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Momentary Fitting in a Fluid Environment: A Grounded Theory of Triage Nurse Decision Making

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A Grounded Theory of Triage Nurse Decision Making

by

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Abstract

Emergency departments (EDs) are fluid environments where conditions are constantly changing. Triage nurses control access to the ED and make decisions about patient acuity, placement, and priority to be examined by a physician. Understanding the processes and strategies that triage Registered Nurses (RNs) use in decision making is therefore vital for patient safety and operation of the ED.

The aim of this classical grounded theory study was to understand the processes and strategies that experienced emergency RNs use when making triage decisions and to generate a substantive grounded theory of triage RN decision making. Data collection consisted of twelve interviews with triage RNs and seven observations of the triage environment at three hospital sites in a major urban centre. Initial sampling was purposive; as categories began to emerge theoretical sampling was used in accordance with grounded theory. The data were analyzed using the constant comparative method.

Findings reveal that the main concern of triage RNs was to achieve best possible fit between patients and the ED as a whole, given the circumstances for each moment in time. The main concern was conceptualized as the core category *Momentary Fitting in a Fluid Environment*. Best possible fit was not synonymous with optimal fit. Decision making occurred in a context where each decision changed the conditions for subsequent decisions. Momentary fitting consists of the interrelated categories *determining acuity, anticipating needs, managing space*, and *creating space*. At certain critical junctures, RNs decided to create space by pushing boundaries and, at times, temporarily crossing boundaries.

Momentary Fitting theory makes explicit the importance for triage RNs to maintain up to date awareness of what is transpiring in the ED. This includes knowledge of incoming critical patients, the condition of patients waiting to be examined, and real time information about available treatment spaces, patients, and staff resources. Moreover, the findings point to the need for structuring triage environments to facilitate mechanisms that allow quick communication between co-workers. The results have implications

for design of triage areas, computer programs, graphical user interfaces and education. Future research needs to account for the contextual and ethical nature of triage decisions.

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Epigraph

I don't feel proud that I say, I was lucky nobody died, but that's how I feel, because there are times out there that somebody easily could have died on me. And it has happened. So, you know, I often think, I had a good day, nobody died.

Belinda, triage nurse and one of the participants

CHAPTER ONE: INTRODUCTION

This is a study of momentary fitting in a fluid environment, specifically how emergency triage Registered Nurses (RNs) conduct the process of decision making (DM). All RNs are expected to make safe clinical decisions in the context of providing patient care, however, the triage RN controls access to the emergency department (ED) with the responsibility of ongoing DM regarding patient acuity, priority to be examined by a physician, and allocation of appropriate treatment space (Edwards & Sines, 2008; Fry & Stainton, 2005). Patient care, other than immediate emergency interventions, is delegated to other RNs and healthcare professionals. The triage RN is geographically separated from the rest of the ED and functions as an independent decision maker (Gerdtz & Bucknall, 1999). Patient safety is dependent on the ability of the triage nurse to make safe, accurate decisions in a timely fashion (Cioffi, 1998; Cone & Murray, 2002; Göransson, Ehnfors, Fonteyn, & Ehrenberg, 2008; Wolf, 2013). Given the triage RN's central role in controlling access to ED care an understanding of how triage RNs undertake the process of DM is crucial and has implications for practice, development, education, and design of triage areas.

The purpose of this chapter is to provide an overview of the history of triage, the development of triage scales, and the process of triage. In addition, my rationale for selecting classical grounded theory as a research method is presented.

History of Triage and the Emergence of Triage Scales

Emergency triage is a process of rapidly assessing and prioritizing incoming emergency patients according to acuity (Bergeron, Gouin, Bailey, Amre, & Patel, 2004; Patel, Gutnik, Karlin, & Pusic, 2008; Wuerz, Fernandes, & Alarcon, 1998). The aim of triage is to ensure that those patients with the most urgent medical needs are seen first (FitzGerald, Jelinek, Scott, & Gerdtz, 2010). The word triage is derived from the French word *trier,* meaning to separate, sort, sift, or select. Baron Dominque Jean Larrey, a surgeon in the Napoleonic wars, first described triage in the early 1800s (Kennedy, Aghababian, Gans, & Lewis, 1996;

Larrey, 1814/1987). He instituted a process whereby injured soldiers were sorted directly on the battlefield, treatment was initiated, and the patients were conveyed by horse drawn “flying ambulances” to field hospitals. Prior to Larrey’s method of rapid sorting, treatment, and transport, injured soldiers had been left for up to 24 -36 hours on the battlefield (Larrey, 1814/1987).

Triage was further developed in the military setting during the First and Second World Wars and later in the Korean and Vietnamese Wars. The knowledge gained from these conflicts resulted in increased survival rates due to early recognition and prompt treatment of the most acute patients (Kennedy et al., 1996). Triage continues to be used in hospital EDs, disaster situations, and in the military (Iserson & Moskop, 2007). Disaster triage differs from hospital triage. During a disaster the aim is to do the greatest good for the greatest number of people meaning that limited resources available may have to be used for those individuals with the best chance of survival (Kennedy et al., 1996).

Hospital EDs started developing triage systems in the late 1970s and early 1980s (Fry & Burr, 2002). Prior to this hospital triage had often been conducted by a variety of staff on an informal basis (FitzGerald et al., 2010; McCallum Pardey, 2006). The Ipswich Triage Scale (ITS), one of the earliest triage scales, was introduced in Australia in the early 1980s (McCallum Pardey, 2006). It was based on a five level system used at the Box Hill Hospital in Victoria, Australia (FitzGerald et al., 2010; McCallum Pardey, 2006) and was derived from observations of triage nurses and their actions at triage (FitzGerald et al., 2010). The underlying principle that guided the nurses’ decisions was the perceived urgency of the patient. According to FitzGerald et al. (2010) the actions of triage nurses following the triage assessment were observed to consist of the following five categories:

1) Immediately call for medical attention.

2) Assign the patient to the next available physician.

3) Place the patient first on the waiting list.

4) Place the patient on the waiting list according to time of arrival.

5) Advise the patient to seek alternate care.

These categories were formalized as timeframes for when a particular patient should be seen ranging from seconds to days (FitzGerald et al., 2010). The designation “days” raised concerns over the acceptability of the ITS to the public (FitzGerald et al., 2010; McCallum Pardey, 2006) and in 1994 the ITS was revised by the Australasian College for Emergency Medicine (Jelinek & Little, 1996). The National Triage Scale (NTS), a modified version of the ITS, was introduced as the national standard in Australia and New Zealand in 1994 with timeframes that were felt to be more in line with consumer expectations (Australian College for Emergency Medicine, 1994; FitzGerald et al., 2010; Jelinek & Little, 1996; McCallum Pardey, 2006). In the modified version patients were classified as category 1 - resuscitation (to be seen immediately), category 2 - emergency (to be seen within 10 minutes), category 3 - urgent (within 30 minutes), category 4 - semi-urgent (within 1 hour), or category 5 - non-urgent (within 2 hours) (McCallum Pardey, 2006). In 2000 the NTS became the Australasian Triage Scale (ATS) (FitzGerald et al., 2010) and it is used nationwide in Australia and New Zealand (Australasian College for Emergency Medicine, 2013; New Zealand Goverment, 2011).

The NTS, or as it is now known, the ATS, was the first five level triage scale to be adopted nationally anywhere in the world (Gerdtz & Bucknall, 2007). Other countries, such as the UK and Canada, have developed their own five level scales based on the NTS (FitzGerald et al., 2010; Göransson, Ehrenberg, Marklund, & Ehnfors, 2005). The Manchester Triage Scale was developed in Manchester, England in 1994 and consists of flowcharts and algorithms intended to guide the triage nurse’s decision (Grouse, Bishop, & Bannon, 2009). In Canada the Canadian triage and acuity scale (CTAS) was introduced in 1999 (Beveridge, Clarke, et al., 1999) and it is now used throughout Canada (Bullard, Unger, Spence, &

Grafstein, 2008). In Taiwan a modified version of CTAS, the Taiwan Triage and Acuity Scale, is used (Ng et al., 2011).

The CTAS has the same time guidelines as the NTS, except for category 2, where the excepted timeframe for physician assessment is 15 minutes. The original CTAS guidelines were revised in 2004 with a shift in emphasis from time to physician assessment to timely reassessment of the patient by the triage nurse; the revision was due to the recognition of the clinical reality of long waiting times in many Canadian EDs (Murray, Bullard, & Grafstein, 2004). A further revision of CTAS occurred in 2008 (Bullard et al., 2008) that included an expanded presenting complaints list, revised first and second order modifiers, and a revised list of mental health issues. Using CTAS guidelines, the triage nurse first assigns the patient to a triage level according to presenting complaint. The triage level is then adjusted using first order modifiers consisting of vital signs, level of consciousness, severity of pain, mechanism of injury, and bleeding disorders (Canadian Association of Emergency Physicians, 2011). For example, a patient with abdominal pain and abnormal vital signs, as opposed to a patient with abdominal pain and normal vital signs, would be upgraded to a higher triage level. Second order modifiers are subsequently applied to specific complaints. For instance, a depressed patient who has a clear suicide plan would be a CTAS level 2 (Canadian Association of Emergency Physicians, 2011).

Emergency departments in the US have not adopted a single national triage scale (FitzGerald et al., 2010), however, the American College of Emergency Physicians and the Emergency Nurses Association have in a joint position statement called for the implementation of a five level triage scale such as the Emergency Severity Index nationally (American College of Emergency Physicians, 2010). The Emergency Severity Index is a five level triage system that was developed in the US. When determining the triage level, the nurse assesses the urgency of the patient and estimates the number of resources needed to treat the patient (van der Wulp, Rullmann, Leenen, & van Stel, 2011).

Triage scales are ordinal levels of clinical measurement tools whereby patients are sorted according to level of urgency. Early research about triage focused on interrater reliability and the assignment of the patient to the correct category (Beveridge, Ducharme, Janes, Beaulieu, & Walter, 1999; Dilley & Standen, 1998; Fernandes, Wuerz, Clark, & Djurdjev, 1999; Jelinek & Little, 1996; Wuerz et al., 1998). While the emergence of triage scales contributed to a standardized approach to triage, the use of triage scales may also have limited the perception of the multi-dimensional nature of triage decisions and what constitutes an accurate triage decision. FitzGerald et al. (2010) suggested that it is difficult to define a correct triage decision due to the complex interaction of personal, emotional, social, and contextual factors that occur during the triage assessment. Triage is a process that cannot be separated from the context and the space where it is enacted.

Triage Process and Context

When a patient arrives at the hospital seeking emergency care the first point of contact with the ED takes place at the triage desk. This contact occurs before the patient has been formally admitted into the ED. The triage assessment is commonly a nursing responsibility in the hospital setting. The National Emergency Nurses Affiliation (2009) in Canada, the College of Emergency Nursing Australasia (2009), and the Emergency Nurses Association (2011) in the US recommend that only RNs with emergency experience should be assigned to triage. Similarly, when CTAS was introduced in 1999 the assumption was that triage would be conducted by RNs (Beveridge, Clarke, et al., 1999).Triaging the patient consists of a brief focused assessment, assignment of a triage category according to urgency, prioritization of order in which to be examined by a physician, and allocation of treatment space (Bergeron et al., 2004; National Emergency Nurses Affiliation, 2009; Wuerz et al., 1998). Following the triage assessment the patient is provided with either immediate medical attention, admitted directly into the ED (space permitting), or asked to sit in the waiting room.

It is important to emphasize that the purpose of triage is not to arrive at a definitive medical diagnosis, rather it is to obtain sufficient information to make a decision regarding urgency and priority (Beveridge, Clarke, et al., 1999). Triaging functions as a safety mechanism for patients by ensuring that those with the greatest need for care are correctly identified and seen first. Moreover, triage is a pivotal process in the efficient management of the flow of patients through the ED (Fernandes et al., 1999; FitzGerald et al., 2010; Manos, Petrie, Beveridge, Walter, & Ducharme, 2002). It is evident that patients who present to the ED have different health care needs and therefore do not require the same level of care, or the provision of care within the same timeframe. Triage therefore becomes a way of managing and distributing limited resources (Patel et al., 2008). FitzGerald et al. (2010) wrote that the underlying principles of triage are based on clinical justice and clinical efficiency. In other words, the care should be matched to the patient's needs and administered within the appropriate timeframe. The triage context becomes a problematic environment when the demand for services exceeds the resource capacity to provide timely care.

Triage is a dynamic process conducted in a complex environment in which conditions change quickly (Beveridge, Clarke, et al., 1999; Fry & Burr, 2001a; Patel et al., 2008). Decisions are made under conditions of uncertainty and with limited information. Interruptions are common and the triage assessment is conducted under time constraints (Chung, 2005; Patel et al., 2008). The triage RN often has to coordinate and perform multiple tasks simultaneously, for instance, assess walk-in patients, answer inquires from family members, reassess patients whose condition may suddenly have deteriorated, and assess patients who arrive by ambulance. If the triage RN is alerted that the paramedics are bringing in a patient with a life threatening condition, the RN must quickly ensure that the trauma team is notified and that a resuscitation space is available. At other times, a family member or friend may simply bring a patient

with a life threatening condition or injury to the triage desk. Dong et al. (2005) described the triage environment as at times chaotic.

Under conditions of overcrowding of the ED, the DM processes that the triage RN engages in are further complicated. Overcrowding occurs when the demand for care in a timely manner exceeds the capacity of the resources that are available and has been identified as an issue internationally and in Canada (Bond et al., 2007; Canadian Association of Emergency Physicians, 2009; Canadian Association of Emergency Physicians and National Emergency Nurses Affiliation, 2003; Collis, 2010; A. Harris & Sharma, 2010; Knapman & Bonner, 2010; Olshaker, 2009). In a survey conducted by Bond et al. (2007) of Canadian ED directors (n = 158), 62% of the respondents perceived ED overcrowding as a major problem, and 79.5% cited increased wait times for sick patients as a consequence of overcrowding. For emergency patients, a prolonged wait in the ED waiting room may result in a deterioration of their condition and an increased risk of suffering an adverse event (Bullard et al., 2009). For the triage RN, overcrowding may result in a lack of available treatment spaces to triage high acuity patients further increasing the complexity of the DM.

The triage RN has been described as a gatekeeper to ED care (Fry & Burr, 2002; Fry & Stainton, 2005). As such, the decisions made by the triage RN determine when emergency care is initiated (Considine, Ung, & Thomas, 2000). One outcome of this is that ED morbidity and mortality rates are potentially influenced by triage decisions (Gerdtz & Bucknall, 2001). Croskerry (2002) suggested that the patient's trajectory through the ED may be influenced by the triage decisions, for instance, a patient who is erroneously triaged to a less acute area in the ED, may be perceived as less urgent by the treating physician. Several authors have argued that an effective triage system in which patients are accurately triaged is essential for the safety of patients who present to the ED, for managing the patient flow through

the ED, and the appropriate use of resources (Fernandes et al., 1999; FitzGerald et al., 2010; Göransson et al., 2008; Wuerz et al., 1998).

Problem

Triage decisions are multifaceted and need to be understood from a broader perspective than whether or not they are in accordance with a particular ordinal level acuity scale. The importance of triage acuity scales is not disputed by the researcher, however, it is important to recognize and acknowledge that triage acuity scores are not always accurate (Atzema, Austin, Tu, & Schull, 2009; Considine, Ung, & Thomas, 2001; Göransson, Ehrenberg, Marklund, & Ehnfors, 2006). In studies of five level triage scales, where the expected acuity score, as assigned by an expert panel, was compared with the actual acuity score assigned to patient vignettes by triage RNs, accuracy was found to be between 58-64% (Bergeron et al., 2004; Considine, LeVasseur, & Villanueva, 2004; Considine et al., 2001; Göransson et al., 2006). Over-triaging occurs when a patient is assigned to a higher category than clinically indicated; this can divert resources away from other patients who are more in need of attention (Considine et al., 2000). Conversely, under-triaging is assigning the patient to a lower category than clinically indicated and may delay necessary interventions (Considine et al., 2000; Gerdtz & Bucknall, 2001). The decisions made by the triage RN have implications for patient safety, morbidity, mortality (Cioffi, 1998; Considine et al., 2001; Croskerry, 2002) and the distribution of the workload in the ED. The consequences of inaccurate triage scores are magnified in the context of ED overcrowding.

Given the triage RN's role in controlling access to ED care an understanding of the processes and strategies that emergency triage RNs use when making triage decisions is an essential component in increasing patient safety. As described above, triage decisions are broader and more complex than just assigning the patient to a particular acuity level. Triage decisions are situated in a particular social context and need to be understood, not as isolated entities based solely on a scale, but as a dynamic process

resulting from interactions between the decision maker, the patient, contextual factors, and institutional requirements.

Based on the description and discussion of the issues associated with triaging by professional Registered Nurses, in addition to the researcher's personal clinical experiences and graduate studies the initial research question that evolved was: "How do emergency triage Registered Nurses undertake the process of triage decision making?"

Purpose

The practice of triaging by RNs is situated in a context where decisions are immediately evaluated for their consequences and practical utility by patients and other ED staff, therefore the purpose of this study was not merely to develop an increased understanding of RN decision making, but also to develop a theory of DM that is useful for practitioners and patients.

The purpose of the grounded theory research was twofold:

a) To develop an understanding of the processes and strategies that experienced emergency triage RNs use when making triage decisions.

b) To develop a substantive grounded theory of emergency triage RN decision making.

Research Question

The research question that guided this study was:

What are the processes and strategies that experienced triage RNs use when making triage decisions?

Research Method

Grounded theory is a research method that is methodologically congruent with the research question: "What are the processes and strategies that experienced triage RNs use when making triage decisions?" In grounded theory, a primarily inductive research method, the aim is to discover what is going

on in a particular social context and how individuals solve what they perceive as being “the problematic” (Glaser, 1978). The problematic is a Glaserian term indicating the main issue or concern as identified by the participants. Three main strands of grounded theory have emerged since the grounded theory research method was first introduced in 1967 by Barney Glaser and Anselm Strauss (Schreiber, 2001; Wuest, 2012), classical grounded theory (Glaserian grounded theory), Straussian grounded theory, and Charmaz’s constructivist version (Hunter, Murphy, Grealish, Casey, & Keady, 2011). This study was conducted using classical grounded theory, which will be discussed more extensively in chapter three.

Key features of grounded theory are conceptualization and the emergence of a core category (Glaser, 1978; Glaser & Strauss, 1967). Emergence is the notion that the data “speaks for itself”, and that the researcher needs to let the core category emerge during the research process, rather than trying to force the data into a pre-existing framework. Grounded theory is characterized by a simultaneous, iterative process of data collection, analysis, and sampling. The outcome of grounded theory research is a theory of a concept consisting of a core category and its related categories. The core category should have explanatory power of what is occurring in the area of interest (Glaser, 1978; Glaser & Strauss, 1967). A grounded theory is evaluated using the following four criteria; fit, work, relevance, and modifiability. Furthermore, grounded theories are not static, they are modified as new data emerge which is incorporated into the theory and used to extend the theory (Glaser, 1978).

In contrast to research methods in which the researcher situates the research within a particular theoretical framework, the grounded theory researcher ideally delays the literature review until a core category starts to emerge in order to accurately reflect the data and not be influenced by preexisitng theories (Glaser & Strauss, 1967). If, however, the researcher is required by an academic institution to conduct a literature review, Glaser advises the researcher to go ahead and do so, and then put the literature review aside until a core category starts to emerge (Glaser, personal communication, August 1,

2012). For the purposes of conducting this research, and to meet institutional requirements for obtaining a PhD, I was required to conduct a literature review.

In summary, grounded theory is a research method in which the theory is generated inductively based on the participants' view of what is occurring in their particular context. As well, a grounded theory that is useful for practitioners should fit, work, be relevant, and easily modifiable. The aim of my research was to develop a theory of triage RN DM that is derived from the actual work of triage RNs and that is considered useful and relevant by triage RNs. Grounded theory is a research method that is congruent with the research question, the goal of the research, and my view of theory development and its utility for practice.

Philosophical Foundation

Triage RNs conduct their work in an environment where the decisions they make are immediately evaluated for their practical consequences. Although Glaser did not state a particular philosophical perspective as the foundation for grounded theory, I would argue that grounded theory has strong links to pragmatism. William James, an American philosopher who made pragmatism widely known during the early 20th century, wrote that theories are instruments (James, 1907/1978). Fundamental to Jamesian pragmatism is the tenet that theories are true if they are useful and work. James (1907/1978) offered two criteria for evaluating if a theory works, first the theory must effectively bridge old and new ideas into a new theory, and secondly, the new theory must lead to a sensible, verifiable end. Theory development, according to James, is ongoing with old theories continuously being modified by new theories. As previously stated grounded theories are characterized by usefulness and relevance, and a grounded theory is always modifiable in light of new discoveries. Jamesian pragmatism will be further elaborated on in chapter three.

My philosophical perspective for theory development in nursing is consistent with pragmatism. Theories are not static, they are dynamic, continuously evolving with new discoveries. The purpose of theory development is practical utility for both practitioners and patients. In addition, I align myself with Glaser's standpoint that theories should be generated inductively from the actual context and how the participants solve what they perceive as being the problem, as opposed to attempting to verify an already existing theory, that may or may not fit the area of interest.

Synopsis

In summary, it is the researcher's belief that emergency triage RN decision making needs to be understood as it is enacted in the context of triage and from the perspective of the triage nurses. In order to reach an understanding a grounded theory study of the decision making of professional Registered Nurses was undertaken. The next chapter consists of a review of a selection of psychological DM theories followed by a review of the pertinent triage DM literature. In chapter three I discuss grounded theory as a research method and provide an account of how the study was conducted. Chapter four contains a description of the triage environment and the empirical findings illustrated, in part, by participant quotes. The theory that emerged, *Momentary fitting in a fluid environment*, is presented at the beginning of chapter five followed by a discussion of how the theory relates to the existing literature. Finally, in chapter six, I offer recommendations based on the findings and suggest areas to pursue for future research. It is my expectation the theory will provide a fuller understanding of triage RN DM, resonate with practitioners, have utility for clinically based health professionals, benefit patients, and continue to evolve.

CHAPTER TWO: LITERATURE REVIEW

In studies that are conducted using the classical grounded theory research method the literature review is ideally delayed until a core category and a theoretical framework begin to emerge (Glaser, 1978, 1998; Glaser & Strauss, 1967). According to Glaser (1978), entering the field with a preexisitng theoretical framework limits the researcher's ability to remain theoretically sensitive to the emerging theory. The purpose of this literature review was therefore to explore a selection of psychological decision making theories in relation to my preexisting knowledge of triage and *not* to develop a theoretical framework. Furthermore, the aim was to identify and critically evaluate previous work relevant to the area of emergency triage RN DM and to identify gaps in the existing knowledge base in order to lay a foundation for the need to pursue research that seeks to understand and develop a decision making theory of triage.

This chapter starts with a discussion of a selection of DM theories from the field of psychology, followed by a review of the literature pertinent to emergency triage RN DM. During the later stages of the study when the core category had emerged, and in accordance with the grounded theory research method, I reviewed additional literature. The latter part of chapter five contains a discussion of the literature in relation to the theory momentary fitting in a fluid environment.

Decision Making

The act of making a decision, consists of both information processing and problem solving (Lehto & Nah, 2006). In order to make a decision an individual must gather, organize, and combine information. Problem solving and DM often exist in a reciprocal relationship, DM necessitates problem solving and problem solving involves DM (Lehto & Nah, 2006). Decision making can be slow and deliberate, such as when a decision maker carefully evaluates all the options and then selects a course of action, or DM can be almost instantaneous, as in an emergency situation, when a rescuer appears to process the available information and problem solve simultaneously (Klein, 1998). Inaction, not doing anything, is also a decision.

Decision making research is an extensive field. Broadly stated three themes have emerged in psychological DM research; work that focuses on normative prescriptions of how decisions ought to be made, descriptive DM research that compares decision makers to normative models, and work that aims to understand and improve how people use their natural DM strategies (Lehto & Nah, 2006).

Classical decision making theory

Classical DM theory originated in the fields of statistics and economics (Lehto & Nah, 2006; Lipshitz, Klein, Orasanu, & Salas, 2001). Classical DM theorists, such as Bernoulli (1738/1954) and Savage (1954) were interested in normative models of DM. Bernoulli, a Swiss mathematician, proposed that when an individual's decision involves risk it is not solely based on the expected monetary outcome of a decision, rather that the decision is also based on the expected monetary gain in relation to a person's pre-existing wealth; the utility of the outcome. Savage, an American statistician, described DM as a process based on logical reasoning in which the rational individual uses principles of probability. In his book, *The Foundations of Statistics*, Savage presented his theory of decision making as a set of logically related mathematical statements. In classical theory DM is conceptualized as a deliberate choice between alternatives. The emphasis is on the process with an orientation towards input-output with predictions of which choice the rational decision maker will, or should make, after carefully gathering and analyzing all the information (Gilovich & Griffin, 2002; Lipshitz et al., 2001). The result is an emphasis on abstract models that can be quantified and tested (Lipshitz et al., 2001).

Triage scales, such as CTAS and ATS, are rooted in normative models of DM stipulating how the triage decision ought to be made. The scales are also a means by which triage decisions can be quantified and evaluated against an existing standard. By virtue of their nature normative models offer a way by which triage decisions can be assessed for accuracy, however they do not explain the actual DM process of triage RNs. Furthermore, if the DM process of the RN was viewed through the lens of classical DM theory

this would imply that the triage RN carefully considers all the information obtained during the assessment of the patient and then, after analyzing all the available options, makes a decision. Careful analysis of all information and options is simply not possible in a time pressured environment such as triage.

Heuristics and biases

As DM research evolved exceptions to the rational models of DM began to emerge (Lehto & Nah, 2006; Tversky & Kahneman, 1974; Wickens, Lee, Liu, & Gordon Becker, 2004). It was recognized that humans do not always follow a prescribed set of rules and evaluate all options before making a decision. One of the most influential contributions to DM research was made by Tversky and Kahneman (1974), who introduced the concept of heuristics and biases (HB) (Gilovich & Griffin, 2002). Heuristics are mental short cuts, or rules of thumb, that people use when making decisions (Wickens et al., 2004). Cognitive biases are systematic errors that occur when heuristics are used incorrectly (Tversky & Kahneman, 1974).

The origins of the HB framework (Kahneman & Klein, 2009) can be traced to Kahneman's reading of Meehl's (1954) book on human versus statistical prediction. In a review of 20 studies in which human judgments were compared to statistical models Meehl had found statistical prediction to be equal to, or superior to, human judgment in all except one study. Kahneman had encountered Meehl's work while serving in the Psychological Research Unit of the Israeli defence force. Meehl's work helped Kahneman make sense of the difficulty he experienced when assessing officers using field tests, observations, and personal interviews.

Kahneman had found that the confidence he had in his subjective judgment was not changed by receiving statistical feedback from officers' training school. The feedback indicated that the validity of his assessments were negligible. Kahneman's time in the Israeli defence force and the influence of Meehl's work laid the foundation for Kahneman and Tversky's later development of the HB framework (Kahneman & Klein, 2009).

Tversky and Kahneman (1974) sought to understand human judgment and especially how error arises. They suggested that human judges commonly use three heuristics which they designated; *representativeness, availability*, and *adjustment and anchoring.* Representativeness means that individuals are assumed to belong to a certain group because they have characteristics that are representative of a particular group and also the reverse, individuals are presumed to exhibit certain behaviours because of the group they are assumed to belong to. For instance, in the emergency triage setting, the nurse may assume that a patient with a darker skin tone is a member of a particular culture and therefore perceive the patient's expression of pain as a cultural response as opposed to actually indicating a high degree of pain. The patient may in fact not even have been raised in the cultural traditions of the group they are assumed to belong to. The nurse may erroneously decide that the patents complaint is minor based on the heuristic representativeness.

According to Tversky and Kahneman (1974), the heuristic availability refers to when individuals base their decision on the ease with which a certain event comes to mind and the event thereby influences their subsequent decisions. For example, a nurse who has recently triaged a patient with flank pain as renal colic, when the patient was in fact experiencing a dissecting aneurysm, may assign a higher acuity score to a subsequent patient with flank pain.

Adjustment and anchoring occurs when decisions are adjusted according to an initial supplied value (Tversky & Kahneman, 1974). For example, if individuals are told that the average value of a home in a particular neighbourhood is $600 000.00 and then asked to estimate the price of a home in that area based on a picture they may supply a higher value than if they are told that the average price in the area is $400 000.00. They have in fact adjusted their estimate according to the initial supplied value. According to Tversky and Kahneman heuristics can be an efficient way of making decisions, however, when they are wrong, heuristics can lead to systematic errors.

Croskerry (2002) extended the work on heuristics and biases into the realm of emergency medicine and compiled a list of 30 heuristics and biases that emergency physicians use. One example, is triage cueing, which is summarized in the statement “geography is destination” (Croskerry, 2002, p. 1197). In other words, the geographical location in the ED to which the patient is assigned by the triage RN may influence how the physician perceives and diagnoses the patient, thus errors that occur during triage may be magnified (Croskerry, 2002).

Within the HB framework expert DM is recognized but the focus is on error in expert judgment (Kahneman & Klein, 2009; Lehto & Nah, 2006). Heuristics are recognized as usually being an efficient and helpful way of making decisions, but occasionally heuristics may result in faulty intuitive judgments (Kahneman & Klein, 2009; Tversky & Kahneman, 1974). Researchers that endorse the HB perspective are interested in how intuitive judgments that are based on simplifying heuristics may lead to incorrect decisions and subsequent systematic errors. Standardized measures are used to define experts, expert decision makers are viewed with skepticism, and models, or algorithms of DM, are preferred (Kahneman & Klein, 2009)

The HB framework offers one way of explaining how errors occur; however, the emphasis is on how faulty decisions are made (Kahneman & Klein, 2009). For instance, a triage RN who recently triaged a patient with anxiety induced shortness of breath, may erroneously use the availability heuristic and subsequently triage another patient with shortness of breath as anxiety, when the patient is in fact experiencing a pulmonary embolism. While it is important to understand how errors arise in order to decrease sources of error, an understanding of how experienced decision makers process information and problem solve, is an important component in supplementing and extending the findings from the HB framework. The emphasis on errors in the HB framework, and the scepticism by which expert DM is viewed, does not lend itself to research that focuses on exploring and capitalizing on the strength of DM by

experienced practitioners. Furthermore, research within the HB framework is often conducted in laboratory settings (Kahneman & Klein, 2009); in order to understand how dynamic decisions such as those in the triage environment are made, the research needs to be context specific.

Naturalistic decision making

The HB research demonstrated that people do not always behave according to optimal models of DM (Gilovich & Griffin, 2002; Tversky & Kahneman, 1974). Naturalistic decision making (NDM), a branch of cognitive psychology, emerged in the 1980s as way of seeking to understand how skilled decision makers reach decisions in real world settings (Klein, 1998, 2008; Klein, Calderwood, & Clinton-Cirocco, 1986; Lipshitz et al., 2001). Researchers within this tradition are interested in proficient decision makers situated in dynamic contexts with time pressure, uncertainty, high stakes, ill defined goals, shifting goals, incomplete information, cues that are changing, action/event cognitive feedback loops, organizational constraints, and decisions that involve multiple persons (Kahneman & Klein, 2009; Klein, 1998; Lehto & Nah, 2006; Lipshitz et al., 2001; Orsanau & Connoly, 1993). The contexts in which NDM researchers are interested are similar to the triage environment. In addition, the underlying premise that DM is best understood based on how individuals conduct the process of DM in the actual setting is consistent with a grounded theory approach.

Models of NDM are descriptive and the emphasis is on understanding how experienced decision makers formulate decisions in natural environments (Kahneman & Klein, 2009). Naturalistic DM is characterized by the concept that experts are competent decision makers and that expertise is domain specific (Klein, 1998, 2008; Lipshitz et al., 2001). Intuition is viewed as a product of experience (Kahneman & Klein, 2009; Klein, 1998). Simon (1992) wrote that a situation provides the individual with specific cues that activate information in the memory. “Intuition is nothing more or nothing less than recognition” (Simon, 1992, p. 155). Expertise emerges with experience, but experience does not necessarily equal expertise (Klein, 1998).

Several models for DM have been identified within the NDM paradigm such as Hammond's (1988) cognitive continuum theory, Rasmussen's (1983) skills, rules and knowledge model, and Klein's (1998) recognition primed decision model (RPD) (Klein, 2008; Lehto & Nah, 2006). Hammond (1988) conceptualized DM as consisting of cognition and tasks structures. Cognition exists on a continuum from analysis to intuition, and task systems range from highly structured to poorly structured tasks. According to cognitive continuum theory, in most instances cognitive processes match the task structures. For example, a highly logical task for which ample time is allowed, such as a mathematical problem, produces analytical problem solving. Furthermore, decision accuracy is greater when the cognitive strategy used matches the position of the task structure on the continuum (Hammond, 1988).

Rasmussen (1983) proposed a model of DM based on the concepts of skills, rules, and knowledge combined with signals, signs and symbols. At the basic level, skills, behavior is automatic and information is perceived as signals that activate mainly the sensory-motor system. At the next level behavior is rule based and signs modify behavior according to previous experience. Signs at this level are not used to generate new rules. In situations were there are no rules available from previous experience the individual moves to knowledge based behavior and uses mental models, symbols that are evaluated against the goal.

Klein (1998) developed the RPD model as a conceptualization of how experienced decision makers make decisions under uncertain circumstances with limited time and limited information available. The research that resulted in the RPD model was motivated by a desire to discover the strategies individuals use to make difficult decisions under complex circumstances, as opposed to conducting research in which individuals are compared to optimal models of DM (Klein, 2008). Klein et al. (1986) initially developed the RPD model based on research conducted with urban US fire ground commanders (n = 26) with between 12 -37 years experience. The purpose of the study was to explore how expert individuals make decisions under time pressure in situations where the outcome of the decisions could

severely impact people's lives or property. In order to collect data Klein et al. (1986) developed a method called critical incident protocol analysis. The method consisted of semi-structured interviews followed by coding of the interview protocols. The participants were asked to recall all the incidents from an event, the events were organized into a timeline, and decision points were identified.

A decision point was a point when an alternative course of action existed. After determining the decision points, the researchers asked probing questions about cues that the fire ground commanders used, how they chose a certain option, and the amount of time involved in the decision. The analysis included 32 incidents for a total of 156 decision points with an average of five decisions per incident. The majority of the decisions, 78%, were made in less than one minute.

Briefly stated, according to the RPD model, experienced decision makers either recognize a situation as typical, based on a mental prototype, and are able to select a course of action as a viable first option. On the other hand, the situation is recognized as atypical and the decision maker either constructs a story leading up to the event to account for the anomaly, or proceeds to mentally simulate solutions in a sequential manner until a workable solution is found. The salient feature of the RPD model is that in most situations experienced decision makers do not evaluate all options before selecting a course of action, rather they are able to select a first option as a viable solution (Klein, 1998).

The NDM paradigm and the RPD model are not without weaknesses. The definition of who is an expert can be problematic. According to Klein (1998) expertise emerges with experience, but experience does not necessarily equal expertise. Shanteau (1992) and Kahneman and Klein (2009) suggested that the definition of who is an expert should be derived from a consensus of peers in the same field and a history of successful performance. Furthermore, what constitutes a "good" decision is sometimes difficult to define. Experienced decision makers are usually able to generate a workable solution as a first option (Klein, 1998). In the triage context a workable solution may not be the same as the optimal solution. The RPD

model was developed based on work with fire ground commanders (Klein et al., 1986). The findings have been replicated with chess players, hand ball players, battle command teams, and tank platoon leaders (Klein, 1998, 2008).

In summary, triage scales are based on normative models of DM and can be used to evaluate decisions against a set standard; however, normative models do not capture the complexity of triage decisions. Viewing triage decisions through the HB lens offers one way of understanding errors, but this framework does not build on the strengths of experienced decision makers. The RPD model is a model that could be used to explore the DM processes of experienced triage RNs, however, it needs to be considered in conjunction with how errors arise and how standards such as triage scales influence triage DM.

The purpose of reviewing a selection of theories of DM has not been to situate this research within a particular theoretical framework, rather it was to illuminate various ways of understanding how DM has been conceptualized in the psychological DM literature and to discuss these theories in relation to my preexisitng knowledge of triage. In using the classical grounded theory research method these theories cannot be superimposed on the data; rather they need to be set aside and then explored again for relevance at the stage when a core category starts to emerge (Glaser, 1978; Glaser & Strauss, 1967).

In the next section I present a discussion of nurses and DM. The emphasis will be on research conducted about triage RNs and DM.

Nurses and Decision Making

Decision making in “general” nursing practice is an area that has been extensively studied. A CINAHL search using the terms *decision making* and *nursing* and by restricting the search to research articles in peer reviewed journals with abstracts yielded 2373 results. Lake, Moss, and Duke (2009) conducted a literature review of the clinical DM literature. They reviewed 461 articles and reported that Benner was overwhelmingly the most quoted source in the nursing clinical DM literature. Benner’s (1984)

work focused on intuition and the development of expertise in nursing practice. Benner used Dreyfus and Dreyfus' (1986) model of skill acquisition. Dreyfus and Dreyfus developed their model, in which the individual progresses from novice to expert, based on research with airplane pilots and chess players. There are some similarities between Benner's work and Klein's RPD model. Benner suggested that experts perceive patterns differently than novices and attend to salient cues without considering a wide range of choices. Similarly, Klein et al. (1986) wrote that experienced fire commanders were able to assess a situation based on pattern recognition from past events and generate plausible options. In Benner's work intuition is treated almost reverently and described as something that nurses had difficulty verbalizing.

Klein (1998) has also described difficulty eliciting descriptions of "gut feelings" and "just knowing", however, through the use of the critical decision method (CDM), which was developed by Klein and associates (Crandall & Getchell-Reiter, 1993) it has been possible to elicit cues that decision makers use. The CDM consists of semi-structured interviews about specific non-routine events with progressively deepening of questions and focused questions probing for cues. According to Crandall and Getchell-Reiter (1993) the method has been used in over 24 studies in areas as diverse as corporate information management and battle planning. In a descriptive study aimed at understanding the kind of cues nurses use when assessing infants that are deteriorating Crandall and Getchell-Reiter interviewed neonatal intensive care RNs (n = 17) using the CDM. Crandall and Getchell-Reiter reported that the RNs were able to verbalize significantly more cues when the researchers used the CDM and reviewed the incident with them using probing questions than during the initial phase of the interview when the nurses first recounted the incident.

Triage Nurses and Decision Making

Significantly less research has been conducted on triage RNs and DM. A CINAHL search using the terms *triage* and *decision making* and by restricting the search to research articles, in peer-reviewed

journals with abstracts in which emergency RN triage DM was the main topic yielded 17 research articles. A search of Medline restricting the search to *triage, decision making,* and *emergency nursing* using the same criteria yielded one additional article. Finally, the bibliographies of published research articles were reviewed for additional studies. In total, 33 research articles were included in the review.

Interrater reliability and accuracy

As triage scales became common in the hospital setting during the 1990s research conducted about triage DM was focused on establishing interrater reliability of triage scales.

Kappa is a statistic used to measure the level of agreement present between observers beyond chance (McGinn, Wyer, Newman, Keitz, & Leipzig, 2004). A commonly accepted scale for the interpretation of level of agreement for kappa values is: 0.00 – 0.20 slight, 0.21 – 0.40 fair, 0.41 - 0.60 moderate, 0.61 - 0.80 substantial and 0.81 – 1.00 almost perfect (Landis & Koch, 1977). A quadratic weighted kappa gives partial credit for minor disagreement when allocating data to categories and can therefore not be directly compared with unweighted kappa values (Beveridge, Ducharme, et al., 1999; Manos et al., 2002). For example, when a quadratic weighted kappa is calculated, partial credit is given for patients that are allocated to categories that are adjacent to the correct category (Manos et al., 2002).

Interrater reliability for triage scales when used by RNs has been reported as fair for the National Triage Scale (NTS) (kappa = 0.2573, $p < 0.01$) (n = 188) (Dilley & Standen, 1998) and ATS (kappa = 0.38 [95% CI 0.38, 0.39]) (n = 66) (Gerdtz & Bucknall, 2007) and substantial for a five level scale similar to NTS (kappa = 0.662 [95% CI 0.313, 0.799]) (n = 21) (Fernandes et al., 1999).

Beveridge, Ducharme, et al. (1999) reported excellent interrater agreement for CTAS (quadratic weighted kappa = 0.84 [95% CI 0.81, 0.885]) (n = 9), as did Manos et al. (2002) (quadratic weighted kappa = 0.8 [95% CI 0.76, 0.84]) (n = 5). Göransson et al. (2005) reported both moderate agreement (unweighted

kappa = 0.46) and substantial agreement (weighted kappa = 0.71) in a Swedish study of triage RNs (n = 423) who were first time users of CTAS.

Due to the different measures used for kappa, it is difficult to draw any conclusions from the preceding studies other than that interrater reliability varies for CTAS, NTS, and ATS. The highest levels of agreement was reported for triage RNs (n = 9) in a Canadian pilot study (quadratic weighted kappa = 0.8 [95% CI 0.76, 0.84]) (Beveridge, Ducharme, et al., 1999), however, the sample size was small, the participants had no previous experience with CTAS, and the statistic used was a quadratic weighted kappa.

Furthermore, in all of the above studies the research was conducted using the survey method with questionnaires consisting of patient vignettes administered to the participants. For example, Dilley and Standen (1998) administered a questionnaire consisting of 20 patient vignettes to Australian triage RNs (n = 188) to assess interrater reliability of the NTS. While having the advantage of ensuring that all participants evaluate the same information, the use of vignettes remove participants from the actual triage context. This means that participants cannot assess visual, auditory, or olfactory cues, and that noise, interruptions, and time constraints are not present. It is possible that the results would be different if RNs were observed during actual triage encounters.

In five studies, in which questionnaires with patient vignettes were administered to the participants, the modal category was used to assess agreement among RNs who used NTS and CTAS (Considine et al., 2000; Dilley & Standen, 1998; Göransson et al., 2005; Jelinek & Little, 1996; Manos et al., 2002). The modal category was the most frequent response for each vignette (Jelinek & Little, 1996). The percentage of modal responses were reported by Manos et al. (2002) as 63.4%, and by Considine et al. (2000) as 65.2% of all responses, whereas other researchers reported results such as, over 50% of the respondents agreed with the modal response for 89% of the vignettes (Jelinek & Little, 1996). Again comparison is

difficult due to different reporting, however, what is most concerning is that the modal category does not always correspond with the expected category (Considine et al., 2000; Göransson et al., 2005).

The expected category is the category in which the patient vignette should be placed as determined by an expert panel. Göransson et al. (2005) found, that for 5 out of 18 patient vignettes that were rated by the participants (n = 423), the modal category did not match the expected CTAS category. Similarly, Considine et al. (2000), in a survey of Australian triage RNs (n = 31), reported that for 3 out 10 vignettes the modal category was not the same as the expected category. Accuracy in assigning patient vignettes to the same category as determined by an expert panel, has been found to be 58% for NTS (Considine et al., 2000), 61% for ATS (n = 167) (Considine et al., 2004) , 58% for CTAS (Göransson et al., 2005) and 64 % for the paediatric Canadian triage and acuity scale (PCTAS) (n = 29) (Bergeron et al., 2004).

The intent in discussing interrater reliability, modal response, and accuracy in this review has not been to offer an in-depth review of the findings, rather to illuminate that RNs who use triage scales are not always in agreement, and that triage decisions are not always accurate when accuracy is defined as adherence to a preexisting triage scale. Triage scales are helpful tools, but do not capture the full scope of RN triage decisions.

Education, experience, and triage decisions

Education

In order to extend the understanding of factors that may influence triage DM the effect of education and experience have been investigated. In an Australian survey of triage RNs (n = 31) using a questionnaire consisting of 10 patient vignettes, it was found that, midwifery qualifications, a Bachelor's degree, or a graduate diploma in nursing correlated positively with increased triage accuracy (Considine et al., 2001). Specialty education in emergency nursing or critical care nursing was not associated with

increased triage accuracy. Considine et al. (2001) suggested that midwifery nursing involves a high degree of autonomous DM and concluded that simply imparting more knowledge about a specialist field may not be an adequate educational strategy and that, instead, education in DM and problem solving is needed.

In an experiment with Canadian triage RNs (n = 132) who participated in a six-week interactive online triage course, the investigators found that the RNs were more confident in their triaging skills after taking the course. The overall triage agreement between the RNs and a triage expert within one triage level was 99.7% (Atack, Rankin, & Then, 2005). On the other hand, in a Swedish survey of triage RNs (n = 423), there was no relationship found between triage education and accuracy in triage scores (Göransson et al., 2006). Göransson et al. (2006) did not clarify the term triage education, such as length or type of education. It is therefore difficult to draw any conclusions from the results of their study. The conclusion made by Considine et al. (2001) that increased education in DM may increase accuracy in triage DM needs to be further explored as to the type of education and delivery mode provided.

Experience

No evidence was found that experience is associated with increased accuracy (Considine et al., 2001; Göransson et al., 2006), or that experience is related to increased interrater reliability (Bergeron et al., 2004; Dilley & Standen, 1998). Considine et al. (2001) did not find any correlation between years of experience as an emergency RN, or years of experience as a triage RN, with increased accuracy of triage decisions.

Similarly in a survey of Swedish triage RNs (n = 423), Göransson et al. (2006) reported, that there was no difference in percentage of accurate triage decision between RNs with more or less than five years emergency experience. In an Australian survey, interrater reliability was found to be similar for triage RNs (n = 188) who were divided into four groups according to years of experience (Dilley & Standen, 1998).

Bergeron et al. (2004) reported that levels of agreement did not vary significantly for Canadian triage RNs (n = 29) with more or less than 10 years experience, who rated patient vignettes according to PCTAS.

Registered nurses use of experience

Registered nurses incorporate their experience in the triage DM process through the use of heuristics (Chung, 2005; Cioffi, 1998; Patel et al., 2008) and pattern recognition (Göransson et al., 2008; MacGeorge & Nelson, 2003). Cioffi (1998) used the think aloud method to describe the triage DM process of Australian triage RNs (n = 20) with more or less than five years experience. Each participant was presented with six different patient vignettes, instructed to seek information by asking the investigator questions, and think out loud while they determined the triage category according to a five level scale.

The more experienced RNs had a higher use of past experiences, estimated their level of correctness to be higher, verbalized more inferences, collected less data, and reported using a recent case more often when assigning a triage category. Both groups were found to use heuristics more under conditions of uncertainty, especially the heuristic representativeness. While this study was not carried out in the actual triage setting, it has some advantages over studies conducted using questionnaires. The interaction with the investigator allowed for information seeking behaviour, which may more accurately reflect what occurs during triage and the think aloud method provided insight into how RNs reason during the triage DM process. Similarly to Cioff, Chung (2005) reported that triage RNs (n = 7) in Hong-Kong with more than one year of triage experience used recent cases, especially impressive cases, as part of the DM process. The participants were interviewed, data analysis was conducted using Miles and Huberman's (1994) coding system, and themes were extracted.

In a Canadian study Patel et al. (2008) used a mix of ethnography, thematic coding, and grounded theory to explore how RNs (n = 9) in a paediatric ED made decisions when working with a five level triage scale. Four participants were observed and five participants were interviewed using semi-structured

interviews. Of the RNs that were interviewed those with over 10 years experience (n = 3) were found to use more heuristics, and to develop hypotheses based on experience, intuition, and knowledge when compared with RNs (n = 2) with less than 10 years experience (Patel et al., 2008). The more experienced RNs used guidelines less and tended to ignore the triage guidelines if, what they described as their “gut feeling”, indicated an inconsistency with the guidelines. The use of heuristics by the more experienced group echoes Cioff’s (1998) findings. Patel et al. (2008) wrote that they used grounded theory, however they described how they first extracted themes and then divided the themes into subtopics. This is contrary to the grounded theory method.

Based on findings from a retrospective chart review in New Zealand MacGeorge and Nelson (2003) suggested that experienced emergency RNs use pattern recognition based on observation and information gathering to recognize warning signs in acutely ill patients. After reviewing 54 charts of patients who presented to triage with acute cardiogenic pulmonary edema they reported that a statistically significant relationship existed between application of continuous positive airway application (CPAP) and the experience of the triage RN ($r = -0.302$, $p = 0.026$). The more experienced the RN, the earlier CPAP was applied.

Göransson et al. (2008) reported that Swedish emergency RNs (n = 16) use both hypo-deductive reasoning and pattern recognition when making triage decisions. They identified two subgroups of RNs from a previous larger study (Göransson et al., 2006) (n = 423). The first group consisted of the RNs with the highest triage accuracy scores (n = 8, mean emergency experience 10.6 years). The second group consisted of the RNs with the lowest triage accuracy scores (n = 8, mean emergency experience 3.9 years).

Triage accuracy was defined as percentage of patient vignettes that were assigned to the expected CTAS category as determined by an expert panel. Göransson et al. (2008) compared the thinking

strategies of the two groups by using the think aloud method. The participants were presented with five patient vignettes and instructed to think aloud as they reasoned to reach a triage decision. The data were analyzed using deductive content analysis, and the researchers thereafter constructed a flow chart of each individual's thinking strategies. The participants used past experience to recognize patterns of typical patient presentations, and to identify profiles that did not fit the usual pattern. Göransson et al. did not clarify if a difference existed in the use of pattern recognition between the high and low accuracy groups. The more experienced group, however, generated more hypotheses, made more assertions about practice rules, and made more assumptions. Increased generation of hypotheses by more experienced RNs is in keeping with Patel et als.(2008) findings.

Emergency RNs have identified anywhere from 7 to 18 months of ED experience as a necessary prerequisite to work as a triage RN (Cone & Murray, 2002; Fry & Burr, 2001a, 2001b). Intuitively the expectation would be that experienced emergency RNs have a higher proportion of accurate triage decisions, however, this has not been found to be the case (Bergeron et al., 2004; Considine et al., 2001; Göransson et al., 2006).

Decision Making Processes of Triage Registered Nurses

In order to understand how triage RNs make decisions the DM processes of triage RNs have been explored. Gerdtz and Bucknall (2001) conducted an observational study of Australian triage RNs (n = 26) using a 20-item instrument to record 13 patient, RN, and environmental variables. Gerdtz and Bucknall suggested that triage decisions are highly contextual and influenced by patient variables. Furthermore, they concluded that triage decisions are influenced by subjective factors, since three quarters of the decisions were made in the absence of vital signs.

They argued that even though there was a statistically significant ($F = 7.11$, $p < 0.05$) increase in duration of triage when the RN collected vital signs, obtaining objective data reduces the uncertainty in

triage decisions. This study presents an objective description of what actually occurs at triage, as opposed to studies in which self-reported descriptions of DM are offered. Although no insight is provided into the actual DM processes of RNs, results from this study can be used in conjunction with other studies to better understand factors that influence how triage decisions are made.

Cone and Murray (2002) used two focus groups to explore the DM processes of triage RNs (n = 10) with more than 5 years of emergency staff nurse experience from two different hospitals in the US. The authors did no state the number of participants in each focus group. The participants identified seven themes that were part of the DM process during triage; established criteria, assessment, patient appearance, communication, experience, intuition, and critical thinking.

Communication involved knowing what to ask and how to elicit information. Established criteria were perceived as sometimes limiting the decisions of experienced triage RNs regarding the patient's placement in the ED. Patient appearance, especially if the triage RN perceived that "something just wasn't right" was an integral component of the assessment and the final triage decision. Sometimes when a decision had to be made quickly based on the perception that something was not right, expert RNs had difficulty articulating why they made a certain decision. The participants were expert emergency RNs, however, Cone and Murray did not state the criteria for how they defined experts. The results add to the existing research by providing insight into factors that are part of the DM process and by highlighting the importance of knowing what to ask.

Fry and Stainton (2005) conducted an ethnographic study of Australian clinical nurse specialists (n = 10). The authors described four processes that were part of the triage DM; information gathering, pattern recognition, probability judgments, and diagnosing. Diagnosing in this context was not the equivalent of a medical diagnosis, but rather the process of consolidating the findings and putting it all together in order to make a decision. Fry and Stainton developed a framework based on their results that consists of the

processes of gatekeeping, timekeeping, and DM. According to the authors, DM is central to the to the process of triage and balances the concepts of gatekeeping and timekeeping. Gatekeeping refers to how the nurses orchestrated patient movement to various treatment areas and how the cultural meaning of timeliness and urgency that was associated with each area in the ED became part of the triage decisions. Timekeeping reflects how the notions of efficiency and timeliness permeate triage work and how the nurses regulated care through different timekeeping practices, for instance by prioritizing and fast tracking patients. Bringing the concepts of gatekeeping and timekeeping to the forefront of triage DM, as opposed to nurse and patient variables, makes sometimes hidden system influences visible. Decision making then becomes embedded and understood in a broader context.

In a study of Hong-Kong triage RNs (n = 7), previously described in this review, Chung (2005) sought to understand contextual influences on triage DM. Participants felt that interruptions increased the potential to miss information, and that time constraints made it difficult to formulate accurate decisions. Triage nurses experienced uncertainty, especially when the wait was long, or when they triaged patients with borderline symptoms. Some participants assigned a higher triage category to borderline patients if the wait was extensive. In order to make decisions RNs used their experience, intuition, and information from patients and paramedics. Triage guidelines were not referred to routinely with exceptions for ambiguous situations and with less experienced RNs. Chung concluded that contextual factors need to be considered when efforts are made to improve accuracy of triage decisions.

Göransson et al. (2008) in the study described previously, reported that triage RNs (n = 16) used three strategies during the triage process; seeking information, generating hypotheses, and allocation acuity rating. The participants could be divided into three groups according to the order in which they used the strategies. The most common approach (n = 12) was to start by seeking information and then proceed to either allocating an acuity rating, or generating hypotheses. Some participants moved back and forth

between the steps during the DM process, whereas other participants proceeded in a stepwise fashion. According to Göransson et al. they did not find any support for an intuitive DM approach. One reason for the high use of information seeking in this study may be that the participants were presented with patient vignettes and then instructed to think aloud as they formulated a triage decision. In the actual triage setting the triage RN would not have to search for information to the same extent, since, for instance, visual cues about the patient would be readily available.

Arslanian-Engoren (2009) used Hammond's (1964) lens model and Evans' (1984) two-stage reasoning process to develop a seven-stage conceptual model to guide a study using focus groups (n = 3) to explore triage RNs (n = 12) DM with respect to cardiac patients. In the model patient cues, heuristic processes, analytical processes, inferences, actions, and goals are described as key features of DM. In the heuristic phase nurses select relevant patient cues based on their knowledge and experience. In the analytical phase nurses process the information from the heuristic phase to make judgments that form the foundation for actions. The conceptual model was used to develop questions for the focus groups. Triage RNs in Arslanian-Engoren's study used three predominant cues when formulating decisions; life-threatening symptoms, past medical history, and the composition of ED staff.

In an ethnographic study of the DM process of triage RNs (n = 12) in two American EDs Wolf (2010) found that the initial acuity assignments were based on patient presentation (looking sick versus not sick), patient presenting complaint, duration of symptoms, and body habitus. In addition, what Wolf terms the environment of care influenced triage decisions; some of the influencing variables were which physician was on duty, unit leadership, and volume of patients. An increased volume of patients resulted in more of a "weeding out" (Wolf, 2010, p. 240) function in which the triage RN focused on distinguishing the sick patients from the less serious patients.

There were obstacles to accuracy in DM such as lack of the consistent use of physiological data to make decisions, role confusion when the charge nurse acted as triage nurse, and a focus on completing a prescribed assessment on a computer form as opposed to actually conducting a patient focused assessment. Of interest is that Wolf (2010) noted that only a minority of nurses focused on what she termed the moral component of practice. She described these nurses as practitioners who used objective physiological data in their assessment to understand the underlying injury or disease process. Findings indicate, according to Wolf that the acuity assigned to patients can be attributed to a combination of individual nurse factors, the immediate environment of the unit, and the general environment of care.

Danish triage nurses (n = 14) who participated in an ethnographic study of the effects of introducing a formal five level triage system reported feeling more in control and to have a better overview of the department after the new system was introduced (Johansen & Forberg, 2011). They did, however, express that is was important to them to not solely rely on the triage system, but to use critical thinking and incorporate their experience and what they termed “gut feeling” in their decisions. When their clinical knowledge and experience conflicted with the triage guidelines they reported feeling uncertainty. The authors suggested that the nurses may indeed be thinking in terms of prioritization between patients, as opposed to according to assigned triage categories. This study indicates that while triage nurses found a formalized triage system helpful, they still ascribed importance to their clinical judgment and experienced conflict when formal guidelines and clinical judgment did not match.

Vatnøy, Fossum, Smith, and Slettebø (2013) reported that introducing a formal triage system in a Norwegian ED resulted in an increased use of vital signs, and emergency signs and symptoms in the acuity decisions by triage nurses. The new system included two steps. Step one was an algorithm for vital signs and level of consciousness. Step two contained 96 algorithms for emergency signs and symptoms. Prior to the new system the nurses used vital signs in 4% of patient encounters (n = 655) and emergency signs and

symptoms in 41% of encounters. After the new system was implemented vital signs were used in 87% of patient encounters (n = 413) and emergency signs and symptoms 77% of the time.

Data were collected by questionnaire pre-intervention and by retrospective chart review post-intervention. The increased use of vital signs is not a surprising finding since the new system was based on collecting vital signs. What is concerning though is the almost non-existent use of vital signs prior to the introduction of the new system. These findings are similar to Gerdtz and Bucknall (2001) who also noted a low use of vital signs. The findings from Vatnøy et al. (2013) and Gerdtz and Bucknall (2001) may not be applicable to the current DM process of Canadian triage RNs since CTAS requires the collection of vital signs and has been in use since 1999. Nurses in the Canadian setting would be used to routinely obtaining vital signs and may by now have incorporated them in their DM processes.

In summary, in research that focuses on the DM processes of triage RNs; personal characteristics, patient factors, triage guidelines, and contextual factors have been identified as part of DM process. Some authors have adopted an individual focus. For example, Göransson et al. (2008) analyzed the DM strategies of each participant in their study and reported the use of three strategies by all participants; seeking information, generating hypotheses, and allocating an acuity. The difference existed in the order in which the RNs used the strategies. Other authors have considered context and system influences. Fry and Stainton (2005) explored how the cultural notions of gatekeeping and timekeeping that are embedded in the emergency culture are central to triage DM. Similarly, Wolf (2010) identified how the environment of care influenced triage DM. Models that have been developed to describe triage DM incorporate the above findings in terms of including RN factors, patient factors, contextual influences, and system influences to varying degrees (Andersson, Omberg, & Svedlund, 2006; Patel et al., 2008; Wolf, 2010).

Models of Triage Nurse Decision Making

Triage DM research has moved from investigating interrater reliability and accuracy, to exploring the impact of RN variables such as education to describing the DM processes and contextual influences, to research that aims to develop models of triage DM. Andersson et al. (2006) used participant observation to study how Swedish RNs (n = 19) with more than six months experience of triage at a rural hospital undertook the process of triage. Actual triage encounters were observed and followed by a brief interview of the triage RNs. The data were analyzed using content analysis. The objective was to describe how RNs work with triage and to describe factors that RNs consider when prioritizing patients.

Andersson et al. (2006) constructed a model of triage DM consisting of four parts; skills, personal capacity, work environment, and assessment. Skills and personal capacity of the triage RN in conjunction with the work environment influenced the fourth part of the model, the assessment. All four components were used when prioritizing patients. The different components could not be ranked. Skills included experience, knowledge, and intuition. Personal capacity consisted of courage, ability to handle uncertainty, confidence, and rationality. The assessment component included patient variables such as pain. Similarly to Fry and Stainton (2005), Andersson et al. reported that RNs tended to summarize and consolidate their findings when making a decision, especially in difficult cases. These findings are to some extent contradictory to Cone and Murray's (2002) study in which expert RNs sometimes had difficulty articulating why they made a certain decision. One reason for the discrepancy might be that the participants in Cone and Murray's study were referring to rapid decisions.

Patel et al. (2008) proposed a model of triage DM based on existing literature and findings from their study of triage RNs (n = 5) who worked in a paediatric ED. The model includes four components; triage guidelines, patient factors, contextual factors, and nurse factors. Patel et al. suggested that each component alone may affect the triage decisions, and that in addition a dynamic interactive relationship

also exists between the parts of the model. Triage RNs were found to use the visual appearance of the patient to form a first impression of acuity, especially experienced RNs who sometimes made instant decisions without referring to the guidelines.

If ambiguity existed the RNs used the physical exam to guide their decisions. Under conditions of uncertainty participants reported seeking advice from other triage RNs or more experienced RNs, however, even though interaction with other staff members was helpful, time constraints often made it difficult to collaborate. One reason experienced RNs seldom referred to the triage guidelines, according to the authors, may be because they had internalized the guidelines. The small sample size and the setting, a paediatric ED, make it difficult to generalize the findings from this study, thus the findings need to be interpreted in conjunction with other studies of triage and DM.

In a survey of emergency RNs (n = 200) Wolf (2013) tested an integrated ethically driven environmental model of clinical DM in emergency settings which she had developed based on a synthesis of current literature, findings form a previous pilot study of DM by ED nurses, and findings from a study of DM by triage RNs (Wolf, 2010). The model consists of three concentric rings with core elements (knowledge base, critical application, and moral agency), immediate elements (nurse-provider relationship and unit leadership), and influential elements (environment of care). Wolf wrote that the model suggests that factors particular to the individual nurse, unit culture, and characteristics of the institution and general healthcare environment all interact to affect DM. The model was tested using the Revised Professional Practice Environment tool for measuring environment of care, the Defining Issues Test for measuring moral reasoning, and clinical vignettes. Wolf reported that higher levels of post-conventional moral reasoning positively correlated with accuracy in problem identification and interventions in complex clinical setting. Furthermore, a positive correlation was found between the environment of care and accuracy in problem

identification and intervention in all levels of clinical situations. She argued, based on the results, that not just the skill level of the individual nurse, but also the practice context should be examined.

Furthermore, she argued that the emphasis on patient flow in EDs cannot take precedence over the ethical nature of nursing practice. The model, although not specifically presented as a model of triage RN DM was developed based on a study of triage RNs and triage literature. As such it offers insight into triage RN DM. Especially noteworthy is how the model, while recognizing the individual RN at the core also accounts for contextual influences.

Anderson et al's. (2006) model of triage DM consists of RN characteristics, contextual factors, and assessment of the patient. Patel et al's. (2008) model includes RN factors, patient factors, triage guidelines, and contextual factors. Wolf's (2013) model includes nurse factors at the center, encompassed by unit culture and system influences. Differences exist in how RN factors are conceptualized. Patel et al. described RN factors as consisting of training, education, experience, and expertise, whereas Anderson et al. also included personal characteristics such as courage, uncertainty, confidence, and rationality. Anderson et al's. model may provide an additional and broader perspective of how personal characteristics of the triage RN influences triage DM than Patel et al's. model, however, the model needs to be further evaluated since the study was conducted in a rural hospital in northern Sweden. Findings from a rural Swedish setting may not be transferable to an urban Canadian ED. Wolf clearly recognizes the ethical nature of triage DM by placing the moral agency of the nurse at the center of her model alongside the nurse's knowledge base and ability to recognize critical cues.

Gerdtz et al. (2009) used Patel et al's. (2008) model as a framework to investigate how nurse characteristics, patient presentation, and type of hospital influenced concordance of acuity ratings according to ATS and reliability of the ATS. In a mail-out questionnaire RNs with more than five years of

emergency experience (n = 42) from 42 different Australian hospitals rated 237 patient vignettes using the ATS. Concordance was defined as the percentage of responses in the most common (modal) category.

The following RN factors were included, age, sex, qualifications, years of experience, number of shifts worked, and appointment level. The only characteristic with a statistically significant difference found to affect concordance was age ($p = 0.05$), increased age was associated with a lower level of concordance. When different acuity levels of the patients were examined concordance was, not surprisingly, highest among RNs for level 1 and level 5 patients. Furthermore, concordance was highest for adult patients with acute pain, and lowest for patients who presented with pregnancy related complaints or mental health issues. Participants from major referral hospitals had higher levels of agreement than participants from major city hospitals or regional hospitals.

As stated earlier in this literature review, the modal category chosen by the participants is not necessarily the same category as the expected category. Including accuracy of ratings as well as concordance would have provided a more comprehensive picture of the reliability of the ATS. Gerdtz et al. (2009) suggested that individual RN characteristics do not influence the reliability of ATS, since factors such as experience, qualifications, or appointment level were not found to have a statistically significant influence on level of concordance. Another way of looking at the findings may be that there are characteristics of the decision maker that were not identified as variables that influence concordance and accuracy. Anderson et als. model (2006) provides a broader perspective of how personal characteristics of the triage RN influences triage DM. Of interest is also the low concordance among RNs for patients with mental health concerns or pregnancy related issues. This finding suggests that there are certain patient presentations that need to be better understood.

Theory and Triage Nurse Decision Making

Edwards (2007) and Edwards and Sines (2008) sought to develop a grounded theory of how triage RNs conduct the process of initial assessment based on what transpired in the triage setting. Triage RNs (n = 14) with at least three years of emergency RN experience from the UK were video recorded during 38 actual triage episodes. The triage encounters were played back to the participants at the end of each shift, stopped after each question, and the RNs were asked to verbalize what they were thinking. The data were analyzed using Strauss and Corbin's (1990) framework. Edwards described three components of the initial assessment; initial visualizing, appraising distress, and walking-in. The findings, according to the author, indicate that the process of assessment commenced as soon as the triage RN first noticed the patient and continued as the patient approached the triage desk. The triage RN formed an impression of urgency based on the way the patient looked and ambulated. This impression was mentally compared against previous cases for fit. According to Edwards the nurses used their knowledge of previous patients with similar issues as a template to determine if the patient's presentation matched what the nurses thought of as the "usual presentation" for that specific complaint.

In their 2008 article Edwards and Sines explained triage as a socially constructed, interactive process, in which both RNs and patients participate to create meaning of the situation. Triage RNs were described as an "adjudicating panel" (Edwards & Sines, 2008, p. 2450) and the patients as participating in an audition where the patients constructed a picture of their complaint based on how they perceived the seriousness of their condition. Triage RNs were thought to judge the data through the lens of credibility. Five components, centered around the notion of credibility, were part of the initial assessment; *initial visualization, patient appearance, narrating the story, reasons for attending the ED*, and *referring agencies*. Edwards (2007) and Edwards and Sines (2008) stated that they had conducted a grounded theory study, however, Glaser (1992) argued that Strauss and Corbin's method is actually a different research method

and should not be described as grounded theory. However, putting the argument aside, the findings appear to be more descriptive than conceptual and conceptualization, according to Glaser, is a key component in grounded theory.

The findings (Edwards, 2007; Edwards & Sines, 2008) are similar to other studies in which triage RNs use the "look" of the patient to determine level of urgency (Cone & Murray, 2002; Patel et al., 2008). The difference in the Edwards' studies is the way in which the authors conceptualized the process of triage DM. According to Edwards, DM does not solely reside with the RN, it is also influenced by how the patient constructs the symptoms and how the patient perceives the level of urgency.

Summary and Discussion

Human DM is a complex subject area and several theories have been proposed in the literature to understand human DM. In early decision theory human DM was viewed as an analytical, linear process in which the individual considered all options and then formulated a decision (Gilovich & Griffin, 2002; Lipshitz et al., 2001). This rational approach is to some extent exemplified by the use of triage scales. Triage scales are normative, stipulating what the expected triage level ought to be based on certain criteria.

Early research conducted about triage DM was focused on establishing interrater reliability of triage scales. Interrater reliability for five level triage scales has been reported as fair (Dilley & Standen, 1998) moderate (Gerdtz & Bucknall, 2007), substantial (Fernandes et al., 1999), and excellent (Beveridge, Ducharme, et al., 1999; Manos et al., 2002). It is difficult to compare the results, since, as Manos et al. (2002) pointed out, different measurements of kappa have been used to assess interrater reliability. In a number of studies modal category has been used to assess agreement (Considine et al., 2000; Dilley & Standen, 1998; Göransson et al., 2005; Jelinek & Little, 1996; Manos et al., 2002), however, modal category does not always correspond with the expected category (Considine et al., 2000; Göransson et al., 2005). Accuracy, assigning the patient to the same category as determined by an expert panel, has been

found to vary from 58 – 64% (Bergeron et al., 2004; Considine et al., 2004; Considine et al., 2000; Göransson et al., 2005).

The most common RN characteristics that have been investigated in relation to triage DM are level of education and years of experience as an RN. Midwifery qualifications, a bachelor's degree, or a graduate diploma in nursing were found to have a positive correlation with an increased number of accurate triage decisions in an Australian study (Considine et al., 2001). Atack et al. (2005) reported that 70% of triage decisions were in the expected category following an interactive 6-week online triage course in CTAS. Years of experience as an RN have not been found to correlate with either increased interrater reliability (Bergeron et al., 2004; Dilley & Standen, 1998), or with increased accuracy (Considine et al., 2001; Göransson et al., 2006).

The fallibility of human judgment is emphasized within the HB framework (Kahneman & Klein, 2009). However, with its focus on human error, research conducted from a HB perspective may result in blame being placed on the practitioner when an error occurs, instead of recognizing system influences. Although triage scales are important tools and provide a common language for communicating patient urgency, adherence to triage scales is not the best way of understanding RN triage DM. Triage RNs have been found to seldom refer to triage scales, or to manipulate them (Chung, 2005; Fry & Burr, 2001a, 2001b; Patel et al., 2008). Chung (2005) and Patel et al. (2008) reported that triage scales were used mostly by RNs with less experience, or by experienced RNs in ambiguous situations. Cooper, Schriger, Flaherty, Lin, and Hubbell (2002) described triage as a complex interaction between the participants in which the RN uses multiple cues from the patient to make a decision. The multifaceted nature of triage makes it difficult to identify a correct decision for any given situation, and triage DM needs to be understood in a broader context than simply focusing on accuracy (Chung, 2005; Edwards, 2007; FitzGerald et al., 2010).

The need to understand triage DM within a broader context is reflected in the research that has been conducted with the aim of understanding the DM process of triage RNs. Themes that have emerged as being part of the DM process are; RN factors, patient factors, contextual influences, and system influences. Andersson et al. (2006) constructed a model of triage DM and identified the RN factors skill (experience, knowledge, and intuition) and personal capacity (courage, ability to handle uncertainty, confidence, and rationality) as part of the DM process. The model proposed by Anderson et al., especially the category personal capacity, provides a broader picture of the characteristics of the decision maker than only examining factors such as level of education and years of experience in relation to DM. Similarly, Wolf (2010, 2013) suggested that the moral agency of the nurse is central to DM.

Patient factors such as patient presentation, perceived level of urgency, and vital signs influence triage DM (Arslanian-Engoren, 2009; Cooper et al., 2002; Fry & Burr, 2001a, 2001b). Edwards and Sines (2008) argued that most triage DM research have situated the triage decision as exclusively belonging to the triage RN. Instead, they proposed that triage is an interactive process in which the patients are part of the DM through the picture they construct of their symptoms. The notion that the patients may affect the outcome of the triage decision through their actions would probably not be perceived as a new finding by triage RNs, however, Edwards and Sines add to the DM research by making visible the patient's role in the triage process.

System influences, which are embedded in the emergency culture in the form of the concepts of timekeeping and gatekeeping, were identified as central to triage DM by Fry and Stainton (2005). Wolf (2010, 2013) found that the unit culture and the general environment of care affected accuracy in DM. Examining how the culture of emergency care impacts the work of triage RNs further extends the understanding of triage DM as part of a larger context.

Triage DM research has largely been conducted using the survey method with paper based patient vignettes. Other methods that have been used are focus groups (Arslanian-Engoren, 2009; Cone & Murray, 2002), the think aloud method (Cioffi, 1998; Göransson et al., 2008), ethnography (Fry & Stainton, 2005), grounded theory (Edwards, 2007; Edwards & Sines, 2008), experimental (Atack et al., 2005) unstructured interviews (Chung, 2005) observation in conjunction with interviews (Andersson et al., 2006), a mix of ethnography and grounded theory (Patel et al., 2008), and observational studies (Cooper et al., 2002; Gerdtz & Bucknall, 2001).

Given that triage decisions are highly contextual, research that is conducted in the actual triage environment provide a fuller understanding of the process of triage DM. Patel et al. (2008) argued that more naturalistic studies are needed to understand triage DM. Similarly, Göransson et al. (2008) identified the need for studies in which the impact of contextual factors on the process of triage DM are examined. Interviews in which triage RNs reflect on what occurs during triage and their DM strategies would add depth and insight to observations of the triage environment.

Naturalistic DM researchers have sought to understand how skilled individuals formulate decisions in real world settings under conditions of time pressure, limited information, shifting goals, high stakes, and uncertainty (Klein, 1998). Errors are understood and recognized as occurring in particular contexts. Emergency triage nursing is a setting that is congruent with the NDM framework. Examples of models and theories of DM within the NDM research tradition are, for example, Hammond's (1988) cognitive continuum theory, Rasmusen's (1983) skills, rules, and knowledge model, and Klein's (1998) RPD model (Lehto & Nah, 2006). The current study concerning triage RNs and DM was conducted using the grounded theory method. Grounded theory researchers do not enter the field with a preexisitng theoretical framework, however, the basic tenet of NDM research, understanding events as they occur in the actual environment based on the participants' account of the process, is congruent with grounded theory research.

The intent of my research is not to prove or disprove a particular model or theory of DM. As a researcher I recognize that having conducted a literature review ahead of time may influence how I interpret the data, however, I come to the area with many years of experience as a triage RN and most likely already have theoretical blinders and preconceived ideas of which I am not aware. The literature review may in fact have broadened my perspective on triage RN DM.

Theory development about triage RN DM is in its infancy. Reay and Rankin (2013) argued for the need to develop a theory of triage RN DM that is derived from the actual practice context. To date three models have been developed (Andersson et al., 2006; Patel et al., 2008; Wolf, 2013). Edwards and Sines (2008) have proposed a grounded theory of initial assessment at triage. Initial assessment is part of the process of triage DM, but does not encompass the full process of triage RN DM. Given the triage RN's role as controlling access to ED care and the lack of theories that explain the decision making processes research that aims to develop a theory of triage RN DM is appropriate and timely.

CHAPTER THREE: RESEARCH METHOD AND DATA ANALYSIS

Grounded theory is primarily an inductive research methodology aimed at discovering what is going on in a social context and how individuals solve what they perceive as being the problematic (Glaser, 1978). The aim is to generate either a substantive or formal grounded theory. Emergency triage RNs practice in a context of rapidly changing conditions in which decisions about patient acuity are formulated under pressure of time and with limited information available. The decisions that triage RNs make form the basis for the patient's access to care and subsequent journey through the emergency department (Cioffi, 1998; Croskerry, 2002; Gerdtz & Bucknall, 2001). As described earlier in this dissertation triage can be thought of as a complicated social arena where multiple interactions, contextual factors, institutional requirements, and personal characteristics of RNs and patients influence the triage decisions. The research question, "What are the processes and strategies that experienced triage RNs use when making triage decisions?" is congruent with research in which the focus is on how participants approach and resolve an issue or concern in their social setting.

The purpose of this chapter is to describe classical grounded theory as a research methodology and to provide an account of how classical grounded theory was used as a research method in the current study to generate a theory of decision making by triage RNs. The historical origins, philosophical assumptions, and knowledge claims of grounded theory are discussed in the first section; the process of conducting the study and data analysis are described in the second section.

Overview of Grounded Theory

Historical origins

Grounded theory is a research method with roots in anthropology and sociology (Wuest, 2012). It is helpful to consider the method in the context and time from which it originated. Barney Glaser and Anselm Strauss developed the grounded theory research method in the mid 1960s while they were conducting

research with dying patients, families, and hospital staff (Glaser & Strauss, 1965; Glaser & Strauss, 1967).They situated grounded theory in contrast to the dominant quantitative research methods and preoccupation with theory verification in sociology in the 1960s in the United States. Both were social scientists who had started to feel increasingly restricted by the predominant logico-deductive research methods of the day (Bryant & Charmaz, 2007; Moore, 2009). Glaser was trained as a quantitative researcher in sociology at the University of Columbia under Paul Lazarsfeld; Strauss had a background in symbolic interactionism (SI) and pragmatist philosophy stemming from his training as a sociologist at the Chicago School (Bryant & Charmaz, 2007; Charmaz, 2006). In the 1960s Glaser and Strauss conducted research together at the University of California in San Francisco and developed the grounded theory method (Bryant & Charmaz, 2007). Charmaz (2006) suggested that both quantitative and qualitative research traditions are reflected in grounded theory. The emphasis on a systematic approach, building of middle range theory, and logical reasoning reflects Glaser's influence, whereas the emphasis on process and individuals as actively participating in shaping interactions, is indicative of Strauss' background (Charmaz, 2006).

In their seminal work, *The Discovery of Grounded Theory: Strategies for Qualitative Research* Glaser and Strauss (1967) first described the grounded theory method for conducting research. Glaser and Strauss argued that theory needs to be generated from the data itself, as opposed to theory being superimposed on the data in the form of empirical testing for the purpose of verifying pre-existing hypotheses. They used the terms "theoretical capitalist" (p.10) and "proletariat testers" (p.10) to describe the relationship between the "great men" (p.10) of sociology and the researchers in the field. Glaser and Strauss claimed that there was an overemphasis on verification of theory, which stifled innovative research and the generation of new theories. According to Glaser and Strauss, some of the sociological theories of

the day were useless, because they were not grounded in the data, and did not fit with the social reality that was being explored.

Characteristics of grounded theory

In the literature grounded theory is commonly described as a qualitative research methodology (Bryant & Charmaz, 2007; Mills, Bonner, & Francis, 2006; Wuest, 2012). Glaser (1998, 2005), however, wrote that grounded theory is a general inductive research methodology that can be used with both qualitative and quantitative data. Glaser refused to situate grounded theory within any particular paradigm.

Grounded theory, as originally conceptualized by Glaser and Strauss (1967), is characterized by the constant comparative method, emergence, theoretical sampling, and the generation of an explanatory conceptual grounded theory centered around a core category. The constant comparative method consists of simultaneous data collection, comparison of data, and analysis (Glaser & Strauss, 1967). As opposed to research methods in which data collection, analysis, and writing occurs sequentially, the grounded theory researcher simultaneously collects, codes, compares, and analyzes data. The data are coded into various incidents, which are constantly compared and organized into conceptual properties that eventually form categories.

Emergence is the notion that the data speaks for itself, and that the researcher needs to let the categories emerge during the research process, rather than trying to force the data into categories pre-determined by an existing hypothesis (Glaser & Strauss, 1967). Initially, the researcher uses open coding and codes all the data. Later, as different categories begin to emerge, the researcher switches to selective coding and codes only for those incidents that are relevant to the emerging categories.

In grounded theory, the researcher begins sampling by seeking out informants who are involved in the process that is being explored, later as the categories emerge, the researcher starts to sample theoretically (Glaser & Strauss, 1967). Theoretical sampling is a form of sampling in which the ongoing

analysis and emerging categories guide further data collection. Data are collected only from those categories that appear to form a beginning framework of the developing theory. Eventually a core category becomes apparent. The core category is the category with the most explanatory power of what is transpiring in the social context, and the category that incorporates the other categories in a coherent theoretical framework (Glaser & Strauss, 1967).

The resultant theory consists of a core category with statements about how the other categories relate to the core (Glaser & Strauss, 1967). The goal is to raise the data to a conceptual level by ongoing theorizing and abstraction. According to Glaser and Strauss (1967), a grounded theory should be a parsimonious conceptualization that explains what is occurring in the social context, not just a mere description of an interesting area. As can be seen from the preceding account, comparison, emergence, and conceptualization are overarching principles of theory generation in classical grounded theory.

Evolution of grounded theory

Glaser and Strauss' (1967) original description of grounded theory has been critiqued for providing insufficient guidance in how to actually conduct the research (Hunter et al., 2011; Moore, 2009). In 1978, Glaser published *Theoretical Sensitivity,* in which he described the process of conducting grounded theory research in more detail and outlined new developments in the method. It is important to note the emphasis placed on development of theoretical sensitivity on the part of the researcher, the description of basic social processes, the in-depth discussion of memoing as vital to the ongoing analysis and abstraction, and the introduction of theoretical coding. Glaser (1992, 1998, 2001, 2002, 2003, 2005, 2009, 2012, 2013) has continued to publish numerous articles and books on grounded theory, as a response to divergent developments of the grounded theory methodology by other researchers, and as his own conceptualization of grounded theory has evolved.

By the 1990s, distinct differences had become apparent between Glaser and Strauss (Charmaz, 2006; Heath & Cowley, 2004; Holton, 2011; McCann & Clark, 2003b). In *Basics of Qualitative Research,* Strauss and Corbin (1990) proposed a more detailed and stepwise approach to grounded theory, with a stronger emphasis on verification and the addition of a new level of coding, axial coding. Strauss and Corbin also introduced the paradigm model, which was intended as a systematic way of relating the different categories. The model is process orientated and organized in a sequential manner. The model consists of causal conditions, the phenomenon itself, the context, intervening conditions, action/interaction strategies and, finally, consequences. Strauss and Corbin claimed that without the use of the paradigm model, the analysis would not be rich enough. On the other hand, it could be argued that the model lends itself to cause and effect thinking, which might limit the way the researcher conceptualizes what is happening in the social arena. Glaser (1992) vigorously critiqued Strauss and Corbin for trying to force preconceived ideas on the data through the use of the paradigm model, and for ignoring the concept of theoretical coding by introducing the, in his view, unnecessary step of axial coding.

Charmaz has developed grounded theory from a constructivist perspective (Bryant & Charmaz, 2007; Charmaz, 2006; Hunter et al., 2011; Lomborg & Kirkevold, 2003). Charmaz (2006) wrote that the researcher co-constructs the theory with the participants through interaction, as opposed to Glaser, who claimed that a grounded theory is discovered (Glaser, 1978, 1998; Glaser & Strauss, 1967). The theory that is generated, according to Charmaz, is an interpretation of constructed meanings between the researcher and the participants about the phenomenon under study. Glaser (2002) opposed the idea of co-construction of meaning and claimed that the constructivist approach distorts the data by imposing the researcher's view on the participants. Hunter et al. (2011) further critiqued Charmaz, and suggested that co-construction and equal participation in the research process by the participants are difficult ideals to transfer into actual research practice, especially for the novice researcher. The main criticism leveled at

Charmaz and constructivist grounded theory by Glaser (2002) is that Charmaz distorts grounded theory by focusing on descriptions of interactions, rather than raising the data to the level of abstract conceptualization and thereby providing a conceptual theory, as opposed to a descriptive theory.

Charmaz (2006) posited that grounded theory research conducted from a constructivist stance has the potential to expose concealed hierarchical power structures. Charmaz's argument can be viewed either as a departure from, or extension of, classical grounded theory. In classical grounded theory, the aim is to uncover sometimes hidden social processes that are problematic to the individuals in the social arena (Glaser, 1978; Glaser & Strauss, 1967). Although power structures are not explicitly referred to in classical grounded theory, identifying a core category might have the effect that power imbalances become apparent. For instance, in *Awareness of Dying* Glaser and Strauss (1965) made explicit how the physicians had the power of knowledge, and the power of choosing to reveal, or not reveal, if a patient was dying.

Philosophical underpinnings of grounded theory

Grounded theory is commonly described in the literature as a qualitative research methodology with its roots in symbolic interactionism (SI) and pragmatism (Charmaz, 2006; Heath & Cowley, 2004; McCann & Clark, 2003a; Morse, 2007; Schreiber, 2001; Wuest, 2012). Pragmatism originated as a philosophical movement in the United States at the end of the 19th century (Ayer, 1978; McCready, 2010; Warms & Schroeder, 1999).

William James is recognized as the philosopher who made pragmatism widely known, although it is Charles Sanders Peirce (1878/1992) whom James (1907/1978) credited with introducing the philosophical principles that later became known as pragmatism. The essence of pragmatism is reflected in the following statement by James (1907/1978): "What difference would it practically make to anyone if this notion rather than that notion were true?" (p. 28). In other words, truth claims are examined by tracing the practical consequences of different ideas. If the outcomes of two competing ideas are evaluated and there is no

difference, then the discussion about the supremacy of one idea versus another is futile (James, 1907/1978). James thought of theories as instruments that we use to remake reality, not static explanations. New theories are developed when old explanations are challenged by new experiences and ideas. Old theories are not replaced; instead old and new ideas are assimilated into a new theory (James, 1907/1978). As can be seen from the preceding description, pragmatism is inherently action orientated in its focus on useful consequences and theories as instruments. Furthermore, the view of theory development is evolutionary rather than revolutionary. Dewey, another early pragmatist, proposed a more radical form of pragmatism than James. He viewed philosophical inquiry as a way of transforming problematic social areas (Hannes & Lockwood, 2011; Talisse & Aiken, 2011).

Symbolic interactionism originated in the sociological tradition of the Chicago school, and is a theoretical perspective derived from the philosophy of pragmatism (Charmaz, 2006; Charon, 1979). Blumer (1969) described SI based on the thoughts of George Herbert Mead in the book *Symbolic Interactionism: Perspective and Method*. Briefly summarized SI is based on the premise that human beings are capable of individual thought and act according to the meaning they attach to various situations and the actions of other human beings. Meanings are learned through observation and interaction. Social situations are interpreted and handled based on the meaning people attach to social symbols such as language. Human actions are modified through experiences and thought. An underlying tenet is that humans are capable of interaction with their own selves, and therefore can adjust their actions based on experience and reasoning within the self. Actions and interactions occur in a social context and society continually develops as a result of this (Blumer, 1969).

Charmaz (2006) drew clear parallels between the interpretivist grounded theory approach based on constructivist tenets that she advocated and SI. She argued that a constructivist perspective is congruent with an SI stance; within the constructivist paradigm social life is viewed as a process and truth

is considered to be conditional. Glaser (2005) took exception to the idea that SI is the theoretical perspective on which grounded theory is based. Glaser did not exclude SI as a theoretical perspective, but objected to SI being almost exclusively adopted as the foundation for grounded theory. Glaser claimed that, by adopting solely an SI framework, the researcher risks overlooking many theoretical concepts, and consequently valuable concepts are lost. Furthermore, according to Glaser, SI is interactional in nature whereas in grounded theory the aim is overall conceptualization.

In *The Discovery of Grounded Theory* (Glaser & Strauss, 1967) and in *Theoretical Sensitivity* (Glaser, 1978), there is no explicit reference made to SI, or to pragmatism, however, it can be argued that some clear parallels to Jamesian pragmatism exist. In classical grounded theory, the theory is evaluated by its usefulness in the actual social context; in other words it must work, if the theory does not work then it is modified. This is similar to how truth claims are evaluated in Jamesian pragmatism. In order for an idea to be true, it must have useful practical consequences (James, 1907/1978). In pragmatism, old theories are modified as new theories are incorporated with existing theoretical frameworks in an ongoing process of theory development and modification. Similarly, (Glaser, 1978) suggested that theory generation in grounded theory is a process of ongoing modification of theories in light of new discoveries. In summary, the principal similarities between Jamesian pragmatism and grounded theory lie in the emphasis on utility and practical application of theory, and of theory development as a dynamic, evolutionary process.

Ontology and epistemology

Classical grounded theory has been situated within the postpositivist (Annells, 1996; McCann & Clark, 2003b) and positivist paradigms (Ghezeljeh & Emami, 2009). Different paradigms, or worldviews, result in different modes of inquiry based on the ontological and epistemological assumptions inherent in each paradigm. As described earlier, Charmaz (2006) has adapted her version of grounded theory to operate within an interpretivist-constructivist paradigm. Nathaniel (2011) argued that the ongoing debate

about the ontological, epistemological, and methodological foundations of grounded theory stems from a lack of a clearly articulated philosophical perspective by Glaser and Strauss. She suggested that the ontology and epistemology of classical grounded theory are congruent with Peirce's philosophy of pragmatism.

Ontology is a branch of philosophy in which the nature of being, the nature of reality, and what exists is studied (Lacey, 1996; Rawnsley, 1998). Epistemology has been called *theory of knowledge* and involves questions about knowledge and how we can know what we know (Lacey, 1996; Rawnsley, 1998). Annells (1996) argued that the answer to the epistemological question of what can be known arises out the researcher's reply to the ontological question about the nature of reality. It is therefore necessary to examine each research methodology with regards to its ontological and epistemological foundations for congruence with the research question that is being asked and the research method that is used.

Ontologically, classical grounded theory has been described as being founded on critical realism (Annells, 1996, 1997; McCann & Clark, 2003b). Lincoln and Guba (1985) situated critical realism within the postpositivist paradigm. Critical realism is a philosophical school of thought developed by the philosopher Roy Bhaskar who critiqued positivism and argued that a conjunction of events is not enough to determine causality (Bhaskar, 1975). He claimed that causative mechanisms exist independent of our experiences. Critical realists assume that an external reality exists that is independent of human thought and can be known thorough observation, however, scientific observations are not infallible (Guba & Lincoln, 2005; McEvoy & Richards, 2003). Critical realists are interested in the connections and interactions between human agency, social structures, and underlying causal mechanisms that might not always be immediately apparent (McEvoy & Richards, 2003). This is similar to how social processes and the uncovering of underlying latent social patterns are central themes in classical grounded theory, along with the view that a

reality exists outside of the researcher, while at the same time grounded theory theorists subscribe to the idea that theory is not infallible and can be modified.

Epistemologically there are some connections between postpositivism and classical grounded theory. The knowledge claims in postpositivism are based on a modified objectivist epistemology (Annells, 1996; Guba & Lincoln, 2005). Within a modified objectivist epistemology findings are probably true, but not proven (Annells, 1996; Guba & Lincoln, 2005). In classical grounded theory findings are subject to continual modification and the aim is not to prove a particular theory (Glaser, 1978; Glaser & Strauss, 1967).

Bryant and Charmaz (2007) wrote that classical grounded theory has obvious positivist components, but that upon a more careful reading of the early texts a different interpretation is possible. For instance, according to Bryant and Charmaz, in *Discovery of Grounded Theory Glaser and Strauss (1967)* suggested that the researcher interacts with the data through insights gained from personal experience. This would suggest a more interpretivist-constructivist view. As noted by Nathaniel (2011) Glaser does not discuss the epistemological and ontological foundations of grounded theory in his writings. Holton (2007) wrote "that as a general methodology, classic grounded theory can adopt any epistemological perspective appropriate to the data and the ontological stance of the researcher" (p. 269). Simmons (2011) an early grounded theorist, argued that classical grounded theory has elements of both objectivism and constructivism. He noted that Glaser (2002) recognized that multiple perspectives exist and that grounded theory "raises these patterns to the abstract level of conceptualization hoping to see the underlying or latent pattern, another perspective" (Glaser, para 6). According to Simmons, recognizing multiple realities and underlying patterns is not a purist objectivist view of reality. To quote Simmons:

> Unlike objectivism, classic grounded theory is not about discovering an obdurate, objective reality independent of subjective realities; it is about discovering, conceptualizing, and explaining

patterned, subjective realities, with full recognition that meanings are continuous, emergent social constructions. (p. 25)

Simmons concluded that classical grounded theory adopts the middle ground by recognizing features of both objectivism and constructivism resulting in a method with a firm theoretical foundation that is grounded in the data and has practical use for change initiatives.

The emphasis in classical grounded theory on data, and the notion that the data speaks for itself corresponds with a postpositivist stance. In *Discovery of Grounded Theory,* Glaser and Strauss (1967) referred to theory as discovered; in other words, knowledge exists apart from the researcher and can be obtained through observation of the data. The notion, however that theories are not infallible and open to ongoing modification situates classical grounded theory within the postpositivist paradigm of a reality that we can only know imperfectly and knowledge claims that are probably true, but not infallible. Simmons (2011) view is that there are features of constructivism and objectivism in classical grounded theory. Moreover, he recognizes that while the data speaks for itself there are also subjective meanings, fortunately this provides a reasonable avenue for understanding the ontology and epistemology of grounded theory without becoming entrenched in rhetorical debate.

Critique of classical grounded theory

The classical grounded theory research methodology has been critiqued for its positivist/postpositivist leanings with the assumption that a mainly objective reality exists that can be discovered by a largely unbiased researcher (Annells, 1997; Bryant & Charmaz, 2007; Charmaz, 2006). Charmaz (2006) contended that viewing the data as external and existing as real in and of themselves does not account for the context, or how the data are extracted. Charmaz critiqued classical grounded theorists for their, in her opinion, objectivist stance as neutral experts, when even the process of selecting what is data shape how the data are taken up and used. Annells (1997) went further and argued that in

classical grounded theory the researcher is perceived as being controlled by the data, as opposed to having any part in how the data emerges.

Leveling critique at classical grounded theory based on its epistemology indicates an alternate view of knowledge and how we derive knowledge. Researchers come from diverse research traditions and ask questions that require different research methods. Whereas it is important to examine the philosophical underpinnings of different research methods and to clarify their strengths and weaknesses, it is also necessary to recognize that scientific knowledge can be obtained through a variety of methods. Glaser (2002) wrote that much of the critique directed at grounded theory has been founded on the inaccurate assumption that grounded theory is descriptive, when in fact the aim in grounded theory is conceptualization. The grounded theory method is intended as a way of grounding theory development in the context, while at the same time facilitating the transition from description to abstraction for the purpose of discovering a theory that is useful to practitioners. Wuest (2012) argued that grounded theory can be used across different paradigms, and that the philosophical orientation of the researcher determines how grounded theory is adopted in a particular study.

Classical Grounded Theory – The Method

As previously stated, the aim in grounded theory is to generate theory about social contexts about which there is limited knowledge and how individuals in these contexts solve what they perceive to be their main concern (Glaser & Strauss, 1967). Limited knowledge does not imply that there is a lack of existing research, but rather that a particular perspective or process has not been explored and uncovered. For instance, in *Awareness of Dying,* Glaser and Strauss (1965) made explicit the influence of awareness contexts on how health care professionals treated dying patients. Dying is not new, but Glaser and Strauss' theory of awareness added a new dimension to how the process of caring for dying patients was viewed (Stern, 1980).

My understanding of grounded theory is like grounded theory itself, constantly being modified and evolving. The subsequent description represents my understanding of grounded theory at this moment in time, but I have no doubt, that my understanding of what grounded theory is will continue to evolve. The method of grounded theory is not a linear process, instead, the researcher continuously moves back and forth between data collection, data analysis, coding, memoing, and theory development (Glaser, 1978; Glaser & Strauss, 1967). Because of the many simultaneous activities that take place, it is difficult to offer a neat description of the method. To make grounded theory more understandable, the following account presents grounded theory in a somewhat stepwise manner, however, the reader needs to keep in mind that the grounded theory researcher engages in an ongoing, iterative process continuously moving between data collection and analysis. For the remainder of this chapter classical grounded theory will be referred to as grounded theory.

The research question

Ideally, the grounded theory researcher enters the field with as few preconceived ideas about what the problem is as possible and lets the research question emerge (Glaser, 1992, 2013). This is entirely consistent with the basic grounded theory tenet of not imposing the researcher's preconception of what the main issue might be on the participants. As the research process evolves, the researcher uncovers the participants' perspectives of what they consider to be the problematic social process. (Schreiber, 2001; Wuest, 2012). The problem, as described by the participants, might not be the same problem as that which the researcher anticipated to find (Glaser, 1978; Schreiber, 2001). For example, after conducting a literature review on triage RN DM a researcher may find that acuity scores as determined by triage RNs are not always correct and conclude that the process of deciding on acuity scores needs to be further explored. The RNs themselves, however, may consider determining acuity scores less problematic, and instead, be more concerned with finding the best place for any one patient to be treated in relation to other patients.

Glaser (1992) wrote that the problem and the processes used to resolve the problem are closely intertwined and that, in fact, the processes used to solve the problem usually point to what the primary problem is.

Grounded theory research questions are often broadly framed around a particular process to uncover latent patterns of what is actually going on in the field (Hood, 2007). Wuest (2012) stated that a grounded theory research question may be formulated as a statement of purpose, however, continued by writing, that the researcher might be forced by institutions and funding agencies to provide a more explicit statement of the question. The objective of this study was to understand how experienced triage RNs undertake the process of triage DM and to generate a substantive grounded theory of triage RN DM. In order to proceed with the research it was necessary to formulate a focused research question. The question that emerged was:

"What are the processes and strategies that experienced triage RNs use to make triage decisions?"

To be true to the grounded theory method, however, it was necessary to remain open to the possibility that a different main concern might be discovered and that DM might not be perceived as a problematic process by triage RNs.

The literature review

In classical grounded theory, the literature review is ideally delayed until the core category starts to emerge (Glaser, 1978, 1998; Glaser & Strauss, 1967). According to Glaser and Strauss (1967) and Glaser (1978) by conducting a literature review ahead of time, researchers might be predisposed to view the data solely through their favourite theoretical lens, and thereby be at risk for attempting to force the data into preconceived categories. General literature may, however, be read prior to the research to provide a background (Glaser & Strauss, 1967), and the researcher may also review relevant preexisting theories to

explore an emergent fit (Glaser, 1978). If a theory is found that appears to fit, it is incorporated in the emerging categories and extended, not merely verified (Glaser, 1978). The delay in reviewing the literature fits with how Glaser and Strauss (1967) argued for grounded theory research as a process of discovering theory rather than a quest for verification of preexisting theories by hypotheses testing.

By not conducting a literature review this does not mean that the researcher delays all reading, instead, Glaser (1978, 1992) encouraged reading extensively in other substantive fields during the stage when the categories are being developed. The theoretical literature in the substantive field should be reviewed when a theoretical framework, and a core category start to emerge. The aim is to see where the emerging framework fits into the existing literature, and to incorporate relevant literature (Glaser, 1978, 1992).

Research is conducted within the constraints of institutional requirements of review boards and funding agencies; therefore, delaying the literature review is not always possible. In order to fulfill academic requirements I conducted a literature review prior to commencing this study. The literature review was in fact beneficial and did broaden my perspective since I, as an experienced triage RN, am deeply embedded in the context, and most likely already have theoretical and conceptual blinders of which I may not be aware. The literature review may in fact to a certain degree have prevented me from preconceiving a main concern of the participants based on my own perspective, and opened up my thinking to new possibilities. Glaser (personal communication, August 1, 2012) advises the novice that if required to conduct a literature review, to go ahead and do so, and then put the review aside until the theory starts to emerge.

Sampling in grounded theory

The sample size is not predetermined when conducting grounded theory research (Glaser, 1978; Glaser & Strauss, 1967). Initially the researcher selects participants who are involved in the social process within the context that is being explored (Glaser, 1978; Glaser & Strauss, 1967). The selection is guided by

the researcher's general knowledge of the area, and a perception of whom the participants are that can offer insights (Glaser & Strauss, 1967; Wuest, 2012). As a core category and its related categories begin to emerge, the researcher uses theoretical sampling to guide further data collection and to enroll more participants (Glaser, 1978; Glaser & Strauss, 1967).

Theoretical sampling is a simultaneous activity of data collection, coding, and data analysis, during which the researcher, guided by the emerging theory and its categories, decides what data should be collected next and from where; it is a purposeful process of seeking out relevant data that can move the theory forward (Glaser, 1998; Glaser & Strauss, 1967). This is different from sampling in "regular" research methods where a preexisitng theoretical framework guides data collection.

Theoretical sampling differs from predetermined statistical sampling. The word theoretical implies that it is always the emerging theory that guides sampling and data collection. For example, if the researcher discerns that a particular category is pertinent to the theory, and decides that it is not yet fully developed, the researcher collects more data about the category. The purpose is to sample data that helps the researcher saturate the different categories and understand their relationship, rather than selecting a sample that is representative of the population. Glaser (1998) described this as sampling with the aim of obtaining an ideational sample.

The researcher actively samples events indicative of conceptual categories, not just individuals (Glaser & Strauss, 1967). The practical implication is that the researcher seeks data that can further advance the theory. For instance, theoretical sampling can take a variety of forms such as enrolling new participants that have information about the particular category the researcher wants to saturate, purposefully observing contexts where more information can be obtained, or asking questions in interviews about the category. Theoretical sampling ceases for a category when the category is theoretically saturated (Glaser & Strauss, 1967). Theoretical saturation means that no new data are discovered that are useful for

further development of the category. The category that takes the longest to saturate is usually the core category (Glaser & Strauss, 1967).

Not being able to specify a predetermined sample size, however, can be problematic when institutional approval is required for the research (Wuest, 2012). Wuest (2012) suggested that sample sizes in grounded theory can vary from 10 to 40 participants, with the caveat that the final sample size depends on the quality of the data and the emerging theory. Similarly, other authors have suggested sample sizes of 10 to 40 participants (Liehr, Lobiondo-Wood, & Cameron, 2009; Polit & Beck, 2012; Stern, 2007), while others do not stipulated a sample size (Morse, 2007; Schreiber, 2001).

Data in grounded theory

One distinguishing feature of grounded theory is that data from a variety of sources are used. “All is data” (para. 2) is a well known grounded theory statement (Glaser, 2002). Glaser and Strauss (1967) wrote that different kinds of data, and different kinds of data collection methods are appropriate. For instance, data from interviews, observations, field notes, surveys, library sources, the researcher’s own experience, and quantitative data can all be used. These different kinds of data are called “slices of data” (p.65) and generate a richer way of knowing, because categories can be examined from multiple perspectives (Glaser & Strauss, 1967). The choice of the data collection method is guided by the type of data that best yields the information that the researcher requires (Glaser & Strauss, 1967).

Glaser and Strauss (1967) also suggested that the researcher’s own experience, general knowledge, readings, and the stories of others, should be included as “anecdotal comparison” (p. 67). By writing memos throughout the research process the researcher accounts for his or her own experiences, and by including these memos as data, biases can be controlled for through comparative analysis, in which the underlying cause of variation is discovered, and the data are raised to a conceptual level (Glaser, 1978; Glaser & Strauss, 1967). Essentially memos are notes that the researcher writes as ideas about various

concepts and their relationships occur during the research process (for a further exploration of memos, see p. 66). Accounting for personal experience, while at the same time placing the experience alongside other data, provides an avenue for the researcher, who is an experienced practitioner in the field that is being explored, to incorporate and analyze his or her experiences in relation to the information offered by the participants. Classical grounded theory has been criticized as objectivist, however, this critique is partially unfounded since the method allows for integration of researcher experience.

Interviews and observations are common ways of collecting data in grounded theory (Polit & Beck, 2012; Schreiber, 2001). Glaser (2002) proposed that during the initial data collection phase, the interview should consist mostly of passive listening. Later, during theoretical sampling, more focused questions can be used as the researcher collects data for particular categories. The objective of the interview is to collect data as the participant offers it. Glaser opposed Charmaz's (2006) constructivist approach, in which the researcher and the participant co-construct the data through a mutually interpretive process of the meaning of the data. Interpretation of data during the interview can occur, but it should be the participant offering up his or her interpretation to the researcher who then records it as data (Glaser, 2002). Furthermore, the researcher should ask questions about the empirical area, not the research question itself (Glaser, 1998). Glaser suggested that the data speaks for itself and that researcher bias can be controlled through the constant comparative method. It can be argued though, that the process of attending to some data and not other data during observations, interviews, and the subsequent coding raises the possibility that the researcher's perception of what is relevant data might become the predominant lens through which the findings are viewed.

Data analysis

The data are analyzed using the constant comparative method, which is central to grounded theory. The characteristic feature of the constant comparative method is the joint collection, coding,

comparison, and analysis of data (Glaser & Strauss, 1967). Theoretical sampling and the constant comparative method are used in conjunction. Although a linear description is offered in the subsequent section, it is important to keep in mind that, throughout the process, the analyst moves back and forth between data collection, coding, and analysis.

After the initial data are collected, the data are transcribed and the researcher commences coding. The purpose of coding is to raise the data to a conceptual level. Data and the resultant theory are connected by conceptual codes. Glaser (1978) defined conceptual codes as "categories and their properties" (p. 55). A grounded theory is discovered by exploring the relationship between the various conceptual codes. Glaser described two types of coding: substantive coding and theoretical coding. Substantive coding refers to coding and conceptualizing of empirical data, theoretical coding refers to conceptualization of how the substantive codes relate to each other.

Substantive coding

The first step is open coding, during which the data are coded line by line. Each incident is named as it occurs in the data. As the researcher compares incident with incident, conceptual categories and their properties begin to emerge (Glaser & Strauss, 1967). A conceptual category can stand by itself and a property is a conceptual aspect of a category. The analyst compares each incident with other incidents in the category and compares the incident with the property it appears to belong (Glaser & Strauss, 1967). Categories and properties are not data; they are concepts derived from the data (Glaser & Strauss, 1967). Glaser (1978) suggested that six rules should guide the coding.

1) The researcher should continually ask three questions;

- What is this data a study of?
- What category does this incident indicate?
- What is actually happening in the data?

Continually asking these questions will aid the researcher in becoming theoretically sensitive to the material and to perceive connections among the codes (Glaser, 1978).

2) Coding should be conducted line by line.

3) The researcher, not an assistant, should conduct the coding.

4) Coding should always be interrupted to memo ideas.

5) The researcher should remain within the substantive area.

6) The researcher should not assume that factors such as age or gender are necessarily analytical variables. In order for such factors to be included, they have to earn their way into the analysis.

The categories that emerge are either sociological constructs, or in vivo codes (Glaser, 1978). Sociological constructs are conceptual names for categories that the researcher has devised; in vivo codes are names for behaviours and processes that the participants use. In vivo codes often denote processes and behaviours that are used to solve the underlying problem (Glaser, 1978). Names for sociological constructs and in vivo codes should convey imagery and be analytical enough to facilitate further conceptualization.

Eventually a framework starts to emerge with a core category (Glaser, 1978). In classical grounded theory, only one category is selected as the core category, and the other categories are incorporated as they relate to the core. The researcher switches from open coding to selective coding as the theoretical framework starts to appear. Selective coding means that the researcher delimits and only codes for the core category, and those categories that relate to the core in the emerging theory (Glaser, 1978). If a new category is discovered that is relevant to the theory, coding for the category starts where it first appeared, it is not necessary to go back through the data (Glaser & Strauss, 1967). One of the key points in grounded theory is to let the core category emerge, versus trying to force it (Glaser, 1978, 1998; Glaser & Strauss, 1967).

Theoretical coding

In substantive coding, the data are disassembled into pieces; in theoretical coding the substantive codes are connected again into a story, an emergent theory (Glaser, 1978). The theoretical codes are the connections between the substantive codes. Theoretical codes help integrate the data, raise it to an abstract level, and might provide new ways for thinking about familiar patterns (Glaser, 1978). In other words, theoretical codes can help us see what was previously hidden. Fracturing the data and then reassembling it again is consistent with the goal in grounded theory to provide an overall conceptualization of what is going on in the field, versus simply describing the experiences of the participants.

Glaser (1978) suggested 18 theoretical coding families. He indicated flexibility in their use and left the door open for researchers to develop their own codes. The most versatile coding family is the six Cs: causes, contexts, contingencies, consequences, covariances, and conditions (Glaser, 1978). Theoretical coding can also be conducted by drawing a model of the theory that illustrates how the various categories are connected. The model can be used as a foundation for writing the theory, however, Glaser (1978) advised constraint in the use of models.

Core category

The core category is the category with the most explanatory power of what is going on in the social arena (Glaser, 1978; Glaser & Strauss, 1967). Any theoretical code, for instance, a process, a consequence, or a condition can function as a core category (Glaser, 1978). Glaser (1978) offered several criteria in order to recognize a core category. The core category is central and accounts for much of the variation in the behaviour that is being studied. Being central means that the core easily relates to the other categories and that the core is integral in helping the researcher extend the analysis. The core category reoccurs often in the data and is generally the category that takes the longest to saturate. The core is what organizes the behaviour of the participants (Glaser, 1998). A core category should have grab, in other

words, the category should be easily recognizable as offering an explanation of what the problematic is in the social context (Glaser, 1978). A foundational principle in grounded theory is to not force the core category, but to let it emerge.

The core, while explaining much of what is occurring in the social context, is also an aspect of the problem (Glaser, 1978). For instance, Glaser and Strauss'(1965) core category, awareness of dying, is explanatory of, while at the same time accounting for, the problematic in the care dying patients received in US hospitals in the 1960s. Patients at that time were usually not told by their physicians that they were dying. Being aware of, or not aware of dying, had implications for variations in the care the patients received (Glaser & Strauss, 1965).

Basic social processes

The theoretical code, the core category that explains what is going on, might be, but is not necessarily a process (Glaser, 1978). Glaser called this special case of the core category a basic social process (BSP). All BSPs are core categories (Glaser, 1978). Two kinds of BSPs exist, basic social psychological processes and basic social structural processes. Basic social psychological processes refers to psychological processes such as, for example, becoming, whereas basic social structural processes refers to changing social structures, for example, centralization (Glaser, 1978). A basic social psychological process occurs within the context of a basic social structural process and is named by a gerund (ing - form) (Glaser, 1978). A BSP is by nature abstract and transcends time and place. As such, the BSP is also a basic underlying pattern in social processes.

Memoing

Memoing is an essential component of the constant comparative method (Glaser, 1978). The purpose of memos is to capture emerging ideas and concepts as they occur. Memos suggest theoretical links between categories and elevate the thinking to a conceptual level (Glaser, 1978, 1998). As the

researcher codes and analyzes the data, it is imperative, according to Glaser (1978) that the researcher stops and writes memos about ideas and links as they occur. Proper grammar and form are not important when writing memos, the objective is to get ideas down on paper and start exploring them (Glaser, 1998). The process of writing memos forces the researcher to slow down and examine various ideas and preconceived notions. The memos become a memo fund that the researcher uses when writing the theory (Glaser, 1978, 1998). The memos are sorted according to categories, and the discussion and elaboration in the memos about each category serve as the foundation for writing (Glaser, 1978, 1998; Glaser & Strauss, 1967). Memo writing continues throughout writing the theory.

Writing the theory

Writing the grounded theory starts with theoretical sorting, a process whereby the memos are sorted into a theoretical outline (Glaser, 1978). The intent is for the researcher to remain on a conceptual level and sort according to ideas, not a preconceived outline (Glaser, 1978, 2012). The outline of the theory will emerge during sorting, as the previously fractured data are woven back together into an emerging theory. Categories should be sorted as they relate to the core category, the researcher must select only one core category, and memoing continues during sorting. As sorting proceeds, the researcher continues to make connections between the various codes and new theoretical codes might appear (Glaser, 2012). Theoretical sorting challenges the researcher to get out of the descriptive data and move to a conceptual level (Glaser, 1978). Sorting stops when theoretical completeness is achieved (Glaser, 1978, 2012). Theoretical completeness means that the process under study has been sufficiently explained in a parsimonious manner, accounting for as much variation as possible and, that at the same time, the theory is as broad as possible (Glaser, 1978, 2012).

The memos are used to write a first draft of the theory. This is a conceptual rendering of the sorted memos and how the substantive codes that are derived from the data relate to each other (Glaser, 2012).

Glaser (2012) wrote that the writing should be in the present tense since the theory is an ongoing abstraction, not just events that took place when the data were collected. The draft is later reworked into a mature paper.

When writing the theory the researcher should start reading as much as possible in the theoretical and substantive area (Glaser, 1978). According to Glaser (1978), it is vital to include the existing literature. Grounded theory should not be presented in isolation from scholarly work that has already been conducted; instead, grounded theory should stand alongside previous work and contribute to a broader understanding of the phenomenon (Glaser, 1978). The final theory can be presented either as a set of related propositions, or as a theoretical discussion of the core category and the related categories (Glaser & Strauss, 1967). Glaser and Strauss (1967) expressed a preference for presenting the theory as a discussion, since this type of presentation facilitates the emphasis on theory as an ever-evolving process that they advocated.

The writing should be conceptual focusing on concepts, not individuals or descriptions (Glaser, 1978). The problematic should be introduced as derived from the data itself and not from a preexisting framework. Illustrative statements from the participants and field notes are introduced for the purpose of supporting the concepts and carrying the concepts forward. Glaser (1978) stated that writing about how the discovered processes were utilized in processing the problem is imperative for maintaining the writing on a conceptual level.

The Grounded Theory Itself

A grounded theory is an inductively derived theory from a social context consisting of a core category and its related categories (Glaser, 1978; Glaser & Strauss, 1967). Two different types of grounded theory can be generated, either formal or substantive grounded theory (Glaser & Strauss, 1967). Formal theory refers to a formal or conceptual area and spans across several substantive areas, for example,

status passage. Substantive theory refers to a particular substantive or empirical area, for example, dying. According to Glaser and Strauss (1967) dying is transitional stage that can be viewed as a form of status passage. They wrote that a formal theory of status passage could be generated by studying other substantive areas that involve a transitional stage, such as, for example, transitioning from being single to married, or from being a student to becoming a professional.

The theory should be as parsimonious as possible, while at the same time, having explanatory power of what is happening in the social arena (Glaser & Strauss, 1967). In other words, the grounded theory is characterized by frugality in expression and comprehensiveness in explanation.

A grounded theory should transcend mere description and provide an abstract conceptualization that explains what the participants believe to be the problematic (Glaser & Strauss, 1967). Glaser and Strauss (1967) argued that theory should be generated from data, and that theory is discovered. They claimed that a theory that is truly grounded in data can be modified and adapted as new data come to light, but that it is rarely proven false.

To be useful for practitioners a grounded theory must have four different properties: *fitness, understanding, generality,* and *control* (Glaser & Strauss, 1967). Fitness means that the theory must fit the area of its intended use, as opposed to merely reproduce the researcher's preexisting theoretical framework. The theory must be induced from the data and reflect what is transpiring in the actual social context. For a grounded theory to be understandable, it must make sense to the persons working in the area and accurately portray their social reality. If the theory resonates with the individuals in the context, they are more likely to make use of it.

Generality, according to Glaser and Strauss (1967), implies that the theory is both general enough to allow its use in constantly changing situations, while at the same time being specific enough not to lose its ability to sensitize people to what is occurring in their particular area. The theory must allow for flexibility

so that the practitioner who uses the theory can readjust it as new situations emerge. Control is the ability of the practitioner to both have enough control over the environment to be able to apply the theory, in conjunction with the ability to understand and anticipate how the application of the theory might produce different outcomes (Glaser & Strauss, 1967). In 1978 Glaser further developed the above criteria and proposed that a grounded theory must have the following characteristics: fit, work, relevance, and modifiability, which will be discussed in the next section

Evaluating Grounded Theory Research

Grounded theory is evaluated by different criteria than quantitative research and in other types of qualitative research. In the following section a brief overview will be offered of the criteria used for assessing quantitative and qualitative research followed by an account of how grounded theory research is evaluated according to Glaserian criteria.

Glaser and Strauss (1967) situated grounded theory in contrast to the dominant quantitative research methods in sociology in the 1960s in the United States. Quantitative research derives its philosophical roots from positivism and postpositivism (Guba & Lincoln, 2005). Theory development occurs thorough hypo-deductive reasoning in which the scientist derives hypotheses from existing theories and then proceeds to test the hypotheses in order to verify the theory (Guba & Lincoln, 2005; Rodgers, 2005). A statement is true if it corresponds to observable, measurable facts, the correspondence theory of truth (Risjord, 2010; Rodgers, 2005). Variables are measured using instruments that are said to be reliable if they consistently measure the same attribute, and valid if the instruments measure what they are intended to measure (Polit & Beck, 2012). In short, quantitative research is characterized by objectivity, verifiability, and generalizability.

On the other hand, in qualitative research the notion that human experience and social processes can be described objectively in quantifiable terms is refuted. Qualitative research is interpretive, naturalistic,

and aims to understand the experience of human phenomena and social processes as they occur in particular contexts (Denzin & Lincoln, 2005; Holloway & Todres, 2003; Polkinghorne, 2006). The importance of the context is recognized and the researcher is acknowledged as situated within the context (Denzin & Lincoln, 2005). Qualitative researchers use a diversity of methods, for example, hermeneutics, ethnography, and discourse analysis, from a variety of philosophical traditions (Denzin & Lincoln, 2005; Liehr et al., 2009; Polkinghorne, 2006).

Qualitative research, as a consequence of the difference in philosophy from quantitative research, is evaluated by different criteria. One early method for evaluating qualitative research that has largely influenced how qualitative studies are assessed was proposed by Lincoln and Guba (1985) (Mackey, 2012; Morse, Barrett, Mayan, Olson, & Spiers, 2002). Lincoln and Guba (1985) suggested that the *trustworthiness* of qualitative research (rigor in quantitative research) can be evaluated by four criteria: *credibility* (internal validity in quantitative research)*, dependability* (reliability), *confirmability* (objectivity), and *transferability* (external validity*),* with the addition of *authenticity* in 1994 (Guba & Lincoln, 1994).

Briefly, credibility refers to the confidence the reader can have in the truth of the data by the way the study is conducted and how the researcher has demonstrated integrity in reporting the data. Dependability refers to similar results being obtained should the inquiry be repeated with similar participants and in a similar context. Confirmability means that the researcher has accurately reflected the participants' view and that another researcher would obtain similar interpretations. Findings in qualitative research are not generalizable, rather by providing a rich description of the setting and the participants the researcher enables the reader to decide if the findings are transferable to other similar contexts. Finally, authenticity means that the researcher has provided a rich enough description of the participants and the context so that the reader can envision the participants' experiences (Guba & Lincoln, 1994; Lincoln & Guba, 1985). Guba and Lincoln's criteria were formative for how qualitative research has come to be

evaluated, however, the criteria have been critiqued in the qualitative research literature and several other frameworks now exist for assessing qualitative research (Beck, 1993; Lincoln, 1995; Mackey, 2012; Morse et al., 2002; Sandelowski & Barroso, 2008; Stige, Malterud, & Midtgarden, 2009).

One example is Morse et al. (2002) who argued for a return to the terms validity and reliability when evaluating rigor/trustworthiness in qualitative studies. According to Morse et al. " while strategies of trustworthiness may be useful in attempting to *evaluate* rigor, they do not in themselves *ensure* rigor" (p. 17). Morse et al. contended, that instead of applying a set of criteria to the final product, responsibility rests with the researcher to continually apply verification strategies throughout the research process. These verification strategies, as described by Morse et al., include methodological coherence, an appropriate sample, concurrent data collection and analysis, the researcher's ability to think theoretically, and theory development. Methodological coherence means that the philosophical underpinnings, the research question, the research method chosen, and the design of the particular study are congruent. The sample selection should be characterized by participants that are best able to offer the information needed and the sample should be adequate for saturation of the different categories. Data collection and analysis should be an iterative process, as opposed to a linear process. The researcher must have the ability to think theoretically and needs to verify new ideas with the data.

Finally, theory development should be the result of the researcher's ability to move between a micro perspective and macro perspective resulting in a conceptual theory. In summary, verification in order to ensure rigor/trustworthiness is an ongoing process throughout the research project, not just a set of criteria applied at the end (Morse et al., 2002). The outcome of research that is conducted using the aforementioned criteria is characterized by a text and findings that are multifaceted, yet easily recognizable (Morse et al., 2002). Although not explicitly stated by Morse et al. (2002) their criteria are similar to the grounded theory process of conducting research.

Glaser (1998) has argued that grounded theory is a methodology that must be evaluated by its own criteria, which are different than the criteria used for evaluating qualitative research methods. In 2003 Glaser strongly refuted Lincoln and Guba's (1985) criteria for assessing qualitative research. He argued that Lincoln and Guba were overly preoccupied with details which ultimately would stifle the generative research process. Glaser wrote that Lincoln and Guba's criteria are not applicable to grounded theory since the overall aim is conceptualization, not detailed description. According to Glaser (2003) the paramount criterion for evaluating a grounded theory should be the ability of the theory to explain how individuals in a social context continually resolve what they perceive to be their main concern.

As stated earlier in this dissertation Glaser and Strauss (1967) wrote that in order for a grounded theory to be applicable it must have four properties: fitness, understanding, generality, and control. In 1978 Glaser wrote that a grounded theory can be evaluated based on four criteria: *fit, work, relevance,* and *modifiability.* According to Glaser (1998) " Fit is another word for validity which means does the concept represent the data it purports to denote" (p. 236). Fit consists of two properties, refit and emergent fit (Glaser, 1978). Refit means that as new data emerges the categories are constantly checked against the data and modified if necessary to fit the new data. Emergent fit allows for the use of preexisitng categories from the literature if there is a fit with the data, however, the preexisitng category may also be modified if this is indicated by the data. In 2003 Glaser discussed the use of illustrative data. He wrote that illustrative data give the reader a sense of where the grounded theory came from; however, illustrative data are not evidence. In summary, fit is assessed by how well the categories and the theory fits the data.

Glaser (1978) did not elaborate extensively on the criterion work. He wrote that a grounded theory should explain, predict, and interpret what is happening in the area. He linked the criterion work with fit and relevance. According to Glaser (1998) work accounts for how the core and categories are linked and how

the participants resolve their main concern. Work would seem to imply that the theory must be useful and have practical application.

Relevance is achieved by letting the core problem emerge from the data (Glaser, 1978). Preconceived theories are a threat to relevance according to Glaser (1978). As the word suggests, the theory must be relevant to what is transpiring in the area and reflect what the true concern is of the participants, not preconceived ideas of the researcher (Glaser, 1998). The implication here would be that relevance can be assessed by whether the researcher has allowed the core category to truly emerge from the data and, again, if the core explains much of what is going on.

The criterion modifiability is linked to how grounded theory research is based on the notion that theories are dynamic concepts that are continually checked against what is occurring in the context (Glaser, 1978). A grounded theory is not static; it should allow for continual modification as new findings emerge. The theory must have the "ability to work the data" (Glaser, 1978, p. 5). Assessing the criterion modifiability would therefore not be a one time event, but rather an ongoing process as the theory is used. According to Glaser (1998) "the theory is not being verified as in verification studies, and thus never right or wrong. As I said above, it just gets modified by new data to compare it to" (p.19).

The aforementioned criteria are closely linked and form a coherent whole for evaluating the results of grounded theory research. Glaser (2003) called this *conceptual credibility*. However, Glaser also emphasized the necessity of *procedural credibility.* In other words, how closely has the researcher adhered to the grounded theory method during data collection, coding, analysis, and presentation. This suggests, similarly to Morse et al. (2002), that credibility is built into the research process itself and that responsibility rests with the researcher to continually be sensitive to the data and how the emerging categories guide further analysis and data collection.

Limitations and Challenges of Classical Grounded Theory

Different research methods have inherent challenges and limitations. Schreiber (2001) described grounded theory as a method that is difficult to grasp for the beginner and that is best learned by engaging in the research process itself. Glaser (2009) encouraged the novice and suggested that some of the best grounded theory research is done by novice researchers because they are still open to learning and not steeped in other methods. Two of the initial challenges facing the researcher conducting a grounded theory study are the delay of the literature review and not being able to stipulate a predetermined sample size. These factors may make it problematic to explain grounded theory to a review board (Glaser, 1978; Glaser & Strauss, 1967; Wuest, 2012).

As the study is conducted there are several challenges facing the researcher. Initially, during open coding, numerous codes are generated. It may be problematic, especially for the novice, to decide when a core category has started to emerge and code only for the core and those categories that relate to it. The researcher may be tempted to continue open coding for fear of missing important concepts, however, it is at this point that the researcher has to delimit the coding and selectively code only for the core and its related categories. Furthermore, the novice may fear that a core will not emerge, and once a possible core has been identified, may be ambivalent about whether the category is indeed the core category. On the other hand, the novice may find it hard to remain patient and let the core category emerge and be tempted to force it (Glaser, 1978). The sheer volume of codes that are generated during open coding presents the researcher with practical issues such as how to keep track of the codes, and how to best organize the data. During the data analysis the researcher may experience difficulty in deciding when theoretical saturation has been reached. Finally, as it comes to writing the theory, following Glaser's (2013) advice of remaining on a conceptual level as opposed to resorting to description presents another challenge.

Generalizing and grounded theory

Grounded theory findings are not generalizable in the same sense as in quantitative research, nor are they intended to be. One of the criteria for evaluating a grounded theory is generality (Glaser & Strauss, 1967), however, generality in the Glaserian sense is not the same as generalizability. Generality implies that the theory can be used and adapted in various situations, not that a sample that is representative of a certain population has been used and that therefore the theory is generalizable to that population. Glaser (1998) wrote that as a grounded theory is applied to a new substantive area it is modified by new data.

A grounded theory is a theory of a concept and therefore, according to Glaser (2012), has grab irrespective of time and place. Glaser discussed conceptual generalizations as opposed to descriptive generalizations. He argued that many authors have misinterpreted what grounded theory is and demoted it to description. According to Glaser, descriptive generalization is not possible, on the contrary, a grounded theory is a theory of a concept and can therefore be conceptually generalized. Glaser argued that "modification, not verifications yields credibility" (p. 136) of grounded theory. Contextualizing occurs as the theory is applied to a new area and modified by new data. For instance, as described by Glaser the original awareness theory (Glaser & Strauss, 1965) was modified as it was applied in a neonatal unit. The infants could not hear their prognosis. The theory was therefore modified to include a new concept called *hearability* of the patients. Furthermore, Glaser used the concept credentializing, which initially applied to becoming a nurse, to illustrate how a concept can be used in other educational settings then where it was discovered. Using a theory in another setting is possible according to Glaser, because grounded theory is conceptual in nature.

Consumers of research will have to determine if a particular grounded theory is applicable to their setting. The researcher's role is to provide a sufficient conceptual account of the theory and its categories, and to move from a merely descriptive level to a conceptual level in order to enable potential users of the

theory to decide if it is indeed a useful tool in the intended context. If quantitative criteria of generalizability are applied to a grounded theory, then it is not generalizable: however, if grounded theory standards for discovering and evaluating the theory are used then a grounded theory is conceptually generalizable.

Choice of Research Method

My view of theory development is congruent with Jamesian pragmatism and a classical grounded theory approach in which theory development is an ongoing process, theory is always modifiable, and the goal of theory development is to produce useful consequences in the practice context. Furthermore, in grounded theory and Jamesian pragmatism theory is generated through exploration of a reality as it is experienced by individuals in the actual setting and that can be known, albeit imperfectly, through our senses. The research question; "What are the processes and strategies that experienced triage RNs use when making triage decisions?" and the aim of the study, to develop a theory of triage RN DM, are consistent with classical grounded theory. As has been stated earlier in this dissertation, the aim in grounded theory is to generate theory about social processes and how individuals solve what they perceive as being the problematic (Glaser, 1978).

In grounded theory, theory development is mainly inductive and, as the name implies, grounded in a particular context. To understand how triage RNs undertake the process of DM it is necessary to observe both the actual triage environment, and to obtain insights of the RNs themselves as to how they conduct triage. The data that are obtained need to be analyzed and evaluated within the broader context of the triage and psychological DM literature. Classical grounded theory is a research method that allows for conceptualization and theory development through the use of the constant comparative method of data analysis, and that incorporates and extends existing theories into a new theory. The aim of my research was not to develop a co-constructed description of triage DM, nor was it to prove or disprove existing

theories, but rather to generate a theory of triage RN DM based on the participants perspective of what transpires during triage DM.

To recap, my philosophical perspective of theory development, the research question, and the choice of research method formed a coherent whole for the current study. The remainder of this chapter is an account of how the grounded theory method was used in the study. The intent is twofold. First, to make explicit how I chose to use classical grounded theory and, secondly, to offer some insights to other doctoral students, who are considering using grounded theory, as to what the actual process of conducting a grounded theory study as a doctoral candidate entails.

Research Design

Research method and research question

The research question: "What are the processes and strategies that experienced triage RNs use when making triage decisions?", was explored using classical grounded theory. As described earlier the aim in grounded theory is to generate theory about social processes and how individuals solve what they perceive as being the problematic.

Setting

The study was conducted at three adult tertiary care hospitals in a large urban center in Western Canada. Each ED had a dedicated triage area with ED staff RNs assigned to triage around the clock (for a description of the triage area the reader is referred to chapter four). Site A is a university hospital and regional trauma center with 79 689 ED visits in 2013, site B had 81 607 ED visits in 2013, and site C had 80 549 ED visits in 2013.

Ethical considerations

Ethical approval was obtained from the Conjoint Health Research Ethics Board (CHREB) at the University of Calgary for all aspects of the study concerning recruitment, data collection, storage, and

disposal. Data collection included interviews with triage nurses and observations conducted at triage. A letter attached to an email (see Appendix A) was agreed to be distributed by the nurse manager at each of the three study sites to all staff RNs asking for volunteers to participate in the study. In addition CHREB approved a poster (see Appendix B) that was displayed in each ED asking for volunteers to participate in the study. A consent form was used to obtain permission to interview participants (see Appendix C). A different consent form was used (see Appendix D) to observe the RNs conducting triage.

The digital recordings of the interviews, the interview transcripts, and the field notes from the observations were stored on a password protected computer that was only accessible to myself and my supervisor. The digital recordings, interview transcripts, and field notes will be erased after five years. Hard copies of the field notes and transcripts were stored in a locked filing cabinet in a secured office at the University of Calgary. The field notes and transcripts will be shredded after five years.

Interviews

Prior to conducting the interviews I obtained written informed consent (see Appendix C) from each participant. I explained that participation was voluntary, that their participation would be kept confidential, and that if they chose to withdraw, data from their interviews would not be used in the study. In accordance with CHREB guidelines I emphasized to each participant that, should they wish to withdraw from the study, to inform me as soon as possible after the interview as it would not be possible to separate any one individual's data from the rest once data analysis commenced.

I further advised the participants that direct, anonymous quotes from their interviews might be used in my dissertation and in publications in academic journals. Each person was allowed as much time as they needed to review the consent form before they signed it. The participants selected an alias of their choice to be used in the transcripts.

I conducted the interviews in a private setting of the participants' choice, either at their home or in an office at the University of Calgary. The participants were reimbursed for travel costs for the interview, parking costs, and they were given a $10 coffee card in appreciation of their participation.

The risks to the participants who were interviewed were considered minimal. No data that could identify the participants, for instance, years of experience, were included in the quotes.

Observations

I obtained written informed consent (see Appendix D) from all the RNs who were working at triage on the days that the observations were conducted. At the beginning of each observation I briefly explained the study to the RNs. Most of the nurses were aware of the research as an email had already been forwarded by the manager to all the RNs in the department and posters had been had been displayed throughout the department. I stated that the purpose was to observe how nurses carry out work and make decisions around triage. The explanation was kept short on purpose since the nurses were busy conducting triage. I asked if they had any questions and ensured that they knew that participation was voluntary. I stressed that the purpose was not to evaluate the work of any individual nurse. All the nurses that were working at triage during the observations were willing to participate. If anyone had expressed concerns, or not been willing to participate, I would not have continued with the observation on that occasion.

Patients

The focus of the study was the DM and work of triage RNs, however, observing triage involves overhearing conversations that take place between triage nurses and patients. I asked the nurses to provide each patient with a brief statement such as; "This is Gudrun. She is a nurse doing research. Is it okay if she listens while I assess you?" This approach was approved by the CHREB. None of the patients refused. If any patient had refused or expressed hesitation I would have left the triage area until the nurse had finished triaging that particular patient.

Recruitment

Recruitment took place over a seven month period in 2013. Inclusion criteria were; five or more years of emergency triage nursing experience and currently employed as a staff RN in the ED. Managers and nurse educators were excluded since they did not routinely perform triage at all of the sites.

Data were collected from one site at a time. As data collection commenced for a particular site an email was sent to the nurse manager in the ED with a request to forward an email to all RNs in the department inviting volunteers to participate in the study (see Appendix A). In addition, posters were placed in each ED inviting volunteers to participate in the study (see appendix B). During the observations three additional RNs, who had not responded to the email or posters, volunteered to participate. In total 26 RNs responded. I contacted all the respondents by phone or email to determine if they met the inclusion criteria and if they were willing to participate in the study. Twenty-two respondents met the criteria and were willing to participate. I explained to them that, due to the nature of the grounded theory research method, data collection would take place over a period of time, that not all respondents would be needed for the study, and that they would be contacted at a later date if their participation was required. In addition, I explained that participation was voluntary and confidential.

Participants

In grounded theory the researcher selects participants from the actual context that is being explored and whom the researcher anticipates can offer insights into what is transpiring in the area under study, therefore RNs with five or more years triage experience were selected as they would have rich and varied experiences to draw on. Nurses work in various shift configurations throughout their careers. Nurses employed part time may have many years of full time experience and conversely full time nurses may have many years of part time experience, therefore no distinction was made between full time, part time, or casual employees.

It was anticipated that the initial sample size would consist of one or two RNs from each site. As the research commenced the decision was made to collect data from one site at a time. This step was taken in order be able to conduct interviews with respondents who had indicated their willingness to participate in a timely manner. The sample was expanded through theoretical sampling to include participants from all three sites until theoretical saturation was reached as outlined by Glaser and Strauss (1967) and Glaser (1978). During the stage of theoretical sampling two interviews that had been conducted with ED triage RNs at site C during previous course work were included in the data analysis. These two RNs met the inclusion criteria, had signed consent for the initial interview, and were contacted again to obtain written consent to include the interviews in the current study. The final sample consisted of 12 RNs whose emergency experience ranged from 6 to 38 years and their triage experience ranged from 5 to 38 years.

Data collection

Data collection took place from April 2013 to February 2014. In grounded theory the researcher choses the type of data collection method that best yields the data the researcher requires (Glaser & Strauss, 1967). The purpose of the study was to understand the processes and strategies that triage RNs use when making decision. This is best understood by observing the actual context where DM occurs and talking to the individuals who are responsible for making the decisions, I therefore elected to carry out direct observations of the triage environment and conduct interviews with experienced emergency triage RNs. The final analysis included data from seven observations and twelve interviews.

As stated above I had decided to collect data from one site at a time. My intention had been to conduct one observation at the site I was studying before commencing the interviews in order for me to better understand the environment the nurses were describing. I had planned to use the first observation as a basis for my questions and then, after I had conducted two to three interviews, return for a second triage

observation. As is often the case in research, the plan had to be modified somewhat during the course of the study. Due the implementation of a new computer program (described below) one week after data collection began, I decided to conduct the first two observations at site C before the new program was in use and before I conducted any of the interviews. The rationale was to be able to observe the triage work and DM without the RNs potentially being distracted by learning to use a new computer program. For the subsequent sites I conducted one observation before I commenced the interviews and then later returned for additional observations. At the time of the observations at site A and site B the nurses had become familiar with the new program.

The program that was in use when the study began allowed the nurses to freely input a triage note and select the CTAS category they determined to be the most appropriate. The program contained five mandatory fields and did not require the nurses to switch between views. The new program required the nurses to select the body system that seemed to best fit with the patient's main concern and then chose one complaint under that system. In addition, the program contained CTAS modifiers that the nurses could apply. For instance, for a patient with flank pain, the nurse would select genitourinary system, then chose flank pain, and then select the level of pain from 1 to 10/10. The program then automatically generated a CTAS category. The nurses could override the CTAS number and place the patient in a more urgent category; however, they could not downgrade the patient to a less urgent category. The nurses were, as with the old program, responsible for deciding in which order they wanted the patients examined. For example, if they considered a CTAS 3 patient to be more urgent than a CTAS 2 patient they could place the CTAS 3 patient higher on the priority list. There was still an area where the nurse could freely input a short triage note. In short, the new program had more areas for the triage RNs to complete, automatically assigned a CTAS category to the patients, and the RNs had to switch between views during the triage

assessment. My aim had been to conduct the research before the program was implemented as I did not know how it would impact triage DM.

Observations

In total I conducted seven observations from April 2013 to February 2014, three at site A, two at site B, and two at site C. Each observation lasted between three to four hours. All the observations took place in the afternoon, as this tends to be the busiest time in the EDs in the study. During the observations I tried to remain as inconspicuous as possible so as to not interfere with the work of the triage RNs. I alternated between listening to assessments of walk-in patients, ambulance patients, conversations with paramedics, conversations between the triage RNs, and conversations with the charge nurse. At times I asked for clarification to better understand what had just transpired, for instance, when the nurses were discussing where to place a palliative patient who was dying. They were referring to the different areas by their letter designation. It turned out that the reason they wanted the patient in a particular area was that the room was private. This was not clear from the conversation.

I also kept a notepad in the back of the triage area and took brief notes during the observations. Prior to doing this I asked the nurses if they were comfortable with me taking notes. Again, I stressed that the purpose was not to evaluate the work of any particular nurse, but rather for me to be able to remember events more accurately from the observations. Immediately following the observations I went to a quiet area at each site and wrote detailed field notes from the notes I had taken during the observations. I then coded the field notes the same evening or the next day.

Interviews

I conducted nine digitally recorded interviews lasting 45 to 60 minutes between April 2013 and October 2014. The interviews were transcribed by either myself or a transcriptionist. Glaser (1998) advised against tape recording and transcribing interviews verbatim, however, I feared that I would be unable to

remember what the participants said. In addition, I was concerned that I would be preoccupied with trying to commit information to memory during the interviews.

The final data analysis included two additional interviews from previous course work and one interview with myself. As discussed previously in this dissertation, I am an ED staff nurse who regularly conducts triage at one of the study sites. In order to control for researcher bias it was suggested to me by Dr. Glaser during a grounded theory seminar to have someone interview me and to include the interview in the data analysis (personal communication, Glaser, June 2013). I therefore asked an experienced researcher who was not a member of my committee to interview me and the data were included in the analysis. The researcher was not an ED nurse; however, the researcher was familiar with the topic of my study and skilled at conducting interviews. In total 12 interviews were included in the final data analysis.

The initial interviews were unstructured with mainly passive listening as suggested by Glaser (2002). I used opening questions such as: “Tell me about your work at triage” to invite the participants to talk about triage. Later, during theoretical sampling I used more focused questions in order to collect data for the emerging categories. Each interview was transcribed and coded as soon as possible after it was conducted.

Prior to each interview I had prepared some broad, general questions, but tried to remain open to what the participants shared as their main concern. Examples of question include; “Explain to me what happens when a patient comes to triage?” “Can you explain the triage process to me as if I wasn’t a triage nurse?” “What would you say to a co-worker who questioned your triage decision?”. The goal when interviewing people in grounded theory research is to get people to talk about what concerns them. Glaser calls this “instill a spill” (personal communication, Glaser, June, 2013). The nurses were all eager to share their experiences; in fact, in some interviews I barely had to ask any questions after the first few questions.

Later during the stage of theoretical sampling I used more focused questions to elicit information about emerging categories and their properties. For instance, I wanted more data on *pushing boundaries,* which had emerged as a property of the category *creating space* (the reader is referred to chapter four and five for an explanation and discussion of the categories). I therefore asked: "Some nurses have talked about pushing boundaries or making up the rules, is this something you have found in your experience?" Followed by: "Can you give me an example of this". I also asked: "Are there some rules you wouldn't break?" since I wanted to know if there were absolute boundaries that triage RNs would not cross.

Data analysis

Data analysis was conducted using the constant comparative method as described by Glaser and Strauss (1967) and (Glaser, 1978, 1998). The researcher collects, codes, compares, and analyzes the data simultaneously. Concepts that emerge guide further data collection. For this study it meant that I coded and analyzed each interview before proceeding with the next interview. Emerging concepts guided further data collection, while at the same time I tried to stay open to new data that emerged during subsequent interviews and observations. Data from the initial observations were used as a foundation for questions during the interviews and later when I returned for additional observations I purposefully conducted theoretical sampling for categories that had emerged during open and selective coding. For instance, during the last observation I paid particular attention to how the nurses worked with managing and creating treatment spaces. As described by Glaser data collection and analysis is an iterative process that demands that the researcher remains open to emerging data and can tolerate feeling confused.

Substantive coding

To recap, substantive coding refers to coding and conceptualizing of empirical data (Glaser, 1978). It includes open and selective coding. I carried out open coding by coding each interview and observation line by line. Each incident was named when it first appeared in the data and then I compared incident with

incident. For instance, the code *digging for information* emerged early in the research as exemplified by this statement *"So, you kind of, you kind of, you DIG. You're a real researcher at triage, because you have to come up with a reason for them to be there, so you can decide how sick they are" (Belinda, interview #2*). Other incidents that appeared to indicate the same code were then compared with this incident and each other. For example, the statement "*You have to be creative, you have to be a detective, you have to keep digging and like, I love those ones that are not quite answering you but you keep digging and digging, it's like I haven't got it yet*" (*Sally, interview #5*), was also coded as digging for information. Later incidents were compared with the category they appeared to belong to.

Three interviews and two observations yielded a total of 122 codes. At this stage of the study I attended a grounded theory seminar for PhD students in Mill Valley, California that was led by Dr. Glaser. During seminar discussions it was suggested to me that perhaps a core category of perpetual juggling was starting to emerge. This was in accordance with what I had observed, therefore I started to delimit by selectively coding for *perpetual juggling* and the categories that related to this tentative core category.

During the coding process incidents were collapsed into properties and those properties that indicated the same category were grouped together. For instance, during interview one some incidents were coded as *considering staffing.* Later this code was thought to be a property of the category *knowing the department.* As coding and analysis continued it became apparent that knowing the department was not a category by itself. Knowing the department was demoted to being a property of the category *managing space.* Managing space had at first been named juggling for space, but was renamed managing space. It is apparent from the data that the RNs were actively managing space, not just simply responding to demands. The preceding example is not meant to confuse the reader, rather it is meant to illustrate how data analysis in grounded theory requires openness to emerging categories, creativity, and that the researcher is always asking; "Is this what the data are telling me?"

Memoing and emergence of the core category

In Mill Valley I had been cautioned to by Dr Glaser to not just “grab on” to perpetual juggling as a core, but to ensure that it “patterned out”. As I continued coding and thinking about how the categories fit together I started asking myself why the nurses appeared to be continually juggling beds and priorities. They were not moving patients around without a purpose, and the reprioritization of patients who were waiting was a very deliberate process. In addition, the categories determining acuity and anticipating needs had started to emerge as related to perpetual juggling, but I still sensed that there was an underlying pattern that I had not yet grasped that would explain how these categories related to each other.

Throughout the data analysis I wrote memos to myself as ideas came to mind. This is an essential and non-negotiable part of grounded theory research (Glaser, 1978, 1998). As I was trying to work out how the different categories related to each other and what the underlying process was, I came to appreciate the importance of memoing. In my memos I had stared to explore the idea of momentary fitting, as the core process that accounted for most of the actions and decisions of the triage RNs. Below are four memos that illustrate how my thinking around selecting a core variable developed. As the reader can see I came to the core variable *momentary fitting in a fluid environment* late in the data analysis. The first time it emerged was in early August after I had coded and analyzed seven interviews and six observations, however, I still hung on to perpetual juggling as the core, but with increasing hesitation. I did not fully commit to momentary fitting in a fluid environment until I had written a first draft of the theory in January 2014. The reader will also note that the writing in the memos follows Glaser’s (1978) advice of not worrying about form or grammar when memoing.

Memo Perpetual juggling in a fluid environment – Aug 1 Is this it!!!

The triage RN accomplishes momentary fit through a process of perpetual juggling. When the pt is sent to the “wrong area” the triage RN tries to match staff (senior RN at non-mon bed, pulling crash cart.

Memo #152 Nov 28 Momentary fitting

The main concern of the triage RNs is *Momentary Fitting.* The goal in momentary fitting is to fit the right patient to the right resources at the right time. The right resources consist of both the best treatment space under the conditions at any given time and the right care provider. The RNs express this a “making the department fit”, referring to both placement of patients and the order in which they arrange the list of patients waiting to be seen. The emergency department is a fluid environment, hence the fit is always the best fit for the moment and could change at any time.

The RNs accomplish momentary fitting through a process of perpetual juggling/relentless rearranging. Perpetual juggling consists of the categories *Determining, Prioritizing, and Space making,* however it is imperative to notice that this is not a linear process. ??????

Memo #163 Jan 3 Fit

How Momentary fitting works into the theory. The RN is looking for a fit between what the pt says, symptoms exhibited (appearance etc). Does it all fit (combining variables). The RN is trying to fit the pt in the priority list. The RN is also trying to fit the pt in the department.

Juggling may be triggered by inconsistencies or sick pt. The list is juggled and beds are juggled.

Memo #175 Jan 22 Momentary Fitting as core variable

Decided that it is going to be the core variable and demoted perpetual juggling to possibly managing space. It will be a theory of Momentary fitting with the categories Determining,

Anticipating, and Managing Space. Collaborating, triggering and prioritizing will be incorporated in the other categories.

My problem all along has probably been that I have played with two cores. Felt I needed to use Glaser's suggestion.

Theoretical sampling

According to Glaser (1998) theoretical sampling is the deductive aspect of grounded theory. The initial data collection and open coding is inductive in nature. During theoretical sampling the researcher uses what Glaser terms "grounded deductions" (p. 157) to guide further data collection in order to theoretically saturate the emerging categories.

In this study theoretically sampling was carried out by focusing questions on the categories that emerged as relevant to the theory and their relationship to each other. This in turn produced new questions, which illustrates how both induction and deduction is used in grounded theory research. For example, I wanted to more fully saturate the category *creating space.* I wanted to understand how the nurses enacted this process therefore, in interview seven I theoretically sampled for creating space by asking the RN, as we were talking about gridlock: "*Can you talk a bit about that, what happens when you get that person with a BP of 76 and you don't have a bed, what do you do?"* I also wanted to know under what conditions the triage RNs would initiate the process of creating space; therefore, as we were talking about gridlock in interview nine I asked the nurse what type of symptoms in a patient would lead her to move the patient ahead of others into a treatment space.

Glaser (1978) wrote that theoretical sampling can be used to check on the emerging framework. Late in the research process I therefore conducted a final observation where I closely observed how momentary fitting accounted for the process of triage RN DM. In particular I wanted to ensure that I had fully saturated the categories managing space and creating space. In addition, I theoretically sampled two

interviews with experienced triage RNs from previous course work. No new data that were relevant to the theory emerged.

According to Glaser and Strauss (1967) and Glaser (1978) theoretical sampling in grounded theory involves selecting participants that can offer information that is relevant and helps expand the emerging theory. These participants can be different from those in the initial group. The purpose is to sample concepts and collect data that is theoretically relevant. In this study the data collection was limited to triage RNs at three different hospital sites.

Emergence of the theory

The grounded theorist stops collecting data when each category is theoretically saturated and no new data emerges (Glaser, 1978; Glaser & Strauss, 1967). After 10 interviews and six observations I was noticing repetitious accounts about triage work and DM, and therefore decided to halt data collection. Glaser (2012) wrote that the grounded theory methodology produces its own readiness for writing when each category is sufficiently saturated. As a novice grounded theory researcher I was hesitant to stop collecting data, but as noted above, was starting to hear similar stories.

Sorting the memos

The first step in writing a grounded theory is to sort the memos (Glaser, 2012). Sorting is done without an outline. The researcher starts with a memo from anywhere in the memo bank and then picks another memo, which is compared to the first one. Memos are then sorted as they relate to each other and eventually as memos are sorted and resorted a theoretical outline becomes apparent (Glaser, 1998). According to Glaser (1998) “Just keep sorting, comparing and resorting and the integration of the theory emerges” (p. 189).

During the course of the study, I followed Glaser’s advice of writing memos on ideas as they occurred. I numbered and dated the memos in order to have a record of how my ideas developed. The

majority of these memos were in a word document. When it was time to sort the memos, I simply printed them out, cut them up, and added the hand written memos that I had. I cleared a large surface and started sorting. Glaser (1998) wrote:

> The world is integrated whether the researcher likes it or not. It is the grounded theorist's task to discover it. He cannot integrate the world. It is going on whether or not he has a theory. Thus the grounded theory problem is to discover this integration while generating a theory that explains what is going on, that is discovering the integration that's occurring in the world. (p. 189)

Discovering this integration and generating a theory of triage RN DM was initially a somewhat elusive process. The first difficulty was to sort without an outline. As a graduate student, I had been trained to organize my thoughts into an outline before I commenced any type of writing. Even though I was not writing the theory yet, the temptation was strong to preconceive an outline and use it for sorting, however, I persisted in using the grounded theory method and sorted and resorted the memos several times without an outline. As I sorted the memos I wrote more theoretical memos about how the categories related to each other. As per Glaser's writings (1978, 1998, 2005) I had expected a theoretical code to emerge during sorting that would conceptually explain how the substantive categories were connected. Glaser (2005) advised against forcing a theoretical code if one does not emerge. He even wrote that a theoretical code is not necessary, but continued by stating that having one makes the theory more complete. After several attempts at sorting the memos I had an embryonic theory with six categories, however, I had not been able to discern a theoretical code yet.

Writing the theory

Part of discovering a grounded theory is the actual writing of the theory (Glaser, 1978). The researcher starts by using the sorted memos to write a first rough draft of the theory (Glaser, 1998, 2012).

The aim is to write conceptually relating concept to concept as opposed to using descriptive statements to connect concepts to people (Glaser, 1978, 1998). This draft is then re-worked into the final theory.

The first rendering of the theory was a conceptual account of six categories, but it was unclear if the core variable was momentary fitting or perpetual juggling. In addition, a theoretical code was not evident. I returned to my sorted memos and verified that I had indeed conceptually sorted them and that each category and its properties reflected the memos. I then decided to cut up the word document that contained my theory into its separate properties. Essentially each section was a theoretical memo. I pinned these sections on a large board in order to discern how they related to each other. It was during this process that the core category momentary fitting in a fluid environment finally emerged with its supporting categories determining acuity, anticipating needs, managing space, and creating space. Other categories and their properties were collapsed and incorporated into these four categories. In one instance, what I at first had thought of as a property of the category managing space became a separate category named creating space. A conceptual rendering of the final theory is presented in the first section of chapter five. For an account of the empirical findings the reader is referred to chapter four.

It was also at this final stage that a theoretical code emerged. I returned to Glaser's writings about theoretical codes (Glaser, 1978, 1998, 2005) and also read several grounded theories to explore how other grounded theorists had used theoretical codes to integrate their theories. Understanding theoretical coding and discerning if there was indeed a theoretical code that integrated the theory was one of the most challenging aspects of the research. During this process it became evident that the theory of momentary fitting in a fluid environment is a basic social process consisting of determining acuity, anticipating needs, and managing space with three critical junctures, at which the RNs initiate actions to create space.

At this stage I returned to the literature. Prior to the commencement of the study I had conducted a literature review of psychological theories of DM, and triage nursing and DM, as per academic

requirements. In classical grounded theory the literature review is ideally delayed for two reasons a) the researcher should enter the field without any preconceived ideas or theoretical framework, and b) the researcher does not know ahead of time what the final theory will look like and therefore does not know beforehand the literature that needs to be reviewed. As the theory of momentary fitting emerged it became apparent that I needed to review literature on both ethics and situation awareness. The reader is referred to the later section of chapter five for a discussion of how the theory relates to the existing literature.

Limitations of the Use of Grounded Theory in this Study

According to Glaser (2001) the process of conducting a study using the grounded theory research method is part of learning the method. Throughout the research process I attempted to stay true to the method, however, I diverged in some instances. I conducted a literature review of the triage nursing DM literature and select portions of the psychological DM literature. Glaser, although not recommending a literature review, allows for a review if one is necessary to obtain approval for the study. I adhered to Glaser's advice of putting the review aside until the theory had emerged.

I also recorded and transcribed the interviews which goes against Glaser's advice. The implication for this study was that I had a more detailed account of the interviews than Glaser would consider necessary. I have also included a chapter with a descriptive account of the context and findings. This was on the advice of members of my committee. After reflecting on the advice and thinking about the participants that literally poured out accounts of their experiences as triage nurses I wanted to ensure that their voices were heard.

Summary

Glaser (2001) warned that endlessly writing about grounded theory does not necessarily produce a better understanding. True learning and understanding evolves with using the method itself. In this chapter I have provided an account of classical grounded theory both as a methodology and as a research method

as I understand it from my readings and using the method. In addition, I have included a detailed description of the actual process of conducting the research and analyzing the data. Glaser wrote that a grounded theory can be evaluated using the criteria fit, work, relevance, and modifiability. The detailed description of the research process and my reflections may therefore seem superfluous to the reader, however the intention was to enable the reader to understand and evaluate how the grounded theory research method was used in this study. In the next chapter I will introduce the reader to the context and empirical findings, followed by a chapter that provides a conceptual rendering of the theory and a discussion of the theory in relation to the existing literature.

CHAPTER FOUR: EMPIRICAL FINDINGS

The purpose in grounded theory research is to generate a theory of a concept that explains most of the behavior in the area under study. The concept should reflect the main concern of the participants and how they resolve this issue. As stated previously in this dissertation the grounded theory researcher may not know what the main concern of the participants is, or may discover during the course of the research that what the researcher thought was the main problem is quite different from what the participants consider to be problematic. The research question that guided this study was:

What are the processes and strategies that experienced triage RNs use when making triage decisions?

The triage RNs in this study indicated that their main concern was to get the right patient to the right treatment space to be examined by the right care provider in the right time and order. In other words, they were trying to achieve the best possible fit. Emergency departments are fluid environments and the best possible fit is always a function of the context as it transpires in that particular moment in time. The main concern of the participants was therefore conceptualized as the basic social process of *momentary fitting.* Momentary fitting was found to be an ongoing activity consisting of a series of decisions regarding the acuity level of patients, priority level of each patient in relation to other patients waiting, and how to best manage and rearrange resources in terms of space and staff to achieve best possible fit. The concept momentary fitting accounted for most of the actions and interactions of the triage RNs and was therefore selected as the core variable. Momentary fitting consists of four categories *determining acuity, anticipating needs, managing space,* and *creating space.* While these categories may occur sequentially if an individual patient is considered, they also occur simultaneously as the triage RN considers the whole department.

Space is defined in this study as a physical space, including resources both in terms of staff and equipment, where a patient can be examined and treated. Space does not refer to square footage, nor

does it necessarily refer to stretcher space. It can mean any type of space from a fully staffed trauma bed with all the necessary equipment to a chair.

In order for the reader to better understand the conditions under which triage decisions are made this chapter starts with a general description of the triage environment at the three study sites. The reader is referred to chapter one for an explanation of the historical origins of triage, the triage process and context, and the use of the Canadian Triage and Acuity Scale (CTAS) as a triage tool. The following description is rendered form an "inside the triage desk" perspective since the objective of this study was to generate a theory of triage RN decision making (DM). This is not denying that exploring the patient's experience of being triaged would be valuable, however, it is emphasized that this was not the intent in this study. The core of the chapter will be focused on a descriptive account of the categories determining acuity, anticipating needs, managing space, and creating space; and how the triage RNs move between these stages to achieve best possible fit.

Setting

The study was conducted at three adult teaching hospitals in a large urban center in Western Canada. While there were differences between the three hospitals, the general triage processes was the same at all three sites. The hospitals were all part of the same organization and the EDs therefore operated under the same policies and with the same computer programs. The observations took place during daytime when the volume of incoming patients typically is higher.

Each site was staffed with three RNs at triage, except for during breaks when two RNs managed the area. Each RN had different assigned roles and role flexibility was evident.

One RN triaged walk-ins, one triaged EMS, and one searching for beds and helping out as necessary. Tasks seemed to overlap and RNs moved back and forth between tasks especially

during breaks. Discussed patients frequently with each other especially when deciding on beds and who should go where. (From observation #3)

Patients could arrive in the ED either as “walk-ins” or by ambulance with paramedics, called “medic patients” or “EMS patients”. In addition patients could present as “referrals” either from a physician’s office, walk-in clinic, or “sending facility”. The term sending facility was generally used as a reference to another hospital. One RN was primarily responsible for checking in walk-in patients and another RN was primarily responsible for checking in EMS patients and assigning patients to beds. The third RN helped out where needed, which usually involved checking in walk-in patients.

Teresa: OK, so we are set up that we have the two roles at triage. So triage one is responsible for generally triaging the patients that come in through the door, walking. And then triage two is responsible for triaging the medics and assigning beds generally in the department.

The triage RNs were physically separated from the ED waiting room by a counter and a glass screen with a small opening. As the walk-in patients arrived they had to stand in line in front of the triage desk to wait for a triage RN to become available to assess them. There were wheel chairs and chairs available for patients that were too ill to stand in line. The RNs maintained vigilance by scanning the line-up.

Allan: Basically there is a queue to get to the triage nurse and before we even start that you are watching that line-up to make sure that, to make sure that there is nobody deathly ill in that line-up and scanning it. And you’re scanning the waiting room and the environment to make sure that you’re not missing something. That people, people are very sick that may be coming to you, they might not even make it to your desk. So it even starts before they even get to you.

The triage RNs first talked to the patients through the opening in the glass window to screen them for any communicable disease and to ascertain why they were in emergency. Not everybody in the line-up

was in the ED for emergency care, some were visitors and others had various requests unrelated to ED care, for example, where to pay for parking. If the patient was in the ED for emergency care he or she was asked by the RN to come in to the triage area and have a seat in a chair next to the RN.

> *Sally: So, you have your line up of patients behind the glass wall… which is one of my biggest pet peeves, the glass barricade…so your patient will come and talk through the glass, just to find out a quick thing. You know, what are you here for? Because some people are just looking for information, so we just need to find out what they want. Then they are often asked through the doors and there are two triage stations.*

Once the patient had entered into the actual triage area the RN obtained the patient's name, conducted a brief focused assessment, and checked the patient's vital signs. The information was entered into the computer system either as the RN was talking to the patient, or after the RN had obtained most of the information. During times of congestion, or when a co-worker was on break the RN had to multitask as she assessed the patient.

> *Betty: Then find out what their concern is for the day, why they are coming to the hospital, what can we do for you and they will usually give us a spiel, or a family member can help. At the same time kind of assessing them, what's going on, how do they look, making mental notes, taking vitals, writing down your assessment at the same time. Then at the same time answering phones, dealing with EMS, talking to physicians behind you dropping off little sheets of paper of RAPID, those kind of things.*

Following the assessment by the triage RN there were three streams that the patients could follow. A patient would be determined to be in need of immediate medical attention and therefore sent directly to a treatment area, the patient would be sent to an admitting clerk to register and provide additional

demographic data and subsequently be directed to a treatment area, or the patient would, after registration, be asked to remain in the waiting room until a treatment space became available.

Options for treatment spaces were the resuscitation room, also called trauma bay, resus, or code room by the RNs, stretchers with cardiac monitors “monitor beds”, stretchers without cardiac monitors “non-monitored beds”, or the mental health assessment rooms. Each site also had a so-called fast track, or ambulatory care area for patients with minor injuries, such as sprained ankles, uncomplicated fractures, or lacerations. In addition, each site had an area called intake, ED 2, or rapid assessment zone, depending on the site, intended for patients who could be treated in a reclining chair, or wait in a designated waiting area with regular chairs after being assessed by a physician in a stretcher space. Examples of patients that were sent to these areas were patients with abdominal pain or flank pain.

The patients who typically had to wait in the waiting room or with EMS were patients that required stretcher space, but did not meet the criteria for the aforementioned fast track or intake areas.

> *Almost the whole time I was there the line up of walk in patients did not stop. When I left there were about 8-10 patients waiting for beds in the waiting room, for example a post-seizure patient, a patient with atrial fibrillation on oxygen (same patient as earlier still waiting), a tachycardic patient with a history of deep vein thrombosis and not on anticoagulants. The patients were either waiting for a bed, (less acute patients went to ED2 - intake), or waiting for an ECG so the nurse could decide if they needed the main department or ED 2. (From observation #4)*

Leaving patients in the waiting room did not mean that the RNs were not concerned about these patients, on the contrary, the triage RNs often engaged in an active process of negotiating space for waiting room patients. In other words, the triage RN had determined that these waiting room patients were too sick, or too complicated for either a fast track or intake space and therefore required a stretcher space with a higher RN to patient ratio. Several RNs expressed distress over leaving sick patients in the waiting room.

Betty: It's a mental stress because you know everybody that's out there. Especially when you leave at the end of the day knowing how many sick people are in your waiting room and there is nothing you can do for them and nowhere you can put them. So, you are walking out, and that is even if you are walking out the front door, personally I like to sneak out the back, and you feel terrible. You have reassessed them multiple times but there is still nothing you can do because sicker people are walking in. Yeah, it's sad, especially when you see the cancer patients or elderly, I can't stand that, everyone has their one little soft spot. The cancer patients, I'll have like hell frozen over if I leave them out, but there has been times….

EMS patients arrived via the ambulance bay through an entrance that was separate from the main ED waiting room. Paramedics came up to a counter off to the side of the triage area to give their history of the patient's illness to the RN. This side of the counter was not enclosed by a glass screen. EMS patients were either triaged directly to a treatment space, or if there was no ED space available, the paramedics had to remain with the patient in the EMS hallway. In some instances, if the triage RN deemed that the patient was stable enough, the patient was sent to the ED waiting room thereby allowing the paramedics to return to their duties outside of the hospital. Generally there was friendly chatter between paramedics and triage RNs, but there was also an element of tension and mistrust as illustrated by Jill's comment:

That is my least favorite part of triage, fighting with EMS. This is partially because I have had a number of bad experience with them changing their story, not assessing their patient properly, bold faced lying because they want a bed… so they are my very least favorite part.

Paramedics sometimes felt neglected and forgotten when they were made to wait with their patients. At one site the EMS hallway was at the end of a long hallway that was separated from triage by a door. During one of my observations a paramedic walked with me to their waiting area. While talking he expressed concern over how isolated they were from triage, especially if a patient were to deteriorate

quickly. In his opinion paramedics were at times made to wait unnecessarily when there were beds available.

At two of the sites the triage enclosures were small, noisy, and immediately adjacent to the main department. The main ED desk with unit clerks was directly behind the triage RNs; while this enabled the RNs to quickly and easily communicate with the clerical staff, it also contributed to the noise. Furthermore, at these two sites the rooms used for patients who required psychiatric assessment were in close proximity to the triage desk. Some of these patients were in the ED involuntarily on a mental health form, which necessitated the presence of security guards. The security guards were not in the triage area itself, but were clearly visible from the triage area. During one of the observations a patient who objected to being locked up and watched by security guards could be heard screaming and banging on the door for an extended period of time before one of the staff RNs sedated the patient.

> *Three RNs were working at triage; cramped space, noisy, phones ringing people coming up to the triage window, and unit clerks directly behind triage desk. I could hear a mental health patient screaming for about one hour. (From observation #3)*

One site had a large, new triage area that was separated from the rest of the ED. This contributed to a quieter environment, but at the same time the nurses were more isolated from the other ED staff.

One of the two sites with a small triage area was the designated trauma, cardiac, and stroke center for the city. From a triage perspective, this meant that the RNs were interrupted more frequently by EMS telephone alerts, known as EMS patches in common triage discourse, than at the other sites and had to attend to electro cardiograms (ECGs) that EMS transmitted via computer on patients with suspected ST-elevation myocardial infarctions. These ECGs had to be evaluated by an ED physician, whom the triage RN had to page to come to triage. For incoming EMS patients with stroke symptoms the RNs had to fill out a special form.

The triage RN on the walk-in side was answering questions from a patient, EMS patch phone rang and she excused herself to take the patch. It was an incoming patient with stroke symptoms. The nurse had to fill out the stroke screening form and decide which stroke team to page. "I don't have time to fill out these screening forms." Filled out form and paged stroke team. Meanwhile the other nurse took over triaging walk-ins. One patient had an oxygen saturation level of 78%. Told colleague that she needed bed. Patch phone rang again. EMS transmitted ECG for query ST-elevation myocardial infarction. Nurse called physician overhead to patch phone. Physician came and took over patch. (From observation #4)

During this observation the steady stream of incoming patients continued. The triage RNs worked against a continuous backdrop of noise, interruptions by phones, EMS patches, and requests for beds when there were no beds, or very limited bed availability.

At one point when the triage RN sent the charge nurse to look for beds they only had trauma bay 1 open. Everything else was full. They were expecting two query strokes and one quad roll over by STARS (helicopter). As well they had a patient with atrial fibrillation walk in with shortness of breath and an oxygen saturation of 89% on room air, a chest pain with EMS, and a patient with dangerously low sodium in the waiting room. The charge nurse now paged the site manager for help in moving patients out of the ED. The patient with low oxygen saturation was placed on oxygen in the waiting room and placed on a row of chairs immediately in front of the triage desk. (From observation #4)

All three sites were busy for the majority of the observations. Less busy times occurred when the stream of incoming patients stopped for brief periods, however, this did not necessarily mean that the waiting room could be cleared. As described above, all the EDs had designated treatment areas for different types of patients. For instance, a patient with chest pain would preferably not be triaged to a non-

monitored area. The RNs then had to consider shifting patients around to create space. There were brief periods during the observations when all the incoming patients could be triaged to appropriate areas, however for the majority of the observations the triage RNs were grappling with how to find suitable treatment spaces for complicated patients. Ambulatory patients with minor injuries were not a concern, since they were triaged directly to fast track areas. Similarly, ambulatory patients with, for instance, abdominal pain or flank pain could generally be sent to an intake area where they waited in a separate waiting room.

The intent of the above description has been to set the stage for an understanding of the context in which triage nurse DM occurs. In the remainder of this chapter the core concept momentary fitting and the categories determining acuity, anticipating needs, managing space, and creating space will be described and supported with findings from the study.

Momentary Fitting: The Core Variable

Triage RNs have traditionally been described as gatekeepers, however, a gatekeeper allows some persons access and denies others access. In the three EDs that were observed the patients were not denied access to ED care; the function of the triage RNs therefore became to channel and to some extent regulate the influx of patients. The main concern of the triage RNs was to match the right patient to the right resources at the right time under the circumstances in that particular moment, called momentary fitting in this theory.

Triage DM occurs in a fluid environment under constantly changing conditions from moment to moment. The fit is therefore the best fit for each moment in time. Each new patient that arrives, or changes in condition of a patient already in the ED, alters the circumstances under which fit occurs.

Sally: And you plan it out perfectly and then all hell breaks loose. You get three medics, a patch, a trauma, resources for nursing staff are down, that's the other thing you have to take into factor that

I have just allocated all my resources in the trauma bay, so my entire plan just went down the drain. So it has to be flexible and there is nothing that you can predict at triage, nothing. It is whatever walks through that door.

Similarly, each decision by the triage RN alters the conditions for subsequent triage decisions. If the RN has just triaged a patient with suspected cardiac chest pain to the last available monitor bed, the circumstances under which she makes a subsequent decision for where to send the next patient with chest pain have now changed. There are no longer any monitor beds available and the RN therefore, having determined that this is indeed a patient with cardiac chest pain, has to engage in a process of anticipating and managing space in order to achieve fit. Momentary fitting is not synonymous with optimal fit; it is the best possible fit as determined by the triage RN for a particular moment in time. Achieving fit is a continuously evolving process as the RN considers the whole department in conjunction with patients in the waiting room and incoming patients.

Teresa: You know, and I think I love putting the puzzle, putting the, making the department FIT (emphasizes this). Like, I like a puzzle you know. Like you've got beds here, and here, and here, and you know this one is coming and so it's like making, it's' like this constant, moving, evolving piece of work that just… Kind of like the, like an artist, right, like these brush strokes here, and here, and here, and you paint this little picture of the department, you know.

Matching the right patient to the right resources for the purpose of achieving *fit* meant that the RNs in this study attempted to triage patients to a treatment space where the patients' needs could best be met. For a cardiac patient that meant an area with cardiac monitors and staff that was trained in interpretation of cardiac rhythms, administering cardiac medications by intravenous, and certified in defibrillation. Similarly, optimal fit for a patient with a minor laceration would be the fast track area and an elderly non-ambulatory patient with increased lethargy would be best suited for a non-cardiac monitored stretcher space.

Sally: I almost find it the worst to justify which area they go to, not that they go in, but to justify which area they go to, to make sure they have the proper resources. So, that's your next decision, can they go to minor treatment and sit a wheel chair, can they go to intake, or if they are going to the back do they need a monitor bed, non-monitor bed or an observation bed, those are your decision trees.

It was not always possible for the RNs to triage patients directly to the optimal space. This was when a best possible fit under the circumstances, as opposed to an optimal fit occurred. Assigning a patient to a place that was not the designated area for that particular patient meant that the next patient who arrived, who was maybe better suited to the area, could not be sent there. Potentially a process of shuffling patients around would have to be initiated later.

Jill: Yeah, or we have to do some shuffling to make it fit. We do a lot of shuffling, lots and lots, because we don't want to keep having to move… I mean we move them all the time but we don't want to put them in an inappropriate place just because there is a bed, we would rather move someone and put them in the right place the first time.

The RNs were considering the patients individually and the department as a whole when they determined how to best match the patients to the right resources in terms of physical placement and staff resources.

Jill: So, I can critically think through something to determine who is sick and what might be their worst case scenario and all that stuff, but it's being imaginative and creative as to how I work that department and it is truly working that department and making that department work best for your patients.

Simultaneously with deciding on the right place and right resources the RNs also had to evaluate the right time order, priority, for each patient to be examined by a physician. The right time order was not necessarily

the optimal time order for each individual patient, it was the best fit in relation to the other patients that were waiting.

To summarize, although triage may be perceived as a linear process of assessing acuity, prioritizing the patient, and placing, the RNs in this study were found to be engaged in a multidimensional creative process of momentary fitting in a fluid environment in order to achieve best possible fit given the circumstance for each moment in time.

> *Joe: So it's not just intake of patients. And assessing their level of illness or their acuity level at that time, but what spaces are available to me, and how long is that list of patient that are still waiting to be seen. And how long have they all been waiting?*

From a triage RN perspective momentary fitting was found to entail both an individual dimension when each patient was considered and an overall departmental view, or differently stated triage DM occurred as a function of both context and patient acuity. The main concern of the triage RNs, momentary fitting, was resolved thorough a process consisting of the categories; determining acuity, anticipating needs, managing space, and creating space. These categories were, at least in part, interrelated and there were critical cutting points embedded in the first three categories that resulted in the triage RNs deciding to initiate a set of actions to create space.

Determining Acuity

In order to determine the best fit for a patient, both for the purpose of assigning the patient to an actual physical space in the ED and to assign a priority number in the list of patients waiting to be examined, the RNs needed to understand why the patient had sought emergency care and what the possible underlying disease process or injury might be. *"So, you kind of, you kind of, you DIG. You're a real researcher at triage, because you have to come up with a reason for them to be there, so you can decide*

how sick they are" (Belinda). Determining acuity consists of the sub-categories *seeking information* and *seeking to understand.*

Seeking information

Information seeking was initiated by the RNs when the patient first arrived to the ED during the triage assessment and at any time when the patient's condition changed. Sources of information were the patient, EMS, family or friends of the patient, and referral notes. Seeking information was a set of sequential strategies that the RNs employed consisting of the properties *funnelling down, digging for information,* and *limiting information.*

Funnelling down

When the triage RNs first interviewed patients as patients entered the triage area they used a strategy of funnelling down, going from the general to the specific. In other words, the RNs first asked the patients why they were in the ED and then tailored their information seeking to the main concern of the patient. During my observations I noted how the RNs would start with a broad question and then proceed to ask more focused questions directed at the main issue.

> *Triage RN: "What brings you here?" Listens to answer. Asks clarifying questions, for example time of onset, severity, similar to last time, ends with medications and medical history. (From observation #2)*
>
> *Joe: I will ask them very directed questions based on what they first told me. For example, if they come in and they have got belly pain and vomiting for example, I would then ask more pointed direct questions around that system. How long has it been going on? Have you tried any medication? Have they worked? Do you have any pain anywhere else? And I would actually touch them, palpate. You know is your belly bigger? So more directed question based on whatever system they seem to have the biggest problem with.*

The RNs spoke of how they followed a pathway for each concern, an individual set of questions that they had developed as part of their repertoire for specific complaints. The questions varied according to the circumstances.

Jill: If they tell me they have had a headache for five years I try and be like "Why are you here today?" and sometimes I prompt them. "Is the pain worse? Is there something different? "

"No just five years of headache"

Some of those questions are the same but you interact differently with everyone. To some degree each complaint has its own script.

Determining the main concern and subsequently funnelling down was not always uncomplicated. Sometimes the issue that the RN deemed to be the most urgent was not the same problem that the patient identified, or the patient had a multitude of concerns. The RNs then selected what they perceived to be the most salient, or urgent problem, and directed their questions accordingly, as Belinda stated: "*Sometimes it's very difficult and sometimes I just have to pick out of their rambling story what I think is the most important thing*. The triage RNs worked under contextual restraints of limited time, which further necessitated the use of funnelling down as a strategy to quickly determine acuity.

Digging for information

As can be seen from the above accounts, patients did not always provide the RNs with the concise story the RNs wished for, instead accounts of the illness could be quite meandering or vague. The RNs then used the strategy of digging for information for the purpose of extracting the information they needed to make a decision. Digging was an extension of funnelling down that was even more directed at uncovering the underlying concern. What distinguished digging from funnelling down was that the patient had difficulty specifying a main reason for seeking ED care and the RN therefore assumed more control over the interview.

Sally: You have to be creative, you have to be a detective, you have to keep digging and like, I love those ones that are not quite answering you but you keep digging and digging, it's like I haven't got it yet (laughter). You know, I have asked my set of order of questions, but I haven't got there yet and you just have to get another questions and make it make sense. You just have to be willing to do that and not be controlled by the department to say that you need to see them faster.

Several of the participants used terms such as detective and digging when they spoke of strategies they used to extract pertinent information. They engaged in an active and very direct process of eliciting information, as opposed to merely recording what the patient said.

The relationship between the triage RNs and families or friends of the patient was characterized by ambivalence. On one hand, the RNs expressed concerns that patients would not always divulge the true story of their illness in front of family members, or that the family would interfere with the assessment process instead of letting the patients speak for themselves. "*Sometimes it's a family member interfering and answering the questions for you, which makes it more difficult*" (Sally). Jane clarified in which instances she would incorporate the family in the assessment and when she would not.

Jane: I try not to at the very beginning unless they are elderly, because my experience is family and friends will exaggerate and not give you…. Like if somebody fainted and seized I would want to know exactly how it looked like from someone who saw it, but this girl for example.. Her family was all laughing and thinking this was all a big joke… and I just had them go and take a seat so that I could talk to her. And sometimes people will not be forthcoming in front of their family. And not everybody is black and white and who as abdominal pain is a hernia. You know everything.., there are so many variables. And sometimes family is a detriment to my gut feeling. But I will sure use them if I can't get the story.

On the other hand, the RNs acknowledged that families could be helpful in providing pertinent information, particularly if the RN had difficulty determining why the patient was in the ED. The process of digging for information in this case would be expanded to include family or friends. This occurred especially under conditions when the patient was confused, elderly, or did not speak English. In addition to clarifying information, the triage RNs also used the family to ascertain the degree of difference between the patient's current status and normal condition.

> *Jill: When I am not getting the information I want from the patient, when they are confused, non-verbal, disabled, language barriers or it was a seizure and they obviously didn't witness their own seizure, but mostly I want to hear from the patient.*

Patients often present to the ED with EMS, as such paramedics become a key source of information. The RNs, while recognizing paramedics as trained health care providers and an integral part of emergency care, also expressed concern that sometimes they were not getting the full story, or an accurate account from EMS. "*And you know which ones are helpful and upfront, in that you can rely on their story and others, you need to dig deeper" (Allan).* Digging for information was then accomplished by asking clarifying questions around the main complaint, especially if the RN detected inconsistencies in the story. At times, if the RN was not satisfied with the information from EMS or the patient looked ill, the nurse would leave the triage desk and walk over to the patient to conduct a brief exam. "*A lot of the times, I have gotten into the habit now of going over to check them out myself, especially if they are looking like crap" (Nancy).*

Limiting information

Although limiting information and digging for information may appear contradictory these two properties coexist on a spectrum of how much information the RN needs. The triage RNs were selective in the amount and kind of information they gathered during the triage assessment. The RNs spoke of how

there was a point with each patient scenario when they had obtained enough information to make a decision.

> *Belinda: Now you don't want to get too much, but you wanna get enough out of them so in your mind you can decide; Are they an appy (appendicitis, my comment), are they an ovarian cyst, can they wait, do they look OK, are they spoofing you on the pain? You can formulate that in you mind.*

Limiting information could occur even before the patient had arrived in the ED. The RNs described how they cut EMS patches, phone calls from consultants, or phone calls from referring facilities short if they felt that there was too much superfluous information. The RNs filtered the information down to what the patient's condition and the plan was, in order to mobilize the right resources through anticipatory action.

> *Allan: Ah, so too much information isn't helpful because it's time, time is so important. You know, like you're under this time gun, so you need to try and filter and get to the heart of things and important stuff. So, important stuff is stability of the pt. Like, eh, what, where, how stable are they and what are the likeliness, what is the likeliness that they are going to stay stable.*

Two factors were at work when the RNs received information about incoming patients, the need to for a succinct, pertinent account since they were often working under time pressure and the need to be able to anticipate the needed resources. As mentioned earlier, the categories anticipating needs and determining acuity overlap to some extent. Anticipating needs will be described later in this chapter as a separate, yet interrelated category.

Two dimensions are embedded in the property limiting information; the more routine, generally non-urgent aspect of knowing enough to reach a decision and the urgent aspect of having ascertained that a patient is critical. If the patient was determined not to be in immediate danger the RNs stopped seeking information when they had formed an idea of what the possible diagnosis was and the degree to which they were worried about the patient. If, on the other hand, at any point during the assessment, the RNs decided

that the patient was critically ill, they stopped gathering information and initiated instant action. For example, during one of my observations a taxi driver dropped off a semi-conscious patient in a wheel chair at the triage desk. The staff had received no information on the patient and after briefly trying to elicit information from the patient who only moaned; they instantaneously summoned additional help and quickly moved the patient to one of the resuscitation rooms.

> *The patient was pale, only responding to physical stimuli, and non-verbal. The staff pulled him into the triage area, yelled "Sir, sir answer me" and shook him by the shoulder, attempted oxygen saturation, but didn't wait for the read-out, instead said "Let's just take him to Resus." Paged "code team to resus" overhead and quickly wheeled him in there. (From observation #5)*

Seeking to understand

As discussed above the purpose of seeking information was to determine the acuity of the patient, however, in order to do this the RNs had to understand and make sense of the information they obtained. In other words, the triage RNs in this study were not just simply gatherers of information; they were actively engaged in a process of seeking to understand what the underlying pathology was and possible consequences. Seeking to understand, a sub category of determining acuity, consists of the properties *combining variables, matching variables,* and *questioning inconsistent variables*.

> *Allan: It goes with the story and the rest of the picture, like how they present. And having a little bit of a fast heart rate, but looking awesome, like you know, looking well. You kind of have to take things in combination. It's not just one thing, although the computer likes to, you know, focus in on black and white things. You know this absolute line, but it's not that. It is really the combination, how these things fit together, that is the decision making part. So, just because you have a fast heart rate, does not necessarily make you a cardiac patient.*

Combining variables

The triage assessment started as the patient approached the triage desk and continued during the interview. It was a dynamic process during which the RNs mentally fit multiple pieces of information together to find an explanation for what was going on with the patient and to determine the patient's degree of acuity.

> *Jill: So if someone comes in who is a diabetic and they have hypertension and they have this vague back pain, I would be more worried about them then a 20 year old who just tripped and hit their back on something. I mean someone who is normally healthy with no other problems, the mechanism wasn't very big, is less worrisome. So all those things play into how I make my decision about how worried I am and where I need to go next.*

The RNs took into account several variables such as the look of the patient, the patient's medical history, vital signs, the presenting complaint, age, medical tests that may have been done, previous ED visits, degree of pain, mechanism of injury, and variation in the patient's present condition from the patient's normal condition.

> *Nancy; It depends on background and everything. You are assessing everything. Everything from, do they have medics with them, are they mobile, what are their vital signs, goals of care, how do they look, what their pain level is, do they need pain management, if they get pain control will they be settled, their ECG's, prior registrations. It's looking at all, you are doing investigative work.*

In addition, the RNs compared the patient against previous patients with similar complaints that stood out in their mind. These were memorable patients who had had serious outcomes. The overriding principle for the RNs was whether the variables fit together or not to form a coherent whole.

Allan: Like, you know, variables, you know, are one thing, you know like, you know it's not just vital signs and it's not just age, it's not just this. It's the combination of how they fit together and I'm not sure if computers can quite get that picture.

Some of the RNs spoke of this coherent whole in terms of being able to form a picture of the patient. It was evident that they were trying to fit multiple pieces of data together in order to make sense of the information they were obtaining. *"From a patient, from a medic. To be able to formulate a complete picture so that you can say, yea this, I am worried about this patient" (Teresa).*

Even though the triage RNs were trying to obtain as much pertinent information as they could in a limited time, triage decisions are still, by virtue of their nature, made with only partial information. Variables were at times erroneously combined by the triage RNs. The assessment and the patient's story appeared to fit together and offer a plausible, yet as discovered upon a full examination in the department, false explanation for the patient's symptoms. At times this led to a delay in treatment for patients with serious conditions.

Cecilia: I had this man who had been diagnosed with a chest cold a week earlier. He had been on antibiotics. He had some chest pain. You know musclo/skeletal, pain from the chest cold and coughing. And he sat and sat and sat in our waiting room and when he finally went back it turned out that he had had an MI.

Matching variables

Combining variables involves looking at how the pieces fit together. Matching variables was an active mental inquisitive process during which the RNs tried the patient's story and presenting complaint for fit against the visual and physical clues that they gathered during the assessment.

Sally: So, it's just questioning and making sure the story fits. To me it's the same thing as a patient, just making sure the story fits with what they are telling you. You do the same thing with the medic,

they tell me a story, does it fit with what you see from the patient, does it fit with what goes together and have they made good judgment.

Simply speaking, matching was reflected in the RNs asking; "But does this fit with what I am seeing, hearing, and finding?" In other words, was there congruence between the patient's and the RN's perception? The RNs spoke of how they continually tried the story for fit during the assessment and puzzled over whether there was a match or not. "A *lot of it is just the look of them, some people just look sick and match their symptoms, they look in pain" (Sally).*

Four different scenarios were possible; the patient thought he or she was quite ill and the RN agreed, the patient thought he or she was very ill and the RN disagreed, the patient thought the complaint was minor but the RN felt that indeed the patient was very ill, the patient thought the complaint was minor and the RN agreed. For instance, Jane spoke of how both she and a patient had attributed the neck pain that he was experiencing to his arthritis and how she had subsequently triaged the patient to a lower acuity area. (The initials GR below indicate myself, the researcher, who conducted all the interviews).

Jane: Um, I learned, I had a patient who had neck pain. "Oh my arthritis." He was an elderly…well not elderly, I don't know how old he was, but white haired. " I have pain in my neck and its been bothering me for three days now, I had the flu. And now I have this pain in my neck. My arthritis is flared up really bad." Well, I went with the pain in the neck and sent him to minor treatment with his cardiogenic shock. He had no other symptoms.

GR: But why do you think it didn't click?

Jane: I was in a hurry.

GR: You were in a hurry.

Jane: Absolutely. Line-ups, and you can slough. Oh this is a no brainer, this lac on the finger, and you keep filing them through like that. And he was one of them that I filed through like that.

One particular variable where there was often disjunction between the triage RN's, and the patient's perception, was pain.

Allan: And speaking of biases there is always you know your drama queens. People that are presenting with huge drama that's not consistent with the pain they have. And now that's tricky, because sometimes pain is your main guiding light. You know is this necrotizing fasciitis or just cellulitis? If this pain is not consistent with the type of wound you're seeing, is this something more? Or is it just a drama queen?

It was not uncommon for triage RNs to doubt patients who expressed a high level of pain, while not exhibiting any overt signs of pain.

Jill: But when I also have a girl with 10 out of 10 pain but is texting her friends I want to give her a 4 (CTAS category, my comment) but if I do the modifiers I have to give her a 2 (CTAS category, my comment) and I don't like that because I am the person seeing this patient. And I know that pain is subjective and all that stuff, but…. I know that a 10 out of 10 can be a (muffled sound), but a 10 and you're texting your friends is a joke.

Belinda: Well OK! What happened to the 12/10, which doesn't even exist, 12/10 pain you had when you were in the lineup? You could hardly walk in here to see me. All of a sudden as they get up: "Where can you smoke here?" Well then I, I edited that triage note pretty quickly.

In the above example the RNs are referring to the pain scale used in the EDs where pain is rated on a scale from 1 to 10 by the patients, 10 being the highest level of pain. The numbers 2 and 4 refer to the CTAS level, with 2 being the more urgent category.

Questioning inconsistent variables

The RNs questioned inconsistent variables when either the combined variables did not form a coherent whole, or when there was a mismatch between the patient's and the RN's perception about the

degree of illness. The RNs then became suspicious that something might be wrong and engaged in a process of questioning and puzzling over inconsistencies and mismatches for the purpose of determining the degree of acuity of the patient. "*So you continue your interview. You do a set of vitals and that helps your decision making. You know if there is anything outside of parameters of normal. You have to put a picture together, why is that?" (Allan).*

Inconsistent variables could occur in a patient who looked well, but had a variable that indicated that something might wrong. The variable did not fit into the coherent whole, for example, a well looking patient with vital signs outside of the normal parameters, or a patient with normal vital signs but puzzling symptoms.

> *Allan: But that's where the vital sign all of a sudden flagged me, Ok there is something more going on, although she presented initially as compensating very well.*
>
> *Jane: I knew there was more to the story. I couldn't believe that she would be fainting like that and her vitals were fine. If she would have been tachy (fast heart rate, my comment) I would have thought dehydration.*

Although the RNs expressed doubt about pain levels, they also considered unexplained pain a warning sign that triggered suspicion, for example, excruciating pain with non-traumatic back pain, or a minor wound. The RNs then tried to find an explanation for the inconsistent variable.

> *Belinda: People who are in excruciating pain, lots of times people with back pain for no known reason. It's very severe and you think of triple A's (aneurysm, my comment), or with necrotizing fasciitis if it's just a small wound, but they have increased pain that they can't stand. You think, you have to always be thinking of the other critical things when they are telling you their story.*

In the second scenario, when there is a mismatch, an RN may question how ill the patient is when, for instance, the patient complains of syncope, and requests to go outside to smoke. During one of my

observations I noted how the RNs where questioning the legitimacy of a patient's story and considered sending the patient to a less acute area in the ED, when what the patient had told them about her symptoms, did not match the behavior they were observing.

> *Triage RN consulting with other triage RN where to place a patient with headache (patient had a history of migraine) and syncope. Had initially decided on bed "but she did go out for a smoke." Decided on bed (From observation #2).*

The RNs also spoke of how at times they became suspicious that there might be something wrong with a patient who presented with vague symptoms and without direct ominous findings. The RNs said they had a feeling that something was not right or talked about intuition, however, suspicion was triggered by the RNs not being able to form a coherent picture of what was going on with the patient, or find a satisfactory explanation for the patient's symptoms.

> *Sally: But she just looked very calm, which is almost more worrisome, and just seemed like she was trying to focus on every task she was doing, overly focusing on every task. To me, I perceived that she was just compensating for whatever was going on.*

This was different from when the RNs combined the variables, found that the variables matched and, as a result, had a high degree of suspicion for a certain disease presentation, for example, cardiac chest pain or ectopic pregnancy.

In addition, the RNs lived with past mistakes. They remembered patients with serious conditions that had been given a low priority. When faced with similar patients Jill and Sally spoke of how they had become more cautious and questioned what the underlying disease process might be. Jill, for example, had mistriaged a patient who had presented with low back pain, but in fact had an aneurysm. "*Yeah, exactly, especially if they are new… I really assess every low back pain (laughter). Just bring me a fast ultra sound. I'll do it myself*" and Sally recounted how past mistakes had made her more observant with similar patients.

"*I think there's always, you know when you get burned by that patient that you missed, and you are always a little more vigilant with the next one."*

Questioning inconsistent variables and becoming suspicions resulted either in the RNs assigning the patient to a treatment space, or leaving the patient in the waiting room while still trying to maintain a degree of vigilance. These patients in the waiting room were at times overlooked when the RN who had triaged them went on break, if there was a shift change, or patients that were deemed more acute arrived.

Seeking information and seeking to understand occurred simultaneously, forming an iterative relationship. The RNs talked about "the look" of the patient and how they initiated the triage assessment by looking for visual clues as the patient approached the triage desk. If the RNs observed a variable that was outside of the parameters of what they considered to be normal they mentally initiated the process of seeking to understand before the patient had even entered into the triage area. "*Ah, and there are variables included like age, are they in a wheel chair, how much distress are they in, do they need to be in a wheel chair, is this a foot or what? Like, why are you in a wheel chair?"* (Allan).

When presented with mismatched or inconsistent information during the triage interview, the RNs focused their efforts on clarifying the search by digging for more information. The RNs were continuously looking for fit. Not only were the RNs in this study trying to achieve best possible fit when they assessed the ED as a whole entity, they were also striving for fit when they looked at the individual patient and sought to understand how the patient's symptoms, behavior, and story fit with the possible underlying disease process or injury.

To recap, determining acuity is the initial instance when the patient appears to the ED. The main concern of the triage RNs was to fit the patient to the right treatment space with the right resources and the right care provider at the right time, momentary fitting. Momentary fitting was resolved through a process of determining acuity, anticipating needs, managing space, and creating space.

Anticipating Needs

The work at triage was driven by anticipating needs, not only with individual patients, but also of the department as a system that needed to be able to respond to an influx of patients. Anticipating means to expect, foresee, predict, and be prepared for something. The RNs anticipated time to treatment, anticipated the trajectory for patients, the consequences of various disease processes or injuries, consequences of their triage decisions, the need for treatment spaces, and engaged in anticipatory action. Anticipating needs consists of the properties *anticipating time to treatment, anticipating trajectory,* and *anticipatory action.*

Anticipating time to treatment

Acuity of the individual patient as perceived by the triage RNs in relation to the other patients waiting was reflected in the priority number the RNs assigned to the patient. Each patient was assigned two numbers a CTAS acuity score, that could not be altered once determined, and a priority number to be examined by a physician, which could be readjusted as the patient's condition changed. The RNs, as articulated by Nancy, anticipated time to treatment and tried to achieve the best fit by continually considering timing and rearranging the priority list. "*You're always increasing, within a 15 minute window you can go from having 7 people to 45 people needing to be seen and you have to go through and prioritize and reprioritize all these people*."

When the RNs entered data from the patient assessment into the computer program that was used at the three sites a CTAS number was automatically generated based on the presenting complaint and the CTAS modifiers that the RNs applied. The RNs could manually override the system and place the patient in a more urgent CTAS category, however, they were not able to alter the CTAS number to a less urgent category. As can be seen from the preceding discussion of pain the CTAS number automatically allocated to the patient did not always reflect the RN's perception of the patient's degree of distress. At other times,

based on their assessment skills, the RNs determined that the patient was sicker than the computer generated CTAS number indicated and changed the CTAS number accordingly. *" I bump up a lot of CTAS. I mean you know. Override from 3 to a 2 because they look sicker than what the system is telling me" (Jane).*

In trying to achieve fit the RNs placed more emphasis on the priority number to be examined by a physician than the CTAS number.

> *Belinda: Ah.. the CTAS number, I would say the priority number to me is more important then the CTAS number. I am not too sure what those CTAS numbers do. I think maybe there is a program where they are entered and actually to nurses, I don't think the CTAS number is that important as the priority number. The priority number to me is how fast this patient is going to get seen.*
>
> *Teresa: Yeah, I really don't think that I consider CTAS as.. I am more, even if they're sicker, I am more concerned about their priority then I am about, about what their CTAS is.*

Triage RNs consistently thought in terms of time to treatment in relation to the patient's presenting problem, not necessarily in terms of CTAS number. Timing was determined by how sick the triage RN thought the patient was and what the possible anticipated consequences were of different time frames.

> *Jill: But I don't put someone I am not worried about ahead of anyone else even if they have a 2 (CTAS number, my comment), I will let the 10/10 belly pain be 21 because they can get a Fentanyl protocol if they really need it. But I might put the granny with her weird belly pain at a 3, but I would be more worried about her because she could get worse so she goes before.*

The RNs continually considered and anticipated time to treatment. Continually anticipating time to treatment was an ongoing process, even as the patient had been placed in a treatment space. Anticipating time to treatment did not end until a physician had examined the patient. It was accomplished through constantly rearranging the priority list to achieve the best fit for each particular moment among patients.

Joe: And managing that priority list. Getting feedback from the nurses that are working with the patient in that care space and having a constant interaction, is this patient getting better or worse, do I need to bump them up that priority list to be seen by a physician and when do I need to do that?

Timing was operationalized as prioritizing. Prioritizing a patient was not a one-time occurrence. Ideally the most acute patient at any given time was at the top of the list. The triage RNs attempted to accomplish this by anticipating time to treatment and the patient's acuity relative to the other patients waiting. As discussed by Jane, prioritizing is complex as it means continually assessing individuals at any given moment to see where they are on the priority list. "*And then we try to sort of determine what is wrong physically or mentally with them. And then in that process we decide really how sick they are, and then prioritize the patients based on who is there at that time*."

The acuity score, CTAS, was static, whereas the priority number was dynamic. When prioritizing the triage RNs took into account the degree of illness and, as stated earlier, where the patient fit in relation to other patients in the ED. The dynamic and complex nature of the priority list is central to all the decisions the RN's make as stated by Cecilia: "*And if there are 30 people waiting to be seen by a doctor, where does this person fit in all that? If I bump you up, how does that affect the other 30 people that are waiting?*" In other words, changing a patient's priority number altered the circumstances for not just that particular patient, but also for the other patients who were waiting. Therefore the decision to change someone's priority number became a multidimensional decision, where the RN had to consider the disease process of each individual patient, and the disease process of, and possible consequences for, the other patients who were waiting.

The priority list was constantly rearranged, refitted, either as new patients arrived in the ED, or as the condition of patients already in the ED changed.

Joe: So that MI would get bumped up to the top, MI in progress, because they need to be transported to another facility they would be the next priority on the list and then the low hemoglobin who is stable. Now if that patient with the low hemoglobin had a pressure of 60 that would influence the decision tree.

Patients could be moved up or down the priority list based on either the initial triage assessment, requests from RNs in ED treatment areas, another triage RN, or as a result of a consultation process with the other triage RNs about the patients that were waiting to be seen.

GR: What would make you bump someone up?

Jill: Their story, history, complaint, if there is something I can't figure out and I want a doctor to be the one to decide, abnormal vital signs, they way they look, how pale they are, how much pain they are in, it is those types of things.

In summary, as the RNs anticipated the consequences of various disease processes the RNs considered optimal time to treatment for each patient, however, optimal time to treatment was moderated by the condition of the other patients who were waiting.

Anticipating trajectory

The triage RNs, as they decided on the best treatment space, anticipated the trajectory for each patient. The anticipated trajectory was based on the information they had obtained during the process of determining acuity.

Allan: And then of course, where is this patient going? Who is going to see them? What is the plan? It's kind of like looking in the future, kind of the triage thing is be able to, eh.., you know to look ahead and predict.

The RNs were thinking ahead about what type of care the patient would require, likely investigations, and also tried to match the staffing to the complexity of the patient. Underlying this was the RNs' experience

with, and knowledge of, various pathologies. For example, during one of my observations the nurses discussed where to send a woman who was 5 weeks pregnant who had a Bartholin's cyst. The RNs knew that, although the patient was ambulatory and would normally have been triaged to a different area, she would likely need conscious sedation to drain the cyst and therefore required resources in terms of a stretcher, intravenous medications, and airway monitoring post procedure. Based on the trajectory the RNs anticipated that for this woman it would be best to send her to a treatment space where these resources were available. In other words, the RNs were looking for the best fit in relation to the woman's anticipated trajectory. Similarly, other RNs explained how they were constantly thinking ahead about what the care trajectory would be for each patient and how that guided their decisions.

> *Nancy: Or a patient who is likely going to need a lumbar puncture, they can go over to the other side because they will need conscience sedation or whatever. I don't know if that answers the question, but I think it is just kind of foreseeing what's going to happen during their stay there and trying to put them on the easiest course, one stop shop I guess.*

An integral part of the triage decision for the RNs, as stated by Jill, was trying to anticipate if the patient would stay stable, or deteriorate. "*Then I decide what area of the department they need to go into, if they can wait or not, will they collapse, can I send them to admitting and they can continue on to another area."* The RNs used knowledge of and experience with different disease processes in conjunction with their interpretation of the information they had gleaned during the process of determining acuity to make a prediction in order to decide on the most appropriate treatment space. "*So you need those years at the bedside to be able to see what a belly pain could develop into, or back pain, or chest pain, and just to see the variety of patients" (Cecilia).* The RNs anticipated which patients were at risk for potentially poor outcomes when they decided on the type of treatment space. For example, a patient with renal colic would be deemed less serious and sent to an ambulatory care area where a nurse could quickly initiate standing

nursing protocols for analgesics, whereas a septic patient would be given a higher priority and ideally triaged to a higher acuity area with a higher nurse to patient ratio.

Allan: You know it's a renal colic. It all adds up. Ah, ..they're CTAS 2, but they're stable and you can just get a nurse to use some protocols and get them some pain meds and get them going and it's not the same as a CTAS 2 that's septic, say. Who could go sour on you, like potential things going wrong. You know, you have to weigh that in so, the priority is going to be towards the septic patient.

Problems arose when the triage RNs anticipated that a patient required a certain treatment area, for example cardiac monitoring, and there was no space available in that area. The RNs then attempted to resolve the poor fit, the mismatch between resources needed and resources available, by either creating space or juggling resources in terms of staffing.

Anticipating the consequences of different disease processes was a dimension of anticipating the trajectory. Anticipating potentially serious consequences guided the RNs decisions about which patients should be given priority for available treatment space, however, the RNs often worked under conditions when there were no suitable treatment spaces available, or very limited space availability. The RNs then resorted to a decision rule of "worst case scenario" and mentally worked out what would be the worst possible consequence for each patient if the patient was left in the waiting room and which patient was most a risk of deteriorating.

Sally: It really all depends, I can't even explain to you how you decide, it's all about who you're most worried about, that but instinct and again it has to go back to that most critical. So a CTAS 2 from a renal colic that's 8/10 pain, that's one thing, I know he's not going to die, but I am really worried about that chest pain that might be something worse or this person has a ruptured appy

(appendix, my comment) that's worse than a renal colic or more life threatening that a renal colic right now.

So, you kind of really have to base your judgment on what's the worst case scenario with this patient, that ruptured appy is worse long term right now than that renal colic even though they are arriving in pain, I have to get them back.

There was an element of protection inherent in anticipating consequences. The RNs were attempting to protect the patients from bad outcomes by trying to ensure prompt treatment for sick patients, and at the same time the RNs were also engaging in a process of self-protection. The RNs considered it critical to be able to identify a sick patient, and spoke of how they, at times, protected themselves by involving the clinician in the decision about who should get a bed when they were faced with multiple high acuity patients and limited treatment space availability.

Belinda: And I, I've triaged a lot and I've triaged many different situations. So, but, triage is triage. Triage is the first line for that patient and you'd better get it right. That's the only thing I can say, is, you'd better get it right, because if you don't the ramifications could be very severe. But, I also get my clinician on board. I don't take that responsibility myself. I am not going to be..

GR: (interrupts) Do you mean to help make the decision or,

Belinda: (interrupts) Helping me make the decision. I am not going to be the only one who is holding the empty pot at the end of the day with nothing in it. That's not going to be me.

The RNs also protected themselves from the consequences of a "bad" triage decision by erring on the side of caution. Erring on the side of caution was a strategy that was used when something in the patient's condition had triggered the RN's suspicion and there were treatment spaces available. The RN had not necessarily found any ominous signs during the triage assessment, however there was a sufficient degree of clinical suspicion that something might be wrong The patient was then placed in a more acute

area than would be indicated by the triage record and the look of the patient. In these circumstances the RNs used the strategy of alerting their co-workers both in anticipation of complaints of wrong placement, poor fit, and as a means of informing their co-workers that they were concerned that something serious might be going on with the patient.

> *Nancy: I will take them back myself and talk to the nurse and just tell them I don't know, just work on them. I feel better about bringing them from the higher acuity down to the main because then we have an extra bed in the acuity and if they call and say it really was nothing, this patient can go non-mon or can even go to minor emerg then fantastic, great, move them….(talks about how she moves patients)……. So yeah, I would rather do it that way than say I have them over in MET and they have a cardiac arrest, and you can't fix that. Whereas if you over triage them, you can fix that, just move them. I am good with that; I can leave with a clear conscience, which is probably my biggest goal at the end of the day (laughter).*

Anticipatory action

The properties anticipating time to treatment and anticipating trajectory have been described primarily in terms of how individual patients were fitted and refitted into the fluid system that constitutes an ED. However, as stated earlier much of the work conducted by the triage RNs was driven by anticipating needs, not just of individual patients, but also of the need for the department as a system to be able to respond quickly to rapidly changing conditions, or a sudden influx of patients. The triage RNs were, through anticipatory action, continually trying to meet the expectation that exists for the ED to function as a system that is readily available to absorb and treat critical patients.

During my observations I noted how, as the need for treatment space increased, the RNs focused more intently on anticipating upcoming space in conjunction with what type of treatment space each patient would require.

The triage RNs were discussing who could move as the department was full. "Bravo 2 maybe, or what about Charlie 3, but his sats (oxygen level, my comment) dropped before he went to x-ray. Maybe someone can move to RAZ (lower acuity area, my comment). I'll phone and ask." (From observation #6).

The RNs engaged in anticipatory action by anticipating upcoming space and planning for which patients needed to go where based on the patients that were waiting for a treatment space. This was accomplished through initiating a set of actions including; reviewing the paper charts of the patients who were waiting, searching for upcoming beds on the computer, and discussing the patients with each other. The RNs reviewed the charts in order to determine what type of space would be needed. In doing this RNs looked at the triage note, medical history, medications, and CTAS in conjunction with discussing the anticipated trajectory for each patient. If unsure and the RN was not the person who had conducted the triage assessment, the RNs consulted with their colleague who had initially assessed the patient. Searching was primarily done by looking for potential discharges and admits on the computer. There was also an ongoing discussion about potential spaces that were becoming available with the charge RN, or a designated RN whose assignment it was to monitor the flow in the ED.

Nancy: Yeah, because you really need to know how long is that bed going to be, when is it coming open? Because you really need to know. So bed 26 has been admitted. She's been there for three hours, why isn't she up?

The triage RNs then combined the information from the review of the charts with the type of space that was becoming available in order to fit the patient to the most appropriate area within an acceptable time frame.

The property anticipatory action also included a set of actions that were initiated in response to advance warning of incoming patients either by STARS (helicopter), EMS, or referrals from other facilities or specialists. For example, during my observations I noted that if the RNs received an EMS patch of an

incoming critical patient they anticipated the needs of the patient by ensuring that an appropriate treatment space was available with the right level of staff resources.

> *Two RNs a triage. One patient being triaged. Two EMS patches back to back. One was a stabbing. Consulted with charge nurse. Decided on trauma bays for both. Paged RNs by name to trauma bays. Paged doctor to call triage. Doctors called and RN told them about patients. Triage RN anticipated arrival by pulling unknown chart and starting to enter info into computer. Paged overhead, "patient en route to trauma 2", when patient arrived and had been triaged. Remained calm. (From observation #3)*

They also tried to consider the needs of the department by allocating staff resources to the incoming patients that ensured that the rest of the department still had the capacity to function. In the above example they consulted with the charge RN from which areas to pull staff.

Under conditions of limited space availability momentary fitting became problematic. Therefore, when the department was either full or if there was a lack of cardiac monitored or trauma beds, the RNs initiated anticipatory actions such as, for example, determining which patients could be moved from higher acuity areas to lower acuity areas, leaving patients deemed to be less acute in the waiting room, or making EMS wait with their patients. In short, the nurses continually considered and managed space, which will be discussed in the next section.

Managing Space

Triage work is inherently associated with the concept of space. Patients are assessed by the triage RN and then channeled to a particular area. The categories determining acuity and anticipating needs were found to form the basis for which space patients were ideally triaged to and within what timeframe, however, the triage nurses in this study often worked under contextual restrains of limited resources in terms of treatment space availability. The work and the DM processes that the triage RNs engaged in

therefore became centered around how to best manage a scarce resource, treatment space, in order to achieve best possible fit under the circumstances, momentary fitting in a fluid context. Managing space was an ongoing activity that consisted of the properties *working with limited space, collaborating with co-workers,* and *knowing the department.*

Working with limited space

The triage RNs worked under contextual restraints of limited treatment space availability, either a complete lack of available treatment spaces or a lack of beds in a particular treatment area in combination with no control over the amount of patients that presented to the ED. *"Eh, and you've got these restraints that you've only got so many spaces available in your emergency department. You really have to sort out who needs the bed* " (Allan). The issue of gridlock, when there is absolutely no space available, resulted in sick patients having to stay in the waiting room. The RNs spoke of how they tried to keep an eye on the patients they were concerned about by placing them close to the triage desk.

> *Nancy: Oh my God, so we have shelves that are all lined up and between EMS and the patients waiting in the waiting room, we try to keep our CTAS 2's and the really sick patients… and this is gong show times, we have CTAS 2's waiting in the waiting room hypertensive, tachycardics, febrile, septic, like you know, query strokes, query MI's. We've got them all there and we've got CTAS 2 waiting area right in front of you so you can keep an eye on them and you are also trying to reassess them according to the triage guidelines.*

While maintaining vigilance and ensuring that sick patients in the waiting room did not deteriorate the RNs revealed their dilemmas of still needing to continue triaging incoming patients and finding treatment spaces.

> *Belinda: So, I am trying to find a bed for my sick ones and more sick ones are coming in.*
>
> *Grace: I don't like it when I am at the triage desk and we have 5 patients that need a bed and we have 4 or 3 beds. I don't like that.. it makes me fussy. I don't like that because you can't stop to*

look after those people because you still have all those people in your line who are wanting to check-in.

Having sick patients, or patients with suspicious symptoms in the waiting room was a source of unease for the triage RNs. They expressed concern that these patients might be overlooked.

Belinda: If they are really sick you're going to want to send them in right away, if you have a spot. But it's those ones where you don't have a bed, and they're iffy, and you don't want them to wait. Those are the ones you don't want to fall through the cracks.

One of the RNs recounted a story about how a patient that he was concerned about had left after having to wait in the waiting room. The patient had returned in life threatening condition with EMS the next day.

Joe: It just gives me shivers because she came in, she was febrile, she obviously had a chest infection of some kind. She had rales in her lungs, she had a history of asthma, her sats were low (oxygen level, my comment), and I sat her beside me at triage and I hadn't had a coffee break. I told my partner that she gets that bed that is coming up. So I go for coffee and I come back and it's like:

"Well, where is this patient?"

"Well you know we got busy and I put her back in the waiting room because I needed the space here at triage."

And then I called her to come into the bed and she was gone. We tried to call her at home. She ends up coming in the next day intubated with EMS.

The EDs in this study were open systems where the influx of patients was not controlled by any external mechanisms. The study was conducted in a city where there was a shortage of family physicians and patients were covered under a universal health care system with no fees for ED care. The triage RNs were therefore the first health professional through which the flow of incoming patients was regulated. In

other words, the RNs had no control over the amount, or type of patients that came to the triage desk. The triage RNs consequently became regulators of the flow, while at the same time being charged with the responsibility to safely handle the influx of patients as they worked under conditions of limited treatment space availability.

Teresa: You know where you, when your partner is on break and all of a sudden you get the flood of medics and it's:

"Anyone there that you're worried about?"

" No, we're good to wait."

"Ok."

You start with the line you know (referring to walk-in patients, my comment).

"Does anybody have chest pain, any shortness of breath?"

" No."

Then ok it's whatever you feel, you know, the back and the forth, and hmm…

When talking about the constant influx of patients some of the nurses spoke in terms of feeling like they were sinking, or used terminology reminiscent of combat.

Sally: Drowning, sinking…those are the, to me the drowning is… but yeah you just constantly... bombarded. When you think all these words where you always feel like you're in the line of fire, it always tends to go back to that very front line, war kind of scenarios, where you just feel like you're exposed and you're in the front lines and constantly people are just coming, and coming, and coming (laughter).

The triage RNs knew from experience and stories told by other RNs that the unexpected could occur at any moment. In other words, the unexpected was an expected event. An awareness of the consequences of limited, or no space availability, underpinned much of the triage work.

Jill: When I don't have beds that makes me super nervous, when all the beds and trauma rooms are full and you have a patient who is seizing or septic, like granny with a pressure of 70. They have to go somewhere. So, I try really hard not to be in that situation. Sometimes you can't help that situation.

There was a feeling of unease and anxiety among the triage RNs when the ED was full. They knew that at any time a patient who needed a bed immediately could come through the door as frankly expressed by Allan:

When your department is full and you have no place to put anybody and you have people sitting in the hallway with EMS and some of them are sick. You have sick people in intake where they shouldn't be and you feel like you're sitting on this bomb that's about to explode, something catastrophic is gonna happen and that is the biggest anxiety, on certain days, and it feels like at triage, like you're sitting on that bomb. And that's the fear, I guess more so than, I, I am pretty confident I can pick out a sick person and get them to the right place, if I had it.

Nurses resolved this concern by trying to always have a bed open in order to be prepared for the expected unexpected, however this was not always possible. During all of my observations there were times when all the treatment spaces in the EDs, except the trauma rooms were occupied. At two of the sites there were occasions when all the spaces including the trauma rooms were occupied. The RNs spoke of the need to be ready and have somewhere to treat a suddenly arriving critically ill patient.

Jill: We try and never get in that position, we try and think ahead and always have an empty bed. So when EMS is inundating us and our trauma rooms are full we try in advance to clear at least one bed. So at least if that had happened we would have somewhere to go, because they show up on our door, you know, someone stabbed show up on our door. They have to go somewhere. At least when I am there, this is one of the things I try really hard to do, I try really hard to never not

have an empty monitored bed, even if there are six ambulances in the hall…, sometimes you can't do that, or you have a trauma bay, one of the two, because you need to have somewhere to go.

Working with limited space and a constant influx of patients occurred against the backdrop of multiple stimuli. Stimuli included the EMS patch phone, incoming paramedics, patients in the line-up, phone calls from sending facilities, phone calls from ED bedside RNs, significant others seeking information, police escorting patients, patients in the waiting room that were either deteriorating or becoming impatient, and at two sites noise from the department itself. The RNs handled the multiple stimuli by prioritizing which stimulus to attend to first; the EMS patch phone was always given priority. The RNs would always interrupt what they were doing to answer an EMS patch as it could mean the emergency of an incoming critical patient.

At the same time another walk-in and an EMS patient were being triaged. Then patch phone rang. One of the RNs interrupted what she was doing and answered patch phone. Patient that was coming in via EMS was unresponsive. (From observation #6)

In the above example, an incoming unresponsive patient meant that the RN that took the patch had to stop what she had been doing in order to determine treatment space availability and resource requirements.

Identifying the sickest patient during a sudden influx then became the next priority for the nurses. "*Well, yea, probably the first thing in my head would just be, who is sickest? You know. Who is my sickest patient?"* (Teresa). This was done by relying on the other triage RNs, paramedics, and by scanning the line-up of patients. The triage RNs depended on their co-workers to alert them when they have triaged a sick patient.

Teresa: So if I am working with a, you know, a nurse that I know is experienced that I've worked with in the past then, then I trust their knowledge. I know they're going to let me know the second they have a sick patient.

If several EMS patients arrived at the same time, the triage RN would ask the paramedics to identify the sickest patient among themselves.

> *Belinda: But medics, I have to go to medics, but when I go to the medics, if I've got six medics, I'll say: " I want the sickest patient here first". I always say :" You guys will have to, you guys are gonna have to prioritize yourselves for me, cause there is just me. I have a lineup and the phones are ringing. So, I want you guys to prioritize yourself and come up in that order."*

The influx was first handled by allocating the treatment spaces that were available. During a sudden influx with limited space availability it became a matter of getting the most critical patients into a treatment space first, even if it meant temporarily overloading one area in the ED.

> *Sally: All I do is tell them that I went with what I had and if they are complaining that I just brought three people back to the monitor beds, I can't control what is coming in the door. If three strokes walked in back to back then three strokes are coming to the monitor beds back to back, I can't make them wait. So, I don't have control over what's coming in.*

Working with an awareness of the consequences of limited space availability and a constant influx patients, meant that the RNs were continuously monitoring and managing the treatment spaces in the ED.

Collaborating with co-workers

The work at triage and managing space was mostly conducted as a team process. The triage RNs considered good communication to be vital as relayed by Nancy: "*And hopefully you are working together, because you need that good communication with your partner… or else you want to shoot yourself (laughter)."* Collaboration was as an ongoing activity that was characterized by a continual exchange of information among the triage RNs. Under conditions of limited treatment space availability and uncertainty the nurses collaborated even more closely in order to manage the available space. The RNs frequently

exchanged information about upcoming spaces and the condition of the patients that were waiting for a treatment space.

> *The nurses collaborated closely the whole time by discussing patients, possible placement of patients, which beds were coming up and how to free up beds by moving patients around. (From observation #4)*

This also included updating each other on requests that they had received from the nurses in the department to move patients who had either deteriorated or required different treatment spaces. For instance, during one of the observations I witnessed how the triage RNs were discussing and trying to accommodate a request from one of the bedside nurses for a more suitable space for a dying patient who was not to be resuscitated.

> *At the beginning of the observation two nurses were discussing were to place a patient that was dying: "Is it imminent? Is it going to be today? Maybe move to room xx or room xx." Later explained to me that one room was private with room for the family. Also had considered another room that doubled as mental health room, but had to consider staffing. (From observation #7)*

Collaboration occurred on three different levels: ongoing spontaneous information exchange, as an informal triage team huddle, and by collaborating with and seeking assistance from the charge nurse. The triage RNs exchanged information frequently in the form of short statements, especially as the patient volume increased. If there were spaces available and the RN who assessed the patient initially decided that the patient met the criteria for a particular area the patient was simply triaged there, however, if a patient appeared ill, or if space was becoming limited the nurses checked with each other before allocating space. The RN who triaged the patient would call out to the other RNs either as the patient was still being triaged if they needed the bed immediately, or as the patient left the triage area to register with admitting. Grace described this interaction: *"So you look at the board:" I'm going to need a non-monitored bed, Alpha 4 is*

going home. Does anybody else have any reason?" "Nope go ahead Grace", or "yea we have a guy waiting for a bed." The purpose of updating each other was twofold; to ensure that there was no other patient who was in greater need of the space, and to make sure that the priority list was adjusted accordingly to get patients with serious conditions seen sooner than time order would indicate.

> *Belinda: But triage 2 won't know that unless I communicate it. So, I always when I am concerned about a patient and I don't really know where to put them in the priority list, because I am just supposed to make them bop right along, whereas I think this one has got to be seen now. Then, then I let triage 2 know. I don't want this person to get out of my grasp with out proper follow-through.*

Not only did the RNs use verbal communication to update each other frequently, they had also designed various informal written communication systems in addition to the computer system and the paper charts. At two of the sites the nurses indicated what area they wanted the patients sent to by leaving yellow sticky notes on the charts. At another site they used the white sticky labels with patient demographics that came with each chart and wrote their main concern with a black marker. The nurses also specified if the patient was with EMS or not by highlighting EMS patients. "*Oh sticky notes everywhere! And you plan it out perfectly and then all hell breaks loose" (Sally)*. These informal written communication systems served as quick visual reminders when the RNs reviewed the charts and were designed by the nurses to remind themselves of what type of bed each patient would need. The notes also enabled their colleagues to step in and allocate space.

As stated earlier, the triage RNs used the process of combining, matching, and questioning to determine acuity and the underlying patient concern. When the nurses were unsure of what the underlying pathology might be they frequently consulted with their co-workers.

Jill: Reassessing people if you are worried about them or having someone else reassess someone and see what they think especially if you are like: "Don't really know what to think about this pt. Their story is weird. Can you reassess them?" And that will help us make a decision. "Are they safe to go over here? What do you think? How soon do they need to be seen?"

They consulted the other triage RNs both for the purpose of deciding what might be wrong with the patient, and to consider possible treatment areas. In fact, being able to discuss patients seemed essential to the work and DM processes of the triage RNs in this study. During my observations at all three sites I noted how the nurses frequently sought advice from each other when unsure. Only one nurse, a very senior nurse, indicated that she only sought advice occasionally, however, she did explain to me that the other nurses used her as resource.

GR: Are there times that you would use your co-workers?

Jane: Some yes, we discuss it, but they come to me more than I go to them.

GR: This is a bit different.

Jane: They are young.

In addition to the ongoing quick updates and requests the RNs used an informal, spontaneous huddle approach. This typically happened when they either had several sick patients waiting or had been notified of an incoming patient in serious condition, and treatment spaces were very limited. As well, they often quickly convened after a sudden influx of a large volume of patients, or after breaks.

Jill: Sometimes when we are getting really inundated we just stop checking people in and just talk to see where we are at, because no one wants to give anyone a bed in case someone else is sicker because we don't know who is triaging what at the same time.

Huddling was a process during which the triage RNs momentarily stopped triaging and updated each other. It was different from shift report in that huddling was an impromptu activity instituted by the triage RNs when they sensed the need to exchange information in order to make decisions and allocate space.

> *Jane: Well you have to look at the whole picture of all 23 of those patients. And you have to figure out of that group, and even though you haven't triaged them, that's when you have a little huddle with your other triage nurses and go… who gets that bed.*

The purpose was to achieve the best overall fit between the patients that were waiting and the resources available in terms of treatment space and staff. The RNs were trying to match the needs of the patients to the circumstances that existed for that particular moment in time. The fit was not necessarily ideal, but the huddle approach was an attempt to ensure that none of the patients that were waiting was overlooked.

> *Jane: Yeah, that more so because I haven't seen their patients. On a one to one, like we will all have somebody that we want to get in right away, and then we discuss out of those three people or two people, who really needs the bed.*

Triage RNs are expected to be astute, independent decision makers, however, they are also keenly aware of the vulnerability of their position. Seeking assistance from, and collaborating with, the charge RN was a strategy that the RNs used under conditions of gridlock, when triage became inundated by a large influx of patients, or when complicated situations arose. "*Well, I think when I get complicated situations and when I get stuck, my next go to is my nurse clinician" (Belinda).* Involving the charge nurse was both a way of communicating that triage was overwhelmed and a protective mechanism. The triage RNs were letting the charge nurse know that they needed help managing space. Jane discussed this. "*Then we are just hooped. Then we just do the best we can. That's bottom line we just look at the patients and prioritize, you say I need a bed, call charge. And charge will try if they can."*

The charge nurse and the triage RNs collaborated in making decisions through discussing the type of patients that were waiting and how they planned to use possible treatment spaces, however, inherent in the situation was a handing over of some of the responsibility for finding treatment space and solving triage issues to the charge nurse. Grace explained: "*And if I didn't have a bed I think I would either call her or I would get the charge nurse to the desk. I think you have to alert the charge nurse that you have something that you think is, umm serious*." Seeking assistance from the charge nurse meant that the triage RNs could focus on the incoming patients during busy times. As well, the charge nurse also had more authority when it came to reassigning staff and moving patients, either to in-patient units or in the ED itself.

In summary, collaboration through frequent communication and joint DM was essential to the triage RNs when they were trying to accomplish momentary fitting through managing space.

Knowing the department

The triage RNs considered knowledge of the whole department an integral component to managing space efficiently. They spoke of the need to be aware of the whole department when they were assigned to triage, as revealed by Jill: "*I don't think so; I mean I think the biggest thing about triage is knowing what is going on in your department and what assignments have the sickest patients and those sorts of things. Knowing what is happening everywhere."* One of the participants contrasted this with how, as a bedside nurse before he started to work at triage he had more or less just been aware of his own area. "*When you start working triage you become always aware of the whole department, even though you're not working triage that day" (Allan).* During an observation one of the triage RNs, after she had received a request from an RN in the department to move a patient to a different area, turned to me and said: " *You have to consider who is in the waiting room, the patients in the back, and incoming patients all at the same time. You have to have your finger on the whole department."* (From observation #7)

Knowledge of the department included knowing how busy each area was, the level of staffing, the acuity of the patients, which physicians were on duty, the condition of the patients waiting for treatment spaces, and an awareness of any incoming sick patients. The RNs tried to combine this information when they made decision about how to best manage the spaces that were available to them.

Sally: So, I can critically think through something to determine who is sick and what might be their worst case scenario and all that stuff but it's being imaginative and creative as to how I work that department and it is truly working that department and making that department work best for your patients.

Joe: So it's not just intake of patients. And assessing their level of illness or their acuity level at that time, but what spaces are available to me, and how long is that list of patients that are still waiting to be seen. And how long have they all been waiting?

In addition to shift report and informal triage huddles the triage RNs primarily used two strategies for knowing the department, they searched the computer for information and conducted walk-throughs of the ED, also known as bed hunts. The triage RNs used the computer as an information tool to obtain an instant update of the department. For example, they could find information on the computer about, how many beds were available, how many patients were admitted, and which patients had been allocated beds on in-patient units. Furthermore, the triage RNs could see how long each patient had been waiting to be examined by a physician and could rearrange the priority list accordingly.

Joe: I can look on the computer. Our computer program allows us to see the spaces in the department. So I look at the computer bed map on the program and then I pull up the priority list of how many patients are waiting to be seen and sometimes there are 5 and sometimes there are 28.

Much of the triage work was centered around and to some extent dictated by what was visible on the computer screen. During my observations I noted how the RNs were constantly checking the computer

for available beds and considering the priority list. *"So, it's funny what perception is, where perception of, people think I am doing nothing because I am sitting at a desk looking at a computer, but I am actually mentally almost overwhelmed" (Allan).*

The triage RNs considered the computer to be a useful tool, however they were also of the opinion that it did not tell the full story and therefore used a strategy of walking through the ED in order to gain first hand knowledge of the department.

> *Joe: And then I still like to physically walk around, just for five minutes, to talk to the nurses in each area. To have an understanding of what's going on in their area, because you can't see that on a computer program. You can't tell how busy those nurses are in that area.*

The triage RNs conducted the walk-throughs in order to find empty beds, visualize the patients to determine who could move, find out how busy each area was, what the staffing levels were, and who the RNs were that were working in each area. This was reinforced by Allan:

> *Ah, I do. And actually one of the things I do in triage if I ever get a moment, I walk through the department to see what the patients look like. You know, generally and to see what kind of patients are in B-area. You know, what does B, C look like? And see who is working down there. You know, just those kind of things, to see, I mean, yes I could see it on paper if I wanted to do that work, but sometimes just a walk through you get the vibe, you know. You get the whole picture, you know.*

The following is an account of a walk-through that I was invited to observe.

> *One of the triage nurses asked if I wanted to come on a walk-through of the department to try and find beds. Observed how nurse was asking bedside nurse who was going home and when, what the plan was for the patient, who could possibly wait in the hallway. Discussed moving patient with flank pain to hallway, but stated: "He might be forgotten there. Maybe move to intake instead."*

Bedside nurse and triage nurse agreed on this plan. Triage nurse said; "I'll page." (From observation #7)

The nurses used the knowledge of the department that they had gathered during the walk-through, when they considered and managed space.

The triage RNs also stated that they tried to be aware of how busy each area was and to incorporate that knowledge into their decision about which patients to send where and when. For instance, nurses spoke of considering the workload and not wanting to overwhelm one area.

Jane: If we have just slammed room C with two sick cardiac I want to know that. Because why would I want to put the third one there. They are not going to cope with it. And there are two junior nurses there. So knowing those things. You need to remember what you have put in.

At times the triage nurses staggered the patients in order not to inundate one area with patients all at the same time. Taking the workload into account was not always possible, especially when several seriously ill patients arrived at the same time.

In summary, knowledge of the department formed the basis for much of the DM about how to best manage space. The triage RNs managed space through a collaborative approach in conjunction with an awareness of working with limited space availability and no control over the amount of patients that presented to the ED.

Creating Space

Managing space was an ongoing activity that occurred as a consequence of determining acuity and anticipating needs. At certain critical junctures, or cut-off points, the triage RNs initiated actions to create space if there was no appropriate space, or a complete lack of available treatment space. In other words, a block existed and the RNs had to find innovative ways, sometimes by making up the rules to circumvent the block and create access to care. Initiating action in order to create space was a cut-off point

in the theory. Cutting points, or critical junctures, according to (Glaser, 1978) indicate that differential behavior occurs. The concept creating space intercepted the work at triage at certain critical junctures, and consisted of the properties pushing boundaries and crossing boundaries.

> *Belinda: Yes, there is nothing written in stone at triage I also find. You kind of have to make up rules sometimes as you go. There, there are no real dedicated rules for triage, except you have a chair to sit in if you are triage one and you type (Laughs).*
>
> *Sally: We are the queens of making do, we have to make do with everything we have and so it doesn't matter what you throw at us… and that's a problem too, is that we are constantly rising to the challenge. We constantly rise to the challenge, so no one notices that maybe we need to change things for the better, but it doesn't matter, keep throwing it at us and well keep doing it.*

Each category had a property that contained a cut-off point, which intersected the triage work and resulted in immediate action to create space. The category determining acuity contained the property limiting information. Limiting information had two aspects. The more routine aspect of having obtained enough information to make a decision regarding acuity, priority, and placement; and the urgent aspect, cutting-point, of determining that a patient was critical and needed immediate attention in combination with no appropriate treatment space.

> *Belinda: You know if they are satting at 76 (low oxygen level, my comment) and gasping using their accessory muscles, you don't have a choice. You know exactly what you have to do and we have the trauma room. I don't hesitate to use those. I know they say we shouldn't, but I'm sorry, if somebody is sick and I want a doctor to see them right away, I'll put them in there.*

The critical juncture for the category anticipating needs was an aspect of the property anticipatory action when the triage RNs were notified of an incoming critical patient and had no appropriate treatment space available.

Patient that was coming in via EMS was unresponsive. The RNs decided to move both resus patients out after a quick joint decision. E6 where one of the resus patients was going was dirty. They then decided to briefly put patient from resus in hallway while waiting for E6. "We'll have to improvise" (From observation, #6)

Working with limited space, a property of the category managing space had a cutting-point when there was an absolute lack of available treatment spaces, including trauma beds.

Cecilia: So, there is the one day, we're full, the whole department is full, the four trauma bays are full, there are medics lined up in the hallway, and I thought: " I have to be ready if something comes through the doors" Because I've worked long enough to know that someone can just come in like: "My baby isn't breathing". You know that type of thing, right. So, I grabbed a stretcher and I just pulled it around the corner from triage right next to the triage desk and I knew we didn't even have enough staff to deal with another critical patient and I said to the medics; " If something comes in, you're my code team and the crash cart is over there."

Pushing boundaries

As stated earlier the triage RNs did not have control over the amount or type of patients that arrived in the ED however, even though on the surface there appeared to be a set number of treatment spaces available, there was stretch in the system. Critical junctures, a patient at triage who was deemed ill enough to need rapid intervention, an incoming sick patient when there was no appropriate space available, or when there was an absolute lack of treatment space, resulted in the nurses trying to create treatment spaces.

Joe: There are some conditions were the longer they wait the more risk to them. You know if someone has a cold pulseless foot and there is no space available in the monitored bed, which is where they really belong. They still need to get seen and get the vascular consult, and you know

that kind of life over limb threatening things. It's a matter of juggling whatever space you have available and that does mean often sort of bending those guidelines or rules.

There was an immediacy to the work at triage that I observed. The patients that were waiting were not anonymous faces on a waiting list, rather they were human beings in front of the nurses that the nurses were answerable to and responsible for while they were waiting. For instance, if the RNs had a high degree of suspicion that a patient with chest pain needed a cardiac monitored bed and there were none available they tried hard to find a solution as discussed by Sally:

So, if I'm really worried I will do a bed shuffle and that's when you start calling to the back and saying who has a patient that can move. Fortunately there is often more than one triage nurse so it is delegated off to hopefully my partner at triage so I can still manage the window, but somebody needs to then go to the back and say I need monitored bed, so who can we move and then we start doing bed shuffles or see who is ready for discharge, it becomes mayhem.

Once they had exhausted their options of moving patients who did not require cardiac monitoring from cardiac monitored areas to non-monitored areas they tried to create space by pushing the boundaries of how the ED was perceived to operate. The triage RNs spoke of how they pushed the boundaries by trying to implement the best fit under the circumstances. One strategy discussed by Nancy was to consider the staffing and reallocate resources to the space the patient was sent to, even if it was considered an inappropriate area according to how the ED was supposed to function.

Nancy: Or you have a non-monitored bed, that maybe has a more senior nurse, and you are pulling a crash cart up just to put alongside the wall so you are monitoring them. So that nurse is just taking on a heavier assignment.

Another strategy was to initially triage the patient to an area that was intended for less acute patients with the intention of transferring the patient to a higher acuity area once space became available. These nurses

recognized that this was a less than an ideal fit, but for that particular moment and that patient it was a better fit than the waiting room.

Allan: Where sometimes you have to send sick people back to the area your A-area, which is kind of like your walking wounded area, but they need the ECG. They need to be seen immediately and you can't just let them sit in a hallway.

Joe: If a patient is very sick but the only space available is in a less resourced area, for example, there is no cardiac monitor. It is sometimes in the best interest of a patient to get them into any available spaces and in front of a care provider with the anticipation that a higher resourced spaces, like a monitored bed with a cardiac monitor would come available. And you would move that patient from the lower resourced area into the higher resourced area.

As mentioned earlier, the triage RNs tried diligently to avoid the situation of having no available treatment space. When there was an absolute lack of treatment space including trauma beds they attempted to create space by making every attempt to have ED patients moved to in-patient wards and expediting discharges from the ED as described by Nancy:

So we utilize the hallway and are constantly moving people around and constantly shuffling and then you're constantly looking: Who has been discharged? Who is going to be admitted? How soon can we get that bed? We are on the phone to admitting asking: "How soon can we get that bed, put a super stat on that", or you call the site ops manager: "What's going on? Is there anything opening up?"

Even though the RNs were making every attempt to have beds available they were also aware of the inherent risks in moving patients out of the ED too soon.

Joe: I know that if I want that bed someone else that is in there is going to go somewhere else sooner than what might be safe for them. It's, there is just such. There is numerous considerations even in that space management, the bed juggling piece that you are thinking about.

Managing space was an ongoing activity for the RNs that included having up to date knowledge of the department. Such knowledge was very useful in situations where the RNs had to quickly make decisions to create space. For instance, knowing that an area was staffed with senior nurses meant that perhaps a sicker patient could be triaged there, or knowing that a certain patient who was waiting for an in-patient bed was stable meant that that patient could be transferred to the hallway. The RNs recognized that these were less than ideal decisions; they were pushing boundaries.

Crossing boundaries

The line between pushing boundaries and crossing boundaries is blurred. Triage can be thought of as a fluid system in which the RNs practice within certain boundaries, cardiac patients go to a cardiac monitored area, the "walking wounded" go to a fast track area, and patients in need of resuscitation go to a resuscitation bay. As stated previously, the RNs were striving to accomplish the best possible fit under the circumstance for each given moment in time, however, there was a certain amount of stretch or give in the system. When the system was starting to become overwhelmed RNs stretched the boundaries by trying to match resources in innovative ways.

At certain critical junctures the RNs became creative and broke a set of informal rules, for instance, they spoke of how they had put an extra bed in the trauma bay, or treated a patient with a myocardial infarction at triage.

Joe: We have on several occasions, utilized a third stretcher. So our resuscitation area has two columns, two patient care spaces, but many times we will take a stretcher from the hallway and put a patient in the middle so we create an add hoc type of space that a patient can go into.

Sally: So, if I can do a 12 lead at triage and get a picture. There have been times when you have done that and you actually sent your patient and got your patient seen at triage, given aspirin and all this stuff and if the cath lab is ready they move from triage. They're literally lying on a stretcher at triage, that's worst case scenario, if I can't get a bed.

The RNs recognized that they were crossing boundaries when they were initiating certain types of treatment at triage, or created informal treatment spaces by the triage desk as revealed by Jane:

And things like that.. and you try to make a bed and we have even gone desperate enough to even put a stretcher by the triage in the hall, and let them lay there for a bit until we get a spot. Which is not as unsafe as the waiting room.

For example, during one observation when the ED was full, a walk-in patient with a suspected neck injury was placed on a stretcher in a C-collar by the triage desk for about half an hour until the nurses were able to create a space in the department. When the patient with the suspected neck injury arrived the RNs were in the process of deciding between three patients and two open trauma beds. They had just created the open trauma beds by temporarily placing one of the patients from the trauma room in the hallway, while another bed in the ED was being cleaned. The three patients that the RNs wanted to assign to the trauma room were; an unresponsive EMS patient, a tachycardic and tachypnic baby, and a patient with cardiac type chest pain. In addition, there were six patients in the waiting room waiting for stretcher space and walk-in patients continued to arrive.

The critical point for crossing boundaries appeared to be no treatment space availability in combination with a life or limb threatening condition as Nancy described:

If you need a bed, you need a bed, you've got a person seizing, you've got to go somewhere. Your trauma bays are full and you can't do anything so you need to pull somebody out who is not sick

and put them in the hallway and slap another stretcher in there and you're good to go. So you just have to do it.

Under these conditions the RNs made the decision to temporarily operate outside of the perceived rules and boundaries until the system could be restored. There was pull within the system to revert back to normality, or differently stated, a need to restore order as quickly as possible. Considering the underlying core process of momentary fitting, crossing boundaries would imply that there was temporarily at least a poor fit, or that there was a momentary loss of control. The RNs aimed to maintain fit and control. Trying to revert to operating within the boundaries was therefore an attempt to regain control of the context and maintaining fit. Adopting this view of triage as an elastic system with boundaries that are crossed at critical points highlights both the flexibility and vulnerability of triage work.

Summary of Findings

The findings of this study provide the reader with an overview of the DM process of the triage RNs in three EDs in an urban center in Western Canada. The triage RNs main concern was to get the right patient to the right treatment space at the right time to be seen by the right care provider; presented as the core variable momentary fitting. Under conditions of contextual restraints or wait times that were outside of the ideal time to treatment as determined by the RN, momentary fitting was difficult to achieve. Momentary fitting transpired in a fluid environment under ever-changing conditions. It was a process of determining acuity, anticipating needs, and managing space. At certain critical junctures, or cut-off points, the RNs attempted to create space by pushing boundaries and crossing boundaries. The next chapter commences with a model of the theory momentary fitting in a fluid environment, followed by a conceptual rendering of the theory, and finally a discussion of the extant literature in relation to the theory.

CHAPTER FIVE: MOMENTARY FITTING IN A FLUID ENVIRONMENT: A GROUNDED THEORY OF EMERGENCY TRIAGE NURSE DECISION MAKING

Emergency departments are fluid environments where conditions are constantly changing (Noon, 2014; Patel et al., 2008). Triage nurses control access to the ED and make decisions about patient acuity, placement of the patient in the ED, and priority to be examined by a physician. Understanding the processes and strategies that triage nurses use to make decisions is therefore vital for patient safety and the operation of the ED (Hodge, Hugman, Varndell, & Howes, 2013). The purpose of the current study was to generate a substantive grounded theory of emergency triage RNs decision making. In the following chapter a concise conceptual rendering of the substantive grounded theory that emerged as a result of the research will be presented, next follows an account of each category, and subsequently the theory is compared with the existing literature. The reader is referred to chapter four for an account of the empirical findings.

Classical grounded theory is primarily an inductive research methodology where the researcher is guided by the participants' views of what their main concern is and how they resolve this concern (Glaser, 1978, 1998; Glaser & Strauss, 1967). The researcher is looking for patterns that explain what is transpiring in the actual context. The aim is to discover a theory of a concept, not to develop full conceptual coverage of an area (Glaser, personal communication, June 2013). It is therefore emphasized that the following is a theory of momentary fitting in a fluid environment and not a full and comprehensive account of *all* aspects of triage RN DM.

The triage RNs expressed concern over several aspects of their work such as, a constant influx of patients and not enough treatment spaces, unease about leaving sick patients in the waiting room, wait times for patients, a continual juggling of priorities, and the shuffling of patients from space to space to make room for new patients. However, the overriding concern that emerged can be expressed as getting

the right patient to the right treatment space to be seen by the right care provider in the right order at the right time. This was conceptualized as the core category momentary fitting in a fluid environment. Momentary fitting accounted for most of the actions and decisions of the triage RNs and during data analysis it emerged as the category that was central to the other categories.

Summary of the Theory of Momentary Fitting in a Fluid Environment

The diagram on the next page offers a visual representation of the theory. Any attempt at portraying such a complex reality in two dimensions is by its nature imperfect, however, the model is included in order that the readers might orientate themselves to the theory, and for ease of discussion and understanding.

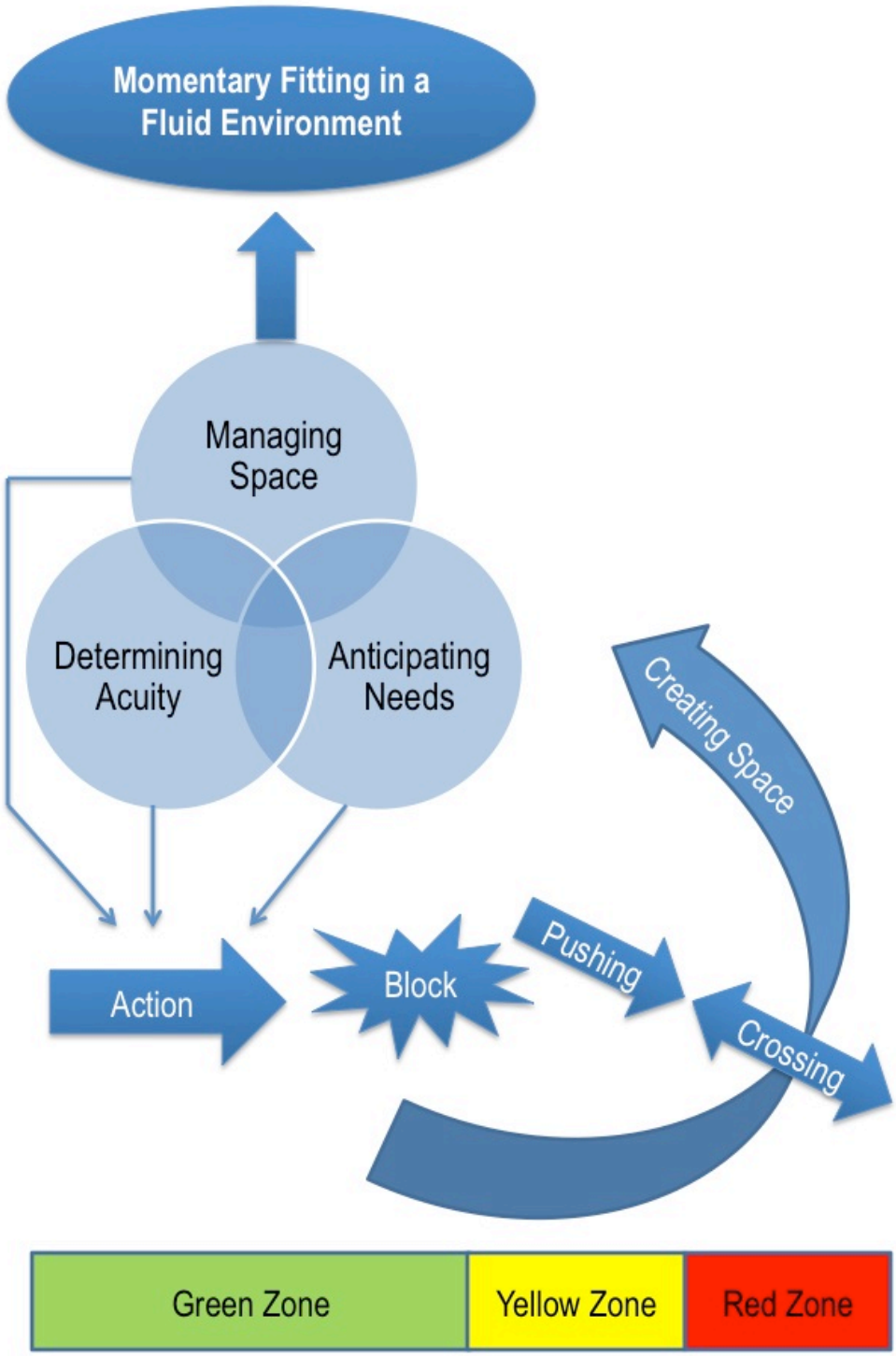

Figure 1. Momentary Fitting in a Fluid Environment

Momentary fitting in a fluid environment is a process that consists of the partially interrelated categories determining acuity, anticipating needs, managing space, and creating space. The goal of triage RN DM is to achieve best possible fit under the circumstances for each particular moment in time. Determining acuity and anticipating needs form the foundation for managing space. Determining acuity is based on the condition of an individual patient. Anticipating needs can occur both in response to an individual patient's condition or departmental needs. A triage nurse can start the process of DM in either of the first three categories, however in order to reach a decision the nurse must enter into the area where they overlap.

There are points in each of the first three categories when the nurses initiate immediate action to place a patient. Under certain conditions, shown as a "block" in the diagram, the nurses engage in a process of creating space. These critical junctures are:

a) a patient at triage is determined to be in need of urgent or immediate medical attention in combination with no appropriate treatment space,

b) an incoming critical patient in combination with no appropriate treatment space,

c) an absolute lack of treatment space including trauma beds.

Creating space consists of the properties pushing boundaries and crossing boundaries. Crossing boundaries occur when the existing boundaries have been pushed enough that the RNs decide to temporarily cross boundaries. Triage nurses, however, are acutely aware that the ED as a system cannot operate safely outside of the boundaries for any prolonged period of time and therefore push to return the ED to a state of operating within boundaries.

In the diagram the green zone represents the area of what might be termed "normal" operations of the ED and RN DM. Green does not imply that this is a problem free zone, rather that this is where the triage RNs still have some options and can achieve a reasonable fit. The nurses move into the yellow zone

when they start pushing boundaries and have limited options for achieving fit. The red zone represents the area where the nurses are crossing boundaries and have instituted temporary measures as a result of one or more of the conditions outlined under critical junctures.

The division between the zones is not absolute; there is movement back and forth among them. Depending on the conditions of the ED for each particular moment in time the nurses may find themselves conducting DM in any of the three zones for varying amounts of time. The goal is to remain in the green zone where momentary fitting is easier to achieve.

Momentary Fitting

Fit can mean to be suitable, to be the proper size or shape, to adjust so as to fit, to be suited to some purpose or function, to be in agreement or harmony with, or to match (Webster's New Worlds Dictionary). Emergency departments are generally structured with specific designated treatment areas for different types of patients. For example, patients in cardiac arrest are triaged to a resuscitation room, suspected cardiac patients are triaged to an area equipped with cardiac monitors and staff trained in interpretation of cardiac arrhythmias, and so-called walking wounded patients are triaged to an ambulatory care area.

Triage RNs try to achieve the best possible fit by sending patients to the type of area in the ED that is best suited to their needs. If this is not possible on occasion the nurses decide to adapt the environment to fit the patient's need, for example, by placing a patient on a portable cardiac monitor in a non-monitored area if there is senior staff available. When assessing patients, the nurses are continually looking for fit between what patients are telling them and what they are observing. They are trying to match what they are hearing and seeing with the suspected underlying pathology or injury. In addition, the RNs are trying to achieve fit among individual patients by performing relative prioritization.

Patients that present to the ED are assigned a priority number for the order in which they to be are examined by a physician. The RNs determine the acuity of each individual patient and then fit the patient into the priority list relative to the acuity of the other patients and expected time to treatment. Triage RNs aim to achieve overall fit in terms of departmental space, resource utilization, and designated treatment space fitting the patient into the appropriate temporal sequence to be examined. The preceding account of how triage RNs work to achieve fit is not a mechanical step-by-step process. On the contrary, triage RNs simultaneously have to consider the acuity of the patients that are waiting, how to best use the treatment space that is available to them, potential treatment space becoming available, and how waiting for treatment will impact each patient. It is self-evident that achieving fit becomes especially problematic under conditions of limited treatment space availability and long wait times.

As stated above, EDs are dynamic environments where the conditions change almost moment to moment. New patients arrive, patients in the department deteriorate and have to be moved, patients in the waiting room worsen, or EMS alerts the triage nurses that they are bringing a patient in critical condition, therefore a decision by the triage RN is a decision made under the circumstance for each particular moment in time. Each decision by the RN changes the conditions under which subsequent decisions occur. The environment changes both as condition of external factors that the RN cannot control, and as a consequence of the decisions the RN makes. The fit is therefore the best possible fit under the circumstances, not necessarily the optimal fit, as determined by the triage RN for each particular moment in time, momentary fitting. Momentary fitting in a fluid environment is a process that consists of the following categories determining acuity, anticipating needs, managing space, and creating space, which will be elaborated on in the next section.

Determining Acuity

Triage RNs simultaneously maintain an awareness the use of space and the acuity of the patients that are waiting to be examined by a physician. The concept acuity in this theory refers to the RN's perception of the patient's degree of illness, not CTAS category. Determining acuity forms the basis for the type of treatment space to which the patient is assigned and the examination priority number that the patient is allocated. Acuity of an individual patient is determined by the RN during the initial triage assessment and can be reevaluated at any time the patient's condition changes. Determining acuity consist of the sub categories seeking information and seeking to understand.

Seeking information

Triage RNs attempt to conduct short, focused assessments in order to glean essential information about why the patient has sought ED care. At times when the nurse thinks the patient strays off topic, shares superfluous information, or is too vague the RN tries to refocus the patient in order to be able to reach a decision about acuity. Seeking information consists of the properties funnelling down, digging for information, and limiting information.

Funnelling down

In order to determine what the patient's main concern is triage nurses generally start the triage assessment by asking the patient a broad, general question such as: "Why are you in emergency today?" From there the nurses focus on the main issue that the patient relays to them. The nurses ask specific questions that are targeted to the particular issue and related body systems. They proceed from the general to the specific. For example, a patient with abdominal pain would be asked questions related to the gastrointestinal system and very pointed questions about time of onset, severity, and exact location of the pain. Nurses develop individual sets of questions that are directed at different types of patient presentations and vary according to the circumstances. In a sense they follow a pathway for each presentation.

Problems arise when patients have difficulty clearly articulating why they are in the ED, or they present with multiple concerns. The nurses then decide to select the issue that they determine to be the most serious on which they focus their assessment. At other times the patient and the nurse may have a different opinion about what the most urgent issue is. Again RNs focus the assessment on what they deem to be the most critical health issue. Triage RNs work under time constraints and funnelling down therefore becomes both a necessary and efficient strategy to quickly obtain essential patient data.

Digging for information

Obtaining the correct information is crucial to being able to accurately determine acuity. As stated above, finding out why a patient has sought ED care is not always a simple straightforward procedure. Funnelling down means that triage RNs focus on what they perceive to be the most salient concern. Digging for information is an extension of funnelling down. It is a very active, inquisitive process during which the nurse seeks to uncover the underlying concern or pathology through persistent questioning. The nurse feels that she is not getting to the true heart of the matter and continues to try to elicit information by asking very specific questions. Digging for information occurs mostly in response to patients that for a variety of reasons are vague or poor historians. Family or friends often accompany patients to the ED. Triage nurses view family and friends both as helping and hindering to their work, however, when they have difficulty eliciting information they will ask the patient's significant others for clarification and obtain additional information.

Digging for information is a strategy that is not only used when interviewing patients and their significant others, it is also used when obtaining information from other health care professionals. The relationship between paramedics and triage RNs is characterized by ambivalence. On one hand the nurses recognize paramedics as fellow health care professionals and an integral part of emergency care, on the other hand, they are suspicious that at times they are not receiving a factual description of the patient's

condition. The nurses then ask clarifying questions and sometimes briefly examine the patient until they are satisfied that they have formed an understanding of the patient's degree of acuity.

Limiting information

Triage RNs actively engage in a process of seeking information and there is then a point at which they have obtained sufficient information to reach a decision. Limiting information occurs during the assessment of non-urgent and urgent patients. During the assessment of a non-urgent patient triage RNs stop gathering information when they have formed an idea of the underlying pathology and the degree of acuity. For an urgent patient nurses stop gathering information if at any point during the assessment the nurse determines that the patient is in immediate need of intervention. The triage nurse then assigns the patient to a treatment space, or if there is no space available initiates a set of actions to create space, which will be described later in this chapter. Determining that a patient's condition necessitates immediate treatment in the department in combination with no availability of appropriate treatment space is a cut-off point in the process of momentary fitting.

Triage RNs also limit superfluous information by sometimes interrupting the caller when they are receiving phone calls from referring facilities or EMS patches. The RNs require a concise account of the patient's condition and what the plan is for the patient in order to anticipate the resources that will be needed.

Seeking to understand

Seeking information is a process that is carried out for the purpose of seeking to understand what the underlying disease process is and the patient's degree of acuity. The processes are described as separate for clarity, however, seeking information and seeking to understand are interrelated and occur in tandem. The triage RN moves seamlessly between information seeking and seeking to understand the information. As the nurse uncovers new information she seeks to interpret the information and during this

process may generate further questions. Seeking to understand consists of the properties combining variables, matching variables, and questioning inconsistent variables.

Combining variables

Triage RNs speak of "trying to understand what is going on with the patient". They are trying to elicit information in order to determine the patient's reason for seeking ED care, what the underlying pathology is, and the patient's degree of acuity. During the triage assessment they combine variables such as, the look of the patient, vital signs, age, presenting concern, degree of pain, medical history, medications, previous visits to the ED, and so forth. The nurses fit the various pieces of information together in order to obtain an impression of a coherent whole. They engage in an active process of mentally trying to fit the various pieces of information together. The guiding principle is, if indeed, the variables form what the RNs call a picture of what is going on with the patient.

Triage assessments are conducted in an environment with time constraints, limited information, and without the benefit of a full physical assessment. At times pieces of information are erroneously combined by triage RNs. This may lead to undertriaging, where patients are determined to be less acute than they are, or overtriaging, where patients are deemed more acute than they are. Undertriaging may lead to delays in treatment for a serious patient. Overtriaging may result in an acute care space being occupied by a less acute patient making the space unavailable for a critical patient.

Matching variables

Matching variables occurs as triage nurses actively seek to match what the patient is telling them against the visual and physical signs that they are observing during the assessment. The nurses are continually trying to make sense of the information and asking themselves if what they are observing corresponds to the information that the patient is relaying. They are looking for fit between the patient's story and the signs that the patient is exhibiting. For instance, at times there is a disconnect between the

patient's perception and the nurse's perception when either the patient displays signs of a high degree of pain when the complaint is considered minor by the nurse, or when the patient expresses a high degree of pain while not exhibiting any overt signs of pain. In other words, there is a mismatch, or poor fit. Four scenarios are possible, the patient thinks he is quite ill and the RN agrees, the patient thinks he is very ill and the RN disagrees, the patient thinks the complaint is minor but the RN feels that the patient indeed is very ill, and the patient thinks the complaint is minor and the RN agrees.

Questioning inconsistent variables

Triage RNs engage in a process of questioning inconsistent variables when the combined information does not form a coherent whole, or when there is a mismatch between what they observe and the story that the patient recounts. It is important for nurses to make sense of what they are hearing and seeing, as opposed to just merely recording information. When the information does not form a logical, coherent whole they become suspicious and puzzle over why there is an inconsistency and what the reason might be. A patient may look well, but have one abnormal vital sign such as a low heart rate. The nurse then considers the possibilities as to why this scenario is occurring; this process is not dissimilar to physicians having to arrive at a differential diagnosis. The RN wants to determine the reason for the mismatch between the well looking patient and the abnormal vital sign, and then decide if this is a cause for concern.

Nurses at times speak of intuition or gut feeling when describing how they become suspicious that something might be wrong with a patient without direct worrying findings or a vague story. In this study it occurred in the context of being unable to make sense of the information they obtained during the assessment, or having their suspicion triggered by a mismatch in the variables.

Triage nurses use the information they acquire during the stage of determining acuity to make decisions about where to place the patient, the priority for examination by a physician, and the resources

needed. The subsequent stage in the process of momentary fitting is anticipating needs, however, it is important to re-emphasize that the stages overlap and are interrelated, hence triage RNs determine acuity and start to anticipate needs simultaneously; these processes are not compartmentalized rather they are part of the holistic approach used in triaging patients.

Anticipating Needs

Triage work is driven by anticipating needs on two levels, individual needs of the patient for access to timely emergency care and the need for the ED to function as a flexible system that can accommodate rapidly changing conditions in relation to increasing numbers of incoming patients and changing acuity of patients already in the ED. Triage RNs carry out their work where these two needs intersect and as a result are decision makers that, under conditions of limited space availability, balance opposing demands. For instance, viewed from an individual perspective a patient with an uncomplicated ankle fracture may feel that he requires urgent assessment and treatment, whereas the triage RN knows that if the one available treatment space is a cardiac monitored bed, placing a non-urgent patient in that space would compromise the ability of the ED to respond to the arrival of a critically ill patient. Anticipating needs is a stage in the process of momentary fitting where the triage RNs balance and resolve, sometimes juxtapositioned individual and departmental needs, through the properties of anticipating time to treatment, anticipating trajectory, and anticipatory action.

Anticipating time to treatment

Triage nurses think in terms of time to treatment for individual patients. Desired time to treatment is based on the triage RNs perception of the acuity level of the patient as determined during the triage assessment. The nurse then considers the degree of illness of the other patients that are waiting to be examined by a physician and balances the need of the one patient against the needs of the many patients. Priority number as assigned by the RN to the patient is always a relative priority number given the condition

of the other patients that are waiting at that particular moment. It is an attempt to achieve the best possible fit for each patient in relation to the other patients.

Anticipating time to treatment is an ongoing process that does not end until a physician has examined the patient. Even if a patient has been triaged into a treatment space the triage RN maintains vigilance over where the patient is on the priority list. The bedside RN shares this responsibility, but it is the triage RN who makes the decision to move the patient up or down the list. This may occur in response to the triage RN being notified of a change in the patient's condition, or as a result of incoming patients deemed to be more acute. The nurse considers optimal time to treatment for each patient, the consequences of having a particular patient wait longer, and the condition of other patients. Changing the priority number therefore becomes a multidimensional decision.

Anticipating trajectory

Triage RNs use the information they have acquired during the stage of determining acuity in conjunction with their knowledge of and experience with various diseases and types of injury when they decide on treatment spaces for patients. They anticipate the trajectory for each patient and attempt to match resources in terms of required treatment space and staffing to the needs of the patient.

Anticipating is linked to being able to predict and in doing so the RNs consider whether a patient may potentially deteriorate. If at all possible such a patient is triaged to a higher resourced area. Problems arise when there is a lack of suitable treatment space. The triage RNs then have to decide whether to leave the patient in the waiting room, or engage in a process of creating space. In addition, under conditions of limited space availability the triage RNs use a decision rule of worst case scenario for each patient when deciding whom out of the patients that are waiting should be assigned to a treatment space. Anticipating that a patient may deteriorate and working in an environment where patients cannot always be matched to the resources they need in a timely manner exposes the vulnerability of the triage nurse position.

Protection of self and the patient is an aspect of anticipating the trajectory. The triage RN considers how a patient's condition might progress and the consequences of having the patient wait for both the patient and the RN. Triage RNs at times elect to protect themselves by consulting with the charge nurse and thereby sharing the responsibility for how to best distribute valuable treatment space. Another dimension of protecting self and the patient is to err on the side of caution. Triage nurses then, based on a suspicion triggered by a mismatch or an inconsistent variable, assign the patient to a higher acuity area than would be normally indicated.

Anticipatory action

The ED is a fluid system where conditions are constantly changing as the number and acuity of patients fluctuate. There is an expectation that the ED should function as a flexible system that can readily absorb an influx of patients, or the sudden arrival of a critical patient. Triage RNs attempt to meet this expectation of always being prepared for sudden change through anticipatory action.

As available treatment spaces become occupied, nurses become more concerned with anticipating upcoming space and planning for assigning a particular space to those patients in the waiting area. The nurses use strategies such as reviewing the paper charts of patients that are waiting, searching the computer screen for upcoming beds, and discussing the patients and potential spaces with their co-workers. The information is then used to try and fit each patient to the space that has the most appropriate resources within an acceptable time frame. Under conditions of no space availability or no available cardiac monitor beds the triage nurses initiate anticipatory actions such as moving patients from high acuity to low acuity areas, leaving less acute patients in the waiting room, or leaving EMS patients with EMS.

In addition, anticipatory action occurs as a consequence of advance warning of an incoming sick patient. As discussed, for the property of limiting information, triage nurses want to know how stable or unstable an incoming patient is and what the plan is for the patient. Based on this information a set of

anticipatory actions can be initiated by the triage RNs to ensure that both a treatment space and the appropriate resources are available. If no appropriate treatment space is available and the nurses determine that the incoming patient is in need of immediate attention they engage in a process of creating space by pushing and, if necessary, temporarily crossing boundaries. No available appropriate treatment space and an incoming critical patient is a critical juncture in the process of momentary fitting.

Managing Space

The concept of space and how to best manage it is central to the DM of triage nurses. To recap, space is defined in this study as a physical space, including resources both in terms of staff and equipment, where a patient can be examined and treated. Space does not refer to square footage, nor does it necessarily refer to stretcher space. It can mean any type of space from a fully staffed trauma bed with all the necessary equipment to a chair. During the process of momentary fitting triage nurses determine the acuity of patients and anticipate needs, both individual patient needs and department needs in order to manage a sometimes limited resource, space, efficiently and appropriately. Managing space is an ongoing process and consists of the properties working with limited space, collaborating with co-workers, and knowing the department.

Working with limited space

Triage RNs work under conditions of limited treatment space availability with no control over the type or number of patients that arrive in the ED. Under these conditions it becomes the responsibility of the triage RNs to safely regulate the influx of patients. It is not unusual for patients that the RNs are concerned about to have to sit in the waiting room. The RNs try to maintain a degree of vigilance over these patients by using strategies such as placing them close to the triage desk and making the other triage nurses aware of these patients. Vigilance is undermined by social structural conditions such as nursing staff shift changes or breaks, as well as the continuing arrival of new patients into the ED.

During a sudden influx of patients nurses focus their attention on identifying the sickest patient through scanning the line-up of patients, and by relying on the other triage RNs and paramedics to make them aware of critical patients in their care. This is done in order to manage space appropriately by ensuring that the most acute patient is not overlooked and indeed allocated a treatment space first. In addition, the work at triage is carried out against the backdrop of multiple competing stimuli. Triage RNs choose the stimuli to which they will attend. The EMS patch phone is always given priority since nurses are aware that an EMS patch may necessitate an immediate re-evaluation of how the available space is managed, especially if space is becoming limited. Continuously monitoring, managing, and re-evaluation how treatment space is utilized in conjunction with maintaining an awareness of incoming patients reflects how the fluidity of the ED environment influences the work and DM of triage RNs.

Triage RNs know that at any moment a critical patient can arrive in the ED without advance warning. The unexpected is an expected event. An awareness of the consequences of no available treatment space underpins much of the triage DM. Nurses try to resolve this concern by always having a treatment space available, however, this is not always possible. An absolute lack of available treatment space, including trauma beds, is a critical juncture in the process of momentary fitting.

Collaborating with co-workers

Triage RNs collaborate with each other through ongoing communication for the purpose of deciding how to best distribute treatment space and to decide which patient should be given priority for available space. As the demand for space increases communication becomes more frequent and more intensely focused on solving the demand for treatment space. Different options are considered and evaluated in light of the current condition in the ED and what the potential consequences would be of a particular solution. In other words, if a particular patient is assigned to a certain bed how will that affect the subsequent options for the other patients that are waiting. Each decision has consequences for multiple

stakeholders and the nurses incorporate this in their DM. Nurses also seek guidance from each other under conditions of uncertainty when they encounter a mismatch in variables and as a result question the reason for the inconsistent variable.

Collaboration occurs on three different levels; ongoing spontaneous information exchange, as an informal triage team huddle, and seeking assistance from and collaborating with the charge nurse. Spontaneous information exchange is frequent, takes the form of short statements, and is done for the purpose of quickly updating the other triage nurses of, for example, the need for a particular space for a patient whom is being assessed. In addition, triage nurses frequently use unofficial written communication tools, for example sticky notes, which are added to the official paper charts to enable quick visual communication of essential information.

Informal triage team huddles occur after a sudden influx of patients and after breaks. Nurses briefly stop the work to update each other on the type and severity of patients that are waiting, spaces that are becoming available, and consider possible options for how to best manage the space. The purpose is to regain control of the environment, to ensure that sick patients are not overlooked, and to achieve best possible fit between the patients that are waiting and the available resources.

Under conditions of gridlock, when triage becomes inundated by a large influx of patients, or when complicated situations arise triage RNs frequently use the charge nurse as a resource. Seeking assistance from the charge nurse for the purpose of problem solving means that some of the responsibility for DM and finding treatment space can be transferred to the charge nurse and the triage nurses can focus on triaging incoming patients. Collaboration through exchanging information, discussion, and joint DM are integral aspects of managing space.

Knowing the department

Knowledge of the department constitutes an awareness of the overall state of the ED at any moment in time. This is not synonymous with an intimate knowledge of each area, rather it is an awareness of where the critical patients are located, number and type of treatment spaces that are open or becoming available, number and acuity of patients that are waiting, potentially serious patients in the waiting room, type of incoming patients, and staff resources. The charge nurse has the overall responsibility for managing the ED, but triage nurses need and use the aforementioned information to make decisions about how to match each patient to the available resources given the circumstance for each moment in time.

In addition to shift reports, informal team huddles, and collaboration with the charge nurse triage RNs use the computer and information gained by walking through the department as strategies to obtain knowledge of the current state of the ED. One of the intentions behind the computer program that was used at the hospitals where the study was conducted was to provide an instant update of the ED. Nurses search the computer screen for information about available beds, number of patients that are waiting, and potential discharges and admits. While this information is available on the computer, triage nurses know that the information is not always updated by the bedside nurses and also believe that there is valuable information to be obtained by first hand visualization of each area. During the walk-through, aptly called bed hunt by the triage nurses, they seek information about how busy each area is, who the bedside nurses are, the acuity and workload demand of the patients, try to spot empty beds, and visualize the patients for themselves in anticipation of potential moves to more or less acute areas.

Knowledge of the department is combined with an awareness of the consequences of working with limited space when triage RNs make decisions about how to best manage available and upcoming space. Under conditions of limited space availability these decisions are often reached through discussion and a collaborative approach.

Creating Space

Triage RNs actively manage the utilization of treatment spaces in the ED as a result of having determined the acuity of patients and by anticipating both individual patient needs and department needs. At critical junctures, a) a patient at triage deemed to be in need of immediate medical attention, or an incoming critical patient, in combination with no appropriate treatment space, or b) if there is an absolute lack of treatment space, including trauma beds, triage RNs engage in a process of creating space by pushing boundaries and at times crossing boundaries. The boundaries are not necessarily written policies, but rather commonly accepted “rules” for how the ED operates on a daily basis.

Each category contains a property with a cut-off point when triage RNs initiate a set of actions to create space. During the stage of determining acuity triage RNs stop collecting information, limiting information, if they determine that a patient is in need of immediate medical attention. If no appropriate treatment space is available, for example a cardiac monitored bed, a block exists for access to care and the triage RN has to engage in a process of circumventing the block. Similarly, during the stage of anticipating needs, triage nurses have to find innovative ways through anticipatory action to circumvent an access block if they are notified of an incoming critical patient and there is no appropriate treatment space available. The cut-off point for the stage of managing space is a dimension of the property working with limited space when there is an absolute lack of available treatment space, including trauma beds.

Pushing boundaries

Triage nurses integrate their knowledge of the department with the anticipated the trajectory of patients when they make decisions about how to push boundaries. Boundaries are pushed by matching available resources with the resources the nurses anticipate that the patients will require in innovative ways, for example, a cardiac patient may be triaged to a non-cardiac monitored area and placed on a portable monitor if a senior RN is working there, as opposed to be kept waiting in the waiting room The fit is

not optimal, but it is the best fit for that particular moment in time. On the other hand, patients that are typically sent to non-monitored areas may be triaged to cardiac monitored areas even if their presenting concern would typically not warrant a cardiac bed, for example, patients with a high degree of abdominal pain. This would occur if a non-monitored bed is not available, several cardiac monitored beds are open and the triage nurse wants the patient to be treated urgently. Again the fit is not optimal and the triage RN would anticipate that this patient could be moved to a lower acuity area once beds become available there. In short, pushing boundaries includes actions whereby the triage nurses use space in creative ways when they have determined that a patient needs urgent attention. Triage RNs push boundaries when they have decided that the alternative, leaving the patient in the waiting room, is a worse fit for a particular patient.

Crossing boundaries

The distinction between pushing boundaries and crossing boundaries is blurred. The ED is a system that is intended to have the capacity to deal with life or limb threatening injuries at a moments notice while still accommodating a steady stream of incoming patients. Triage RNs are the initial decision makers that have to find rapid solutions when a patient with a life or limb threatening injury presents to the ED and there is an absolute lack of available treatment space.

Emergency departments can be conceptualized as systems with a degree of elasticity. As discussed above, triage RNs push boundaries and at times cross perceived boundaries at certain cut-off points. The critical point for when triage RNs decide to cross boundaries appears to be no treatment space availability in combination with a life or limb threatening condition. Under these circumstances triage RNs make decisions to use strategies such as initiating treatment at triage, creating over-capacity beds in the trauma rooms, creating ad hoc treatment spaces in the hallways, or by the triage desk. While the nurses initiate actions that mean that they are temporarily operating outside of the normal parameters for how the ED is organized there is pull within the system to revert back to normal. In other words, the fit is suboptimal

and the RNs try to achieve better fit as quickly as possible. Trying to revert back to operating within the boundaries is therefore an attempt to regain control of the context and reestablish fit. Viewing triage DM as occurring within a stretchable system where triage RNs under certain conditions decide that they temporarily have to cross boundaries underlines both the flexibility that is necessary to conduct triage and the vulnerability of the position.

Summary

The main concern of triage RNs is to get the right patient to the right treatment space at the right time to be seen by the right care provider, conceptualized in this study as momentary fitting. Under conditions of contextual restraints, or wait times that are outside of the ideal time to treatment as determined by the RN, momentary fitting becomes problematic. Momentary fitting transpires in a fluid environment under ever-changing conditions. It is a process of determining acuity, anticipating needs, and managing space. At certain critical junctures, or cut-off points, RNs decide to create space by pushing boundaries and crossing boundaries.

Momentary Fitting in a Fluid Environment: A Comparison with the Literature

Grounded theory studies are ideally conducted without a preexisting theoretical framework (Glaser, 1978, 1998; Glaser & Strauss, 1967). The purpose is to ensure that the researcher stays open to emerging concepts from the data itself, instead of being influenced by preconceived ideas from the literature in the substantive area, when developing the theory (Glaser, 1992). This does not imply that the literature is ignored, on the contrary, when the core concept and its related categories are established the researcher compares the existing literature with the emerging grounded theory. Glaser (1978) distinguished between theoretical completeness, meaning that the researcher has explained as much variation as possible with the fewest possible concepts, and scholarly completeness, complete mastery of the literature in the area. Scholarly completeness, according to, Glaser, is not possible. The task for the grounded theorist when

reviewing the literature is to compare it with the emergent grounded theory, integrate it into the grounded theory, and contribute to the literature with the new grounded theory, not to achieve complete coverage of the literature. The remainder of this chapter will therefore be focused on a comparison between the theory of Momentary Fitting in a Fluid Environment and a selection of the existing literature.

To recap, the purpose of the study was to develop a substantive grounded theory of experienced triage Registered Nurse decision making. Decision making is intertwined with information processing and problem solving (Lehto & Nah, 2006). Simply speaking, information processing consists of perception of a stimulus, transformation of the information, choices about actions based on the information, and an assessment of the outcome of the actions (Wickens & Carswell, 2006). Decision making often necessitates problem solving and problem solving requires DM (Lehto & Nah, 2006). The main concern of the triage RNs, getting the right patient to the right place to be seen by the right care provider at the right time, is conceptualized as momentary fitting in a fluid environment. Momentary fitting consists of a series of decisions and actions regarding patient acuity, anticipated needs of both patients and the department as a system, and decisions about how to best manage and create space. In other words, triage RNs process information, make decisions, and frequently have to engage in problem solving to achieve momentary fitting.

FitzGerald et al. (2010) discussed triage in the context of clinical justice and clinical efficiency. The aim in clinical justice, according to the authors, is to ensure that the patient receives the right level of care within a suitable time frame; clinical efficiency implies that department resources are used appropriately. The triage RNs in the current study did not use the same vocabulary as FitzGerald et al., however, similarities exist with how they verbalized their main concern. Momentary fitting could therefore be viewed as an attempt by triage nurses to achieve clinical justice and clinical efficiency. Viewing triage as vehicle for achieving clinical justice and efficiency may shift the focus from merely looking at how triage RNs make

decisions to how they enact the triage role, and expose the complexity of triage DM as a function of the context. Fry and Burr (2002) argued that the contextual nature of triage decisions needs to be understood and that understanding triage decisions cannot simply be reduced to the measurement of numbers and an evaluation of accuracy.

Determining Acuity

The category determining acuity denotes the triage RN's sense of how ill she thinks the patient is. The RN's perception of degree of illness may be in agreement with the CTAS number, or the RN may decide that the CTAS number does not truly reflect the patient's level of urgency.

> *Jane: The female who says I have 8/10 pain while she is eating her chips. You are not going to lie, you are going to write down 8/10 pain, and that makes her a 2 when she is not a 2.*

In the above quote Jane is referring to how a patient with acute onset central pain at 8/10 automatically becomes a CTAS 2 in the computer assisted triage system that the RNs used.

The Canadian Triage and Acuity Scale (CTAS) is a five level ordinal triage system rooted in classical DM theory. One of the characteristics of classical DM theory is models of how decisions ought to be made after the individual has considered all the alternatives and then makes a rational choice (Gilovich & Griffin, 2002; Lipshitz et al., 2001). FitzGerald et al. (2010) contended that due to the complex nature of triage decisions there is no gold standard against which triage accuracy can be measured. Patients are individuals with diverse health issues and each triage encounter has to be viewed in relation to the interaction between clinical and contextual cues (FitzGerald et al., 2010; Fry & Burr, 2002). In addition, some literature suggests that RNs do not always use triage scales to make acuity decisions, or that they use triage guidelines loosely (Chung, 2005; Fry & Burr, 2001a, 2001b; Patel et al., 2008). Fry and Burr (2001b) in an Australian study of triage RNs (n = 400), reported that only 27% always used the National Triage Scale (NTS).

Accuracy for RNs using five level triage scales has been found to vary from 58% to 64% when the RNs were presented with patient vignettes and asked to select the correct triage category as predetermined by an expert panel (Bergeron et al., 2004; Considine et al., 2000; Göransson et al., 2005). Findings from studies where interrater reliability for five level triage scales, when used by RNs was investigated, have been reported as kappa 0.2573 - 0.662 (Dilley & Standen, 1998; Fernandes et al., 1999; Gerdtz & Bucknall, 2007), weighted kappa 0.71 (Göransson et al., 2005), and quadratic weighted kappa 0.8 - 0.84 (Beveridge, Ducharme, et al., 1999; Manos et al., 2002). While triage scales are useful tools for communicating level of urgency they represent only one aspect of triage RN DM, and as other authors have argued and findings from the present study indicate, triage decisions are highly contextual and multifactorial.

In the theory momentary fitting the subcategories seeking information and seeking to understand are inter-connected and occur in tandem for the purpose of determining acuity. Triage RNs actively focus their search for information on variables that help them understand why the patient has sought ED care and the underlying disease process. For ease of understanding seeking information and seeking to understand have been discussed separately in the theory, however it is important to note that triage nurses move back and forth between seeking information and seeking to understand. These findings are to some extent similar to what Göransson et al. (2008) reported in a study from Sweden on the thinking strategies of emergency triage RNs using the think aloud method. Sixteen RNs from a previous study (Göransson et al., 2005) who had demonstrated either low (n = 8) or high (n = 8) accuracy when assigning CTAS categories to patient vignettes were given fictitious patient scenarios and asked to reason out loud as they made triage decisions. A portion of the RNs (n = 9) moved between gathering information and generating hypotheses. In order to generate a hypothesis interpretation of the cues has to take place. The process of interpreting and analyzing information may trigger a more in-depth search for information and new

information may lead nurses to question inconsistent variables, in other words to further extend their analysis. They are seeking to understand how the variables fit together into a coherent whole, a pattern.

Seeking information

The subcategory seeking information consists of the properties funnelling down, digging for information, and limiting information. Triage RNs frequently have a line-up of several patients of unknown acuity waiting to be assessed, making the need for quick efficient assessments based on the most pertinent information crucial (Andersson et al., 2006). In an online position statement the National Emergency Nurses Affiliation (2009) described triage as "a sorting process that utilizes critical thinking in which an experienced Registered Nurse assesses patients quickly upon arrival to the emergency department." The ability to ascertain essential information in a short period of time is fundamental to determining acuity within the triage setting, however, the awareness that several patients are waiting and the need to quickly assess the patients may affect the quality of the assessment.

> *Mary: I often find too that if you're rushed, if you feel that there's a line up of people waiting to be checked in or seen, you feel that your, often your quality of assessment deteriorates because you know that time is of the essence and you need to see them quickly.*

Triage RNs collect and consider various pieces of information about the patient when making acuity decisions. Not surprisingly Göransson et al. (2008) found, when they explored thinking strategies of triage RNs, that a majority of the RNs started the assessment by seeking information. A smaller portion commenced the assessment by generating hypotheses, however, this group continued by collecting more information before determining acuity. In a grounded theory study conducted in England of how triage RNs carry out the initial assessment RNs were found to form an initial impression of the severity of the patient's condition as they visualized the patient approaching the triage area (Edwards & Sines, 2008). It could be argued that the nurses were already generating a hypothesis about the patient's degree of illness.

Information that nurses have indicated as important for determining acuity includes, but is not limited to, the patient's presenting problem, general appearance, degree of pain, vital signs, risk or threat to the patient, mechanism of injury, medical history, onset of symptoms (Andersson et al., 2006; Fry & Burr, 2001a; Patel et al., 2008). Fry and Burr (2001a) asked triage RNs to rank eleven items that influenced how they determined acuity scores using the NTS. The top five factors were the patient's presenting problem, mechanism of injury, medical history, and patient's general appearance. Interestingly NTS guidelines ranked only as number 7 and age as number 9.

Momentary fitting theory suggests that triage RNs tailor the information gathering by going from the general to the specific, termed funnelling down in the current study. Nurses generally initiate the triage assessment by asking a broad question about why the patient has sought ED care. The initial impression would to some extent determine the questions the RNs pose to the patient. For instance, if the RN has formed an impression of the patient as ill based on the patient's pallor and the patient relays a minor complaint, the RN might chose to pursue reasons for the pallor during the process of seeking information by targeting the questions to potential causes. Tailoring the assessment and the triage exam to presenting complaint was evident in a Canadian study of triage practices in a paediatric ED. The RNs conducted focused physical exams based on information obtained from the parents and the child (Patel et al., 2008). When asked about the use of predetermined questions to guide the triage assessment nearly half the RNs in a study of triage practices in Australia indicated that they wanted to tailor their questions to the patient presentation (Fry & Burr, 2001a). While Fry and Burr's (2001a) findings do not indicate a strong preference for either protocol or nurse generated questions, the findings suggest that a large portion of triage RNs tailor their questions to the patient presentation. Wolf (2010) identified forms and technology as a possible barriers to accurate triage assessments. Triage nurses in the same study were found to mainly follow the

order questions appeared on a triage form, as opposed to tailoring their assessment to the patient presentation, and consequently missed important cues (Wolf, 2010).

Triage RNs are expected to conduct brief, focused assessments (NENA, 2009). Mean triage time has been reported as 3.36 minutes (range 9.47) (Gerdtz & Bucknall, 2001). The process of funnelling down is in keeping with professional and organizational expectations of how triage RNs enact their role. The theory of momentary fitting brings to the forefront the extent to which triage RNs attempt to obtain accurate information about why the patient has sought ED care and to identify the most worrying underlying pathology through actively searching for information, digging for information. As indicated in previous chapters, digging for information is an extension of funnelling down. No explicit support for, or description of, the property digging for information was found in the triage literature that was reviewed.

Limiting information occurs when the RNs have elicited enough information to reach an initial decision regarding patient acuity. The nurse knows enough to formulate an initial decision regarding time to be examined by a physician and placement of the patient and stops seeking information. The patient is directed either to the ED admitting clerk to provide additional demographics, or to a treatment area if the RN determines that the patient is in need of immediate nursing or medical attention. In addition, limiting information can be viewed as a function of time constraints and having multiple patients waiting to be assessed.

The RNs in the present study indicated that there were warning signs that would lead them to initiate immediate action, for instance abnormal vital signs, or a patient who looked obviously ill. Nurses do not consider all cues of equal importance (Arslanian-Engoren, 2009). Arslanian-Engoren (2009) used focus groups to explore how ED triage RNs make decisions about patients with cardiac symptoms. The participants indicated that potentially life threatening cues such as chest pain, abdominal pain, shortness of breath, nausea, and the patients' medical history strongly influenced their triage decision. Patients with

these symptoms were considered more urgent. Some authors have noted that at hospitals where RNs were not required to obtain vital signs during the triage assessment, the RNs were not routinely using vital signs as part of their DM (Gerdtz & Bucknall, 2001; Vatnøy et al., 2013). At the three sites where the present study was conducted obtaining vital signs as part of the triage assessment was an expectation and, most importantly, the RNs considered vital signs to be an essential factor in their triage decisions.

Limiting information is the end point of the initial assessment. In the theory of momentary fitting limiting information, for the purpose of initiating immediate treatment, is a critical juncture. The RN makes what on the surface may appear as a snap decision, however, as discussed above seeking information and seeking to understand occur in tandem. The RN has therefore, already during the process of seeking information, started to interpret the cues by combining variables, matching variables, and questioning inconsistent variables. In the subsequent section the process of seeking to understand will be discussed, however, the reader needs to keep in mind that seeking to understand occurs already during the stage of seeking information. At any point the nurse may, based on the interpretation, end the triage assessment, limit information, and initiate action. As well, the interpretation may lead to further questions, funnelling down, or digging for information.

Seeking to understand

In order to decide on a disposition for the patient triage RNs have to interpret the information they have gathered. This is done by combining patient cues during the assessment in order to determine if the pieces form a coherent whole. Classical DM theory would suggest that the nurse carefully considers all the alternatives and then makes a rational choice. Triage is a context characterized by uncertainty, and decisions about the acuity of patients are formulated under the pressure of time. Tversky and Kahneman (1974) studied how individuals make decisions under uncertainty. They found that people use mental

shortcuts, heuristics to make decisions. Heuristics simplify the two tasks of evaluating all available options and making predictions about probabilities.

According to Tversky and Kahneman (1974), heuristics are useful most of the time, but may result in systematic errors, cognitive biases. In an early study of triage RN DM processes Cioffi (1998) used the think aloud method to describe the thinking strategies of twenty Australian triage nurses. She reported that triage RNs used the heuristics representativeness, availability, and adjustment and anchoring. Availability means the ease with which a certain event or occurrence comes to mind, the ease of retrieving the event (Tversky & Kahneman, 1974). According to Cioffi (1998) triage RNs, especially experienced RNs, used vivid cases from the past that were easily recalled when deciding on acuity. Similarly Chung (2005), reported that triage RNs used recent, notable cases to help them identify critical patients. One aspect of the property limiting information is an instant decision about immediate need for treatment and intervention. RNs in the present study recalled memorable cases with poor outcomes. This may indicate that RNs in acute situations, who have to make rapid decisions, use past experiences that are easily retrievable and remembered because of serious consequences. The nurses' interpretation of the patient's symptoms fits with a similar patient presentation in the past.

The subcategory seeking to understand is presented in the theory of momentary fitting as consisting of the properties combining variables, matching variables, and questioning inconsistent variables. This occurs in an environment with constantly shifting conditions. Dynamic DM refers to decisions that are made in fluid contexts were the outcome of each decision affects subsequent decisions (Lehto & Nah, 2006). Hammond (1988) developed a theory of dynamic DM, the cognitive continuum theory. According to cognitive continuum theory task systems (environments) and cognition exist on a continuum in a linear relationship. Cognition, analytical or intuitive, is matched to the task structure. Tasks,

as described by Hammond, can range from highly analytical, well-structured to intuitive, ill-structured (Cader, Campbell, & Watson, 2005).

Briefly stated, a mathematical problem with ample time available would tend to produce analytical cognition, whereas a context with a large amount of cues available only for a brief period would tend to produce intuitive cognition. Dynamic DM has elements of both intuitive and analytical thinking depending on where on the continuum the task system exists (Hammond, 1988). Aspects of the triage environment, multiple cues presented in a short period of time would then induce intuitive thinking, however, RNs also engage in analytical thinking as they use their experience and knowledge to reason within themselves and with their co-workers about the underlying cause for the signs and symptoms that patients are exhibiting. According to Hammond (1988) accuracy is increased when the task system and type of cognition match. Cader et al. (2005) argued that cognitive continuum theory provides RNs with a tool to understand the type of DM best suited to different clinical scenarios and a rationale for explaining why intuitive DM may be preferable in some instances.

If applied to the triage context this would imply that analytical reasoning is not necessarily the best option in all situations. For instance, in time critical situations such as when the triage nurse is confronted with a patient in obvious respiratory distress, analyzing all the possible causes for the distress may not be optimal according to cognitive continuum theory. However, triage nurses need to rapidly understand the situation and determine if the reason for the distress is upper airway obstruction by a foreign body, or a different etiology. If the reason is upper airway obstruction the nurse needs to quickly perform a Heimlich manoeuvre. It can be argued that, although the decision and subsequent action appear intuitive, a rapid analysis of the situation has occurred.

Benner (1984) wrote that expert nurses practice with an intuitive comprehension of clinical scenarios. They use past experiences to focus on salient features. According to Benner expert nurses often

have difficulty explicating their knowledge and articulating their reasons for choosing a certain course of action. In addition, they do not spend time considering a wide range of solutions. It is important to note that Benner does not equate experience with expertise. Expertise develops as a result of experience, but experience does not guarantee expertise. Benner derived her model of nursing practice as proceeding from novice to expert from Dreyfus and Dreyfus (1986) skill acquisition model. Benner's description of expert nursing practice as largely intuitive has been taken up in some of the nursing discourse as an almost mystical component of nursing practice. In the current study the nurses spoke of intuition or gut feeling as well, however, this was in the context of questioning inconsistent variables. Nurses questioned the reason why the variables did not match and therefore often decided to give these patients a higher priority. What the nurses called intuition or gut feeling was based on their knowledge and experience with different types of patient presentations.

Klein (1998) studied experienced decision makers in dynamic contexts. While he claimed that most individuals with domain specific experience are skilled decision makers, he also points out that experience does not necessarily equal expertise. He demystified intuition by claiming that, "Intuition depends on the use of experience to recognize key patterns that indicate the dynamics of the situation" (Klein, 1998, p.31). Simon (1992) wrote that a situation provides the individual with specific cues that activate information in the memory. "Intuition is nothing more or nothing less than recognition" (Simon, 1992, p.155). Klein and associates (Klein, 1998; Klein et al., 1986) developed the Recognition Primed Decision (RPD) model based on work with fire fighter commanders for the purpose of understanding how experienced decision makers formulate decisions in dynamic contexts under time pressure when the stakes are high (for a description of the model the reader is referred to chapter 2).

One aspect of the RPD model describes how individuals recognize a situation as either typical or atypical (Klein, 1998, 2008). Decision makers in dynamic contexts match cues in a situation against a

range of patterns that they have acquired from experience. If there is a discrepancy they attempt to understand why and construct a story leading up to the event (Klein, 1998, 2008). Momentary fitting theory suggests that triage RNs combine variables to form a coherent whole, in other words, they are looking for a pattern that makes sense. If there is a misfit, a variable that violates their expectation of what the coherent whole should look like, they seek an explanation for this by puzzling over why this is and further questioning the patient. Klein (1998) talks about constructing a story of leading up to the event. In a sense triage RNs seek to understand the story behind the unexpected variable.

Triage RNs have identified intuition, or a gut feeling, as important components of triage DM (Andersson et al., 2006; Chung, 2005; Cone & Murray, 2002; Patel et al., 2008). Intuition is often discussed in conjunction with experience, but not necessarily linked as closely to experience as in Klein's (1998) definition. Experienced triage RNs use intuition more often than inexperienced triage nurses (Patel et al., 2008), but have problems articulating the basis for their intuitive decisions, other than a feeling that something was not right (Cone & Murray, 2002). Crandall and Getchell-Reiter's (1993) study, on the other hand, indicate that nurses are able to explain their gut feeling, or reasons for just knowing. The authors interviewed RNs that worked in a neonatal intensive care unit in an American hospital using the critical decision method in order to understand how the nurses knew that infants were deteriorating. Nurses spoke of intuition or gut feeling, however, when they were asked more in-depth questions about memorable cases the RNs were able to articulate subtle signs that they had noticed, but initially had attributed to just knowing or intuition. Similarly Klein (1998) refers to a fire fighter commander who attributed his decision to immediately withdraw his crew from a house fire to his sixth sense. When more probing questions were asked, it turned out that the fire fighter commander had noticed several cues that did not match his expectations of the progression of a typical house fire. As a result, he made an instant decision to pull his crew out. When triage RNs in the current study spoke of intuition or gut feeling, they stated that something

did not make sense to them in light of their experience and knowledge. In order for an individual to notice a discrepancy, or misfit, an interpretation of the situation has occurred. The nurses appeared to combine and evaluate the cues available to them.

> *Jill: Intuition, for sure, makes me worried. I know that that one is hard to qualify but sometimes, sometimes it is just the story that makes you concerned and it has things that you know from experience, or you know from whatever you have learned, that makes you more concerned that it is one path more that the other.*

There are elements of both the heuristics and biases approach, and the RPD model in the theory of momentary fitting. RNs used the availability heuristic, typically when patient presentations reminded them of similar patients, especially patients with poor outcomes that had experienced delays at triage. RNs also sought to understand the reason for why a patient's story at times did not match what they were observing and then questioned the inconsistency. They were trying to find a reason for the inconsistent variable. Similarly, Klein (1998) discussed violated expectations and how experienced decision makers question why a discrepancy exists. Momentary fitting theory brings to the forefront the constant "why" of the triage assessment and how triage RNs continually search for fit, expressed by the nurses as "how it all fits together". In reasoning about how the pieces fit together RNs critically evaluate the fit, as demonstrated by the RNs in the study pursuing further information when they noted discrepancies. They were using analytical thinking to understand why. Noon (2014) suggested that cognitive continuum theory can provide an understanding of how both analytical DM and intuitive DM is used in the triage context, however qualifies her statement by noting that in emergency situations triage RNs must be able to base their interventions on rational clinical reasoning about principles for care, such as the ABC's. Interpreting information in time critical situations is not purely intuitive, as exemplified by a scenario described in chapter four when a patient with altered level of consciousness presented to triage. The RNs quickly

assessed and analyzed the situation by determining that; a) the patient was breathing, b) that the patient did not respond to verbal, only physical stimuli, and c) determined that it was more important to initiate treatment then waiting for a read-out of the oxygen saturation. The analysis and subsequent actions were rapid, but not purely intuitive. They were based on sound logical reasoning about the need for rapid intervention to protect the patient's airway.

There is no commonly accepted definition in the literature of intuition (Pretz & Folse, 2011). This may account for some of the debate about what intuition is and its role in DM. Göransson et al. (2008) stated that they found no basis for intuitive DM by triage RNs, and reported that a portion of RN's commenced the triage assessment by formulating a hypothesis. Formulating a hypothesis before assessing the patient might be viewed by others as a form of intuitive practice, for example, Edwards and Sines (2008), who used grounded theory to discover how triage RNs in a British ED carried out the process of initial assessment. They reported that triage RNs started assessing patients by noting physiological and behavioural signs as the patients approached the triage desk. The authors referred to this as intuitive DM, however, it can be argued that the nurses were combining and evaluating cues. Klein (1998) discussed intuitive DM in the context of when an experienced decision maker quickly assesses a situation, notices that something is amiss, and mentally starts searching for an explanation, the story behind the event. These decision makers are using their experience to interpret and evaluate the situation, though, on the surface, giving the impression of purely intuitive DM.

Klein defined intuition as the use of experience to recognize key patterns. Traynor, Boland, and Buus (2010) used focus groups to explore how nurses who were attending post qualifying courses at a London university represented clinical DM. They reported that nurses used intuition as an initial part of their assessment, but that experience and a more formalized assessment guided their subsequent DM, as expressed by a participant in their study "Your instinct is sharpened by your experience I think. It's not just

sort of a floaty feeling. I think sometimes you're actually putting together clinical expertise quickly" (p. 1587).

Experienced triage RNs have been found to use the processes of information gathering, pattern recognition, probability judgments, and diagnosing during triage DM (Fry & Stainton, 2005). According to the authors pattern recognition and probability judgments in combination with the information obtained during the assessment results in a working diagnosis that allows nurses to reach a decision regarding acuity, treatment space, needed staff resources, and possible interventions. In the theory of momentary fitting the process of DM is further explicated into the interrelated and mutually dependent stages of determining acuity, anticipating needs, and managing space.

In summary, triage RNs seek information and seek to understand the information in order to determine acuity. In doing so they evaluate pieces of information against their experience and knowledge. It has been suggested that experienced decision makers engage in pattern matching behaviour. The theory of momentary fitting indicates that triage RNs are not only looking for patterns, they are actively searching for uniformity between cues to obtain a coherent whole. The information is then used to obtain best possible fit for each patient in the fluid context that constitutes an ED. Given the fluidity of the environment and that the patient's condition may change, the fit can be re-evaluated at any time.

Anticipating Needs

Decision making in the triage context is driven by anticipating the needs and trajectory for individual patients balanced against the needs of other ED patients, combined with expectations that the ED should function as a system able to readily respond to both changing acuity of patients and changing volumes of incoming patients. Triage nurses are situated at the crossroads of these expectations.

Several authors have discussed the moral and ethical implications of triage (Aacharya, Gastmans, & Denier, 2011; FitzGerald et al., 2010; Moskop & Iserson, 2007). FitzGerald et al. (2010) wrote that one of

the main principles underlying triage is clinical justice, ensuring that the patient receives the appropriate care within an acceptable timeframe. Moskop and Iserson (2007) viewed triage as an ethical problem of distributive justice. Distributive justice addresses issues of how benefits andq burdens should be distributed within a population (Beauchamp & Childress, 2009).

Several theories have been proposed for how benefits and burdens should be distributed (Beauchamp & Childress, 2009; Oberle & Raffin, 2009). One school of thought is utilitarian theory, which can be traced back to the writings of Jeremy Bentham (1748 – 1832) and John Stuart Mill (1806 – 1873) (Beauchamp & Childress, 2009; Oberle & Raffin, 2009). Briefly stated, the principle of utility holds that actions should be evaluated for their consequences and that good actions are actions that produce the greatest benefit for the greatest number of people (Aacharya et al., 2011; Beauchamp & Childress, 2009; Moskop & Iserson, 2007; Oberle & Raffin, 2009).

Triage systems are often justified by the use of the principle of utility. Moskop and Iserson (2007) examined distributive justice in relation to triage by applying the principle of utility. They posed three questions of concern with employing the principle of utility to triage. First of all whether the trieur should focus only on the patients at hand, or make allowances for expected future patients. Secondly, to select actions based on potential future consequences raises the issue of being able to, with some degree of accuracy, predict what those consequences will be. Finally, triage is a system for resource allocation of sometimes scarce resources, for example, according to the principle of utility, time used to treat severely injured patients that may not be salvageable, to the detriment of other patients, would not be an optimal use of resources. This last aspect of triage would apply mainly in disaster situations.

Aacharya et al. (2011) analysed triage from an ethical perspective using Beauchamp and Childress (2009) four principles of biomedical ethics; autonomy, non-maleficence, beneficence, and justice. These same principles are reflected in the College and Association of Registered Nurses in Alberta's (2010)

position statement on ethical DM by nurses. In the triage setting respect for autonomy implies that if the patient considers his or her condition an emergency, denying emergency care compromises the patient's right to chose and therefore contravenes the principle of autonomy (Aacharya et al., 2011).

Non-maleficence, the principle of "do no harm", may be compromised when patients experience long waits and consequently have to endure stress, anxiety, pain, and potentially a worsening of their condition. Beneficence, to do and promote good, is reflected in giving priority to the sickest patient. Furthermore, the tendency to err on the side of caution by overtriaging, especially in the context of overcrowding and long waits, may be problematic, but on the other hand, reflects the principle of beneficence.

Finally, according to Aacharya et al. (2011) justice, more specifically distributive justice, in the triage context is founded on the principles equality, utility, and priority to the worst off. This means that, although viewed from an individual patient perspective immediate care may be desirable, it may not be feasible given the context (Aacharya et al., 2011). The needs of the individual patient is, in other words, considered in relation to and subordinated to other patients. Triage can be regarded as a classical ethical dilemma of distributive justice represented by a conflict between the principle of utility and the principles of autonomy, non-maleficence, and beneficence (Aacharya et al., 2011).

Aacharya et al. (2011) argued that abstract principles are difficult to apply in face-to-face relationships and that emergency staff operate at the intersection between abstract principles and the individual in need. The triage RN is thus situated at the intersection between ethical principles and clinical reality, charged with the responsibility of making decisions, often under conditions of limited space availability and extended waits, that ideally translate these principles into action. Momentary fitting theory suggests that triage RNs seek to accomplish this task by anticipating needs in order to achieve best possible fit for both patients and the department as a whole for each moment in time.

Anticipating time to treatment

The category anticipating needs consists of the properties anticipating time to treatment, anticipating trajectory, and anticipatory action. Triage research has been conducted on the accuracy of triage RN DM and interrater reliability of triage scales, for example, (Considine et al., 2000; Gerdtz & Bucknall, 2007; Göransson et al., 2005; Manos et al., 2002), relatively little has been written about how triage RNs determine the order in which patients are examined.

It is not clear from the studies that were reviewed for this dissertation whether patients with a higher acuity number were *always* examined before patients with a lower acuity number. At the three hospitals where the current study was conducted triage nurses used a computer program whereby the patients were automatically queued in a temporal sequence. The triage nurses had the option of, and were responsible for, changing the priority number as needed. As stated earlier the acuity number CTAS remained the same, but the RNs could at any time adjust the priority number which reflected the patient's place in the list of patients waiting to be examined by a physician. The nurses considered prioritizing to be an integral part of triage DM.

Anticipating time to treatment and continually re-evaluating the priority list was an ongoing process that permeated triage work. Similarly, Fry and Stainton (2005) reported from an ethnographic study of triage RNs in Australia that the process of time keeping was an essential feature of triage work. The concept of time, according to the authors, is a foundational part of ED culture and triage RNs are temporal workers that orchestrate the flow of patients through the ED by various timekeeping practices. For instance, by allocation higher acuity codes and implementing fast track procedures nurses could facilitate patients being treated sooner. Care in the context of the triage nursing is represented by time keeping practices according to Fry and Stainton.

The nurses in the current study were at times managing waiting lists of over 20 patients. The patients were dispersed throughout the department, some were in treatment spaces being cared for by an ED staff nurse, some were in the EMS hallway, and some were in the ED waiting room. Although the specifics of how triage RNs manage waiting lists have not been studied some authors have discussed priority alongside assigning acuity scores (Andersson et al., 2006; Chung, 2005). Triage RNs have identified uncertainty, being less knowledgeable about a certain presentation, and compassion as instances when they would assign a patient a higher acuity than is necessarily clinically indicated for the purpose of having the patient examined sooner by a physician (Andersson et al., 2006; Chung, 2005). The authors did not clarify if patients with higher acuity scores were always examined before patients with lower acuity scores.

In the theory momentary fitting anticipating time to treatment guides the triage RN DM. While triage RNs acknowledge that the CTAS score can be used as a common language to convey the acuity status of a patient, they consider the priority number, how soon they want a patient examined based on their perception of the patient's degree of acuity, as more important. Adopting Fry and Stanton's (2005) notion of timekeeping as essential to triage care practices, the priority number can then be viewed as a reflection of how urgent the triage RN considers the patient to be. The priority number is always considered in relation to other patients; in other words, it is a relative priority number.

Triage RNs are acutely aware that changing the priority number for one patient has implications for other patients whom are waiting to be examined by a physician. Trying to achieve best possible fit for each patient under the circumstance for each moment in time means that commonly accepted bioethical principles are at times compromised if considered from an individual patient perspective. For instance, although non-maleficence is typically considered in conjunction with refraining from inflicting harm (Beauchamp & Childress, 2009), the principle of non-maleficence maybe inadvertently be violated when

prolonged waits for patients cause deterioration in their condition or increased stress. At the heart of triage is the notion of distributive justice. Momentary fitting theory suggests that triage RNs formulate decisions considering individual patients in relation to other patients when anticipating time to treatment. In other words, they are attempting to distribute resources equitably. At times triage RNs are faced with ethical dilemmas of how to balance beneficence against non-maleficence. As one nurse expressed: *"Everyone has their one little soft spot. The cancer patients, I'll have like hell frozen over if I leave them out, but there has been times….* " (Jill). Nurses are trained in a spirit of compassion and seeking to good (Andersson et al., 2006). As Aacharya et al. (2011) suggested face-to-face encounters make it complicated to apply abstract ethical principles. Momentary fitting through prioritization of patients becomes problematic when the principle of beneficence for an individual patient results in the principle of non-maleficence being compromised for another patient.

Anticipating trajectory

Anticipating the care trajectory for individual patients is an important determinant as to which treatment space the patient is assigned to. Fry and Stainton (2005) wrote that nurses learn the cultural meaning of *place* by working in various areas of the ED. According to the authors an understanding of place, how different areas in the ED are structured and designated for particular patient groups, enables the triage RN to match the patient to the resources that are needed. Their description of place is similar to how space is conceptualized in the theory of momentary fitting. Different work settings have different cultural notions about work practices (Wolf, 2010). Learning how space is utilized and thought of in a particular setting therefore evolves with practice and is domain specific.

Triage nurses have identified between 7 – 18 months of ED experience as necessary before being assigned to triage (Cone & Murray, 2002; Fry & Burr, 2001a, 2001b), however it is not clear from these studies if the nurses were referring to simply learning about different patient presentations, or were also

including an understanding of the structural and cultural aspects of the setting as components of experience. One triage system, the Emergency Severity Index, incorporates predictions made by the triage RN. In the Emergency Severity Index acuity scores for level three, four, and five patients are based on the triage RN's prediction of how many resources the patient will require (Tanabe, Gimbel, Yarnold, & Adams, 2004). In other words, it is acknowledged in this system that the nurse anticipates the care trajectory as triage decisions are made. During the process of momentary fitting triage RNs anticipate the care trajectory, use their knowledge of the department, and attempt to match the patient to a space with the needed resources.

Predicting a patient's course in the ED is based on information obtained and interpreted during the stage of determining acuity. Triage nurses initiate this process of predicting already as the patient approaches the triage desk by evaluating the patient's "look" (Edwards, 2007). Göransson et al. (2008) reported that triage RNs continued by making predictions during the triage assessment about anticipated actions and possible findings. Predicting during the stage of anticipating trajectory is done for two purposes; to be able to fit the patient to the most appropriate treatment space with the necessary resources and to determine if the patient has the potential to deteriorate.

When treatment space is limited triage RNs use a decision rule of worst case scenario to decide whom out several patients should be assigned to a treatment space first. Croskerry (2002) identified ruling out worst case scenario as a strategy that is used by ED physicians to ensure that they do not fail to diagnose a critical condition. Physicians compare the patient against mental templates of critical diagnoses for the purpose of excluding the most serious diagnosis first. Triage RNs not only consider the worst case scenario for each patient that is waiting, they also evaluate these possible scenarios against each other and their long term consequences for each patient.

Anticipating consequences is closely linked to protection of self and patients. At times when triage RNs are unsure of what the patient's symptoms indicate they err on the side of caution by triaging a patient with suspicious symptoms to a higher acuity area. From a distributive justice perspective this has implications for efficient resource utilization and means that the appropriate resources may not be immediately available when a more serious patient arrives.

Anticipatory action

Triage can be viewed as system for risk management and resource utilization (Aacharya et al., 2011; FitzGerald et al., 2010; Hodge et al., 2013). One aspect of this function is to ensure that there is space immediately available for incoming critical patients and that patients whom are waiting receive timely interventions.

Triage RNs make triage decisions not only based on the patients in front of them, but also based on anticipated future consequences and needs. These decisions are operationalized as anticipatory actions; for instance, leaving cardiac monitor beds open and having patients determined to be less acute wait for a more suitable treatment space. Much of the anticipatory action is focused on the concept of space. Nurses are acutely aware of the consequences of a complete lack of treatment spaces. As identified previously triage systems are to some extent based on the principle of utility.

Moskop and Iserson (2007) discussed whether triage decisions should be based solely on patients at hand, or also include anticipated future needs and anticipated consequences of decisions. Applying the principle of utility to triage may be problematic since it is difficult to predict the outcome of triage decisions (Moskop & Iserson, 2007). For instance, the triage nurse cannot with certainty predict the consequences for individual patients that have to wait, nor can she predict the amount or type of incoming patients. The nurse is essentially weighing uncertain consequences for patients that are waiting against tentative future needs. Triage nurse practice is thus situated in a context that produces an ethical dilemma of distributive justice.

The nurse is responsible for deciding whether potential future needs outweigh the risks for individual patients whom are awaiting treatment.

Momentary fitting theory suggests that anticipatory action to a large extent drives triage RN DM. Although future needs maybe difficult to predict with certainty, triage RNs are aware of and have experienced situations where patients with life threatening injuries suddenly present to the ED. The nurses strive to be prepared for such situations by having space available for critical patients. In addition, triage RNs are continuously seeking to find space for patients whom are waiting through anticipatory action. The principles of beneficence and non-maleficence thus drive anticipatory action in the sense that RNs attempt to facilitate timely access to care and prevent harm to patients that they deem need priority treatment. Other than in immediately life threatening situations, this is accomplished through a deliberate process of managing space in conjunction with weighing potential outcomes of different triage decisions against each other. Deliberate process and considering alternatives should not be equated with a slow process in the triage context.

Managing Space

The use of space for the purpose of obtaining the best possible fit for each moment in time is central to triage RN DM. While studies have been conducted on how triage RNs make decisions, there is a paucity of studies on how these decision are enacted beyond assigning acuity scores. One study was found in which the authors discussed the need for triage RNs to be familiar with the cultural notions of how space is used in the specific ED where they were working in in order to conduct triage effectively (Fry & Stainton, 2005).

Bergeron et al. (2004) noted that efficient triage is an essential step in managing patient flow. Other authors have identified triage as a crucial safety component of ED care (Fernandes et al., 1999; FitzGerald et al., 2010; Manos et al., 2002). The nurses in the current study frequently worked under

conditions of limited treatment space availability in conjunction with having patients that were high acuity waiting for space and, as a consequence, they were actively engaged in a process of managing ED space.

> *Sally: That's the big questions, so great you came up with CTAS score, now what? That's the hard job, the easy job is getting to the CTAS score, the hard job is figuring out what you do with that patient within this mayhem of our departments that is too busy and how do you decide between ten 2's, ten 2's that all arrived within the last 30 minutes, how do you decide?*

Emergency department overcrowding has been extensively addressed in the ED literature. Various strategies to resolve the issue have been suggested, for example, rapid assessment zones (Bullard et al., 2012), short stay units (Lo et al., 2013), bed management strategies to improve flow through the ED (Barrett, Ford, & Ward-Smith, 2012), and triage nurse ordered interventions (Rowe et al., 2011). In a survey conducted by Bond et al. (2007) Canadian ED directors identified increased stress among nurses, increased ED wait times, and extended stays of admitted patients as effects of overcrowding. Patients that experience long waits have the potential to deteriorate and suffer adverse effects (Aacharya et al., 2011; Bullard et al., 2009).

The triage role, by necessity, extends beyond simply assigning acuity scores, prioritizing patients, and allocating treatment space, to actively managing space. Triage RNs are vital in facilitating flow and, at times, expediting flow through the ED. If triage RNs were to simply assign patients to the first available space in a system that is structured according to the acuity and anticipated trajectory of patients instead of trying to achieve fit, this would result in a mismatch of resources. Safety and efficiency would be compromised by low acuity patients occupying high acuity areas making these unavailable for critical patients that arrive. Conversely, by placing high acuity patients in low acuity areas, the safety of high acuity patients would potentially be compromised by being cared for in suboptimal areas were their needs could not be fully met. In addition, these patients may drain all the staff resources in low acuity areas

compromising the efficiency of so-called fast track areas. Managing space consists of the properties working with limited space, collaborating with co-workers, and knowing the department.

Working with limited space

The results of the current study do not suggest that triage RNs can resolve the issue of ED overcrowding through managing space, rather that the triage nurse DM role is frequently complicated by a lack of appropriate treatment space. As early as 1996 J.Harris and Hendricks discussed ED overcrowding and the impact on the triage RN of being responsible for, and dealing with, patients who were waiting for a treatment space. Nurses who participated in educational workshops expressed that they experienced increased stress, and were concerned about hostility and increased demands from patients who were kept waiting in the waiting room. J. Harris and Hendricks (1996) suggested that triage nurses cope with large volumes of patients by pretending that patients classified as non-urgent are not really important. Findings from a phenomological study of the effects of overcrowding and access block on nurses in Ireland indicate that nurses may experience a feeling of powerlessness and moral distress when they are expected to perform a job without having the necessary resources available such as access to timely care for patients (Kilcoyne & Dowling, 2007).

Deconstructing the waiting room into its separate parts from a critical social theory perspective shows the triage nurse as a powerful, knowledgeable expert and the patients as a marginalized group relying on the triage nurse to dispense care. The triage nurse holds the power and the patients give up power when coming to the ED. This inequality is consistent with a critical social theory view in which one group has to give up power in order for another group to gain power (Freire, 1970; Kuokkanen & Leino-Kilpi, 2000). The relationship is unequal with asymmetric nurse and patient roles (Sumner & Danielson, 2007). However, triage nurses do not function in a vacuum. They are in turn influenced by social, political and historical forces, which place constraints and expectations on their role. In a strained health care

system the focus may shift to the process of triage with a prevailing factory line mentality and a mainly task orientated behaviour by the nurse.

In the theory of momentary fitting ED treatment space is conceptualized as a valuable resource that the triage RNs are responsible for allocating in order to achieve fit. As stated above, not having the necessary resources to perform their duties may cause nurses distress. Triage nurses attempt to resolve this concern by trying to identify the most critical patient and allocating them space first. This is accomplished by visually scanning the line-up, and relying on the other triage RNs and paramedics to alert them to sick patients in need of care. Edwards (2007) noted that triage RNs visually assess patients already as they enter the ED, but did not elaborate on if this was for the purpose of identifying the sickest patient. There may be some support for J. Harris and Hendricks (1996) notion that that triage RNs cope by mentally downgrading the needs of patients perceived to be less urgent as expressed by one participant:

> *Belinda: I am always looking for the sick one. Other ones, I'm sorry, they can wait. There is nothing wrong with them waiting. They could have waited in a family doctor's, or clinic, so they can wait in my lineup.*

The decisions of how to manage space are made in an environment with multiple competing stimuli and frequent interruptions. Chung (2005) reported that triage RNs found interruptions to negatively affect triage DM. The theory of momentary fitting suggests that triage RNs attend to stimuli that they know will immediately impact their work, such as the paramedic patch phone. Experienced decision makers have been found to select and attend to salient features in the environment (Benner, 1984; Klein, 1998). Thus one aspect of working with limited space is attending to stimuli that will have consequences for immediate space utilization.

Collaborating with co-workers

The current study was conducted in EDs with large volumes of patients where two or three RNs were assigned to triage. The property of collaborating with co-workers is therefore mainly applicable in contexts were more than one RN conducts triage. Triage and DM research has largely been carried out from the perspective that the triage decision resides with the individual triage RN.

For example, Göransson et al. (2008) used the think aloud method to describe the thinking strategies of RNs with either low or high accuracy in in acuity decisions according to CTAS, Considine et al. (2001) used a questionnaire to study the influence of experience and educational preparation of the triage RN on decision accuracy, and Gerdtz et al. (2009) explored the influence of gender, educational preparation, and appointment level of the individual nurse on triage decisions in a survey. A few authors have referred to the collaborative aspect of triage, either between triage RNs, or with the charge RN (Patel et al., 2008; Wolf, 2010). Patel et al. (2008) indicated that triage RNs discussed patients with other triage RNs when unsure about a decision, but that time constraints were an obstacle to collaboration. Wolf (2010) reported that, at one specific US hospital site in her ethnographic study of how triage nurses assign acuity, there was an ongoing discussion with the charge RN regarding acuity level, however, this appeared to be mainly because the acuity level was not accessible in the computer. Collaboration was at times hampered by personality conflicts and different skill levels.

Collaborating with co-workers was found to be an integral aspect of triage work and DM in the current study. Although the triage RNs to some extent had different assigned roles, information exchange and discussion was frequent, especially in situations of uncertainty, for the purpose of DM, problem solving, and keeping each other updated on the status of patients that were waiting, incoming patients, and potentially upcoming beds. The nurses were keeping each other abreast of the current situation, anticipated future developments, and potential use of space. In other words, they were function as a team attempting

to maintain situation awareness (SA). The triage team was not a stable team; it was a loosely knit team of colleagues that sometimes changed members as often as every four hours, however, it is important to note that the team members were familiar with each other and worked together on a rotating basis in different configurations in various assignments in the ED.

While each triage RN maintains awareness of the current situation according to her specific role, the triage team also maintains SA. Individual SA has been described as an integrated mental model of incoming information about the current state of the environment which then forms a basis for DM and action (Endsley, 2012). One of the most commonly cited models of SA according to Stanton, Salmon, Walker, and Jenkins (2010) is Endsley's (1995) three step model. It consists of the perception of salient features in the environment, comprehension of the situation and the significance of the salient features, and finally projection of the future status of the elements in the environment. For example, the triage RN has to become aware of a patient with chest pain, interpret the chest pain as a possible sign of a myocardial infarction and understand the potential outcomes for the patient, and finally make decisions based on the anticipated trajectory such as the need for time critical interventions. Endsley's model has been critiqued as being too focused on SA as an individual phenomenon (Sorensen, Stanton, & Banks, 2011; Stanton et al., 2010) and being too information processing orientated (Chiappe, Strybel, & Vu, 2012; Stanton et al., 2010).

Three common schools of thought describing SA have been identified; the psychological approach, the engineering approach, and the system ergonomics approach (Sorensen et al., 2011; Stanton et al., 2010). The psychological view holds that SA exists in the individual's mind. An example of this is Endsley's (1995) model of SA (Sorensen et al., 2011; Stanton et al., 2010). The engineering approach adopts an in-the-world conception of SA as residing solely in external structures such as, for instance, instruments in a cockpit. Finally, the system ergonomics school of thought sees SA as emerging from the interaction between humans and the environment.

As stated above, triage RNs maintain SA as a team. Endsley (1995) described team SA as a Venn diagram where each circle represents the SA of the individual team members and the overlapping area represents shared SA. Stanton et al. (2010) on the other hand, argued for the systems ergonomics view and that team SA can be thought of as distributed cognition. Agents, both human and non-human actors, are considered to form a system. “Distributed cognition is considered to be activated knowledge for a specific task within a system at a specific time by specific agents” (Stanton et al., 2010, p. 34).

Stanton et al. (2010) described the system as a series of nodes that are activated for a specific purpose in response to changes in the environment, tasks, and interactions. The information can be held either by technology or by humans, the essential component is that the right information is activated and shared through interaction at the right time. As stated above, triage RNs maintain team SA, however, not all information is shared. Information considered essential for DM is activated at critical times. For instance, the display on the blood pressure machine may alert one of the triage RNs to a dangerously low blood pressure. The nurse who notices this is not the nurse who is responsible for allocating beds and therefore she notifies her colleagues of the blood pressure thorough a short statement such as “ I have a BP of 70 here”. In terms of distributed cognition, nodes in the system have now become activated for the purpose of quickly obtaining an appropriate treatment space for the patient.

Collaboration between co-workers for the purpose of managing space mainly occurs in the form of information exchange and joint problem solving. Salas, Prince, Baker, and Shrestha (1995) noted that team SA is a dynamic entity characterized by ongoing information seeking, processing, and sharing. The theory of momentary fitting explicates both the importance of on the spot communication between triage RNs and how this communication is maintained. In addition, it highlights how the triage team supplements information that is residing in devices such as computers by informal communication tools, yellow sticky notes for example, and brief team huddles. This information then becomes part of the distributed cognition.

The charge nurse is at times brought into the triage team as a partially external actor that holds information about the department and upcoming admissions that may not be immediately available to the triage RNs.

Knowing the department

To recap, actively managing space utilization for the purpose of achieving fit was an essential component of triage DM in the current study. Knowledge of the ED consequently became a necessary aspect of efficient triage DM. Knowing the department includes both being familiar with what Fry and Stainton (2005) refers to as the cultural notion of place in the ED and real time knowledge of each area.

Although much of the triage work that was observed was collaborative, one triage RN was primarily responsible for bed allocation, space management. The computers that were available at triage and each nursing station displayed information about available beds. The ED bedside nurses were responsible for "clearing beds" on the screen as they became available. Triage RNs knew that delays sometimes occurred and therefore used walk-throughs of the ED as a strategy to maintain real time SA. However, knowing the department refers to more than up to date information of available space, it refers to an intimate knowledge of the intricate workings of the specific ED including knowing the staff, knowing which areas have sick patients, understanding how to expedite movement of patients, understanding which patients can be safely moved to alternate areas for the purpose of managing space efficiently and inventively. In short as one of the participants stated, "*being imaginative and creative as to how I work that department*" (Sally).

To recap, triage RNs when managing space maintain SA through information exchange with the rest of the triage team, the charge nurse, technical devices, informal communication tools, and first hand knowledge of the ED obtained during walk-throughs.

Creating Space

To create means to bring forth out of nothing or bring into existence something that did not exist previously (Webster's New World Dictionary). While managing space is an ongoing process at triage that

occurs as a result of determining acuity and anticipating needs, triage nurses are at times faced with situations where space is needed and none is available. As identified three critical junctures exist when triage RNs decide to initiate a process of creating space.

- For the category determining acuity - a patient at triage determined to be in need of urgent or immediate medical attention in combination with no appropriate treatment space
- For the category anticipating needs - an incoming critical patient in combination with no appropriate treatment space
- For the category managing space - an absolute lack of treatment space including trauma beds

As discussed by Aacharya et al. (2011) triage staff operate at the intersection between abstract ethical principles and the individual in need. Lack of appropriate treatment space, or an absolute lack of available treatment space constitutes an access block and triage RNs, at the above critical junctures, create ways to circumvent the block by pushing boundaries and temporarily crossing boundaries. Thus these critical junctures become points were ethical principles and clinical reality sometimes collide.

For instance, nurses are aware that instituting actions to create space might potentially compromise the safety of patients that are moved, as Joe explained: "*I know that if I want that bed someone else that is in there is going to go somewhere else sooner than what might be safe for them".* In this instance individual patient needs are considered in relation to each other and the nurse is balancing the principle of beneficence for one patient against the potential of harmful effects for another patient.

Fry and Stainton (2005) discussed how it is necessary for emergency RNs to learn the culture of the ED where they practice in order to be effective triage RNs. The term boundaries in the current study refers to the expectations for how each ED was supposed to function. Boundaries are thus generally accepted practice standards for the specific ED where the RN is working, for instance, only sending a

certain type of patient such as “walking wounded” to certain designated areas. Nurses frequently used statements such as “making up the rules” when they discussed triage. When asked if there were absolute boundaries they would not cross one participant answered:

> *Joe: “Umm you know I really can’t, unless it’s umm. There are very strict rules, you have to give medication to the right patient, and you can’t just make up protocols as you go along. Those are strict rules and strict boundaries around practice, I would never put in a central line for example, or a pacemaker even though I thought the patient needed it. You know there is very scope of practice boundaries that are quite hard. No one would dream of, you wouldn’t.”*

Pushing boundaries and crossing boundaries are properties of the category creating space. The line between pushing boundaries and crossing boundaries is blurred. The purpose in grounded theory research is to find an underlying process that accounts for much of the variation in behavior that is seen in the context under study and that accounts for how the participants resolve what they perceive to be the main problem. The fluidity of the triage environment and the core category momentary fitting become especially visible when the triage RNs initiate the process of creating space.

Pushing boundaries

Triage RNs push boundaries when they have determined that the alternative for a particular patient, leaving the patient in the waiting room, is worse than pushing for a bed, or when there is an absolute lack of treatment space. The ED itself and triage are dynamic contexts were conditions change moment to moment as new patients arrive, or patients already in the department deteriorate. The triage RN therefore needs to be able to make multiple rapid decisions and enact theses decisions as events unfold. The decisions frequently involve several stakeholders as the triage RN collaborates with and negotiates for space with other members of the ED team. The pieces that make up the ED; patients, staff, resources, and treatment spaces area fitted and refitted in order to obtain best possible fit under continually changing

conditions. Pushing boundaries requires creativity, courage, knowledge of the particular ED, and the ability to anticipate potential consequences of different solutions for both patients and staff.

Researchers that study naturalistic DM are interested in proficient decision makers situated in dynamic contexts with time pressure, uncertainty, high stakes, ill defined goals, shifting goals, incomplete information, cues that are changing, action/event cognitive feedback loops, organizational constraints, and decisions that involve multiple persons (Kahneman & Klein, 2009; Klein, 1998; Lehto & Nah, 2006; Lipshitz et al., 2001; Orsanau & Connoly, 1993). In other words, environments that are very similar to triage.

Klein (1998) reported that experienced decision makers in dynamic contexts are quickly able to assess a situation and recognize salient features. Similarly, triage RNs, as described for the property of limiting information, recognized some cues as overriding whatever other information the patient offered and that these cues necessitated action, for instance, dangerously low oxygen levels. In Klein's model of DM experienced decision makers understand the goals, which cues are important, what to expect, and the typical ways of responding to a particular situation.

In the preceding example of a triage RN confronted with a patient with dangerously low oxygen levels, the nurse knows that the goal of triage is to get the most critical patients treated first, understands that low oxygen levels take precedence over completing a more thorough triage assessment, recognizes that low oxygen levels may lead to further complications or even death, and if there is a treatment space available, responds by sending the patient directly to that space. However, problems occur if there is no space immediately available. Under these circumstances triage RNs push boundaries. The patient would be placed on oxygen while the triage RNs rapidly try to find a solution. In Klein's model decision makers evaluate options one by one by imagining the course of action, if a difficulty is encountered for the option under consideration the course of action is altered. The key point is that the decision makers evaluate the

options one at a time and selects the first workable solution that is found, as opposed to evaluating all the available options before making a decision as would be suggested by a classical DM model.

In order to evaluate different options for the purpose of pushing boundaries triage RNs require up to date knowledge of the department gained through information available on the computer, collaboration with the other triage RNs and the charge RN, and by walk-throughs. When nurses in the study elected to push boundaries they did not always select the first feasible option as is suggested in Klein's RPD model, nor did they evaluate all the available options, rather, when time permitted, they considered a selection of feasible solutions. Solutions were evaluated in light of how they would affect not just the patient at triage needing a space, but also how it would affect the area the patient would be sent to and the patients that needed to be moved. Each decision had a ripple effect on the workings of the ED. The approach was frequently collaborative. Fry and Stainton (2005) suggested that knowledge of the specific ED is important. The triage RNs in the current study used their familiarity with the ED they worked in to decide how different areas could be utilized depending on, for example, if senior staff was working there or who the physician was, when they decided to push boundaries.

Crossing boundaries

Crossing boundaries is conceptualized in the theory of momentary fitting as a state when the triage RNs have temporarily, by pushing boundaries, exhausted the stretch that is available within the system that constitutes an ED. The triage RNs are in a situation with a patient with a life or limb threatening injury either at triage, or imminently arriving by EMS, in combination with an absolute lack of available treatment space.

Faced with an immediate need the RNs have to rapidly make decisions to resolve the situation. Simon (1956; 1979) wrote about the concept of satisficing as an aspect of DM. His research was mainly conducted in the field of economics. According to Simon (1979) decision makers search for an option that is good enough "satisficing", as opposed to optimizing decisions by evaluating all the possible alternatives.

In addition, according to Simon, evaluating all the possible alternatives and their outcomes is too complex of an operation and the decision maker cannot necessarily predict the outcomes of various decisions. Klein (1978) built on Simon's concept of satisficing when he developed his model of naturalistic DM.

The DM that triage RNs engage in when they cross boundaries can be viewed as an extreme form of satisficing. Faced with an immediate need the nurses institute actions that are good enough for the present situation, for example, placing an extra stretcher in the trauma bay or looking after ill patients at triage. However, the fit, although meeting an immediate need and the best under the circumstances, is suboptimal and the nurses know that as a system the ED cannot operate outside of the boundaries for a prolonged period of time. Just as crossing boundaries occur when the existing boundaries have been pushed enough that the RNs decide to temporarily cross boundaries, the RNs push when boundaries are crossed to return the ED to a state of operating within boundaries. Possible solutions are considered as the immediate situation stabilizes. Examples of strategies to resolve the situation would be pushing for discharges, pushing to have admitted patients transferred to the floor, and asking the charge RN to request an ambulance diversion.

Summary

In this study, momentary fitting in a fluid environment is the core variable that accounts for much of the DM and actions that occur at triage. While research has been conducted about the DM processes of triage RNs the research, with a few exceptions, seems to end with the triage RN assigning an acuity score and prioritizing. As stated, some authors recognize that the triage RNs are vital in managing flow thorough the ED, but stop short of explaining how this is done. Lack of treatment space has been recognized in the literature as a prevailing problem of many EDs. The outcome of this, patients held in the waiting room, has been identified as a serious problem, however, there is a paucity of studies on how triage RNs facilitate patient flow and work to manage ED space in optimal ways. The next chapter offers implications for

practice derived from this study and recommendations for future research. Furthermore, the adequacy and limitations of the theory are discussed.

CHAPTER SIX: IMPLICATIONS, RECOMMENDATIONS, AND FUTURE RESEARCH

It is not the major goal of grounded theory research to generalize the findings in the same manner as in quantitative research, rather the purpose is to generate a theory of a concept that has fit, work, relevance, and modifiability. The core concept, momentary fitting in a fluid environment, strongly resonates with my experience as a triage nurse. The recommendations and implications discussed in this chapter are based on direct observations in three EDs, the in-depth and rich descriptions provided by the participants, the researcher's 20 years of experience as a triage RN, and most importantly, the theory itself.

In this classical grounded theory study triage RNs stated several concerns such as finding treatment space for sick patients, being able to quickly identify sick patients among several incoming patients, getting patients examined by a physician in a timely manner, getting the most critical patients seen first, and having to continually evaluate and juggle how treatment space was used. The main concern can be summarized as getting the right patient to be seen by the right care provider at the right time in the right order in relation to other patients who are waiting, and in the most appropriate treatment space given the conditions for each moment in time.

To reflect the dynamic conditions of DM by triage RNs this concern was conceptualized as momentary fitting in a fluid environment. The word momentary was chosen to highlight that the fit is only the best fit for each particular moment in time and may quickly need to be reevaluated as conditions change. Fit reflects the multifactorial nature of triage DM and how nurses actively consider the various pieces that comprise the ED context. Triage DM in this study was found to be a very deliberate process of trying to achieve best overall fit for each patient in the ED and best fit for how treatment space was utilized in the ED. The term fluid environment exposes how the context is ever changing. The term brings attention to how triage conditions are never quite stable and the need for triage RNs to be prepared to revise their decisions continuously. Triage DM can be likened to standing on constantly shifting ground.

Momentary fitting is accomplished through a process of determining acuity, anticipating needs, managing space, and creating space. If viewed from an individual patient perspective determining acuity is the starting point for the patient's journey through the ED, however, triage DM, as shown in this study, consists of making decisions both about individual patients and considering overall departmental needs in terms of treatment space usage and staff resources. Managing space is therefore an ongoing process at triage that occurs as a result of, and concurrently with, determining acuity and anticipating needs for the purpose of achieving best overall fit for each moment in time. It is important to appreciate that triage DM extends beyond assigning acuity scores and prioritizing which has implications for practice and research.

Recommendations and Implications for Practice

Environment

Consideration ought to be given to the overall design of triage areas that is based on work processes that nurses have identified as important for their ability to carry out efficient and safe triage. Nurses in the study spoke of how they visually scanned the line-up for sick patients in order to be able to quickly identify patients in need of intervention. As they were assessing the patient that was currently in the triage area, they also maintained awareness of the patients who were in the line-up waiting to be triaged. The line of patients and the entrance into the emergency waiting room therefore need to be clearly visible from the triage desk. Sight lines should be unobstructed. At two sites reconstruction of the waiting room was in process, which resulted in poor visibility of patients that were seeking ED care. Having patients line up where they cannot be visualized compromises the safety of patients.

Under conditions of limited treatment space availability triage nurses attempted to maintain vigilance over patients that they were concerned about by placing them close to the triage desk. Waiting rooms, as was the case in the EDs in the study, need to be constructed with designated chair space immediately adjacent to, and clearly visible from, the triage desk where these patients can wait. Patients

that are placed in these areas need a mechanism for calling for help in the event their condition deteriorates. All three sites had volunteers in the waiting rooms who alerted the nurses if a patient felt worse. However, relying solely on volunteers who are not medically trained and frequently busy with other tasks such as answering questions and accompanying visiting family members in to the ED is not optimal. Patients who are placed in high visibility waiting areas should be provided with a call bell or buzzer to alert the triage nurse if they are feeling worse. A caveat is necessary here. The goal of any health care organization should be to provide timely care to all patients that visit the ED, however, the reality the triage nurses in the study described did not always allow for this.

Triage assessments are brief and patients who have been determined to be of lower acuity may unexpectedly deteriorate while they are waiting, therefore, the entire waiting room needs to be clearly visible from the triage desk. TV monitors are helpful to monitor areas that are not directly visible from the triage desk. It is preferable though, to design ED waiting rooms so that the entire area can be quickly visualized from the triage desk. It could of course, be argued that instead of constructing waiting areas efforts should be directed towards overcoming the causes of ED wait times, however, while these efforts are ongoing the effects of the present reality need to be recognized. Triage RN DM involves assessing acuity and prioritizing patients in relation to each other. In order to accomplish this triage RNs need to be aware of the status of all the patients that are waiting.

In the EDs in the study EMS patients often had to wait with paramedics before being assigned to a treatment space. Paramedics continued to provide care for the patients using EMS protocols. Patient safety was a joint responsibility. Paramedics were expected to update the triage RNs on the condition of their patients and triage RNs were responsible for assigning treatment space within an appropriate time frame. Some paramedics expressed concern that they were made to wait quite some distance from the triage

desk and that this jeopardized the safety of their patients. Waiting areas for EMS patients should be in close proximity to the triage desk to facilitate communication between paramedics and triage RNs.

The triage area itself should be designed to allow for as much privacy as possible for patients while they tell the triage RN their reason for seeking medical care and provide their medical history. At the same time while focusing on the patient in front of them the triage RN, as stated above, needs to be able to maintain vigilance over the waiting room. If more than one RN conducts triage, as was the case in the study, enough workstations are required to accommodate each RN. Workstations should include a computer, phone, some desk space, and equipment to measure vital signs.

The theory of momentary fitting identifies how triage work is a collaborative process and how triage RNs value quick and easy communication with each other. During one of the observations an RN recounted how she had once worked in an ED where the triage RNs were separated in cubicles and how this hampered efficient communication. The triage area needs to be open enough to allow the RNs to quickly alert each other if one of their patients needs to be given immediate or high priority for a treatment space.

Triage nurses spoke of noise and interruptions as part of the triage environment, however, the effect of multiple stimuli on triage RN DM was not specifically evaluated in this study. Some of the interruptions were necessary, for instance, EMS patches and phone calls from RNs in ED treatment areas requesting that patients who were deteriorating be given higher priority. It seems, however, that it would be prudent to reduce noise levels and interruptions. The effects of noise and interruptions on triage RN DM is an area that needs to be further investigated.

Maintaining awareness

Triage RNs manage space by maintaining overall awareness of the current state of the ED. This includes maintaining awareness of the patients in the waiting room, the patients on the priority list that are

in the department, but have not yet been examined by a physician, incoming patients, critical patients in the department, available treatment spaces, upcoming treatment spaces, and staffing levels. It follows that the appropriate tools need to be in place for the RNs to maintain awareness. These include direct phone lines to each treatment area in the ED and computer programs that enable quick visualization of the moment-by-moment state of the ED.

During the course of the study the existing computer program was replaced by a new program with a significantly different design. The focus of the study was not how the new program affected triage RN DM, therefore the questions were directed towards how triage decisions are made and how triage work is conducted. In retrospect important information about triage RN DM may have been obtained by exploring the reasons several RNs were dissatisfied with the new program. It is clear though from the findings that it is of vital importance for triage RNs to have easily accessible up to date information about the state of the ED.

Computer programs need to be designed based on the work processes that the end users have identified as important. In short, computer programs need to be in the service of the user and facilitate work, especially in environments such as triage were time is often critical. Triage RNs therefore need to be actively involved in both design and evaluation of triage computer programs. Recommendations for triage programs based on the finding of this study include, but are not limited to

- A map of the department that clearly shows available treatment spaces, blocked treatment spaces, beds that are empty (but not yet clean), admitted (but not yet transferred patients), and patients ready for discharge. The new computer program contained a map like this, but with pale colours and small symbols that made it cumbersome to visualize. The graphical user interface (GUI) design is an important component to consider in relation to the work of triage RNs.

- A list of all current patients in the ED, including the waiting room and EMS patients, with the CTAS number, priority number to be examined, main complaint, triage note, time of arrival, how long each patient has been waiting, and current location. The list should contain both patients waiting to be examined and patients that have already been examined by a physician.
- The design of both the map and list should be clear and uncluttered. Input should be sought from triage RNs concerning the GUI.
- Triage RNs should be able to quickly access information such as medical history, medications, ordered test, test results, and treatment plan for each patient.
- The program should be constructed so that nurses can easily and quickly switch between screens.
- Moving patients on the map should be easy, for example, drag and drop using a name.

The above recommendations are based on what triage RNs considered to be important information regarding knowing the department and managing space. It could be argued that it is not necessary for triage RNs to keep track of what is happening with the patients that are already being treated. Triage nurses, however, emphasized the importance of having up to date information about the entire ED when making triage decisions, especially when they had to initiate actions to move patients around or reassign priority numbers to be examined to individual patients.

Up to date information in combination with knowledge of the specific ED both in terms of physical layout and the more subtle workings of the department was used when triage RNs made decisions about how to manage and create space. As recommended by Fry and Stainton (2005), new staff should be given the opportunity to work in each area of the ED and sufficient time to learn the specific culture of the workplace before being assigned to triage.

Communication

The theory of momentary fitting suggests that triage DM is often a collaborative process that involves frequent communication between triage RNs, especially under conditions of limited or no treatment space availability. Wolf (2010) suggested that collaboration between the charge RN and triage RNs was sometime adversely affected by personality conflicts and different skill levels. Although Wolf did not discuss collaboration between triage RNs, attention needs to be directed towards how triage RN DM is carried out as a team process. Training for triage RNs needs to include teaching, discussion, and practice in effective team communication. In addition, triage training needs to include aspects of what type of information needs to be communicated and what type of information is superfluous.

At all three sites the RNs emphasized that they worked as a team, although on the daily work sheet they had different assigned roles. One RN typically assumed more responsibility for allocating treatment space, assigning the priority number to be examined, and managing space. Whether a team model, or having one RN as the lead triage RN, is most effective needs to be evaluated. It is possible that too much discussion around triage decisions may slow down the triage process.

When space was limited one triage RN frequently conducted a walk through of the department to search for beds and negotiated with the bedside RNs about moving patients. The nurses at the bedside, especially if not triage trained, did not always have an understanding of the need to find space. As well the bedside nurses, understandably so, advocated on behalf of their patients. Triage RNs need training in effective communication skills to facilitate cooperation with bedside RNs. Furthermore, based on the findings it would seem prudent that all RNs that work in the ED, once they have the necessary experience and training, should be given the opportunity to conduct triage. In addition, new RNs, as part of their orientation, should shadow the triage RNs to obtain some appreciation for the complexity of the role.

Communicating with patients for the purpose of determining acuity consisted of funnelling down, digging for information, and limiting information. The extent to which digging for information is necessary in situations of uncertainty is not clear from the findings. The RNs stated that it was necessary in order for them to determine acuity and anticipate trajectory. One participant stated that the longer the wait was, the more information she needed. Amount and type of information that is needed to make triage decision need to be further explored and whether this is a function of wait times.

Triage and ethical issues

The momentary fitting theory identifies how triage RNs balance the needs of the individual patient against the need of the ED to function as a system that is capable in responding quickly to the changing acuity of patients and changing volumes of incoming patients. Aacharya et al. (2011) discussed triage as a classical ethical dilemma of distributive justice represented by a conflict between the principle of utility and the principles of autonomy, non-maleficence, and beneficence; and argued that emergency staff operate at the intersection between abstract principles and the individual in need. Triage training should therefore, at a minimum, include a discussion and examination of the ethical and moral issues surrounding triage. In addition, evaluation of triage decisions for cases where triage delays have resulted in adverse effects for the patient should take into consideration the context in which the event occurred.

Nurses in the study identified how they experienced a dilemma when, for instance, elderly patients or those with cancer had to be left waiting for a treatment space. Triage nurses need to be given the opportunity to reflect on and discuss complicated triage situations.

Recommendations for Future Research

To recap, previous research about triage RN DM has focused on how triage RNs determine acuity, the reliability of different triage scales, and how individual characteristics of the triage RN affects accuracy of acuity ratings. The focus has mainly been on the triage RN as an individual decision maker, as opposed

to how triage work is conducted in larger EDs with more than one triage RN. Furthermore, limited research has been conducted on what occurs after the patient has been assessed by the triage RN. In the theory of momentary fitting in a fluid environment it is recognized that assessing and determining the degree of acuity of each patient is a vital part of triage DM. The theory, however, extends beyond the initial nurse-patient encounter and brings attention to the anticipatory nature of triage decisions and how triage RNs actively engage in a process of managing and creating space. Several aspects of triage RN DM, with regards to managing and creating space, need to be better understood and further explored.

Triage RNs were found to work as a team and engage in joint problem solving, especially as complicated situations arose. Further understanding is needed as to what type of team model is best, a model with interchangeable roles, a model with set roles and a designated leader, or a model with a set leader, but predominantly interchangeable roles. The team composition shifted as frequently as every four hours. It would be valuable to explore if it is preferable to have a triage teams that always consist of the same members, or triage teams with rotating membership.

The study sites varied in the length of time that nurses were assigned to triage, four, eight, or twelve hours. Four hours may be just enough time for the triage RN to feel comfortable with knowing the department and the patients for that particular day, whereas twelve hours in the multi-stimuli triage environment may lead to fatigue and negatively affect DM capabilities. While it may seem intuitive that longer hours at triage has a negative effect on triage DM, this needs to be explored with further research.

Furthermore, research needs to be conducted on what factors would make RNs hesitant to push boundaries to create space, for instance, push back from more senior co-workers, or simply fatigue after working a long shift and seeing several ill patients.

Triage RNs conduct their work in an environment where abstract ethical principles are often difficult to translate into action. The emotional effect on the triage nurse of facing a demand for access to care that

is challenging to meet in a timely manner needs to be explored. In addition, an understanding of how the DM capabilities of the triage nurse are affected by not being able to meet the demands for care, need to be understood.

Triage RNs anticipate the care trajectory for individual patients when they allocate treatment space. An important avenue for future research would be to explore the degree to which triage nurses accurately predict the resources needed for particular patients and the patients trajectory through the ED. FitzGerald et al. (2010) suggested that due to the multifactorial nature of triage decisions it is difficult to evaluate the correctness of an individual triage decision. Accuracy for acuity scores according to preexisitng triage scales have been found to be only 58 – 64% (Bergeron et al., 2004; Considine et al., 2004; Considine et al., 2000; Göransson et al., 2005). Triage decisions cannot be solely assessed based on adherence to a scale. A more sophisticated approach for assessing triage decisions is therefore needed. Exploring the ability of triage RNs to predict the patient's diagnosis, course through the ED, and resources needed to treat would be one way of evaluating triage decisions.

A considerable amount of time is spent by triage RNs thinking about, discussing, and managing treatment space. Some recommendations have been made in this dissertation about the type of computer programs that would seem to be helpful based on the findings. Further work is needed on developing tools that enable triage RNs to maintain up to date awareness of the ED. In addition, attention should be focused on the physical environment and how to best support communication among triage RNs, the charge nurse, and nurses in the ED for the purpose of maintaining situation awareness.

Assessing the Theory

Adequacy

As discussed in chapter three a grounded theory is evaluated by different criteria than those used in quantitative research and other types of qualitative research. The criteria used to evaluate grounded theory are fit, work, relevance, and modifiability (Glaser, 1978, 1998).

Fit means that the theory must fit with the data (Glaser, 1978, 1998). Fit was achieved in this study by allowing the categories to emerge from the data, as opposed to selecting a preexisitng theory to guide the study. More specifically it meant that the literature review and other triage literature was consciously put aside until the theory started to emerge.

Furthermore, I came to the field as a researcher with substantial personal experience of conducting triage. In order to take into consideration my preexisitng assumptions of triage DM and the effect this might have in shaping the categories to the detriment of what the data indicated I, as suggested by Glaser, asked someone to conduct an interview with me. The interview was coded and included in the analysis. In addition, it had been suggested to me that the core might be perpetual juggling. However, as I memoed and considered the data, it became apparent that perpetual juggling is an aspect of, but does not account sufficiently for, what occurs at triage. Thus the core category momentary fitting in a fluid environment was selected as it provides a more comprehensive fit for the data.

Work means that the theory should explain, predict, and interpret what is occurring in the context (Glaser, 1978). The theory works because it explains how the categories determining acuity, anticipating needs, managing space, and creating space are linked and used by nurses to achieve momentary fitting, as well as identifying three critical junctures when RNs initiate immediate action. The theory especially brings attention to how managing and creating space are integral components of triage work. Drawing

attention to these categories offers an explanation for why triage RNs consider it important to be able to maintain an up to date awareness of the what is transpiring in the ED.

Relevance indicates that the theory is relevant to the area and that it is indeed the main concern of the participants that has been allowed to emerge (Glaser, 1978, 1998). Relevance was ensured during the research process by continually asking; “Is this indeed what the data is telling me?” Concepts were not forced on the data, for example, perpetual juggling was discarded as a core concept when it was found not to offer sufficient explanatory power. As stated earlier in this chapter, the theory resonates with triage RNs. However, relevance cannot be fully assessed until the theory is presented to a wider audience of emergency triage RNs

Modifiability is a key criterion for assessing grounded theories. Grounded theories are not verified, they are modified as they are applied to new substantive areas and new data emerges (Glaser, 1978, 1998). As the theory is used in different ED settings it is expected that the theory will be modified. In addition, the concept momentary fitting, while discovered studying emergency triage RNs, could be applicable in other rapidly changing settings where participants have to make decisions considering multiple competing demands simultaneously.

Limitations

The theory is not generalizable in the same sense as in quantitative research. As stated above, however, the concept momentary fitting in a fluid environment can be conceptually generalized. As the concept is applied in other settings, it is expected that the theory will be modified.

The study was conducted with a fairly homogenous sample of 12 triage nurses from three different hospital sites in the same city in western Canada. The results may have been different if nurses from diverse ED settings had been included. Furthermore, in accordance with the aim of the research, the

sample consisted of RNs with five or more years oft triage experience. A different main concern may have emerged if inexperienced triage RNs had been included.

The sample consisted of RNs that were willing to talk about their experiences as triage RNs and data collection was conducted by face to face interviews with the participants by myself. I have been employed as an emergency RN in the city where the research took place for 27 years. It is possible that different data may have emerged if the interviews had not been conducted by someone who was well known to the participants at one of the sites. During the interviews, however, all of the participants appeared to freely and eagerly share their experiences.

As part of the study I conducted seven observations. Having an external observer present at triage may have caused the RNs to feel that they were being evaluated and they may consequently have altered their work processes and conduct. I attempted to minimize this effect by clearly stating that the intent of the research was not to assess the performance of any individual triage nurse.

The small sample size is a possible concern, however, according to the grounded theory method, data collection continued until theoretical saturation was reached.

Throughout the research process I attempted to maintain both conceptual and procedural credibility by closely adhering to the grounded theory method. I did, however, conduct a literature review prior to the study. Although I put the review aside until the core category had emerged, it is possible that some of the theories in the review may have influenced my thinking. My experience as a triage RN may also have influenced the data collection and analysis in terms of the questions I asked and my interpretation of the data. I tried to control for this by conducting fairly unstructured interviews in the early stages of the study that started with a few grand tour question and I then let the participants freely elaborate on what concerned them. Researcher bias was controlled for by, as suggested by Glaser, including an interview with myself in the data analysis.

Conclusion

Triage can be viewed as a space of uncertainty (Göransson et al., 2008). As described in this dissertation, the nurse who occupies this space of uncertainty is charged with the responsibility of making decisions within a short timeframe with limited information available regarding the patient. During my practice as an emergency triage RN and during my graduate studies I have come to think of triage as a complicated social context where the scientific model, institutional requirements, and individual patient needs all merge. The triage RN assumes a dual role with inherent tensions as both a representative of the institution, and as a professional who is trained to be a patient advocate. For instance, CTAS is based on the scientific worldview and has merit as a tool for determining acuity level, however, many triage scenarios do not fit neatly into a predetermined scale. In the actual practice context an elderly patient with a minor complaint, or a palliative cancer patient, may need to be given priority on compassionate grounds, even if they are not assessed as belonging to a high acuity group.

In addition, I have come to reflect on how the relationship of various power dynamics influence the decisions made by the triage nurse. If a critical social theory lens is applied to the triage context the patient might be viewed as a supplicant seeking ED care, with the nurse functioning in the dual role as both a powerful gatekeeper to ED care, while at the same time being subordinate to system requirements. My thinking around triage decisions as both autonomous and subject to institutional expectations is continuously evolving. I have come to think more critically about the dialectic tension inherent in the role of the triage nurse as both a powerful and powerless decision maker. Furthermore, I have come to contemplate how individual nurse characteristics, patient characteristics, the context where triage takes place, and institutional requirements coalesce into a particular triage decision.

Perennial questions that are asked when triage DM is discussed are; “How do triage mistakes occur and how do we prevent them?” The current research was not intended to answer those questions.

The main purpose was to understand how triage decisions are made by experienced triage RNs given the context in which they work. A major finding that has not been clearly articulated in the literature was how a large portion of triage DM centered around issues of managing space. In addition, the core variable momentary fitting in a fluid environment suggests that triage work and DM extend beyond assessing, prioritizing, and placing to decisions and actions that enable the triage RN to, at least momentarily, achieve fit. Striving to achieve fit is an overriding principle that guides decisions about acuity, priority, and placement of the patient in conjunction with managing available treatment spaces and to a certain degree staff resources.

The findings also suggest that experienced triage RNs, to a large extent, feel confident in recognizing sick patients, however, contextual factors such as limited treatment space in combination with multiple sick patients waiting affect where the individual patient fits into the system. These are not surprising findings, however future research needs to account for the contextual and ethical nature of triage RN DM and explore the conditions for when triage RNs start to initiate actions to create space. Three critical junctures are suggested in the theory of momentary fitting; a) a patient at triage determined to be in need of urgent or immediate medical attention in combination with no appropriate treatment space, b) an incoming critical patient in combination with no appropriate treatment space, and c) an absolute lack of treatment space including trauma beds.

The theory of momentary fitting in a fluid environment is an explanatory substantive grounded theory of triage RN DM. As such it offers a conceptual rendering of triage DM, however, grounded theories are constantly evolving and it is anticipated that the theory will be extended and modified by future findings.

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APPENDIX A: LETTER OF INVITATION

UNIVERSITY OF CALGARY
NURSING

Dr. James A. Rankin
Professor & Nurse Practitioner
Telephone: 403-220-4640
Fax: (403) 284-4803
Email: rankin@ucalgary.ca

Invitation to Participate in Nursing Research

We are researchers in the Faculty of Nursing at the University of Calgary and would like to invite you to participate in our study.

We are interested in the valuable work that triage RNs do and how they handle the multiple challenges of the triage environment.

We would like to interview emergency RNs with five or more years of triage experience.

The interviews will be 45 to 60 minutes in length. You will be interviewed in a private setting by an experienced emergency nurse. Your identity will remain completely confidential.

If you have five or more years of triage experience and would like to help us increase our understanding of emergency triage nursing please consider participating in our study.

Since participation in this study will be kept confidential, please do not contact your manager for more information, instead please contact Gudrun Reay at 403-220-4640 or email at g.reay@ucalgary.ca

Sincerely,

Dr. James Rankin RN NP PhD
Principal Investigator & Professor

Gudrun Reay RN BN
PhD Candidate & Co-researcher

Faculty of Nursing, University of Calgary

The research has received ethical approval from the Conjoint Health Research Ethics Board, Office of Biomedical Ethics, University of Calgary.

APPENDIX B: POSTER

Dr. James A. Rankin
Professor & Nurse Practitioner
Telephone: 403-220-4640
Fax: (403) 284-4803
Email: rankin@ucalgary.ca

Triage Nurses Research Study

Are you an emergency RN with five or more years of triage experience?

Would you be willing to participate in our study about triage?

We would like to interview you to understand more about your work and how you handle the challenges of triage.

The interview will take 45 to 60 minutes in a private setting by an experienced emergency nurse.

Your identity will remain completely confidential.

For more information please contact:

Gudrun Reay at 403-220-4640 or email at g.reay@ucalgary.ca

Dr. James Rankin RN NP PhD
Principal Investigator

Gudrun Reay RN BN PhD Candidate
Co-researcher

Faculty of Nursing, University of Calgary

The research has received ethical approval from the Conjoint Health Research Ethics Board, Office of Biomedical Ethics, University of Calgary

APPENDIX C: CONSENT FOR INTERVIEW

Dr. James A. Rankin
Professor & Nurse Practitioner
Telephone: 403-220-4640
Fax: (403) 284-4803
Email: rankin@ucalgary.ca

TITLE:

Decision Making in Emergency Department Triage Registered Nurses

INVESTIGATORS:

Dr. James A. Rankin RN NP PhD, Principal Investigator
Gudrun Reay RN BN PhD (C), Co-researcher
Contact number 403-220-4640

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, please ask. Take the time to read this carefully and to understand any accompanying information. You will receive a copy of this form.

BACKGROUND

As an emergency triage RN you make decisions about how sick patients are and in what order patients are examined by a physician. An understanding of how triage nurses formulate triage decisions is a vital aspect in ensuring patient safety.

Fifteen RNs will be enrolled in the study and the triage environment will be observed at three different emergency departments on two occasions. The research method we will be using is called "Grounded Theory".

Our study will consist of a 45 to 60 minute interview with you. The interviews will be recorded, transcribed, and analyzed. In addition one of us (Gudrun Reay) will make observations of the triage environment. The participants that are interviewed are not necessarily the participants who will be observed. The analysis of the data will be done in accordance with the Grounded Theory method.

WHAT IS THE PURPOSE OF THE STUDY?

The purpose of the study is to increase our understanding of how triage nurses make decisions and then we will develop a theory of triage nurse decision-making.

WHAT WOULD I HAVE TO DO?

If you chose to participate in the study you will be asked to take part in an interview for 45 to 60 minutes. You will be asked some questions about your experience as an emergency triage nurse. The only personal information that will be collected is the number of years you have been an RN and the number of years you have been an emergency nurse.

You do not have to answer any questions you do not wish to answer, and you may terminate the interview at any time. The interview will be digitally recorded to make an accurate record of what you say during the interview. The interview will be take place in an office at the University of Calgary, or in a private setting of your choice.

WHAT ARE THE RISKS?

There are no risks to you as a result of your participation in this study.

WILL I BENEFIT IF I TAKE PART?

If you agree to participate in this study there may or may not be a direct benefit to you. The information we get from this study will help us to better understand how triage nurses make decisions about patient acuity and priority.

DO I HAVE TO PARTICIPATE?

Your participation is voluntary and you do not have to answer any questions you do not wish to answer. You can terminate the interview at any point during the interview.
You can withdraw from the study at any time should you wish to do so by contacting the co-researcher Gudrun Reay at 403-220-4640.
If you decide to terminate the interview during the interview the data you have provided will not be included in the study.
If you decided to withdraw from the study after the interview is completed you need to inform Gudrun Reay at 403-220-4640 as soon as possible. If data analysis has already commenced it will not be possible to withdraw the data you have provided.

WILL I BE PAID FOR PARTICIPATING, OR DO I HAVE TO PAY FOR ANYTHING?

If you have to travel to the interview location you will be reimbursed mileage cost at $0.53/km. You will be reimbursed for parking costs and be given a complimentary $10.00 coffee card.

WILL MY RECORDS BE KEPT PRIVATE?

Yes, your records will be kept private. The digital recording of your interview will be stored on a password-protected computer with a firewall.

The interview transcript will be stored in a locked filing cabinet at the Faculty of Nursing, University of Calgary. This transcript will not contain any information that links the interview with you. Your name and the names of any people or organizations you mention will be replaced with fake names. Only Dr. James Rankin, Dr. Shelley Raffin, and Gudrun Reay will have access to the recordings and transcripts.

The digital recording will be erased after 5 years. The transcript will be shredded after 5 years.

Quotes from your interview transcript may be used in Gudrun Reay's PhD dissertation and publications in academic journals. The data will be presented in a way that conceals your identity.

SIGNATURES

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time. If you have further questions concerning matters related to this research, please contact:

Gudrun Reay, Co-researcher at 403-220-4640

Or

Dr. James A. Rankin (403) 220-4640

If you have any questions concerning your rights as a possible participant in this research, please contact The Chair of the Conjoint Health Research Ethics Board at the Office of Medical Bioethics, 403-220-7990 or the Ethics Resource Officer, Internal Awards, Research Services, University of Calgary, at 403-220-3782.

Participant's Name	Signature and Date
Investigator/Delegate's Name	Signature and Date
Witness' Name	Signature and Date

The University of Calgary Conjoint Health Research Ethics Board has approved this research study.

A signed copy of this consent form has been given to you to keep for your records and reference.

APPENDIX D: CONSENT FOR OBSERVATION

Dr. James A. Rankin
Professor & Nurse Practitioner
Telephone: 403-220-4640
Fax: (403) 284-4803
Email: rankin@ucalgary.ca

TITLE:

Decision Making in Emergency Department Triage Registered Nurses

INVESTIGATORS:

Dr. James A. Rankin RN NP PhD, Principal Investigator
Gudrun Reay RN BN PhD (C), Co-researcher
Contact number 403-220-4640

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, please ask. Take the time to read this carefully and to understand any accompanying information. You will receive a copy of this form.

BACKGROUND

As an emergency triage RN you make decisions about how sick patients are and in what order patients are examined by a physician. An understanding of how triage nurses formulate triage decisions is a vital aspect in ensuring patient safety.

The triage environment will be observed at three different emergency departments on two different occasions. In addition 15 RNs will be interviewed. The research method we will be using is called "Grounded Theory".

WHAT IS THE PURPOSE OF THE STUDY?

The purpose of the study is to increase our understanding of how triage nurses make decisions and then we will develop a theory of triage nurse decision-making.

WHAT WOULD I HAVE TO DO?

If you chose to participate in the study one of us (Gudrun Reay) will observe the triage environment while you are working. Your name will not appear in the study. The intent of the observation is to gain an understanding of the triage environment. The observation is not intended as an evaluation of your work.

WHAT ARE THE RISKS?

There are no risks to you as a result of your participation in this study.

WILL I BENEFIT IF I TAKE PART?

If you agree to participate in this study there may or may not be a direct benefit to you. The information we get from this study will help us to better understand how triage nurses make decisions about patient acuity and priority.

DO I HAVE TO PARTICIPATE?

Your participation is voluntary. You can terminate your participation at any point by advising the observer (Gudrun Reay) that you do not wish to have your work at triage observed. Date collected up to that point will not be included in the study.
If you decided to withdraw from the study after the observation is completed you need to inform Gudrun Reay at 403-220-4640 as soon as possible. If data analysis has already commenced it will not be possible to withdraw the data you have provided.

WILL I BE PAID FOR PARTICIPATING, OR DO I HAVE TO PAY FOR ANYTHING?

You will not be paid for participating in the study.

WILL MY RECORDS BE KEPT PRIVATE?

Yes, your records will be kept private.
The field notes from the observation will be stored in a locked filing cabinet at the Faculty of Nursing, University of Calgary. The field notes will not contain any information that links the observation with you. Only Dr. James Rankin, Dr. Shelley Raffin, and Gudrun Reay will have access to the field notes.

The field notes will be shredded after 5 years.

Descriptions from the observation may be used in Gudrun Reay's PhD dissertation and publications in academic journals. The data will be presented in a way that conceals your identity.

SIGNATURES

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time. If you have further questions concerning matters related to this research, please contact:

Gudrun Reay, Co-researcher at 403-220-4640

Or

Dr. James A. Rankin (403) 220-4640

If you have any questions concerning your rights as a possible participant in this research, please contact The Chair of the Conjoint Health Research Ethics Board at the Office of Medical Bioethics, 403-220-7990 or the Ethics Resource Officer, Internal Awards, Research Services, University of Calgary, at 403-220-3782.

Participant's Name	Signature and Date
Investigator/Delegate's Name	Signature and Date
Witness' Name	Signature and Date

The University of Calgary Conjoint Health Research Ethics Board has approved this research study.

A signed copy of this consent form has been given to you to keep for your records and reference.