signed & date & time stamped _____
R Recommendation	Areas of concern to monitor: Neuro CVS Resp GI GU Unit Bed # _____ Tests in progress _____ Treatment Plan _____ Family notified <input type="checkbox"/> PCH <input type="checkbox"/> Alternate Living Facility <input type="checkbox"/> Reporting Nurse (Signature): _____ Date: _____ Time: _____ Nurse Receiving Report(Signature): _____ Date: _____ Time: _____	

