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Fitting Things Together: A Grounded Theory Study of Clinical Judgment in Nursing

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FITTING THINGS TOGETHER:
A GROUNDED THEORY STUDY OF CLINICAL JUDGMENT IN NURSING

A DISSERTATION SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

PROGRAM IN NURSING

BY
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CHICAGO, ILLINOIS
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To my family. Thank you for making this possible.
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Figure 1. Fitting Things Together. Model of the process registered nurses use to make clinical judgments in the acute care setting  80/135
ABSTRACT

Safe and appropriate patient care hinges on the nurse’s skill in assessment and interpretation of data to support accurate clinical judgments; however, a review of nursing literature reveals the lack of an empirically derived theory of clinical judgment or methods to teach the skill. Progress has been limited because of the difficulties inherent in measuring cognitive work in complex practice environments, as well as the tendency of nursing authors and researchers to substitute a wide variety of terms for clinical judgment. Knowledge development in any discipline is hampered when terms are not clearly defined and the distinction between related concepts is blurred. The purpose of this study was to develop a substantive theory of clinical judgment in nursing to overcome the limitations of existing research.

Classical grounded theory was used to discover the process hospital based registered nurses with two to three years of clinical experience use to make clinical judgments as they provide care to patients in the course of a work shift. Semi-structured interviews were conducted with 15 nurses employed on a variety of inpatient nursing units in three Magnet® status teaching hospitals in the Midwestern United States. Data were analyzed using the constant comparison method. A substantive theory of clinical judgment emerged from the data, with the core category Fitting Things Together integrating additional categories that represent stages in the model, including Knowing, Anticipating, Prioritizing, Observing, Thinking, Catching Things, Figuring Out What’s
Going On, and Determining What Needs to be Done. The theory that emerged in the study explains how each stage of the model contributes to knowing the patient and how each situation that requires clinical judgment provides an opportunity for learning at work.

The substantive theory of the clinical judgment process that emerged from this study will facilitate research and measurement of clinical judgment in nursing practice and education and the design of strategies to teach the skill at various levels of clinical expertise.
CHAPTER ONE

INTRODUCTION

In the high stakes setting of direct patient care, safety and quality hinge on the nurse’s skill in assessment and interpretation of data to support accurate clinical judgments. The primary responsibility for surveillance at the point of care lies with the nurse; therefore, it is the nurse’s clinical judgment that often determines the speed with which life threatening conditions are addressed (Etheridge, 2007; Minick & Harvey, 2003). The entire health care team depends on the nurse’s ability to recognize critical clinical cues, interpret the importance of those cues, and reach an accurate conclusion regarding the patient’s immediate and long-term needs. However, little is known about the cognitive work that underlies the visible tasks nurses perform, or the relation between the planning, intervention, and predictive reasoning that accompanies the intellectual effort (Thompson, Spilsbury, Dowding, Pattendon, & Bronlow, 2008). Work that is poorly understood is often undervalued. Therefore, despite the essential role of the nurse as the patient’s last line of defense at the point of care (Despins, Scott-Cawiezell, & Rouder, 2010), the lack of a clear understanding of the clinical judgment process that informs nursing interventions has tied the image of nurses to the tasks they perform instead of the knowledge they possess (Evans & Donnelly, 2006).

Since nursing judgment plays a critical role in patient outcomes related to both quality and safety (Welsh & Lyons, 2001), a primary goal of nursing education is to
assist students to develop skills that will facilitate accurate clinical judgment (Etheridge, 2007). However, the manner in which students learn to make clinical judgments is not well understood (Bowles, 2000; Grealish, 2000; Thompson & Stapely, 2011), and new graduates in the workforce report a lack of preparation for the scope of their responsibility in the clinical practice setting and a lack of confidence in their ability to make accurate clinical judgments (Etheridge, 2007). A review of the literature related to clinical judgment reveals the lack of a widely accepted theory of clinical judgment in nursing, or methods to teach the skill at various levels of clinical expertise. Many variables thought to influence clinical judgment have been identified, but a coherent structure for the variables has not been established and widely tested. Until clinical judgment in nursing is understood, nursing faculty will struggle to fulfill the mandate of accrediting bodies to prepare nurses who are both confident and competent in their clinical judgment skills. The struggle of nursing faculty will extend to the practice setting, where nurses in administration and staff education must support the learning necessary to refine clinical judgment skills as a key component of professional development.

Background

Despite decades of interest in the cognitive tasks associated with nursing work, progress in promoting understanding of the clinical judgment process has been slow. The numerous difficulties inherent in the measurement of invisible cognitive work in complex practice environments (Taylor, 1997) have deterred investigators from the study of clinical judgment in its own right (Doona, 1995). Researchers tend to subsume clinical
judgment under other processes, such as decision-making, or focus their work on concepts, like critical thinking, for which widely used measurement instruments are available. Textbook authors use the term in book and chapter titles, but often make little or no mention of the concept (Rushing, 2009), instead focusing on related terms such as critical thinking or problem solving, perpetuating the assumption that clinical judgment can be learned if associated cognitive skills are discussed. Therefore, best practice in education related to clinical judgment has not been identified, and theory development has been limited.

Terms nursing authors and researchers routinely use interchangeably with clinical judgment include clinical inference, clinical reasoning, critical thinking, clinical decision making, and problem solving. While all of these terms relate to the process of collecting, organizing, and analyzing clinical data (Lee, Chan, & Phillips, 2006), some terms reflect clinical judgment as a means to an end (decision making and problem solving) while others describe the cognitive processes (clinical inference, clinical reasoning, and critical thinking) nurses use to make their judgments. Due to the lack of uniformity in the use of terminology related to the cognitive aspect of nurses’ work, the antecedents of clinical judgment have become confused with its consequences, the distinction between related concepts is blurred, and existing research is difficult to interpret (Maule, 2001).

Investigating the Cognitive Aspect of Nursing Work

Licensure in nursing has long been accepted as a measure of readiness to practice; however, it is incumbent upon the profession to routinely examine the skills necessary to insure competence (Utley-Smith, 2004), since trends, resources, and knowledge
development impact the health care needs of society and the role of the nurse in the healthcare system. Changes in nursing practice and education, driven by advances in technology and the scientific community’s embrace of the positivist paradigm, were instrumental in focusing attention on the cognitive skills that underlie the visible tasks nurses perform in the latter half of the 20th century. The complexities of the current practice environment and the unique role nurses play in patient surveillance to insure safety and quality in the acute care setting (Despins et al., 2010; Schmidt, 2010) are key factors in the persistent struggle to understand nursing work.

**Building nursing science.** A significant impetus to describe the cognitive skills that inform nursing practice was the positivist paradigm that dominated the scientific community in the latter half of the 20th century (Cioffi, 1997). To advance nursing as a science, nursing work had to be transformed from visible tasks based on routine and intuition (Young, 1987) to practice based on sound scientific principles that required education beyond the apprenticeship model of hospital based training for nurses (Wolf, 2006). As nursing struggled for recognition as a discipline, the nursing process was embraced by those who saw parallels between the process and the respected scientific method (Cioffi, 1997). Once the nursing process was established as the organizing framework for the delivery and planning of nursing care, the scope of identifiable nursing problems expanded, resulting in the recognition of domain specific knowledge and an independent realm of nursing practice.

The term *nursing diagnosis*, characterized by the North American Nurses Diagnosis Association (NANDA) as clinical judgment (North American Nurses
Diagnosis Association, 1999), was added to nursing vocabulary when it was recognized as a step in the nursing process in the 1970’s (Pesut & Herman, 1998). The addition of diagnosis as a formal step in the nursing process created an interest in identifying diagnoses pertinent to the nursing care of patients, as well as the thought processes necessary to accurately assign nursing diagnoses based on assessment data. It soon became obvious that nurses at the point of care would need more than empirical and theoretical knowledge to engage in the reasoning required to use nursing diagnoses in practice. Thus, the advent of nursing diagnosis provided a strong impetus for scholars to begin to investigate the cognitive aspect of nursing work (Pesut & Herman, 1998), giving rise to the numerous terms currently associated with and substituted for clinical judgment, including clinical reasoning, clinical inference, critical thinking, problem solving, decision making, and nursing diagnosis.

**The education – practice gap.** While advocates of the positivist paradigm noted with interest that nursing, based on assessment as opposed to ritual, tradition, and routine (McCain, 1965), was evolving into a science that required complex cognitive work, nurses in practice were growing increasingly frustrated with the perceived lack of adequate preparation of new graduates for independent practice in the acute care environment. That frustration was documented in two publications released in the 1970’s: *Reality Shock: Why Nurses Leave Nursing* (Kramer, 1974), and *The New Nurse’s Work Entry: A Troubled Sponsorship* (Benner & Benner, 1979). Both works were landmark in contributing to identification of work entry issues that lead to the burnout of new nurses and early exit from the profession. While Kramer is still associated with the term “reality
shock,” Benner and Benner’s book launched a program of research that led to the novice to expert model (Benner, 1984) of skill acquisition in nursing. This model, based on the model of skill acquisition originally proposed by Dreyfus and Dreyfus (Benner, 2004), has formed the basis of much of the research on the development of clinical expertise in nursing, including the refinement of the clinical judgment skills inherent in expert practice; it has been adopted as the framework for professional development of newly licensed RNs in countless practice settings around the world (Nelson, 2004).

Benner’s development of the novice to expert model of skill acquisition in nursing challenged the assumption that the simple completion of technical skills checklists (Nelson, 2004) and orientation to organizational policy and procedure would successfully transition the new nurse to practice. The separation of the practice and educational settings, as nursing education moved from hospitals into colleges and universities, was thought by many to have contributed to the disconnect between the expectations of newly licensed RNs and experienced nurses in practice (Benner & Benner, 1979). However, the work environment of the nurse was changing, as was the delivery of nursing education, with advances in technology, including diagnostic and monitoring equipment, resulting in hospitalized patients with higher acuities and more complex treatment regimens. Based on observations of nurses in practice, Benner (1984) eventually concluded that theoretical knowledge must be augmented by real world experience to facilitate professional development, which would occur in a predictable, sequential fashion in practice after licensure.
The novice to expert model (Benner, 1984) provided an explanation for both the reality shock newly licensed RNs were reporting in the 1970’s and the frustrations of experienced nurses with the inability of new graduates to practice independently upon entering the work force. However, the realization that newly licensed RNs required support in practice to augment the theoretical knowledge they had acquired in pre-licensure education in order to refine clinical judgment skills did not radically change practice. Newly licensed RNs are still expected to assume responsibility for a group of patients in the practice setting within a few months of licensure (Ebright, Urden, Patterson, & Chalko, 2004), when their focus on rules, tasks, and mastery of practice routines obscures the sensitivity to context necessary for accurate clinical judgment.

**The uniqueness of nursing work.** Clinicians from different disciplines interpret situations and understand problems differently based on their histories, experiences, and scope of practice (Schon, 1987); there are, therefore, aspects of clinical judgment that are unique to nursing. In the medical literature, clinical judgment is synonymous with diagnosis, which precedes decision making about appropriate treatment for a client (Cioffi, 2002). Clients seek an answer from their physician, in the form of diagnosis, but the expectations of nursing care are different, and the nature of nurses’ work is different, as well. Nurses focus more on the response of patients to their conditions and associated treatments, as well as surveillance to detect changes in a patient’s status or risk of complications (Cioffi, 2002; Lavin et al., 2002). The physician may diagnose the patient’s primary medical problem and prescribe treatment, but the episodic nature of the
physician’s encounters with the patient in the acute care setting leaves detection of subtle changes, indicative of progress or deterioration, to the nurse (Minick & Harvey, 2003).

Surveillance has always been a primary responsibility of the nurse at the point of care; however, the complex needs of hospitalized patients and the multidisciplinary approach to health care have increased the significance of this aspect of the nurse’s work. Every member of the health care team shares responsibility for the outcomes of care provided; however, in the acute care setting nurses are the only profession with a representative at the patient’s side on a continual basis. As the common denominator in the patient’s care and the key interface between multiple providers, the nature of the nurse’s relationship with other team members is unique. Since the nurse’s extended contact with patients and families creates a different dynamic than that resulting from the intermittent presence of other health care providers, the nurse has a unique relationship with patients and family members, as well. Nurses in the acute care setting balance competing demands from multiple sources (Despins et al., 2010) when they assume responsibility for the care of a group of patients, but it is currently unknown how they adjust their priorities in the real world of practice as they make the clinical judgments necessary to insure patient safety.

The focus in the literature on patient safety and quality of care has traditionally been on patient outcomes and patient satisfaction (Burhans & Alligood, 2010). Lessons learned from the failure to rescue literature can, no doubt, inform practice, but the scope of nursing practice goes beyond crisis management (Benner, Sutphen, Leonard, & Day, 2010). Every patient problem or need the nurse encounters cannot be resolved with
practice guidelines or algorithms designed to standardize care and prevent errors in judgment that jeopardize patient outcomes. The frequent interactions between nurses, patients, and families often facilitate a trust and a willingness to confide in the nurse that other providers do not enjoy (Welsh & Lyons, 2001), placing nurses in a position to deal with personal and psychosocial aspects of care that other providers do not experience. The danger in a persistent focus on crisis management, and algorithms and protocols that fail to consider the individual patient’s perspective, is that clinical judgment will be replaced by scripted problem solving, with the focus of care on the provider instead of the patient. Nurses at the point of care can contribute to the safety and quality literature by describing the process they use to make clinical judgments in the everyday situations that represent a broader scope of practice, beyond responding to crises.

In summary, while evidence suggests that newly licensed nurses transition to expert practice over time (Benner, 1984), the complexities of the current practice environment are a challenge to new graduates who report difficulties integrating multiple sources of data to make clinical judgments and manage a group of patients in the acute care setting (Li & Kenward, 2006). The focus on safety and quality in healthcare has been on evidence-based practice and the development of protocols and practice guidelines, but limited attention has been given to the process by which individual nurses, who patients and providers depend on to appropriately initiate safeguards, make their clinical judgments in the dynamic acute care setting.
Significance

As a profession, nursing is granted authority to practice based on a social contract with society (American Nurses Association [ANA], 2010) that delineates the rights and responsibilities of professional nurses; autonomy over practice is granted with the expectation that the profession will protect the public by responding effectively to the health care needs of society (Silva, 1983). Clinical judgment figures prominently in the current social contract (ANA, 2010), with nursing defined, in part, as the “application of scientific knowledge to the process of diagnosis and treatment through the use of judgment and critical thinking” (p. 9). Since the education of practitioners to fulfill the social contract is the responsibility of the profession, nursing educators are obligated to accept responsibility for the development of students’ clinical judgment skills as an outcome of nursing education. However, the traditional design of nursing education, the complexities of the current practice environment, and the lack of a theory of clinical judgment in nursing pose considerable challenges to educators in their attempts to teach the skill.

Current Practice in Nursing Education

As a profession, nursing is unique in terms of expectations of independent practice by new graduates in the acute care setting (Spector & Echternacht, 2010), where the margin for error is small and the consequences of poor judgment can be fatal. Other health care professions have more standardized educational requirements for entry into practice, lengthy residency programs that use experienced practitioners to supervise the care given by novices (Ironside, 2008), or a more limited scope of responsibility for
coordination of care, administration of medications, and participation in invasive procedures. Newly graduated RNs are deemed competent to practice based on a passing score on a multiple choice licensing examination, despite clinical experience that is often limited to that acquired in the clinical component of nursing courses in one of many possible options for pre-licensure education. Even though computerized test delivery has expanded the potential for more authentic test items, the context of the practice environment cannot be replicated in a multiple-choice examination; success on such an examination does not necessarily translate into the ability to make accurate clinical judgments in the practice setting.

Alternative models for pre-licensure education in nursing have been developed in recent years to accommodate adult learners and individuals pursuing nursing as a second career; however, overall changes in nursing education have been minor (National League for Nursing [NLN], 2005). The traditional model of theory in the classroom and experiential learning in the hospital continues (Benner et al., 2010), despite little evidence this approach is the best method to prepare entry level nurses for today’s practice environment. With accreditation dependent on acceptable passing rates on the National Council Licensing Examination (NCLEX), there is a focus in most pre-licensure programs on multiple choice testing and a tendency to equate successful licensing examination pass rates with educational success (Oermann, Salivert, Charasika, & Yarbrough, 2009). However, since new graduates continue to echo their dismay at their lack of preparation for the responsibilities they must assume in practice and a lack of confidence in their clinical judgment skills (Etheridge, 2007; Li & Kenward, 2006),
concerns shared by nursing administrators (Oermann et al., 2009), it may be that current methods of teaching and assessment in pre-licensure programs prepare new graduates for the licensing examination, but not for the realities of practice. A study designed to conceptualize clinical judgment will help nurse educators to bridge the gap between pre-licensure preparation and the skills necessary for accurate clinical judgment in contemporary practice settings.

Experiential learning in the clinical setting is a critical aspect of nursing education (Benner et al., 2010). However, the challenges inherent in clinical education are exacerbated by a host of factors (Tanner, 2006a), including the increased acuity of hospitalized patients, decreased length of stay for patients in the acute care setting, competition for appropriate clinical placements, shortage of nursing faculty, and technology that varies from one clinical setting to the next. Opportunities for student learning are limited by the patients that are available on the assigned unit on any given day, as well as the constraints imposed by the faculty-student ratio and restrictions the clinical agency may place on student activity. Opportunities for students to manage a crisis are often limited to observation of agency staff; experience with skills necessary for practice after graduation, such as delegation, coordination of care, and collaboration, are limited for students in most clinical settings. While the experience students gain in clinical education no doubt increases their exposure to the technical aspects of nursing care, the contribution clinical education makes to the development of clinical judgment skills is less certain.
High fidelity simulation is a teaching strategy used with increasing frequency in nursing education to overcome some of the limitations inherent in traditional clinical instruction (Parker & Myrick, 2009). Research on the use of simulation in nursing education indicates faculty and students like the strategy (Nehring & Lashley, 2009), but statistical evaluation of the efficacy of simulation is difficult, particularly in relation to its association with individual performance in the actual clinical setting. Whether simulation is used as a teaching strategy or a method of evaluation, the performance of students in a simulation scenario, where they have a vested interest to succeed and are not challenged by contextual influences on clinical judgment, does not necessarily translate into accurate judgment in the clinical setting. The use of simulation to enhance clinical teaching in nursing education may increase personal confidence in clinical performance, but the influence of simulation on competence in clinical judgment in practice is unknown.

The complexity of nursing practice is escalating faster than innovations in education can be researched, designed, and implemented to resolve the concerns of multiple stakeholders regarding the readiness of new graduates to practice (Ironside, 2008). Currently, the National Council of State Boards of Nursing (NCSBN) is considering mandatory transition programs for newly licensed RNs (Dyess & Sherman, 2009; Spector & Echternacht, 2010); formal residency programs are advocated by the Joint Commission (2002) and recommended in a recent report on nursing education supported by the Carnegie Foundation (Benner et al., 2010). It seems the traditional measures of readiness to practice in nursing are no longer appropriate; what is less clear is where the fundamental flaw lies.
Regulatory models for the transition of new graduates to practice may bridge the education practice gap, but supplementing deficiencies in pre-licensure preparation with post-licensure programs will do little to inform best practice in nursing education. While it is true that newly licensed RNs report a lack of confidence in their clinical judgment skills (Etheridge, 2007) that contributes to difficulties managing a group of patients in the acute care setting (Li & Kenward, 2006), it appears the majority of nurses do, in fact, somehow achieve competence in clinical judgment. The concern in health care over preventable medical errors is not unfounded, but most patients admitted to acute care settings do experience positive, or at least neutral, outcomes. Some of that success must be attributed to the clinical judgment of nurses at the point of care, since the primary responsibility for surveillance in acute care lies with the nurse. Even in those situations where surveillance is enhanced by system interventions, such as algorithms to direct assessment or rapid response teams to promote early intervention, the initiation of safeguards and the application of protocols and guidelines still depend on the clinical judgment of the nurse at the point of care.

The concerns of newly licensed RNs (Etheridge, 2007; Li & Kenward, 2006), nurse executives (Dyess & Sherman, 2009; Utley-Smith. 2004), managers (Burns & Poster, 2008) and expert clinicians (Hickey, 2009) regarding the clinical judgment skills of new graduates are well documented, yet little progress has been made in understanding how nurses develop competence in clinical judgment. It is unknown how the complexities of the current practice environment impact the development of clinical judgment skills, or whether the socializing forces in the contemporary clinical setting
affect all nurses in the same manner. These questions will remain unanswered until efforts to understand clinical judgment move beyond description to conceptualization, which will generate the theoretical models necessary to test hypotheses and measure clinical judgment in practice and education.

For decades the focus has been on the new graduate, yet the concerns of multiple stakeholders regarding the ability of new graduates to make accurate and timely clinical judgments independently persist. The voice that is missing is that of the nurse who is neither newly licensed nor considered an expert, but who functions at the point of care in the acute care setting, presumably having developed both confidence and competence in clinical judgment skills. A study of nurses with two to three years of experience on acute care units regarding the process they use to make clinical judgments, and the evolution of their clinical judgment skills, will provide new insight into the gap between education and practice, and facilitate the design of educational interventions to teach clinical judgment skills at varying levels of expertise.

**Fulfilling Nursing’s Social Contract**

Although *Nursing’s Social Policy Statement* (ANA, 2010) mandating the development of clinical judgment skills in the course of nursing education is recent (ANA, 2010), clinical judgment was a key component of Montag’s (1951) well known proposal to move nursing education from hospitals to colleges and universities and differentiate the work of technical from professional nurses. Montag depicted the functions of nurses on a continuum ranging from those that required only common knowledge, to intermediate functions that required some judgment, to complex functions.
that required expert judgment. Montag envisioned the functions requiring expert judgment would be the responsibility of professional nurses prepared in baccalaureate programs, and would encompass “identification or diagnosis of the nursing problem and the recognition of its many interrelated aspects” (p. 5). Even in an era when the complexity of the practice environment paled in comparison to the contemporary practice setting, Montag recognized clinical judgment as an essential element of nursing work and a key organizing concept in the design of nursing education.

The nursing profession can no longer rely on successful NCLEX scores alone as a measure of educational success in nursing or proof that the social contract to educate nurses who are competent in clinical judgment has been fulfilled. The ethical obligation of nursing educators to prepare students for the licensing examination must be balanced with the obligations imposed by the profession’s contract with society to prepare professionals who are competent in their clinical judgment skills. If evaluation of clinical judgment in nursing education does not assume the prominence currently given to technical skills and the testing of theoretical knowledge, a key element of nursing’s social contract will remain unfulfilled. However, understanding of the clinical judgment process at the point of care is limited; it is unlikely the skill can be taught or fostered if it remains poorly understood. Research is necessary to conceptualize clinical judgment and generate the theory necessary to facilitate the planned development of clinical judgment through education, as opposed to leaving development of the skill to chance in practice after licensure.
Summary

The primary responsibility for patient surveillance in acute care lies with the nurse, yet new graduates today report a lack of preparation for the scope of the clinical judgments they are required to make upon entry into practice, a finding nurse researchers and authors documented decades ago. The concerns of stakeholders regarding the readiness of new graduates for practice have been acknowledged, but not addressed. Nurse educators have made few substantive changes in the design and delivery of nursing education at the pre-licensure level, and the expectations of new graduates upon entry into practice remain essentially unchanged. Academic nurse educators are obligated by their social contract with society to prepare nurses who are competent in clinical judgment, yet clinical judgment in nursing is poorly defined, and this has hampered theory development, measurement of the concept, and the design of evidence-based strategies to teach the skill in nursing education.
Judgments reflect conclusions made in the course of evaluating information; therefore, the literature related to the thinking and reasoning skills associated with judgment crosses multiple disciplines, professions, and occupations. However, judgments in the context of health care often must be made in the face of uncertainty, where the margin for error is small and outcomes cannot be guaranteed merely by knowing what rules to apply. Since judgments made in the clinical arena impose unique cognitive demands, a perspective on the state of the science of clinical judgment in nursing is best achieved by a review of the literature on theories of judgment, as well as factors thought to specifically influence clinical judgment in nursing practice. However, in order to understand theories and interpret research, clinical judgment must be distinguished from other cognitive skills used in the problem solving process.

The Role of Clinical Judgment in Decision Making and Problem Solving

The study of clinical judgment in nursing has been complicated by authors who use the term interchangeably with terms such as clinical inference, clinical reasoning, critical thinking, clinical decision making, and problem solving (Benner, Tanner, & Chesla, 1996; Lee et al., 2006; Tanner, 2006b; Thompson, 1999; Thompson & Dowding, 2002). Failure to differentiate the cognitive skills that influence the collection and
interpretation of data, such as clinical reasoning, clinical inference, and critical thinking, from the resulting clinical judgment has perpetuated the belief that theoretical knowledge and the ability to think analytically are sufficient to insure accurate clinical judgment. Furthermore, the tendency to equate clinical judgment with decision making and problem solving leads to the assumption that a nurse who implements appropriate interventions has made an accurate clinical judgment, while the nurse who fails to intervene appropriately has made an inaccurate judgment. Neither is necessarily the case; some clinical problems can be solved simply by knowing what rules to apply, while decisions to intervene often reflect the influence of personal and situational factors.

Psychologists have avoided the ambiguity prevalent in nursing related to the conceptualization of clinical judgment by identification of basic tasks related to judgment, with particular attention to the distinction between judgment and decision making. Psychologists contend analysis of decision making is informed by statistical models of how decisions should be made when decision makers are confronted with unknown outcomes and conflicting goals (Harvey, 2001), while judgment is best understood by research on perception. According to this line of thinking, judgment precedes decision making, just as perception precedes action.

In psychology, judgments generally are conceptualized as assessments or predictions (Harvey, 2001), which are a reflection of the judge’s observation and cognitive interpretation of environmental cues to predict a condition or event. Perception, the first step in judgment, is influenced by the judge’s knowledge base relative to the situation at hand and the personal epistemological perspective of the judge, both of which
determine the importance attached to cues available in the environment and the thoroughness of data collection (Hofer & Pintrich, 1997). Interpretation of cues is influenced by information processing strategies that affect the manner in which initial hypotheses are revised as new data become available (Lee et al., 2006).

Judgments, based on perception and interpretation of data, inform decision making (Cioffi, 2002). To reach a decision, which involves selecting from available alternatives, the predicted probability of an event or condition (the judgment) is combined with the judge’s beliefs about the desirability of that event or condition (Harvey, 2001). If the judgment is not accurate, either because cues were ignored or inappropriately weighted, the resulting decision may be poor. However, an accurate judgment can still result in a poor decision, if the judge is misguided in beliefs about the desirability of the event or condition predicted given the circumstances of the situation, or lacks the motivation to pursue resolution of the problem identified. In either case, the judgment made directs decision making and, as such, is the first step in the problem solving process (Taylor, 2000).

**Theoretical Frameworks Underlying the Study of Clinical Judgment in Nursing**

The rational and intuitive frameworks provide the major theoretical perspectives for the design of research on clinical judgment. Since attempts to clearly delineate the concept of judgment as a distinct aspect of the problem solving process are more recent, studies to uncover the cognitive work associated with clinical judgment in nursing are characterized by a focus on decision making, critical thinking, or use of the terms critical thinking, clinical judgment, and decision making interchangeably. Investigators tend to
structure their work based on prevailing research paradigms; therefore, one observes a focus on the rational perspective, statistical models and information processing theory in the 1970’s and 80’s, a phenomenological perspective in the 1990’s, and a combination of the two perspectives in work related to clinical judgment in the current decade (Lee et al., 2006; Standing, 2008; Tanner, 2006).

**Rational Models of Judgment**

The rational approach to the study of clinical judgment is based on the assumption that human beings can employ rational methods to solve problems (Galanter & Patel, 2005). In direct contrast to the intuitive perspective, the focus in rational models is on objective data and hypothesis testing. Those who extend the rational approach to include any planned process using orderly steps to achieve problem resolution (Hill, 1979) place the nursing process in the realm of rational approaches to judgment and decision making (Watkins, 1998). However, more commonly recognized theoretical models in the rational perspective from the field of cognitive psychology are Baye’s theorem, decision analysis theory, and social judgment theory, all of which are based on information processing theory.

**Information processing theory.** Information processing theory, developed as an alternative to the stimulus-response conceptualization of learning (Mayer, 1996) provides an explanation of the role of theoretical knowledge and cognitive skills in the problem solving process (Simmons, Lanuza, Fonteyn, Hicks, & Holm, 2003). Early pioneers of information processing theory borrowed substantially from computer science (Mayer, 1996), contending the mind consisted primarily of memory stores and control processes,
with output created as a result of the application of cognitive processes to data received. During cognitive processing, the output from one process could become the input for the next. Thus, in assessment of a situation, data collected would inform a judgment that would, in turn, lead the judge to collect additional data or cease data collection and move on to the selection of an available option to resolve the presenting problem.

The influence of computer science on information processing theory led to an original conceptualization of information processing as a completely objective exercise. Computers, once programmed, process data in the same manner each time information is presented; computer performance is predictable and consistent. Human performance, however, is not based on programming, but on learning, which is a continuous process shaped by experience and cultural norms that influence perception and organization of facts in the memory (Taylor, 2000). To reconcile the predictability of artificial intelligence with the influence of individual experience, the initial, literal view of information processing was replaced by a belief that information processing is an active attempt to understand data presented, with incoming information received, reorganized, and integrated into the individual’s existing knowledge base (Taylor, 2000). It is the individual’s interpretation and understanding of the data presented in a situation that informs judgment and subsequently directs the search for options to resolve the problem or achieve a desired goal. This more holistic view of information processing theory has guided studies in nursing, typically in investigations of the cognitive processes employed while developing nursing diagnoses in simulated scenarios (Taylor, 2000), reasoning
associated with planning care (Corcoran, 1986; Simons et al., 2003), or performing specific nursing tasks (Eisenhauer, Hurley, & Dolan, 2007; Taylor, 1997).

Since information processing theory is a descriptive theory, it does not provide direction for making judgments and solving problems, but rather describes the interaction of an individual with the environment given the task at hand and the natural limits of the mind (Newell & Simon, 1972). Accurate judgment, key to successful problem solving, is thought to depend upon the individual’s ability to adapt to the challenges posed by bounded rationality, or the limits on what can be attended to at any one time, and the amount of information available in short term memory (Taylor, 2000). The adaptation necessary to process information efficiently is thought to be related to task complexity, formal education, domain specific knowledge, and the ability to employ heuristics (Hughes & Young, 1990; Newell & Simon, 1972).

Baye’s theorem. Baye’s theorem is a prescriptive rational model that combines the insight gained from descriptive information processing theory with the control afforded by the use of mathematical formulas and probability theory to decrease the subjectivity inherent in the judgment process. In the Bayesian approach, the judge attaches probabilities of occurrence to each hypothesis suggested by the available data based on experience, the known association of one condition with another, or the prevalence of the condition in the general population (Harbison, 2006). As new data become available, adjustments are made in the likelihood of the original hypothesis being true (Thompson, 1999); however, the adjustments made are subject to biases inherent in information processing.
**Biases inherent in information processing.** Descriptive and prescriptive problem solving models, such as information processing theory and Baye’s theorem, are based on the premise that objective data should be used to make a judgment or reach a conclusion; however, Tversky and Kahneman (1974) are well known for their contention that people do not always follow rational models when making judgments, nor consider all data equally in a given situation. Rather, people tend to use heuristics or shortcuts in their thought processes when faced with situations where outcomes are uncertain (Galanter & Patel, 2005; Levy, 2002). These shortcuts, employed without the use of analytical models or mathematical calculations (Tversky & Kahneman, 1974) allow individuals to use past experience to inform judgment and decision making. However, because all of the salient aspects of a situation are not considered, the use of heuristics can lead to errors in judgment and bias in cue interpretation; resulting judgments may be consistent, but inaccurate.

The availability heuristic is associated with the accessibility of past events in the judge’s memory (Galanter & Patel, 2005). Individuals predict the likelihood of an event based on the relative ease with which similar events can be called into mind (Raghubir & Menon, 2005). Salient experiences are easily recalled and, therefore, influence perceptions in subsequent situations deemed to be similar. Events experienced at particularly formative times in an individual’s life, those that have an intense emotional impact on the individual or society, and those that are directly experienced are the most likely to influence judgment (Galanter & Patel, 2005). The judge will have a tendency to overestimate the probability of an event, diagnosis, or outcome because of memories
associated with the previous event, even if there are discrepancies between the previous event and the current situation that make an outcome less likely (Levy, 2002). This heuristic may come into play for nurses who overestimate risk despite clinical cues to the contrary; a critical incident in a nurse’s past that resulted in a negative outcome may distort evaluation of cues in subsequent situations.

The representativeness heuristic is evident in situations where an individual makes a judgment about an object or person based on a comparison of the object or person with a prototype or category (Elstein & Schwarz, 2002; Galanter & Patel, 2005; Garb, 1996). For example, a clinician might diagnose a patient based on the clinician’s stereotype of a typical patient with the condition, even if the patient’s presenting signs and symptoms are inconsistent with published diagnostic criteria for the condition. On the other hand, a nurse might dismiss the possibility of a condition or event if the patient’s presentation is inconsistent with the nurse’s prototype of the diagnosis. The representativeness heuristic is illustrated in studies of triage nurses in emergency rooms; Arslanian-Engoren’s (2009) findings indicate triage decisions are heavily influenced by nurses’ personal prototypes for a given condition. Patients who present with atypical symptoms are often discounted, even when their atypical presentation has been addressed in the literature. In focus groups conducted with experienced emergency room nurses, participants indicated appropriate assessment factors for cardiac disease and impending cardiac events, but indicated their personal cultural and gender stereotypes impacted their triage decisions. The sample for the study was small and all participants were employed in the same university – affiliated hospital emergency department. Nonetheless, the
results are significant because participants in the study placed more importance on personal prototypes than clinical data in evaluation of patients in their care.

Anchoring and adjustment are additional heuristics that influence clinical judgment. Anchoring involves establishing a reference point based on preliminary data collection (Galanter & Patel, 2005); adjustments to the anchor are made based on subsequent data collection. Normative models of judgment and decision making, such as Baye’s theorem, prescribe methods for combination of new data with previously established hypotheses, but research suggests that people do not adjust established anchors efficiently or accurately (Hammond, Kelly, Schneider, & Vancini, 1967; O’Neill, 1995; Rosenthal, 2004). Initial hypotheses are inappropriately weighted and influence subsequent data collection (Taylor, 2000). Confirmation bias unconsciously influences the individual judge to gather data selectively and interpret evidence in a manner that supports the original hypothesis, even when confronted with contradictory evidence (O’Neill, 1995; Rosenthal, 2004). Clinicians with limited experience or an inadequate knowledge base are especially prone to premature closure (Caputo & Mior, 1998), neglecting to consider all hypotheses relevant to a situation because of data presented early in the assessment process.

Social judgment theory. Social judgment theory provides a means to measure the accuracy and consistency of an individual’s judgments (Dowding & Thompson, 2003), both of which depend upon the degree of predictability in a situation, the judge’s knowledge of the world within which the judgment must be made, and the degree of consistency with which the judge applies knowledge in situations regarding judgment
(Cooksey, 1996). Also called the “lens model” and judgment analysis, social judgment theory is based on the premise that in situations where uncertainty cannot be eliminated, a judge constructs a lens through which a situation is viewed by selecting and weighting cues available (Dowding & Thompson, 2003). The cues selected and the weights assigned are determined by the reality the judge perceives, and reflect domain specific knowledge, as well as personal values and beliefs. If the appropriate cues are noticed and weighted correctly, the resulting judgment will be accurate; if cues are missed or inappropriately weighted, the judgment will be inaccurate. Although the biases inherent in information processing are not controlled or eliminated, judgment analysis through regression modeling facilitates measurement of the judge’s consistency in the use and weighting of cues and the accuracy of judgments reached in comparison to an established criterion judgment (Thompson et al., 2009).

The Intuitive Model of Judgment

Although the strictly intuitive model of judgment is unique to nursing, there is considerable disagreement within the profession surrounding the role of intuition in the cognitive aspect of nursing work. Some equate intuition with pattern recognition (Benner & Tanner, 1987; Young, 1987) that facilitates “understanding without rationale” (Benner, 1984, p. 23), while others contend pattern recognition is conscious and, therefore, different from intuition (Offready, 1998). Regardless of the definition or parameters of intuition specified, the intuitive model of clinical judgment is based on the premise that experts do not have to rely on analytical reasoning to identify appropriate action in a given situation; intuition, informed by experience, provides the tacit
knowledge key to the task at hand (Benner & Tanner, 1987). The primary influence on clinical judgment in the intuitive model is the judge, which represents a contrast to the information processing models where the focus is on the nature of the judgment task and the conditions under which the judgment must be made.

**The Cognitive Continuum Model: Reconciling Rational Models and Intuition**

The original interest in objective knowledge and the scientific method characteristic of the positivist paradigm has traditionally been in contrast with the value for knowledge developed from practice in nursing (Lee et al., 2006). Rational models of judgment fail to account for the psychosocial variables that shape the clinical environment at the point of care. On the other hand, particularly in an era of evidence-based practice, intuitive models and subjective data are troublesome because of the inability to generate probability estimates, calculate prevalence rates, or evaluate parameters of sensitivity and specificity. Cognitive continuum theory reflects a synthesis of the rational and intuitive perspectives, with both aspects of cognition recognized as relevant to the clinical judgment process.

According to cognitive continuum theory, different judgment tasks require different cognitive approaches (Harbison, 2006; Standing, 2008; Thompson, 1999); efficiency is maximized when the mode of cognition used to address the judgment task is consistent with the thought process necessary to resolve the situation at hand. Factors that determine the complexity of the judgment task include the structure of the task, the time available to make the judgment, the cues available to inform the judgment, existence and knowledge of statistical data relative to the problem, and the resources available to the
judge (Thompson, 1999). The continuum is anchored at one end by intuition and at the other by scientific experiment; intermediate anchors are peer aided judgment, system aided judgment, quasi-experimental techniques, and controlled trials. Judgment tasks that are ill structured and made under time pressure favor the intuitive end of the model, while tasks that are well structured and lack time pressure favor more rational modes of cognition. According to Harbison (2006), most nurses operate at the intuitive and peer aided perspectives on the continuum; this is consistent with reports that nurses at the point of care favor experience over evidence (Thompson et al., 2009). Intuitive judges tend to be confident in the outcomes of their judgments, whereas judges who operate at the more rational perspectives on the continuum are confident in their methods (Dunwoody, Haarbauer, Mahan, Marino, & Tang, 2000).

The cognitive continuum first proposed by Hamm (1988) to explain the processes used for clinical judgment and decision making in medicine was recently revised by Standing (2008) to increase its applicability to nursing practice. The six modes of cognition in the original model have been extended to include nine modes of practice. The anchors on the continuum are unchanged, but Standing’s model incorporates reflective judgment as the mode just above intuition, adds “patient” to the peer assisted judgment mode, and revises the remaining anchors to include critical appraisal of research, action, survey, and qualitative research. The final anchor on the rational end of the continuum is experimental research. Standing recommends the revised continuum be used as a teaching tool and practice guide; the visual representation of the sources of knowledge on the continuum may indeed be useful in assisting nurses at the point of care.
to appreciate the cognitive work inherent in their practice, as well as the necessity to match cognitive mode to judgment task (Cader, Campbell, & Watson, 2005).

**State of the Science of Clinical Judgment in Nursing**

The struggle that has persisted in nursing to name and describe the cognitive aspect of nursing work may be related to the tasks that are the visible part of nursing practice. Unlike members of other professions, nurses are known more for what they do than what they know (Evans & Donnelly, 2006). Even though nurses engage in complex cognitive work in the course of planning care and performing psychomotor skills, the skills performed are often isolated from the knowledge required, and clinical judgment, the first step in the problem solving process, is overlooked. However, the complexities of the current practice environment, calls for practice based on evidence rather than tradition, and the demand for efficient use of resources at all levels have heightened the accountability of the nurse at the point of care and renewed an interest in the process by which nurses make clinical judgments that form the basis of safe and effective care.

There is no widely accepted theory of clinical judgment in nursing to parallel information processing theory in cognitive psychology. Until recently, the realities of clinical practice settings, the educational preparation of the majority of nurses at the point of care, and the lack of objectively derived frequency data for many of the conditions of concern to nurses have been accepted as obstacles to the use of the rational models of information processing theory in nursing, particularly the prescriptive models that employ statistical formulas and the use of probability theory (Harbison, 2006; Lee et al., 2006). However, Harbison (2006) argues nurses engage in probability based thinking
when they determine the relevance and weight of evidence as they evaluate clinical cues or estimate the likelihood a treatment will be effective in a given situation. Technology has simplified the calculations necessary to use complicated statistical formulas and probability theory is an effective means of dealing with the uncertainty inherent in clinical practice (Harbison, 2006); therefore, traditional arguments against complex prescriptive models are no longer viable. Nurses at the point of care require the analytical and numeracy skills necessary to interpret evidence, or they will continue to favor subjective approaches to clinical judgment and persist in their tendency to value experience over evidence (McCaughan, Thompson, Cullum, Sheldon, & Raynor, 2005; Thompson & Dowding, 2002).

The evidence-based practice movement is appealing to nurses in practice and education who have been frustrated in attempts to identify an orderly, linear process for clinical judgment at the point of care. In reality, the order science and evidence can impose on the clinical judgment process is limited. Nurses need the skills to evaluate evidence, but because they deal with patients who are unique in environments that are complex, every situation nurses encounter cannot be resolved with mathematical formulas and probability theory. The significance of clinical cues is not equal across all situations. Intervening variables unique to a particular situation, including the goals of the patient, may alter the salience of a particular clinical cue. Therefore, the precision the prescriptive models, such as Baye’s theorem, provide is not sufficient to unravel the complexities of clinical judgment. Thus, nursing authors and researchers often turn to descriptive theory in an effort to explain clinical judgment at the point of care. However,
the descriptions proposed are not sufficient to fill the gap in the nursing literature related
to clinical judgment because description cannot generate the theory necessary to
represent relationships between the variables thought to influence clinical judgment in
nursing practice.

Research based models depicting the personal and contextual variables that
influence the clinical judgment process in nursing have recently been proposed by Lee et
al. (2006) and Tanner (2006b). While the literature reviews were extensive, many of the
references used were associated with cognitive tasks related to judgment, such as
decision making or critical thinking, and the authors did not distinguish clinical judgment
from associated cognitive processes. Lee et al. (2006) did not provide a definition of
clinical judgment, but equated it broadly with diagnostic practice. Tanner (2006b)
specifically defined clinical judgment in terms of assessment and conclusions about a
patient’s status, but included decision making as part of the judgment process. Although
both authors recognize the impact of personal and environmental factors on the clinical
judgment process, Tanner (2006b) concluded “what the nurse brings” (p. 205) is more
important than the objective data in a judgment situation. This perspective is consistent
with cognitive psychologists who contend judgment is determined by perception (Maule,
2001) and challenges the notion that a rule based approach to clinical judgment is
possible.

Lee et al. (2006) and Tanner (2006b) are in agreement the personal characteristics
of the nurse that influence clinical judgment are theoretical, procedural, and tacit
knowledge, experience, and personal values. Although neither author referenced social
judgment theory, this group of variables lends credence to the premise of that theory. If the cues noticed in a situation and the significance attached to those cues are a reflection of the reality an individual perceives as social judgment theory proposes (Dowding & Thompson, 2003), the knowledge, experience, and personal values the nurse brings to the judgment task are critical. Cues can only be recognized as salient if the nurse’s accumulated knowledge provides the appropriate focus for observation, and if personal values broaden, as opposed to narrow, the nurse’s perspective.

**The Role of Knowledge in Clinical Judgment**

Studies related to the knowledge base of the nurse are primarily focused on the role of tacit knowledge, often equated with intuition, in the clinical judgment process. Theoretical and procedural knowledge have been largely overlooked due to study design and widely held assumptions about knowledge in nursing. The technology available in simulation laboratories affords increased opportunities to evaluate the role of theoretical and procedural knowledge in clinical judgment, but the realities of the practice setting are difficult to replicate in a simulated environment.

The discourse in nursing related to the role of intuition, or tacit knowledge, in clinical judgment that has persisted for decades was born anew with the evidence-based practice movement. In a report on the state of nursing science related to the role of intuition in both judgment and decision making, Rew and Barrow (2007) acknowledged progress has been negligible; studies have remained descriptive and exploratory and suffer from the same lack of consensus regarding definition of terms as is found in the literature on clinical judgment. When intuition is the focus of nursing research, studies
tend to involve self-report of situations where study participants describe their perception of the role of intuition in the clinical judgment process. These studies are often criticized because self-report can be biased by selective memory, and clinical encounters described are often limited to those situations where patient outcomes were favorable (Lamond & Thompson, 2000). Nurses tend to be confident in their intuitive judgments (Dunwoody et al., 2000), but the favorable impact of intuition on judgment is typically assumed based only on personal practice.

The widespread tendency in nursing to equate knowledge with competency (Whyte, Ward, & Eccles, 2009) has limited measurement of theoretical knowledge in studies conducted at the point of care. Since licensure is required for nursing practice and achieved through objective examination, RNs are assumed to possess the theoretical knowledge necessary for safe and effective practice and, further, to enhance their theoretical knowledge base through practice. However, unless an RN pursues an advanced degree or certification in a specialty, theoretical knowledge is not routinely measured after initial licensure, and studies that include direct measures of both theoretical knowledge and actual performance in the clinical setting are rare. When investigators incorporate measures of theoretical knowledge into study design, competent performance in practice is often evaluated through self-report (Sandie & Heindell, 1999), reports provided by peers or managers (Meretoja & Leino-Kilpi, 2003; Simmons et al., 2003), or simply attributed to participants based on the measure of theoretical knowledge employed in the study (Rieman & Gordon, 2007). At the present time, there is not a body of research in nursing to support the often assumed direct link between theoretical
knowledge and competent performance in practice (Whyte et al., 2009). This gap in the nursing literature has particular implications for study designs that incorporate criterion judgments to evaluate judgment accuracy. If theoretical knowledge is assumed, but not measured, participants’ accurate judgments may simply reflect practice routines or organizational policy, as opposed to an understanding of the theoretical basis for nursing care in a clinical situation.

Many investigators assess clinical judgment using retrospective verbal protocol analysis or think aloud techniques (Simmons et al., 2003); nurses deemed expert by years of experience or supervisor evaluation recall and explain the thought processes in which they engage as they make their judgments in the clinical setting. Criterion judgments are usually not established; the accuracy of judgments described is not evaluated, and theoretical knowledge is not measured. Investigators using these approaches describe the process by which study participants make their judgments. Sample sizes are limited by study design, and descriptions of the clinical judgment process are specific to the clinical settings where the studies are conducted.

In judgment analysis via social judgment theory investigators attempt to model the use of theoretical knowledge in simulated judgment tasks. Studies based on social judgment theory typically involve the presentation of multiple scenarios of a case in which the values for a set of clinical cues are manipulated (Thompson et al., 2009); theoretical knowledge is assumed necessary for appropriate observation and correct interpretation of the clinical cues provided to the participants in the scenarios presented. Regression modeling is used to measure the accuracy and consistency of the judgments.
made, as well as the use and weighting of clinical cues by judges as they respond to the cases presented. This design, which accommodates large sample sizes and incorporates criterion judgments, overcomes the limitations associated with both verbal protocol analysis and self-report of the role of intuition in the judgment process.

Recent nursing research based on social judgment theory has been conducted primarily by Thompson and colleagues (2003; 2008; 2009), who have consistently demonstrated that even when given the same clinical data, nurses do not arrive at the same judgment in a given situation; often, when overall group consensus with a criterion judgment is reached, the relative weight assigned to cues by study participants is quite variable. Of further note is the tendency of nurses in two of the studies reported (2008; 2009) to rely more on intuition than objective data, a finding reported by Hammond et al. (1967) several decades ago and reaffirmed in more recent work related to cognitive continuum theory (Harbison, 2006) and the preference for experience over evidence by nurses at the point of care (McCaughan et al., 2005; Thompson & Dowding, 2002).

In their most recent study, Thompson and colleagues (2009) used social judgment theory and the associated lens model to investigate both the accuracy and consistency of study participants’ identification of patients at risk for critical events and their hypothetical judgment of the need for intervention to prevent the impending critical incident. Study participants were provided with multiple scenarios in which the values for a set of clinical cues were manipulated. The participating nurses recorded their judgment of each scenario, their perception of the need to intervene in the situation, and the relative weight or importance they assigned to each cue presented. Regression modeling was used
to reveal each participant’s consistency in the use and weighting of cues and the accuracy of judgments reached in comparison to the established criterion judgment.

The sample for the multi-site study, composed of RNs from both critical care and general inpatient nursing units, provided adequate power (.90); the number of scenarios and cues provided were generated using SPSS software to insure appropriate representation of cues across scenarios. Although all nurses in the study responded to the same data, estimation of risk and use of clinical cues varied considerably among the participants, and from the criterion judgment model. The nurses overestimated general risk for an impending critical incident, their perception of the significance of clinical cues was inconsistent with the actual significance of those cues, and nurses in the study attributed more significance to cues associated with time pressure and protocol guidelines than to the clinical data most important to the accurate prediction of risk. Overall, study participants demonstrated moderate accuracy and high consistency in the judgment tasks, but they discounted salient data and used intuitive reasoning that did not contribute to the accuracy of their judgments.

According to social judgment theory (Dowding & Thompson, 2003), the significance attached to cues or data in a judgment task represents a combination of the judge’s theoretical knowledge relative to the task, personal values and beliefs, and the context within which the judgment must be made. Like many nursing researchers, Thompson and colleagues (2009) did not include a measure of the study participants’ theoretical knowledge in their study design (Whyte et al., 2009), but assumed the RNs in the study possessed the requisite theoretical knowledge for the judgment tasks based on
their years of general nursing experience ($M = 11, SD = 8.8$), or years in specialty practice ($M = 8.8, SD = 6.6$). While it is common practice to equate experience with theoretical knowledge in nursing, this complicates interpretation of study results. It is unclear whether nurses in the study disregarded salient data in the scenarios because they did not possess the theoretical knowledge necessary to recognize the significance of the data, possessed the necessary theoretical knowledge but discounted significant data due to personal values and beliefs, or, possessed the requisite theoretical knowledge but were swayed by contextual factors incorporated into the scenarios. Finally, correct weighting of cues in the scenarios might only reflect study participants’ familiarity with practice routines or early warning system algorithms, as opposed to an understanding of the significance of cues based on theoretical knowledge pertinent to the scenarios presented. Despite these limitations, Thompson and colleagues’ work raises important concerns in terms of both safety and quality, as the tendency of experienced nurses to overestimate risk has significant implications in a system already constrained by limited resources.

Well designed studies based on social judgment theory may illustrate participants’ application of theoretical knowledge in a particular scenario, but the studies suffer from some of the same limitations inherent in other protocols based on simulated cases. While it is informative to determine how nurses weight the cues presented in a particular judgment task, scenarios are similar to a multiple choice examination; the participant’s judgments do not reveal their inclination to search for data, but only their ability to deal appropriately with data gathered for them. Participants may make connections between data in a scenario because a cue is offered, but that does not necessarily indicate the
scope of data the participant would collect if a similar situation was encountered in practice. Some contextual variables can be incorporated into the scenarios; for example, time pressure encountered in the actual clinical setting can be simulated by imposing time restrictions on participants as they respond to the scenarios presented (Thompson et al., 2009). However, emotional and psychological influences on both the nurse and the patient that are part of many clinical situations are difficult to replicate, as are the limitations that may be imposed by organizational culture and resources. Finally, the responses to carefully constructed scenarios provide a measure of a participant’s theoretical and domain specific knowledge, but may not be a measure of how that same individual performs in practice (Whyte et al., 2009).

**The Role of Experience in Clinical Judgment**

Clinical experience is included as a variable in many studies of clinical judgment; however, investigators tend to compare students or novices to experts and findings are difficult to interpret because categories are arbitrarily established or associated with years in a specialty area (Radwin, 1998). The most famous work related to the role of both intuition and clinical experience remains that reported by Benner and colleagues (Benner, 1984; Benner & Tanner, 1987; Benner et al., 1996) in research and development of the novice to expert model of skill acquisition. Novices, lacking the experience that informs pattern recognition, rely on rule based thinking, protocols, guidelines, and theoretical knowledge to interpret data and make clinical judgments. Experts can respond more quickly to a situation, because their experience facilitates cue organization and pattern
recognition, enabling them to combine theoretical and tacit knowledge to inform their judgments.

Novice nurses are often challenged by limited flexibility and rule based thinking (Benner, 1984), but experience can introduce bias into the clinical judgment process that obscures important cues and limits interventions considered (Caputo & Mior, 1998). Research on information processing validates the use of heuristics (Tversky & Kahneman, 1974) to decrease the cognitive strain imposed on individuals when confronted with uncertainty. In an attempt to resolve uncertainty, individuals use their experience to construct subjective probability estimates that support the belief that certain events or conditions are more likely to occur than others (O’Neill, 1995); critical incidents in one’s past tend to distort the use of cues in similar situations experienced later in life. Research by Cioffi (1997; 2001) and Cioffi and Markham (1997) confirmed the use of heuristics by nurses in the course of clinical judgment, and the tendency of nurses to overestimate prevalence rates for conditions of concern to them, particularly in cases where there was a potential for an adverse event.

The inability of nursing researchers to demonstrate a linear relationship between experience and clinical judgment skills is informed by the research on heuristics, but Benner’s (1984) conceptualization of experience is important to an understanding of clinical judgment, as well. Benner (1984) described the hallmarks of expert practice, but cautioned that experience is not acquired merely due to the passing of time or because one performs similar tasks repeatedly. The expert performer, according to Benner (1984), refines clinical judgment skills through reflection, turning knowledge into wisdom that is
transferrable to new clinical situations. There is a distinction, according to Benner, between knowing how and knowing that; a distinction that parallels Aristotle’s techne and phronesis (Flaming, 2001) and Schon’s theory of reflective practice (Kinsella, 2007). Experience and reflection are proposed to inform clinical judgment because the expert performer recognizes knowledge should not be uniformly applied, but translated in a manner that gives priority to the particulars of a situation.

Although the body of literature related to reflection has grown steadily, connections between clinical judgment and reflection remain limited. Tanner (2006b) reported a tendency for nurses to reflect on their practice after an adverse event, but a failure to incorporate reflection into the daily routine of clinical practice. Benner et al. (1996) described stories from nurses’ practice that prompted their review of a clinical situation in an attempt to learn from errors in judgment or decision making. Benner & Wrubel (1982) identified nurses in environments that failed to support reflection as at risk for limited professional growth; without reflection, the uniqueness inherent in each patient care situation can be lost to preconceived expectations and textbook interventions.

Since experience cannot be taught but must be acquired, the state of the science of clinical judgment in nursing might be more efficiently advanced by a focus on reflection in practice than on experience alone. Reflection is associated with learning from experience and developing self-awareness (Freshwater, 2002; 2008); as such, it is key to constructing the lens through which a situation is viewed. Like judgment, reflection begins with noticing and involves critical interpretation to frame a situation in the context in which it exists. The dynamic nature of the clinical environment necessitates a flexible
approach to patient care. A focus on reflection may be the key to the phronesis Aristotle proposed (Flaming, 2001) as necessary for translation, as opposed to rigid application, of knowledge.

**The Role of Personal Values in Clinical Judgment**

The impact of personal values on clinical judgment has been described by Benner et al. (1996), based on a study of 130 nurses practicing in general and critical care units in eight hospitals. Individual and small group interviews were conducted to investigate the process of skill acquisition and identify the practical knowledge underlying expert nursing practice. Even though nurses interviewed did not often articulate or even recognize their underlying sense of what was right, their personal beliefs strongly influenced what they noticed in a situation, what options they entertained when deciding to take action, and the course of action selected. In exemplars reported, nurses identified the role of common goals, such as the desire to relieve suffering, in directing both their assessment of a situation and their responses to it.

McCarthy (2003) investigated the clinical reasoning of nurses caring for older patients who developed acute confusion in the course of the nurse – patient relationship in an attempt to generate a theory of nursing response to acute confusion in older adults. McCarthy categorizes her research as grounded theory; however, dimensional analysis was employed instead of classical grounded theory method (Glaser & Strauss, 1967). In a classical grounded theory approach, the core category discovered would have represented the primary concern of nurses caring for older adults with acute confusion, but McCarthy’s goal was to discover why nurses fail to diagnose or respond to acute
confusion in older adults. Therefore, McCarthy did not attempt to discover a basic social process or a core category in generating her theory, but instead searched for a dimension that would explain the meaning of interactions (Kools, McCarthy, Durham, & Robrecht, 1996) between nurses in the study and patients in their care.

McCarthy (2003) used observation and individual semi-structured interviews with 28 nurses from a variety of acute care units to identify the perspectives of nurses in the study regarding confusion in older adults and their subsequent approach to the care of confused patients. The researcher’s goal in dimensional analysis is to determine the key perspective among competing dimensions that explains the various components of a phenomenon (Kools et al., 1996). In McCarthy’s data analysis, the personal perspective of the study participants related to the expectations of health and decline in aging persons emerged as the primary influence on the nurses’ clinical reasoning and their decisions to address cues related to the onset of acute confusion in the older patients in their care. Three primary perspectives were identified as participants interacted with older adults experiencing acute confusion: a decline perspective, a vulnerable perspective, and a healthful perspective. Each perspective was characterized by a specific reasoning pattern that determined the nurse’s investment in resolution of the changes in cognitive status observed.

Nurses with a decline perspective on aging expected cognitive decline in older adults, and were unlikely to invest time and effort in resolution of the condition unless consequences of the patient’s behavior posed a threat to patient safety, disrupted the unit, or increased the workload of the nurse (McCarthy, 2003). Nurses who held a vulnerable
perspective related to aging acknowledged healthy aging was possible, but not likely. Although nurses with the vulnerable perspective verbalized an understanding that acute confusion could be the result of underlying pathophysiology, these nurses lacked the conviction necessary to make further assessment and intervention a priority in their work. The final perspective identified among nurses in the study related to aging was the healthy perspective. Aging was viewed by these nurses as a natural stage of growth and development; cognitive decline was seen as abnormal and cause for alarm. Nurses who viewed aging as a normal process were the most likely to distinguish between acute and chronic confusion, employing linear reasoning processes to generate and rule out hypotheses in an attempt to identify the cause and appropriate intervention for confusion when it was observed.

McCarthy (2003), like so many other nursing researchers, failed to clearly define terms, citing an understanding of clinical reasoning as an aim of the study and then describing the interviews as an attempt to uncover cues about clinical judgment. Sample size was limited by study design, few demographic details regarding the sample were provided, and some conclusions regarding education, experience, and reasoning were not explained. Finally, the study was based on the premise that nurses fail to appropriately notice and respond to acute confusion in older adults, which may have influenced data analysis and interpretation. Nonetheless, McCarthy’s research warrants consideration in the study of clinical judgment, particularly since the research was conducted with a vulnerable patient population as those patients experienced a significant change in status that warranted investigation by the nurse.
According to cognitive psychologists (Harvey, 2001), an accurate judgment leads to poor decision making when the desirability of the condition assessed is miscalculated. Nurses in McCarthy’s study (2003) noticed the change in patient status and acknowledged confusion as an undesirable state, but elected not to investigate the etiology of the condition or take steps to resolve it based on assumptions that were not supported by theoretical knowledge or evidence. Nurses who elected to discount the importance of the client’s change in status did so because of their personal opinions about patients in their care. Similar influences of social and moral evaluation of patients on clinical judgment have been reported in studies related to pain management (Abu-Saad & Hamers, 1997; Brockopp, Ryan, & Warden, 2003; McCaffrey, Ferrell, & Pasero, 2000). Given surveillance in all clinical settings is primarily a nursing responsibility, there are significant implications for patient safety and quality of care if the nurse’s personal perspective is indeed the overriding influence on clinical judgment.

**Critical Thinking and Clinical Judgment**

The inability to establish a clear relationship between critical thinking and clinical judgment (Hicks, 2001; Kintgen-Andrews, 1991; Staib, 2003) is puzzling. Critical thinking is often described as a process that requires reasoning and reflection (Cody, 2002; Ford & Profetto-McGrath, 1994; Hicks, 2001; Kataoka-Yahiro & Saylor, 1994; Lauder & James, 2001; Locsin, 2001), so it seems logical critical thinking skills would be required for accurate clinical judgment. However, neither term is clearly defined (Banning, 2006), and discipline specific tools to measure each are lacking. In the absence
of research verifying a direct relationship between critical thinking and clinical judgment, reflection, a key component of both processes, may provide the missing link.

Critical thinking and clinical judgment are cognitive processes, but psychologists and several nursing authors recognize motivation is as important as skill in cognitive work (Facione, Facione, & Sanchez, 1994; Loving, 1993; Rubenfeld & Scheffer, 2001). Some problems can be resolved merely by the application of rules with little interpretation of data required; a nurse can assess a situation and follow a clinical practice guideline or algorithm that will often produce favorable results. However, protocols are not always enough when problems are controversial, information is incomplete or unavailable, or outcomes cannot be predicted with certainty (King & Kitchener, 1994). In these situations, the judge must consider other criteria, such as the coherence of an argument, plausibility of available solutions, and the limitations imposed by the context in which the problem is encountered. Critical thinking skills are not enough to resolve problems that are ill defined; there must be a willingness to engage in the cognitive work required (Facione, Facione, Giancarlo, & Gainen, 1995).

The motivation necessary for critical thinking has been referred to as the disposition for critical thinking (Facione et al., 1994) and habits of mind (Rubenfeld & Scheffer, 2001). Facione et al. (1994) describe critical thinking dispositions as attributes of the ideal critical thinker, encompassing such qualities as the willingness to entertain multiple perspectives, use reason and evidence to solve problems, and maintain an openness to revision of conclusions as new data become available. These qualities, which
influence what is noticed and how it is interpreted, require a commitment to engage in reflection and a sense of inquiry to support the search for truth.

An instrument developed specifically to measure critical thinking dispositions by Facione et al. (1994) has not consistently demonstrated the theoretically assumed relationship between critical thinking skills and dispositions in research studies in nursing (Hicks, 2001); it is not clear whether the instrument fails to measure the construct of habits of mind as it applies to clinical nursing practice environments, or study design is an issue. At this point, the relationship between the disposition for critical thinking, critical thinking skills, and clinical judgment remains a theoretical assumption. However, since the disposition for critical thinking is thought to determine the motivation to engage in reasoning and reflection (Facione et al., 1995) and clinical judgment in nursing requires more than scripted problem solving, the disposition for critical thinking is an avenue that should be explored to advance the science of clinical judgment in nursing.

**Environmental Influences on Clinical Judgment**

Researchers have paid increased attention to the environmental variables that influence nursing work in response to the Institute of Medicine’s (IOM) (2003) call for an examination and redesign of work cultures thought to contribute to errors and inefficiency in health care. With attention on systems instead of individuals, much of the research conducted has focused on factors such as interruptions the nurse encounters in the course of nursing work (Bucknall, 2003; Kalisch, 2010; Potter, Wolf, Boxerman, &Grayson, 2005; Redding & Robinson, 2009), physical layout of the nursing unit and work flow processes (Hedberg & Larson, 2004), technology at the point of care, and
nurse-patient ratios and patient outcomes. The complexities of the contemporary practice setting have been verified, but there has been limited progress in understanding how the environment impacts clinical judgment, as individual performance has received little attention.

The nature of nursing work complicates efforts to investigate environmental influences on clinical judgment in the real world of practice. In many industries where work is linear and predictable, the science of human factors engineering is used to analyze and improve work processes and identify potential sources of error at the human – technology interface (Potter et al., 2005). However, since nursing work is nonlinear, performed at a pace determined, at least in part, by the individual clinician, and designed on a shift basis by the individual nurse, task analysis and time and motion studies from a human factors perspective alone do not explain the cognitive work that underlies the visible tasks nurses perform, because the unique features of each patient situation cannot be captured.

Although the IOM report (2003) focused researchers, educators, and policy makers on the chaotic nature of the nurse’s work environment, the body of research on environmental influences on nursing work at the point of care remains limited. For example, studies on the impact of interruptions on the nurse’s work (Bucknall, 2003; Kalisch, 2010; Potter et al., 2005; Redding & Robinson, 2009) indicate frequent interruptions require a cognitive shift that puts the nurse at risk to lose focus, but the impact of interruptions on working memory and cognitive processing in the course of making judgments and decisions is unknown. Similarly, team work and collaboration
have long been advocated to improve patient outcomes (IOM, 2003), but research on the impact of team work on the delivery of care is limited and difficult to interpret; much of the work is focused on the physician – nurse relationship in specialty units and confounding variables are difficult to control. Likewise, it is unknown whether the use of ancillary personnel promotes patient safety or threatens it, as RNs are freed from tasks that do not require nursing expertise, but removed from the patient and dependent on unskilled workers to monitor patients (Cook, Render, & Woods, 2000; IOM, 2003). In short, assumptions, anecdotes, and descriptions are more prevalent than evidence in the literature on the impact of the environment on nursing work in general, and clinical judgment in particular.

Physician orders dictate some of the care patients receive, but much of the care nurses provide is initiated based on the clinical judgment of the nurse. With studies of the impact of environmental influences on clinical judgment limited, available research on the processes nurses use to monitor patients and detect subtle changes may be helpful to identify the resources nurses require to do their work and, therefore, the impact of the environment on clinical judgment. Currently, the effectiveness of nursing work is often determined based on the use of large administrative data sets that obscure the care provided by individual nurses on a shift by shift basis (Schmidt, 2010). If the care provided by individual nurses can be better understood, the potential to support nurses at the point of care will be enhanced.

Registered nurses require time and focused attention to provide the surveillance necessary to inform clinical judgment. Hospitalized patients have reported the frequency
of nursing observation and a sense their nurses were close by (Schmidt, 2003) positively influence their perceptions of the care they receive. In a grounded theory study of the process acute care nurses use to provide surveillance Schmidt (2010) confirmed focused attention and careful watching were key to promoting positive outcomes and preventing adverse events. While the focus of Schmidt’s work was not clinical judgment, it provides new insight into nursing care at the patient-nurse interface and support for the assertion that environmental factors that facilitate monitoring and observation may positively influence the nurse’s ability to make accurate clinical judgments.

Staffing patterns that impact the nurse’s knowledge of the patient have received considerable attention in the nursing literature (Minick & Harvey, 2003; Peden-McAlpine & Clark, 2002; Radwin, 1998; Tanner, 2006b; Tanner, Benner, Chesla, & Gordon, 1993). Theoretical knowledge and clinical experience facilitate an accurate grasp of the patient’s situation, but knowledge of the patient as a person, gained through frequent interactions over time, has been reported as key to focused perception and accurate interpretation of clinical cues. Peden-McAlpine and Clark (2002) and Minick and Harvey (2003) looked specifically at early recognition of patient problems by nurses to avoid critical incidents in the acute care setting. The detection of very subtle clinical cues indicative of impending deterioration was facilitated by knowing the patient; nurses used both their theoretical knowledge and knowledge of the patient to construct a normative frame of reference that enabled them to distinguish salient from insignificant data.

While some might question the need for research to validate the importance of the nurse-patient relationship, the increased responsibility and accountability nurses face in
light of higher patient acuity, complex technology, personnel shortages, and a focus on cost containment place nurses at the point of care today in more dynamic settings with fewer resources. The ability of the nurse to make accurate clinical judgments takes on even greater importance when environmental conditions complicate the process. Since nurses are the only providers with a continual presence in the acute care setting, the impact of the environment is felt most intensely by them; their perspectives are key to an understanding of the social structures and resources they negotiate in the course of protecting patients and making clinical judgments.

**Gaps in the Clinical Judgment Literature**

Clinical judgment is difficult to measure, because it is a cognitive process that takes place in work environments complicated by multiple variables that are difficult to control (McNiesh, 2007) and across practice settings that may impose different cognitive strains on nurses as they make their judgments. To date, studies of clinical judgment tend to be descriptive with small sample sizes (Ludwick, Zeller, Lauder, & Winchell, 2004); study designs typically involve the use of simulated scenarios, verbal protocol analysis, or direct observation of nurses in the clinical setting. Simulated scenarios do not reflect environmental and contextual influences that complicate clinical judgment in the real world setting, while observation and verbal recall can heighten participant sensitivity to the judgment process and may not capture the typical behavior of study participants. Designs based on social judgment theory accommodate larger sample sizes and provide insight into how individual nurses use cues in a clinical judgment task, but the nature of the scenarios does not typically provide insight into the motivation of individual nurses to
search for information in their daily practice. At this point, research related to clinical judgment in nursing is descriptive and provides a limited perspective of the realities of the practice environment. Conceptualization of the clinical judgment process will move beyond the contextual limits imposed by description to reveal patterns of behavior (Glaser, 2001) inherent in the clinical judgment process, facilitating the theory development that is missing in the existing body of research.

Much of the research on clinical judgment has focused on students, new graduates, or nurses with more than five years of experience (commonly taken to be clinical experts) in specialty units; little attention has been given to nurses with two to three years of clinical experience or those working on general acute care units (Minick & Harvey, 2003). Studies have shown that novices tend to model their practice on their expert colleagues (Taylor, 1997) rather than search for data on their own, while experts are reluctant to revise original hypotheses in clinical situations even when evidence to the contrary exists (Hammond et al., 1967). However, little is known about the manner in which nurses who are classified as neither novice nor expert search for and interpret the data necessary to make clinical judgments, while balancing the competing demands imposed by the dynamic practice environment on an inpatient nursing unit.

**Summary**

Despite decades of interest and research in clinical judgment in nursing, little progress has been made in understanding the cognitive work that underlies the technical skills nurses perform. Clinical judgment in nursing remains poorly defined due to limited efforts to differentiate judgment from associated cognitive skills and the persistent
tendency to use the term interchangeably with a myriad of expressions that represent various steps in the problem solving process. The work of clinical psychologists in distinguishing judgment from decision making, as well as theory development in information processing, is helpful; but nurses function in a more dynamic environment than clinical psychologists, and understanding of information processing by nurses in the real world of clinical practice is limited.

There is no empirically derived theory of clinical judgment in nursing. Variables thought to influence clinical judgment have been incorporated into two research based models of clinical judgment; however, variables common to both models, including theoretical knowledge, critical thinking skills, and experience, have not been found to be consistent predictors of clinical judgment ability (Bowles, 2000; Hicks, 2001; Lauri & Salantera, 1998). While the inclusion of these variables in the models of clinical judgment seems logical, the relationships between theoretical knowledge, critical thinking skills, and clinical experience remain assertions that have not been consistently validated in studies to date.

Relationships cannot be verified when concepts are poorly understood. Clinical judgment in nursing has been given considerable attention, but it remains vaguely conceptualized. The first step necessary to close the gaps that exist in the current body of literature related to clinical judgment is a qualitative approach that will allow examination of the clinical judgment process from the perspective of nurses at the point of care. A grounded theory study will provide the data necessary to generate a substantive theory of clinical judgment, grounded in the experiences of nurses who negotiate social
structures and resources in the clinical environment every day as they make their judgments. Without a theory of clinical judgment in nursing developed using the grounded theory approach, the models available represent the best thoughts of experts regarding what might occur, as opposed to what actually takes place (Mc Callin, 2003), in the clinical judgment process.

Those who engage in a process can provide insight that observation alone does not afford, which helps to determine what is effective and significant in the context where the process takes place (Lykkeslet & Gjengedal, 2006). To advance the state of the science of clinical judgment in nursing, efforts to develop empirically derived theory are essential. If those efforts begin by listening to nurses who make clinical judgments in real world contexts, the theory generated is more likely to fit the realities of clinical practice (Glaser & Strauss, 1967), increasing the potential of the work to assist educators in academia and clinical practice settings in their efforts to support the professional development of nurses related to clinical judgment.
The purpose of this study was to discover the process hospital based registered nurses on inpatient units use to make clinical judgments as they provide nursing care. The grounded theory method was used to conceptualize the clinical judgment process from the perspective of registered nurses who have direct experience with clinical judgment as a cognitive skill employed in the course of nursing work. This approach to the study of clinical judgment fills a gap that exists in the nursing literature through the development of a substantive theory of clinical judgment derived from participants’ narratives of the clinical judgment process at the point of care.

**Research Question**

What is the process hospital based registered nurses with two to three years of acute care experience acquired on a single inpatient unit use to make clinical judgments?

**Method**

This study was conducted using the grounded theory method. The purpose of grounded theory is to generate theory (Glaser, 1978; Glaser & Strauss, 1967; Walker & Myrick, 2006) inductively discovered and developed through systematic data collection and analysis relative to an area of interest. The grounded theory method allows conceptualization of attitudes, perceptions, and motives and generates evidence related to the way participants react to their milieu and relate to others (Houser, 2008). The
method is based on the premise that members of a group define situations for themselves and others, resulting in common patterns of behavior adopted to manage their main concern related to a process or event (McCallin, 2003). The aim of the researcher is to discover a basic social process that occurs in response to a problem or event (Hutchinson, 1993), rather than describe a phenomenon (Glaser, 2001); this basic social process emerges as the principal pattern in the participants’ behavior and becomes the core variable in the theory generated.

The distinct features of the grounded theory method, theoretical sampling, and the constant comparison method of data analysis (Ploeg, 1999) allow theory to emerge from the data. Theoretical sampling refers to the process by which the researcher engages simultaneously in data collection, coding, and analysis (Glaser, 1978; Glaser & Strauss, 1967); the data help the researcher to identify logical next steps in data collection in terms of participants to include, questions to ask, or situations to observe. The constant comparison method of data analysis helps the researcher to identify similarities and differences that help to flush out the emerging categories and their properties. Systematic coding of data using the constant comparison method continues until new information is no longer being obtained and emergent categories are saturated. Categories are then reduced by clustering related codes; the core variable that accounts for the majority of variation in a pattern of behavior emerges (Carpenter, 2007). Categories are integrated into the theory around the core variable, resulting in a theory that is theoretically complete and grounded in the data (Glaser, 1978; Glaser & Strauss, 1967), with the source of the evidence the reality of experience.
Grounded theory is appropriate for the study of clinical judgment in nursing because research to date has not yielded an understanding of the process registered nurses in acute care settings use to make clinical judgments. The substantive theory of clinical judgment that emerged should fit the realities of contemporary clinical practice and overcome the limitations of existing research that describes what might occur, as opposed to what actually takes place, as nurses engage in the process of clinical judgment.

**Setting**

This research was conducted at four sites located in a large metropolitan center in the Midwestern United States. The study sites included a private, university-affiliated hospital with over 500 inpatient beds designated as a Level 1 Trauma Center and a 400-bed community teaching hospital; both hospitals have achieved Magnet® status. In addition to the hospital study sites, two CCNE accredited schools of nursing situated within private universities, both of which offer BSN, RN to BSN, Bachelor to BSN, MSN, and DNP programs, were used for recruitment and data collection. The inclusion of the schools of nursing as study sites extended the opportunity for participation in the study to registered nurses from a wide variety of hospital systems; therefore, the final sample included registered nurses from three acute care hospitals.

**Sample**

**Participants.** The sample consisted of registered nurses with two to three years of clinical experience currently employed on an inpatient unit in an acute care hospital who spent the majority of their time in direct patient care. These nurses represent a group previously understudied in nursing research on clinical judgment in terms of years of
experience and clinical practice settings, but have the experience with clinical judgment necessary to address the research question. The size of the final study sample could not be specified prior to data collection (Glaser, 1978; Glaser & Strauss, 1967), as the theoretical sampling used in grounded theory studies requires the simultaneous collection, coding, and analysis of data to direct subsequent data collection. Based on a review of the CINAHL database of grounded theory studies published in nursing journals over the past two years, 20 participants was determined a reasonable estimate of the final sample size prior to beginning the study. However, data saturation was reached with 15 participants.

**Inclusion criteria.** Registered nurses who spend at least 80% of their time in direct patient care were eligible to participate in the study if they had two to three years of nursing experience acquired on the single inpatient unit where they were employed at the time of participation. Since care processes and resources may differ from one unit to another, nurses with two to three years of experience who had transferred from their original unit of hire were excluded from the study; orientation to an additional nursing unit may impact the acquisition of clinical judgment skills. Registered nurses employed in outpatient units were excluded from participation in the study, as the nature of the care they provide is episodic and intermittent. Nurses employed in surgical suites and labor and delivery units were excluded because the care provided in those areas is limited to a single procedure or event.
Recruitment

At the hospital study sites, the researcher presented a summary of the proposed study to the nursing research councils and nursing management groups and received affirmation of interest in the study and a commitment for assistance with identification of potential study participants. Institutional Review Board approved flyers explaining the study and inviting participation were distributed to all registered nurses at both hospitals through the employee e-mail systems; paper copies of the flyers were also posted on inpatient nursing units and distributed at internal continuing education events. These recruitment strategies required nurses to self-select based on eligibility criteria; however, announcing the study to an audience beyond those who qualified for participation had the potential to support recruitment, as nurses who did not meet the eligibility criteria for the study could encourage their co-workers to participate. In addition to widespread e-mail distribution of study flyers, personal paper invitations to participate were distributed to RNs identified by the human resources department as eligible for participation in terms of years of nursing experience. This strategy was only employed at the university-affiliated hospital, as data saturation was reached prior to using this approach at the community teaching hospital. At hospital sites, clinical educators and unit level nurse managers encouraged eligible RNs to participate in the study by calling their attention to posted study flyers and advising potential participants that further information regarding the study could be obtained by contacting the researcher.

At the schools of nursing, the IRB approved study flyer was posted on school Facebook® pages, in Blackboard® course shells for courses delivered online to licensed
registered nurses, and distributed electronically to members of each school’s chapter of the Sigma Theta Tau International Honor Society of Nursing. One school distributed the study flyer via an e-mail newsletter to all alumni from all nursing programs, while the other school provided a mailing list for alumni of all undergraduate nursing programs. The mailing list facilitated delivery of study flyers and a reminder post card inviting participation six weeks after the initial mailing via the United States Postal Service (USPS).

When potential participants contacted the researcher, any questions they had were addressed; for those RNs who elected to participate in the study, interviews were scheduled at a time and location convenient to the participant. At the conclusion of the study interview, participants were provided with a cash token of appreciation for participation in the study and copies of the study flyer to pass on to peers who met the eligibility criteria for the study. Recruitment of participants continued until interviews elicited no new data, indicating saturation had been achieved.

Data Collection

Data collection took place in individual face-to-face audio-recorded interviews conducted by the researcher in a location of each participant’s choice that afforded the necessary freedom from interruption and privacy required for open dialogue. Interviews lasted between 45 and 75 minutes. At the beginning of each interview, the purpose of the study was reviewed; informed consent forms were provided for each participant’s review and signature. Participants were reminded verbally, at the outset of the interview, of their right to decline to answer any interview question, request the audio recording device be
turned off at any time, end the interview at their discretion, or withdraw from the study at any time. The interview began after written documentation of informed consent was obtained and the participant verbalized understanding of the interview process.

Demographic data were collected from each study participant as part of the interview.

All interviews were recorded using a digital voice recorder, with handwritten notes taken by the researcher to document impressions and potential areas for further exploration in subsequent interviews with other study participants. The interviews were semi structured with a general interview guide (Appendix B) developed to provide initial direction for the conversation; however, the interview guide was refined and revised as data collection provided direction for additional questions to explore emerging categories and codes (Carpenter, 2007). Since the study participants were well versed in the manner in which they make their clinical judgments, the “opening the locks” (Rubin & Rubin, 2005, p. 144) approach was taken in initial interviews. Study participants were asked a general question about the process they use to make their clinical judgments in the course of a work shift, as well as what factors facilitate and hinder the judgment process at the point of care. Continuation and elaboration probes, as well as follow up questions, were used to encourage participants to continue explanations or provide more detail where needed.

Interviews conducted early in the study were less structured than those conducted later in the study, when theoretical sampling and the constant comparison method of data collection influenced the direction of the interviews (Wimpenny & Gass, 1999). However, since the goal was to discover the primary concern of the participants related to
clinical judgment and how they attempt to resolve that concern on a daily basis (Carpenter, 2007), all interviews were primarily directed by each participant’s story of the process used to make clinical judgments in the course of daily nursing practice.

**Data Management**

All participants were assigned a numerical code known only to the researcher; the master list of numerical codes was kept in a locked file cabinet in the researcher’s home office. The numerical code was used as a label for the interview audio compact disc (CD), interview transcription, and theoretical memos recorded during data collection and analysis.

Digital voice recordings of all interviews were downloaded to audio CDs and transcribed verbatim by the researcher. Any identifying information on the audio CD was deleted and replaced with a generic term to preserve confidentiality. Transcriptions were checked with audio CDs for accuracy, with corrections made as necessary. Two password protected data storage devices (i.e., flash drives) were used for data management; all data were copied to both devices to insure a backup file would always be available. Data were not stored on the hard drive of any computer system. Audio CDs, transcriptions, and the temporary data storage devices were kept separately in a locked cabinet in the researcher’s home office during data collection and analysis. When documentation of study findings is complete, audio CDs will be destroyed. Transcriptions will be maintained for further study and analysis with the security measures described maintained throughout the period of storage.
Data Analysis

In grounded theory, data collection and analysis are not separate processes (Carpenter, 2007), but occur simultaneously using the constant comparison method of data analysis and theoretical sampling (Glaser, 1978; Glaser & Strauss, 1967) to guide the researcher in discovery of the primary concern of study participants related to the research question. Therefore, data analysis began immediately after the first interview was transcribed and checked for accuracy. In the initial stage of analysis, open coding involved examination of transcripts line by line using words, phrases, and sentences as units of analysis to identify as many codes as possible and insure the data were thoroughly analyzed. Using the constant comparison method of data analysis (Glaser, 1978; Glaser & Strauss, 1967), each new transcript was compared with those from previous interviews to identify similarities and variability in codes generated. Second-level coding entailed clustering of first-level codes into conceptual categories.

Theoretical memos were recorded during the entire data collection and analysis process to capture the theoretical ideas and observations of the researcher. Oversight in the data analysis process was provided by an experienced nurse researcher with expertise in grounded theory.

Data collection continued until interviews yielded no new information and emergent categories were saturated (Glaser, 1978; Glaser & Strauss, 1967). Categories were compared to one another to identify properties of each category; subcategories were clustered under major categories. The number of categories was reduced as indicated by the patterns in the data and the properties of the identified categories. A core category
emerged that identifies the basic social process, or central category in the data (Carpenter, 2007) related to the participants’ experiences with clinical judgment in their daily work. Once the core category emerged, further analysis through constant comparison involved sorting of categories and review of theoretical memos to identify how major categories and subcategories related to each other and to the core category. This facilitated conceptualization of the core category as the basic social process registered nurses use as they make clinical judgments in the course of their daily practice.

Protection of Human Subjects

Permission to conduct this study was obtained from the institutional review boards at all study sites and the researcher’s academic institution. The researcher obtained documentation of informed consent from all study participants prior to each interview conducted; the purpose of the study, potential risks associated with participation, measures to protect participant privacy, and right to withdraw from the study without penalty were detailed on the consent form and reviewed verbally for each participant prior to beginning the interview process.

Face-to-face interviews precluded anonymous participation in the study; however, privacy and confidentiality were maintained and protected. Any identifying data on the interview audio CDs was replaced with generic terms during transcription; both audio CDs and transcription records were identified with numerical codes instead of participant names. In oral or written presentations of study findings, passages from audio CDs included to contribute to the interpretation of study results will not be identified with participants’ names or the numerical codes assigned to them. During the course of the
study, informed consent forms, audio CDs, and transcription records of the taped interviews were maintained in separate locked storage files in the researcher’s home office. Study participants were informed of measures taken to maintain confidentiality and protect privacy.

The risk associated with participation in this study was considered minimal; however, when data collection occurs primarily through interactive dialogue it is not possible to predict with certainty what direction an interview might take (Carpenter, 2007). Sensitive topics may be raised, or memories associated with events the participant chooses to or is asked to discuss may be unpleasant. Participants were advised of their right to refuse to answer any question posed by the researcher, request the recording device be turned off at any time, end the interview at their discretion, or withdraw consent and end their participation in the study at any time without penalty.

There were no direct benefits to individual participants associated with involvement in this study. However, there may be indirect benefits for participants associated with the discovery of substantive theory related to clinical judgment in nursing. Theory development may further understanding of the clinical judgment process, improve efforts to teach the skill at various levels of clinical expertise, and contribute to the efficient use of resources in clinical practice.

Summary

Grounded theory is appropriate for the study of clinical judgment in nursing because no empirically derived theory of clinical judgment currently exists. The concerns of multiple stakeholders regarding the readiness of new graduates to practice
Independently upon entering the workforce, persist in an era where the scope of nursing work has changed; what was previously assumed about the nurse’s work at the point of care may no longer be accurate. Theory development is necessary to discover the process hospital-based nurses currently use to make their clinical judgments, so evidence-based strategies can be developed to teach the skill more effectively. The substantive theory of clinical judgment discovered through this study should fit contemporary practice, because it was inductively derived from the narratives of registered nurses who negotiate the realities of the current practice setting in the course of making clinical judgments.
CHAPTER FOUR

RESULTS

Data collection and analysis using the grounded theory method (Glaser, 1978; Glaser & Strauss, 1967) yielded discovery of the process hospital based registered nurses with two to three years of experience use to make clinical judgments as they deliver care in the course of a work shift. The model of the clinical judgment process that emerged from the data reveals a core category that integrates eight categories in a process with stages that occur sequentially across the variety of situations that require clinical judgment. Careful adherence to the grounded theory method, including use of the constant comparison method of data analysis, theoretical sampling, and theoretical memos, increases the trustworthiness of the study results and the likelihood the process discovered fits the realities of inpatient nursing practice in the acute care setting.

Sample

The sample for the study consisted of 15 registered nurses employed in three Magnet® status acute care teaching hospitals located in a large metropolitan center in the Midwestern United States. One hospital is affiliated with a private university that has a medical school and a nursing school, as well as several other degree-granting programs in the health sciences. Two hospitals are community hospitals that provide clinical education placements for medical students and residents. The hospitals all offer clinical services to patients across the life span, with a similar array of general medical, surgical,
and specialty services available. The hospitals range in size from 400 to 675 inpatient beds, with two of the three hospitals designated as Level 1 trauma centers.

The sample was composed of 14 females and one male; the age of participants ranged from 23-31 years, with an average age of 26 years. Registered nurses participating in the study held Associate degrees (two participants), Bachelor of Science degrees (12 participants), and a Master of Science degree (one participant). Four of the participants with Bachelor of Science degrees earned the degree in an accelerated second-degree pre-licensure program. All RNs in the study were employed on their original unit of hire; all participants had two to three years of RN work experience, with the majority of participants (n=12) in practice for three years.

Registered nurses participating in the study represented a wide variety of inpatient nursing units, including Medical Intensive Care (three participants), Surgical Intensive Care (one participant), Neuro-Surgical Intensive Care (one participant), Cardiothoracic Intensive Care (one participant), Cardiac Step-down (two participants), Medical-Telemetry (two participants), Medical-Surgical Telemetry (four participants), and Transitional Care (one participant). Nurses in the sample worked a variety of shifts; eight participants routinely worked a 12 hour (7:00 am – 7:30 pm) day shift, four participants routinely worked a 12 hour (7:00 pm to 7:30 am) night shift, one participant rotated between 12 hour day and 12 hour night shifts, one participant routinely worked an eight hour evening (3 – 11:30 pm) shift, and one participant routinely worked a 16 hour (7:00 am – 11:30 pm) shift. The shift charge nurse role was regularly assumed by nine of the study participants; the responsibilities associated with the charge nurse role were most
often assumed in addition to a regular patient care assignment. Typical patient care assignments ranged from two to nine patients per nurse per shift; nurses in intensive care units reported an average assignment of two patients per shift, while nurses working in general care units reported an average assignment of five patients per shift.

Recruitment

The original plan for recruitment of study participants involved the use of one hospital setting, a university-affiliated Magnet® status Level 1 Trauma Center with over 500 inpatient beds. Approved study flyers were disseminated to all registered nurses via the hospital e-mail system and distributed at internal continuing education events, allowing nurses to self-select based on eligibility criteria for participation. Despite strong support for the study at this site from the nursing management group, the nursing research council, and clinical educators, e-mail distribution of the study flyer at the original study site yielded only two study participants. A wider variety of recruitment strategies was deemed necessary to facilitate data collection and eventual saturation of the emerging categories.

Institutional Review Board approval was obtained to add the school of nursing situated within the private university affiliated with the hospital as an additional study site and to provide study participants with a $10 cash token of appreciation for participation in the study. The two RNs who had already participated in the study were provided with the $10 cash token of appreciation to insure equal consideration for all study participants. In an attempt to increase support for the study within the peer group of eligible participants, the researcher presented the study to the Magnet® Ambassador’s
Council at the hospital, and revised flyers were distributed via the hospital e-mail system and at internal continuing education events. Unit level nurse managers and clinical educators verbally encouraged participation in the study, encouraging eligible RNs to contact the researcher. At the school of nursing, which is CCNE accredited and offers a variety of pre and post licensure nursing degree programs, the study flyer was distributed electronically via the alumni and Sigma Theta Tau International Honor Society of Nursing newsletters and posted in Blackboard® course shells in courses offered to registered nurses. The researcher also visited classes offered to registered nurses to explain the study and invite participation. Since these recruitment efforts at the hospital and school of nursing yielded only seven additional study participants, IRB amendments were submitted to further expand recruitment efforts.

An additional CCNE accredited school of nursing within a small, private university that offers a wide variety of pre- and post-licensure degree granting nursing programs was added as a study site with IRB approval from both the study site and the researcher’s academic institution. Paper copies of the study flyer, personally signed by the researcher, were sent via the United States Postal Service (USPS) to the 200 alumni of the school’s undergraduate nursing programs who had graduated within the past two to three years. Two weeks after the initial mailing, members of the school’s chapter of Sigma Theta Tau International Honor Society of Nursing received notice of the study and an invitation to participate via electronic distribution of the chapter newsletter, which was followed by a reminder post card delivered via the USPS to the 200 alumni contacted with the original mailing. Phone and Skype interviews were offered as an alternative to
face-to-face interviews to accommodate potential participants who had relocated since graduation. Flyers advertising the study and inviting participation were also posted in Blackboard® course shells in all courses delivered to registered nurses. These efforts yielded only one additional participant.

Clinical educators and members of the nursing research council from a 400-bed Magnet® status community teaching hospital approached the researcher, expressed support for the study, and encouraged the researcher to seek IRB approval to add the hospital as a study site. Once IRB approval was obtained from the researcher’s academic institution and the community hospital IRB, the researcher presented the study to the full nursing management group and secured affirmation of their willingness to identify potential study participants. The study flyer was distributed via the hospital e-mail system and at internal continuing education events. Clinical educators and nurse managers verbally encouraged eligible RNs to contact the researcher for further details regarding participation in the study. However, there were no inquiries from potential participants; this might have been due in part to the timing of the release of the study flyer, which coincided with the December holiday season.

With enrollment of participants stalled at ten registered nurses after 16 months of recruiting, IRB approval was obtained to increase the cash token of appreciation from $10 to $30 for each participant. Registered nurses who participated in the study prior to the approval of the increase in the cash token of appreciation were provided with $20 cash to insure all participants received an equal token of appreciation. The additional $20 was delivered personally to former study participants by the researcher, with study flyers
provided for distribution to their peers who met the eligibility criteria for the study. This strategy yielded an additional participant.

Efforts to advertise the study at each hospital site were renewed, with study flyers redistributed and clinical educators and nurse managers again asked to encourage eligible RNs to participate. At the initial hospital study site, a list of RNs by hire date was obtained from the human resources department and crosschecked with the Department of Professional Regulation to identify those RNs on the list who had received their original license within the past two to three years. Personal invitations, signed by the researcher, were delivered to these RNs on the unit where they were employed to encourage participation in the study. However, this list of potential participants was surprisingly short, given the size of the hospital, once nurses working in outpatient units, the emergency department, labor and delivery, and surgical suites were removed from the list. Also, it was not possible to discern from the list those RNs who had transferred from their original unit of hire, making them ineligible to participate in the study despite two to three years of clinical experience. Nonetheless, these combined strategies yielded enough additional participants to reach data saturation after 17 months of recruitment efforts.

**Data Collection and Data Analysis**

Data collection and data analysis take place concurrently in grounded theory studies using the constant comparison method of data analysis and theoretical sampling (Glaser, 1978; Glaser & Strauss, 1967). These methods help the researcher determine areas to pursue in the process of data collection based on data analysis and insure the
theory generated is grounded in the data. Therefore, data analysis began in this study immediately after the first study interview.

Data collection took place in face-to-face interviews that lasted between 45 and 75 minutes. Interviews were audio recorded with a digital recording device; a backup recording device was available but never needed at study interviews. Interviews were transcribed verbatim by the researcher and checked for accuracy; any identifying information was removed and replaced with generic terms to protect privacy and maintain confidentiality.

Interviews were scheduled as participants contacted the researcher; therefore, data collection took place across the hospitals, nursing units, and work shifts represented by the study sample throughout the data collection period. Participants determined the time and location for study interviews, which were held in individual study rooms in a medical school located near one study site, in conference rooms near inpatient nursing units, in coffee shops, or in the researcher’s office; all locations provided the privacy necessary for open dialog. Four interviews were conducted during a scheduled break in the nurse’s work shift; the remaining interviews were scheduled before or after a work shift, or on the participant’s scheduled day off work.

Interviews were conducted using a semi structured interview guide, with demographic data collected at the beginning of the interview after informed consent was obtained. The interview conversation was approached using the “opening the locks” technique (Rubin & Rubin, 2005, p. 14). Participants were asked to think about the patients they cared for on the most recent shift worked and to explain the process they
used to make clinical judgments for those patients in the course of the work shift. Continuation and elaboration probes were used to elicit detail about the activities the nurses engaged in while formulating clinical judgments, as well as their rationale for data collected and strategies used in the process of making clinical judgments. Additionally, participants were asked to identify factors that facilitate and inhibit their ability to make clinical judgments for the patients in their care. Since the goal was to discover the primary concern of the participants related to the clinical judgment process, the interviews were predominately guided by the stories conveyed in response to the general interview questions.

In the grounded theory method, the researcher must be continually sensitive to the potential for forcing data rather than allowing theory to emerge from the data (Glaser, 1978). To meet this challenge, previous work related to models of clinical judgment in nursing and theories of judgment from other disciplines was set aside at the outset of data collection. The general interview guide reflected none of the hypotheses from models or theories previously proposed in the literature. This enabled the researcher to remain sensitive to the data generated and guarded against analysis based on assumptions or preconceived ideas about the clinical judgment process.

Handwritten notes were taken during the interviews to identify areas where additional follow up might be indicated later in the interview or in subsequent interviews with other participants. While the interview guide was used as a general source for interview questions, participants were also asked about their experiences with incidents described by participants previously interviewed to determine if an incident, event, or
concern was unique to one participant or common to participants from the variety of hospitals, nursing units, and work shifts represented by nurses in the sample. Data collected in each interview directed the search for data in subsequent interviews, which is a form of theoretical sampling (Glaser, 1978) that insures the participants’ concerns related to the process under study are thoroughly explored. This increases the likelihood theory will emerge from the data and fit the reality of the participants, instead of being forced by preconceived ideas of the researcher.

Data analysis was done using the constant comparison method. In the initial stage of analysis, open coding was used to examine transcripts line by line, with key words noted in the margins of each transcript that represented the exact language of participants whenever possible. The coded interview transcripts were then cut apart line by line or incident by incident and pasted on code sheets that were labeled with the same key words noted in the transcript margins. The line-by-line excerpts from each transcript were labeled with the numerical code assigned to the participant and the transcript page number to enable the researcher to refer back to an intact copy of the transcript for review during data analysis and write up of study results. On two occasions during the open coding stage of data analysis, interview transcripts were coded separately by the researcher conducting the study and a researcher with expertise in grounded theory. Codes generated by each researcher were compared and discussed to insure the novice researcher’s labeling of transcripts accurately reflected the actions of participants as relayed in the interviews.
Line by line coding of interview transcripts yielded a large number of codes. As each new interview transcript was coded, the codes generated were compared to existing codes, and the incidents represented by each code were compared to the incidents previously assigned to the code sheets. Thus, passages from interviews were added to existing code sheets, codes were revised, and new codes were generated as each interview transcript was analyzed. Data that did not generate a code related to the process of clinical judgment were labeled as miscellaneous. Data labeled as miscellaneous were reviewed periodically to check for fit with new codes generated and after all transcripts had been coded to be certain codes or incidents representing codes had not been missed.

The handwritten notes taken during the interviews and the identification of first-level codes were used to develop theoretical memos that documented the researcher’s thoughts about potential relationships between codes, conditions under which codes existed or were manifested, and general insights regarding the codes and the participants’ accounts of the process used to make clinical judgments. As more incidents were added from each interview transcript to the code sheets the circumstances associated with positive and negative phrasing of codes, for example “being confident” and “not being confident,” became clearer. As data collection progressed, interview questions were tailored and elaboration probes used to explore participants’ experiences related to the emerging hypotheses proposed in the memos. For example, after several participants identified accrued experience with a patient population as a factor that facilitates clinical judgment, it was hypothesized that a relationship existed between the codes “learning at work” and “being confident.” In subsequent interviews, participants were asked about
situations where they were confident or not confident in their clinical judgments to see if work experience emerged as a contributing factor to confidence in the clinical judgment process. The participants’ responses to this more structured interviewing later in the data collection process generated more memos and hypotheses that encompassed relationships between increasing numbers of codes.

Theoretical memos and theoretical sampling facilitated the second level of coding where codes were grouped into categories, with the relationships between codes identified based on reviewing and sorting of the theoretical memos. Codes representing opposite actions generated from the first level of coding were used to identify the range of the categories developed. For example, participants spoke of “trusting your judgment” and “second guessing yourself”; these codes helped to define the property learning at work, one aspect of the category Knowing.

At the end of the coding process, 137 unique codes had been identified. The clustering of similar individual codes into categories and the identification of the relationships between those categories enabled the researcher to see how the categories sequenced in time. Thus, a model of the process nurses use to make clinical judgments as they provide care to patients in the course of a work shift emerged. The model depicts the beginning, middle, and end point of the process, as well as the outcome of the nurse’s clinical judgment. Participants also described how the outcome of the clinical judgment process influences their subsequent judgments to add to the explanatory power of the model.
All interview transcripts were reviewed to determine if the model fit all of the data; data coded as miscellaneous were also reviewed again to be certain pertinent incidents had not been overlooked. As the transcripts were reviewed in light of the model, the category Fitting Things Together emerged as the core category in the process of clinical judgment. This category reflects the primary concern of the participants (Glaser, 1978) and captures the full range of activities represented by the unique codes and properties that define the eight categories in the model of the clinical judgment process. The core category integrates all other categories in the model, and reflects the actions taken over time by study participants from different types of nursing units in a variety of circumstances that require clinical judgment. The model illustrates the process hospital based registered nurses with two to three years of clinical experience use to make clinical judgments; therefore, the research question can be answered by a review of study findings.

Findings

The process nurses use to make clinical judgments as they deliver care over the course of a work shift is represented by a model (Figure 1) with a core category, Fitting Things Together, that integrates eight additional categories: Knowing, Anticipating, Prioritizing, Observing, Thinking, Catching Things, Figuring Out What’s Going On, and Determining What Needs To Be Done. In this presentation of study findings, the Core Category is capitalized; Categories are capitalized and italicized, and properties of categories are italicized, but not capitalized. Quotations from study participants used to illustrate findings are labeled with brackets that include the participant number, followed
by the transcript page number where the quotation can be found. Short phrases or single words that appear in quotation marks without a participant number or transcript page number represent words and phrases used by multiple participants in the study.

**Process and Model**

Data provided by the participants in this study indicate clinical judgment is a process that requires Fitting Together the pieces of information available in a clinical encounter in order to reach a conclusion about a patient’s status and ultimately identify appropriate interventions. The clinical judgment process begins with the nurse fitting together (Fitting Things Together) what the nurse knows (Knowing) based on learning in school, learning at work, and knowing the patient. The nurse’s knowledge base (Knowing) relative to a particular patient determines the nurse’s ability to anticipate (Anticipating) the patient’s clinical presentation and necessary interventions, prioritize (Prioritizing) the issues that require attention for each patient, and rank pressing issues for all patients in a patient care assignment. Anticipating and Prioritizing influence Observing, as the nurse tailors observations based on the clinical presentation that is anticipated for each patient and observes patients based on the priorities established. The Thinking that occurs while Observing the patient enables the nurse to put what is observed in context based on Knowing; this is key to the nurse’s ability to catch discrepancies (Catching Things) between what was anticipated and what is observed. Observing and Thinking set the stage for Figuring Out What’s Going On, where the nurse either confirms what was anticipated or engages in activities directed at Figuring Out What’s Going On to the extent that time, Knowing, and risk to the patient (i.e., perceived
danger) allow. Regardless of the extent to which the nurse is able to engage in activities to figure out what is going on, the result of *Figuring Out What’s Going On* is always *Determining What Needs to be Done*.

**FITTING THINGS TOGETHER**

![Diagram of the process registered nurses use to make clinical judgments in the acute care setting.](image)

Figure 1. Fitting Things Together. Model of the process registered nurses use to make clinical judgments in the acute care setting.

The outcome of the process of clinical judgment, *Determining What Needs to be Done*, takes the nurse back to the stages of *Observing* and *Thinking*. If the patient remains in the nurse’s care, actions that are taken as a result of *Determining What Needs to be Done* take the nurse back to *Observing* and *Thinking* to monitor the patient’s response to interventions implemented and evaluate the care given. If the patient does not remain in the nurse’s care after the stage of *Determining What Needs to be Done*, the nurse returns to the stages of *Observing* and *Thinking* to review the circumstances of the clinical encounter and the care provided. In either case, this return to the stages of *Observing* and *Thinking* explains how the outcome of the clinical judgment process in each clinical encounter influences the nurse’s future clinical judgments.
Observing and Thinking affect knowing the patient and learning at work, two properties of the category Knowing. The data collected and interpreted while Observing and Thinking increase the nurse’s knowledge of the individual patient (knowing the patient) because the nurse observes (Observing) the patient’s clinical presentation, as well as the patient’s response to interventions that are implemented as the nurse cares for the patient. As the nurse builds a knowledge base relative to each patient (knowing the patient) to facilitate clinical judgment in the course of a work shift, the nurse is simultaneously building a knowledge base that will be used to facilitate clinical judgment in future situations with similar patients, because the nurse takes what is learned from one situation (learning at work) and applies the learning to future patient care situations where clinical judgments are required.

**Fitting Things Together**

Fitting Things Together emerged as the core category in the discovery of the process nurses with two to three years of experience use to make clinical judgments as they deliver care to patients in the course of a work shift in the acute care setting. Fitting Things Together meets the criteria for a core category as specified by Glaser (1978), because it integrates all categories in the theory and accounts for the behaviors in which nurses engage as they make clinical judgments. Fitting Things Together is central to the process of clinical judgment; it can be recognized in the activities that demonstrate the properties of all categories in the model, and it carries through the model to promote learning that facilitates continual development of clinical judgment skills.
When nurses are faced with situations that require clinical judgment, they try to Fit Things Together to understand the clinical situation, because isolated pieces of data, like pieces of a puzzle, only create a picture if the pieces are Fit Together. Nurses in the study talked about “putting the big picture together,” “putting the progression together,” and “understanding.” One participant explained Fitting Things Together as “the work I do to try to figure out why you look like this.” [8.6] Another participant described Fitting Things Together on assessment:

The numbers will be off. You know, their extremities will be cool, they just won’t be feeling well again. Just that assessment, the correlation of the numbers. Trying to picture in my head or figure out what’s causing these abnormalities or the abnormal assessment. Their heart rate will get a little higher, and I’ll wonder, is it because they’re hypovolemic? [1.18]

Nurses in the study Fit Things Together from many sources. One participant said, “If they have any labs that were ordered, any diagnostics, that can help fit things together” [10.12], and another participant explained, “Medications tell you a lot about the patient; they really help to paint a picture of what is going on with the patient medically, yes, medically what is going on with the patient.” [13.7] One nurse said, “I sit and read the notes, understand, you know, fit all the pieces together, anticipate what can happen, things like that.” [3.16]

Data generated from participant interviews make it clear that a primary concern of nurses in this study is “keeping patients safe,” and participants believe “keeping patients safe” requires Fitting Things Together. As the only provider with a continual presence at the bedside, nurses “pick up on things” and Catch Things; they notice changes that physicians are not present to observe. Therefore, participants Fit Things Together to
make sure physician’s orders, rules, protocols, and guidelines are adjusted as needed to identify and address patient problems and prevent adverse events.

Problems can only be solved if the nature of the problem can be identified. Participants in the study described constant looking, assessing, listening, checking, and investigating as they deliver care to their patients, but the nurses in the study also focused on Thinking. One participant said, “You just have to think, you have to put the progression together…you see it from start to finish, when you are able to trace back and kind of recognize the warning signs.” [8.16] Another participant explained:

You have to think, because it is often more than one thing that is causing the problem. Everything is connected and whatever response the patient is having sometimes can be the combination of three different things and you have to know that. [2.14]

Nurses try to Fit Things Together in situations that require clinical judgment so they can Figure Out What’s Going On, which puts them in a better position to Determine What Needs to be Done. The core category Fitting Things Together integrates the categories of Knowing, Anticipating, Prioritizing, Observing, Thinking, Catching Things, Figuring Out What’s Going On, and Determining What Needs to be Done.

Knowing

The clinical judgment process begins with the nurse Knowing, a category defined by the properties learning in school, learning at work, and knowing the patient. The nurse’s knowledge base relative to a situation that requires judgment is determined by these three aspects of Knowing. Attributes of the nurse or the work environment that affect any aspect of Knowing will impact all subsequent steps in the clinical judgment
process. Ideally, learning in school, learning at work, and knowing the patient are all at play in situations that require clinical judgment. However, since nurses might lack experience with a particular patient population or be called upon to make clinical judgments for patients assigned to another nurse, the influence of each aspect of knowing is not equal across all situations that require clinical judgment.

Participants in the study were quick to say that for those patients assigned to them in the course of a work shift, clinical judgment begins with the report received from another RN at change of shift or from a nurse transferring a patient to their care from another unit. This report enables the nurse to “get a picture of the patient” or “a general idea” of the patient’s most pressing issues. As one participant stated, “I get report from the night nurse, and that is where I get my biggest picture from.” [9.1] The report received is an important step in knowing the patient. Participants were very clear about the information they want in report.

Well, I mean, obviously I want to know why the patient is here, the diagnosis; I want to know the vital signs, if they are currently stable, or, you know, something is off, something is wacky. Any abnormal lab reports, like you know if the potassium was high for the morning labs, the medications that were given, the medications that were not given and why they were held. Obviously, you know if the blood pressure was really low and they held the Lopressor, things like that. Any, oh, well, this is a xxxx [name of unit] unit, so obviously a quick update on how they did with rehab would be nice, too. You know, if they didn’t participate in therapy and why not. You know, any issues with families, you know, trying to see what else. Dressing changes that need to be done, obviously any orders that I need to follow up on, trying to see if I am missing anything else. I think that is about it. [13.2]
In those situations where no report is provided to the RN by another nurse, such as in the case of a patient directly admitted to the hospital, participants put their picture of the patient together by collecting data from whatever sources are available.

It really helps if they’re alert and oriented and know their past. I’ll just ask them, you know, what brought you in? We get a lot of direct admits for anemia, cellulitis, things like that. And they’ll just say I got a screening and my blood was low, so I came in. So, you kind of get the story from them. If they’re not very alert, sometimes family is with them and you can get the story from the family. What changes did you see in your family member? And, if they’re not alert and you can’t get hold of family, sometimes the best you can go off of is their diagnosis, and if they’ve been here before you can see some of their old charts, their old history. If they’re from a nursing home you get that chart with them, so that can maybe give you an idea; you can always call the nursing home, too, if you have questions, but usually direct admits tend to be more alert anyway, because they’re just coming from home. But you ask them, what are your concerns? Why did you come in? And then, that’s the story you start with. [10.11-12]

Every participant echoed the importance of “getting a picture” or “getting an idea” as the first step in knowing the patient, and the point where the clinical judgment process begins. However, it is clear from the above passages that the participants do not only collect information or data about a patient in report or on admission, but they interpret the data as it is relayed to them and pose questions based on the information they are given. The “story” a nurse hears from another nurse or a patient can only help the nurse to “get an idea” if the nurse knows (Knowing) what is significant. In order to determine if the vital signs or laboratory values reported are cause for concern, the nurse must have a point of reference. Therefore, theoretical knowledge that is acquired in school (learning in school) is one aspect of Knowing that informs clinical judgment.

Knowing the patient at the beginning of the clinical encounter requires more than report;
the nurse must fit together the data presented with norms and principles that were learned in school in order to use the information provided.

Learning in school helps nurses recognize deviations from established norms as they “get a picture” of each patient in their assignment, and as they incorporate additional data into that picture throughout the work shift. Most of the clinical judgments nurses make are related to patients in their assignment, so nurses use at least two aspects of Knowing, learning in school and knowing the patient, to make the majority of their clinical judgments. However, nurses are occasionally called upon to make clinical judgments for patients assigned to another nurse; this occurs most often in situations where a nurse responds to an equipment alarm or help is requested by a patient, family member, or ancillary staff. In these situations, since the nurse cannot incorporate knowing the patient into the clinical judgment that must be made, the nurse relies on learning in school. As one participant stated:

I mean, you typically know when you walk into a room and see a patient that they should at least be able to acknowledge you. They might be having, you know, showing signs of pain or something, which is something else to address, but if they were stable, medically, you know you shouldn’t see them breathing really rapidly, you shouldn’t see those kinds of things happening. [5.3]

Learning in school helps nurses recognize deviations from the norm, but participants recalled their inability as new graduates to interpret the significance of the deviations they observed, or put pieces of data together to understand the patient’s clinical presentation. One participant said, “Well, when I first started, I really didn’t know what all those numbers meant” [11.9], and another participant explained:

That was very difficult too, to figure out what all of these numbers are and make
sense of them, how they correlated you know? It’s because if you don’t have enough volume, blood pressure would be low, your cardiac index would be low, and your urine output would be low, but it took a while for me to figure out when all those numbers were low, that’s what it meant, you know…[1.7]

Participants in the study recalled being frustrated as new nurses, because they wanted a norm or a number that could be used in every situation to determine when each piece of data should be cause for concern. The following quote illustrates the desire for a number or a norm could be driven by a failure to understand what the numbers actually represent:

Like why is a pulse ox a concern? You know, what number do I start getting concerned about or kick into action? Or the heart rate, for instance. I know that 160 is high, but why is it 160? When I first came here, I’m like [a pulse ox] of 80 is low, but is it that low? I mean, it’s not really low. But then the doctor puts it in perspective. You hold your breath for five minutes and see how low yours goes; 80 is low, you know, and 70 is really low. That’s oxygen getting to your organs and you don’t put that into perspective, you know. [9.15]

As licensed RNs in clinical practice, the participants soon realized that learning in school would only take them so far when caring for patients; they initially relied on learning in school, but over time on the nursing unit learning at work occurred. The experience the participants acquired with patient populations helped them learn to put data in perspective. With experience, nurses in the study came to realize norms could not be rigidly applied to all patients, but should be used more as a general guideline that must be adjusted depending on the unique circumstances of each patient. As one participant stated:

And, what I’ve learned, too, is that certain patients, that number which is abnormal might be normal for them. You know, that their body adapted and changed, so you can’t always go to that. Cause, I’ve told doctors, you know his pulse ox is 92% and he’s like, well he’s a COPD so that’s ok, and you’re like, ok,
so you learn about those things, too. [10.10]

The participant went on to say:

It clicks into place here. That now you know the reason for this happening is because of this and because of that. And when you see it and actually work with it, you can understand it better than just reading it from a textbook; it doesn’t make sense. You’re like ok. It makes enough sense to pass the test, but not in real life sometimes. [10.11]

*Learning at work* helped participants in this study acquire the skills necessary to recognize and respond to patients who were deteriorating. Even though *learning in school* provided the participants with norms and guidelines, the actual experience of caring for a deteriorating patient, while trying to provide care to a group of patients, was new. “Well, in nursing school, I never had a patient that went bad, so that was, it took a learning curve to see how that looked.” [7.11] Participants also described the role of experience in dealing effectively with sudden changes in a patient’s status.

But definitely, the experience helps. When you have had enough patients that have Afib [atrial fibrillation] and RVR [rapid ventricular response], you can say, I’ve had this patient before, or a patient like this before, so that all comes into play. Definitely when I first came on, I was not confident to say anything like that. [9.6]

In addition to recognizing deterioration, participants indicated they were more comfortable dealing with change in a patient’s status as the result of *learning at work*, because they had learned what to expect from the physician. “You’re more comfortable because you’ve dealt with that situation before, and you kind of know like what direction the doctor is going to go.” [13.15]. *Learning at work* gives the nurse a basis to evaluate the interventions ordered by the physician based on experiences in similar situations. This is in contrast to the new graduate who has not had an opportunity to learn from
experience:

Sometimes I feel like when we first start, you almost just do it because it’s ordered; because you’re not, you don’t want to go against the grind and tell them I don’t want to do that because I don’t know what the heck I’m doing. I would not have spoken up when I first started here. Because you kind of think, maybe that’s not a good idea, or you wouldn’t say anything because you’re too afraid. You don’t feel confident enough to say something. It took me at least a year, I think, to feel confident enough to, you know, because you’re still really new and there is a lot of stuff you haven’t seen. [9.7]

In addition to recognizing deterioration in a patient’s status and knowing the interventions physicians are likely to order in those situations, participants in the study explained that many responsibilities associated with their role that require clinical judgment were never experienced in their clinical rotations as a nursing student. For example, learning at work was necessary to coordinate the care required for patients during the admission and discharge process.

But that was something I never did in nursing school, anything with an admission or a discharge. Oh, my, that was the biggest challenge for me coming out of nursing school. Because, coming out of nursing school, I would have one or two patients. You do a lot for them in nursing school, but you are not assuming the full responsibility for those patients. Maybe you might be passing medications with your instructor; maybe you might be doing bedside care, but when it really comes to like, talking with doctors, working with social workers, case managers, identifying needs for home, we never did that. And that is challenging when you have four patients on a floor. [12.19]

Participants in the study identified “knowing the population” as an important outcome of learning at work, because patients in a given population have a similar clinical presentation, similar medical orders, and a similar path to recovery. Nurses with experience can compensate to some extent for not knowing the patient if they “know the population” because the similarities among patients within a given population give the
nurse a general idea of what to expect. As one participant explained:

You know, we have so many of the same surgical procedures that you know even if I don’t know the patient, I typically know how they’re going to present; of course, that is not always how it goes. But, our gyne patients, I know, usually have void trials and they’re usually pretty stable and healthy people; whereas, our whipple patients I know are going to be high acuity patients. [2.5]

Another participant said, “I think we have seven ICUs; so it’s very specific. We get the same patients from the same three surgeons.” [1.13] Participants emphasized “knowing the population” could only be achieved through learning at work; they described this learning as key to their ability to make appropriate clinical judgments. “The biggest thing is just learning the patients, learning what’s expected, like what they will present.” [1.25]

Participants also talked about “learning protocol” through their experience on the same nursing unit with the same groups of patients. Protocols typically specify nursing interventions, topics for patient teaching, diagnostic tests and therapies that are indicated, and the daily progress that is expected for patients in each diagnostic or procedural group. “So, I think it works well for me that the knee patients all have guidelines, the gyne all have guidelines, and now that I’ve learned them all, I’m more confident because I know each protocol.” [6.11]

In addition to the clinical presentation and treatment protocol, nurses in the study indicated an ability to predict problems with a patient based on knowledge of a population acquired through learning at work. A participant explained her initial concern about a patient in her assignment:

I specifically remember an incident one of my last shifts where she, you know, she was a lung transplant and so, typically they don’t do as well. She’d come back after a bronch; so with transplants they just don’t do well afterwards. [8.10]
The above participant explained that just hearing the diagnosis and the fact that the patient was post bronchoscopy “is already alarming. You know you’re probably in for a tough night with them.” [8.10] In this case, even though the patient’s vital signs and oxygen saturation were normal at the beginning of the shift, the participant determined this patient was the patient in her assignment who required the closest monitoring based on the nurse’s experience with pulmonary transplant patients. The patient’s condition did deteriorate during the shift to the point where transfer to the Intensive Care Unit became necessary. Another participant also spoke to the importance of “knowing the population” through *learning at work* in determining priorities for surveillance.

Because, it’s like, you’ll have this liver patient. You’re like, well, I remember that I had a liver patient that was, you know, the varying degrees of liver patients. You’ve seen them; you can put this patient within that lineup somewhere, and you know how worried you should be about certain things. [15.19]

Common threads in narratives from participant interviews related to *learning at work* and “knowing the population” are ‘being comfortable” and “being confident,” both of which are the result of “knowing what to expect.” Participants described gaining confidence as an important outcome of *learning at work*, because it helped them learn to trust their clinical judgment and overcome a tendency to “second guess” themselves. As one participant said:

I remember it; you see what the nurse before you charted, you know, and then all of a sudden, you second guess yourself. It’s easier now to make the decisions, to be confident in the decisions, and to know, or at least know how to figure it out if I don’t know.[1.24]

Other participants explained how gaining confidence through *learning at work* facilitated
their ability to interact with other health care providers, particularly physicians. “I feel
like I am much more comfortable with the physicians and getting across what you need to
say to them and what you suggest than when you start.” [10.23] Another participant said:

And it wasn’t that way to begin with, because I had never spoken to doctors in
clinical and I was definitely afraid when I first started. Every time I had to pick up
the phone to call somebody, I was like, ok, I can do this. Now, I have no problem
waking you up. We’re in this together. [7.12]

While participants recalled “just doing it because it’s ordered” [9.7], when they first
started, learning at work gave the nurses in this study the confidence to call physicians
without hesitation, question orders, and make suggestions. The same participant who
recalled “just doing it because it’s ordered” [9.7] explained how her approach with
physicians has changed over time:

You make some suggestions to the doctor; because some of them are new and
they don’t know exactly what to do sometimes. You know, we think this. He’ll
give 10 of dilt [Cardizem] and then you say, well, it’s not working, so we have to
do something else here. So then he thinks we should put them on a drip, and I’m
like, well if the dilt isn’t working in the pushes, it’s not going to work in the drip,
either. So then, you tell them, you know, maybe try Lopressor, things like that.
[9.6]

Every participant in the study emphasized the importance of learning at work in
the development of their clinical judgment skills. However, participants also explained
that even with two to three years of experience, the confidence that is gained through
learning at work is limited to the patient population and the unit where that learning takes
place. Nurses in the study explained that in situations where they are temporarily
assigned to a unit other than their own, or when caring for patients on their unit who
would normally be admitted elsewhere, their confidence in their clinical judgment is
limited. As one participant with three years of experience stated, “Because we get patients who are from neuro and this and that and I don’t have, you know the know all at all or the confidence really to go ahead and make decisions or go from there.” [1.13] Another participant explained that patients normally admitted to another unit cause nurses to second guess themselves.

Sometimes they have drains coming out of their head that you are just not used to; you know, different lines. You know, you’ll have to maybe measure the ICP and it’s like, oh man. How do you do that again? Like I remember you hook them up to the monitor this way, but like, how do you get that? And, you know, you might not fully remember what the number means and, usually, you have to do q1 hour neuro checks on this patient and if there are, and if there does start to be deviations, I have found that we seem to kick ourselves more. Like, if we find them, we assume that we missed them at some point. Even though we do them every hour, we’ll be like, oh man, maybe it was there that hour before. We’re like less confident in our assessment skills. I am, anyway. [15.11]

The participant’s continued account of the situation above is similar to the situations described by other participants in the study when they spoke about their inability as new graduates to interpret the significance of data collected.

Cause, it’s like, it’s not so much the machines that are sticking out, it’s that we’re not as comfortable with the numbers. You know, it’s like whereas we see a CO₂ of 79, we know that means, all right, let’s get going. Whereas, we see an ICP of like 14, and you might understand the range and yeah, that’s out of the range, but how bad is that? How bad is an ICP of 14 versus an ICP of 16, or 10, you know? [15.12]

Several participants shared accounts of incidents where they were assigned to care for patients typically admitted to units other than the unit where they were employed. When the participants were asked if they might call the unit where a patient would normally be admitted for advice or assistance from another RN, most indicated that would not be their first inclination. The participant above stated, “Absolute worst case scenario, you know,
you might feel like a goofball, but you just call the unit, the unit they came from, and just say like, hey, I don’t know what this is, can you give me some background information?”

Another participant stated, “So, once in a while you will [call another unit], but I don’t think it’s as often as you’d think it would be. I think sometimes there is a disconnect between units.”

Learning at work, according to the participants in the study, might be affected by the shift the nurse works. Participants all agreed that priorities differ on the day shift and night shift, and this impacts the problems nurses working those shifts are expected to address. Obviously, situations occur during the night that are appropriately deferred to the day shift RNs for attention. However, participants from all study sites explained that resident physicians on call at night are reluctant to intervene in situations that do not pose imminent danger to a patient, and often instruct the nurses who call them for orders to pass the information to the day shift staff for resolution. When talking about nurses working the night shift one participant who routinely works the day shift said:

And I’ve learned a lot of the resources that are available on the day shift, just because we are able to access them; they just, you know, often times have to say, hey, this is what we’re dealing with, can you figure this out today? [2.10]

Another participant also explained how working the night shift could potentially impact learning at work, because nurses have fewer opportunities to see how problems might be addressed:

When they call the doctor about something, he’s just like, yeah, ok, whatever, you know, it’s not critical, I’m not going to address it. I’ll let the day team figure it out. So, instead of being able to develop those skills and say, you know in the future, whatever it is, the night doctor will just be like, ok, it’s not a critical issue,
I’ll put it aside, I’ll tell the day team about it, and then the night nurse doesn’t ever have to do anything about that situation. [5.8]

Another participant agreed there are more opportunities for learning on the day shift.

On nights, on nights, your main goal is to give a bath, I think. Keep the patient stable, obviously, and give them their bath. I feel like I can learn more [on days] because all of the procedures are done during the day. EGDs, bronchs, everything. So I learn more, I get a better picture of like what is going on with my patient. I interact with the docs more. [11.13]

In summary, Knowing, the first step in the clinical judgment process, is defined by

*learning in school, learning at work, and knowing the patient.* When nurses must make a clinical judgment, they begin by getting a picture or a general idea of the patient by combining what they have learned in school with what they have learned at work and what they know about the patient. Factors that influence any aspect of the nurse’s Knowing in situations that require clinical judgment affect all subsequent steps the nurse takes in the course of making a clinical judgment and the outcome of the clinical judgment process, as well.

**Anticipating**

Knowing sets the stage for the second step in the clinical judgment process, Anticipating, a category defined by the properties predicting and being proactive. The participants in the study indicated that Anticipating becomes possible only after learning at work. In order to Anticipate the nurse must know what to expect, which only comes with knowing the population, learning protocols and guidelines, and acquiring experience in clinical practice. One participant said, “When you first start, even on the day shift, you don’t think about the rest of the day or anticipate a discharge.” [2.12] The participant
went on to explain that tasks, such as passing medications, were her priority when she first started; this participant reacted to events as the day unfolded, instead of *Anticipating*.

*Anticipating* begins in report; the nurse Fits Together what is known based on *learning in school and learning at work* with “the story” provided about the patient. As one participant explained:

> Then you get the story, too, from the night nurse, about what’s going on with the patient, how they are, how they’re doing, did they have any problems that night, or the day before. It’s pretty much just to kind of organize and get a plan right now of what they’re going to need. [10.2]

Participants in the study indicated that the story they hear in report establishes their expectations for medical orders and nursing interventions. As one participant said, “Obviously, if they’re hypertensive you want to see some BP meds in there, you know. If they’re diabetic, you want to see insulin, metformin, glyburide.” [13.8] On the other hand, participants indicated they adjust the mental picture of the patient they get from report if they see the patient is on medications they were not *Anticipating* when they review the medication administration record. As one participant stated:

> So, even if you’re not getting it in report, you know, you’re not getting a certain diagnosis, and then you’re looking at the medications and, you know, they’re getting something that is not there [in the diagnosis], you kind of have a picture already of what else is going on with the patient. [13.7]

*Anticipating* what the patient will need enables the nurse to identify discrepancies between interventions that are in place and what is needed to care for the patient that shift.

I always make a list of things that I feel I need. Like, I need medication wise that they haven’t ordered, or restraints, or their diet, you know. Like the guy didn’t have a Dobhoff in, so I need that today. So, I make a list of things I definitely
need from them. They round later, they round around 10 or 11, so I know they’ll be coming. [3.18]

Once nurses have learned protocols, such as the protocol for weaning a patient from a ventilator after surgery, the “story” in report enables the nurse to Anticipate the primary concerns for each patient and predict the events that are likely to transpire over the course of the shift.

We have protocols, then it’s also just listening to report as to, you know, if the patient, cause a lot of times if we’re going to try to extubate them after surgery they’ll shut off sedation and tube feeds at four in the morning, so that I know they’re looking to get weaning parameters and keep the patient awake and you know, get the breathing tube out. Whereas, if it’s been a very hectic night, the blood pressure is labile and everything like that we know they are going to keep the breathing tube in, you know; it’s just based on how critical the patient is. [1.4]

Nurses in the study also indicated that “knowing the population” enables them to predict potential problems that might arise. As one participant explained:

Yeah, when I am getting my report, I am already thinking, ok. Like I said, COPD, a lot of the patients, you know, it comes hand in hand with the anxiety with the COPD. They’re like always connected. So, I’m just thinking, ok, I’m probably going to have to deal with that. That’s just something that’s in the back of my mind already. A lot of times I do encounter it. [13.6]

Anticipating depends on Knowing. When Knowing is incomplete because “the story” provided in report is not accurate, nurses cannot Anticipate; instead, they must deal with the unexpected. One participant said:

And when I walked in there, she was kind of a mess, very anxious, lines everywhere tangled up; and then when the next nurse, after the shift was over, the next nurse came back and kind of said like, yeah, I thought that was going to happen. And that was like, then why didn’t you tell me, you know? Because the patient ended up having to get intubated, like a PE or something. That was one instance where I thought this is not what I expected. [12.5]

Another participant related a similar incident and explained the implications of dealing
with the unexpected.

So, that was like a four hour rapid response. It was just, he was not what I got in report at all. And then you’re like, ok, well now I have to deal with this first thing in the morning and not see my other patients until 10 or 11. [10.18]

*Knowing the patient* can contribute to *Anticipating*, but participants were clear that *learning at work* also influences *Anticipating*, because nurses come to recognize the potential for sudden changes in patients’ status through experience on the nursing unit.

Several participants shared comments similar to the following:

Yeah, I never got to see the things that I see, you know, every day now. So it was a real quick turnaround. Especially given the activity, the environment of my unit. To see how quickly they do turn, even when you’re not expecting it. [7.12]

*Learning at work* also facilitates *Anticipating* because experience enables the nurse to *predict* questions a physician might ask or interventions that might be ordered when the physician is called. One participant said:

And a lot of that comes over time with experience, that you think to yourself what’s the next step? You know what you are supposed to tell the doctor, but you should also be thinking a couple of steps ahead and kind of anticipate what he is thinking might need to be done. [5.6]

This is in contrast to a participant who recalled not *Anticipating* data a physician might request when she started in clinical practice as a new graduate.

I think that comes from discussions with physicians, or just you know, when you call for something and they give you orders and then, and then they’ll ask you well what about this? And you go, oh, I didn’t even think about that. [10.10]

*Anticipating* and *predicting* enabled the nurses in this study to *be proactive* and “take initiative.” A study participant summarized the importance of *being proactive*. “I try to be proactive, because I’ve learned that really does benefit the patient and myself.
You know, going through it without being proactive, you realize you kind of make more problems for everybody.” [2.11] Being proactive causes nurses to take precautions. One participant explained:

Falls, that’s something you can’t expect, you don’t want it to happen. I think being proactive about if everyone is okay, if they need to go to the bathroom. They are kind of impulsive, but you know putting the bed alarm on so you can catch that before. [8.14]

Anticipating side effects that are associated with medications alerts the nurse to make sure the necessary tests are ordered and monitored. A participant stated:

We are giving a lot of diuretics, so we want to make sure the electrolytes are in play; you want to check the kidney function, make sure they are not becoming renal insufficient. Because with our Lasix drips and stuff like that, and with all of the contrasts we use in our procedures, you do see changes in kidney function. [14.11]

Another nurse said that even though standing medical orders include oral medications to control a patient’s blood pressure after a cardiac procedure, she would not wait for the situation to escalate. “Usually, if I have a patient that comes to me and their blood pressure is already 180, I just call the doctor right away and get the blood pressure medication for the IV. I’ll control it faster.” [12.5]

In summary, nurses in this study indicated they Anticipate the clinical presentation and treatment plan for each patient in their care by Fitting Together the pieces of data provided in report with Knowing that is informed by learning at work and learning in school. Fitting Together the data provided enables nurses to “get a picture of the patient,” which facilitates Anticipating care that will be required over the course of the work shift, predicting potential problems, and being proactive to address risk and
facilitate early intervention.

**Prioritizing**

*Prioritizing* patient care activities occurs based on *Knowing* and *Anticipating*. Properties of the category *Prioritizing* are *planning*, *adjusting*, and *addressing pressing issues*. In the course of a work shift, nurses must *Prioritize* the care needed by the patients assigned to them, but nurses must also be prepared to *address pressing issues* in situations that require immediate attention. The dynamic nature of the clinical environment requires nurses to *adjust* their priorities continually throughout the work shift.

All participants in this study made it clear that they want to leave the shift report with a *Prioritized plan* for the work shift that is informed by the data received in report, what is known about the patient population, and experience gained by working on the unit. The nurse’s original *plan* for the shift is driven by patient acuity and medical orders, primarily medication orders or orders for diagnostic tests. On those nursing units where some portion of the shift report is conducted at the bedside, the nurse gets a visual picture of each patient that helps to determine acuity and establish *Priorities*. As one participant explained:

> Now typically, I will have already seen the patient, just real briefly when we finish report. So, from there, I’ll kind of, you know, just prioritize myself. I’ll take a look at what I got in report, what they were saying about the patient, what their vitals and everything look like, and I’ll say, ok, this patient is more critical to see at the beginning than another. [5.1]

In addition to acuity, the participants also identified complexity of care as a factor that influences *Prioritizing* and *planning*. A participant stated:
After report I think the number one thing is to kind of just look at your team and see what you’re dealing with. I usually look at all their latest vital signs, their lab work, you know, you have to kind of picture in your head like who’s going to take longer to assess, to give their meds, cause everyone’s meds are due at 8:00, right when we come in. It took me awhile to figure that out, but that is the best way I think you can get everyone done in a timely manner. [8.1]

Participants explained that it is important to get initial assessments done in a timely manner because “if there is something wrong I want to know about it right away so I can address that immediately” [5.2]. However, the nurses in the study indicated the plan made for the shift based on report sometimes has to be adjusted before it is even implemented. Patient requests for comfort measures, such as an analgesic or antiemetic, were identified by nurses in the study as Priorities that require them to adjust their plan for seeing their patients after shift report. As one participant stated, “Some people want pain medicine right then, and no, I didn’t want to see you first, but since you have pain medicine due, I’ll see you first.” [2.3]

Nurses in the study explained that as they implement a Prioritized plan at the beginning of a shift, priorities are adjusted if the nurse discovers a discrepancy between the clinical presentation that was Anticipated and the clinical presentation that is Observed. A participant stated, “Well, if I don’t see the picture I’m expecting, that would alter my priority.” [5.3] In the course of the work shift, priorities are adjusted based on changes in a patient’s status or new medical orders. As one participant explained, “So I might have an idea of doing this, this, and that, and then an order for blood or electrolyte replacement comes up; well, that’s going to take priority. I have to rearrange.” [6.5]
The need to *adjust* often arises because of unanticipated patient discharge from the hospital. “Sometimes, there’s you know, estimated discharge tomorrow, or in two days, but I think for the majority of the time, you don’t really know until that day.” [10.17]. *Prioritizing* is significantly impacted by unanticipated patient discharge because the nurse has a very short window of time to coordinate input from multiple providers and complete patient discharge teaching, and nurses often have to facilitate multiple discharges in one shift. As one participant stated, “You definitely have to give your attention to the people who are about to go home, cause you have to make sure they understand everything right before they go.” [14.14]

*Prioritizing* is based on *Anticipating*, but participants in the study indicated they often find themselves in situations where they must *address pressing issues* that were not *Anticipated* when care was *planned* for the patients in their assigned group. However, while specific events for particular patients might not be *Anticipated*, it is clear that *learning at work* helped the nurses in this study understand that the unexpected is always a possibility, and organization is key to dealing with the unexpected when confronted with a situation that requires immediate attention. As one participant explained, “There’s always a sense urgency because I never know what’s going to go wrong, and I kind of always expect something to go wrong.” [7.13] Another nurse in the study said:

Yeah, you know, that would happen quite a bit, with our cardiac patients and them kind of flipping into uncontrolled Afib. You know, you can’t really, it just happens. You know, you can’t really expect that to happen so, but you just learn you have to just take it in stride and call. Be quick about it and get what you need to do. [8.14]
Nurses in the study also described incidents where they had to *adjust* their priorities because a patient assigned to another nurse required immediate attention. One participant described an incident where the nurse assigned to a patient was unavailable when the cardiac monitor alarm indicated a life threatening arrhythmia:

So she [the other nurse] is still in the other patient’s room. So, I’m like well, I’ve got to call the doctor because we need to get something done immediately about this. You know, she comes over, the doctor, and everything is taken care of in the situation, but I’m like oh my god. But that’s where you have to drop everything you’re doing because another patient is not doing well. [9.14]

In this case, even though the nurse could not *Anticipate* this specific problem in a patient assigned to another nurse, the participant did *Anticipate* potential problems that commonly occur in the patient population on the unit and *Prioritized* a prompt response to monitor alarms for all patients.

In summary, *Prioritizing* enables nurses to *plan* care for a group of patients, *adjust* in response to changes in patient status or treatment plans, and *address pressing issues* that develop in the course of a work shift. *Prioritizing* is facilitated by *Anticipating* the care that will be required for patients based on *learning at work*.

**Observing**

*Anticipating* and *Prioritizing* set the stage for *Observing*, a category defined by the properties *seeing the patient*, *assessing*, and *comparing*. Based on report the nurse “gets a picture” or “an idea” of each patient’s clinical presentation and who or what needs attention first. Participants indicated they want to *see* the patient to *compare* assessment findings with the clinical presentation they *Anticipated* and “get a baseline” at the beginning of the shift. Participants reported asking themselves questions similar to, “Is
this the image that I thought of when I first saw the charting?” [15.5]. One participant described her initial assessment of a patient she had cared for on the previous day:

And I am just looking to see how they interact with me, you know? They told me this patient is alert and oriented times 3. Are they really? Sometimes they’re not, you know. That way I get a baseline for how they are, at least at the beginning of my shift. [15.9]

Another participant explained, “And then I’ll typically see each of the patients in the morning rounds, assessment and meds, and then pick up from there what kind of a patient, from my own judgment.” [6.1]

Nurses in the study indicated they perform a “head to toe” assessment on the patients in their assigned group when they first see the patient, but tailor their Observing based on Knowing, as well. One nurse explained her initial assessment of a trauma patient at the beginning of the shift:

Depending on what surgery they had or what trauma they had, like my guy today. He was in a car accident so he had been paralyzed from here [waist] down. So, I wanted to check to see he had peripheral pulses in his legs and feet, so we have to Doppler his pulses, feel his pulses, see if they are still there and if there is blood flow. And, then those are the assessments I do on a person, and then I’ll do the other generic things like listening to their lungs and things like that, that’s not so specific to what their injury is. [9.1]

Another participant said, “If you know they have a past smoking history, or something cardiac, or past vascular surgeries, it gives you kind of a picture of what you should be looking out for a little extra.” [6.3]

After the initial assessment of a patient in their care, participants indicated they focus their assessments based on interventions that are implemented or changes they
detect by *comparing* the patient’s clinical presentation to the baseline the nurse established. One participant stated:

> I’ll do an initial head to toe, like full assessment in the morning and then, I guess, as the day goes on if I’ve got drains that are taken out, then I’ll do more wound assessment stuff. If I hear a patient wheezing then I’ll listen to their lungs, you know. If I notice a patient is having more swelling in one leg then I am going to look for a DVT, so then it’s more of a focused type assessment throughout the rest of the day. [2.12]

Another nurse explained that *assessing* throughout the shift is focused on looking for changes. “You know, depending on how they progress throughout the day, make sure there’s not any changes in mentation, their vital signs are ok.” [13.8]

For nurses in this study, *Observing* throughout the shift involved incorporating data from multiple sources. For example, nurses listen to their patients. One participant said:

> Someone might say to you, you know, I’m feeling pain in my leg. You know, you might not have found that on the assessment but now all of a sudden they’re coming up with something, not coming up with, but something is happening to them that they are verbalizing to you; so, you know you have to address that. [5.5]

Data family members might provide were also considered helpful. One participant said listening to family members is important, “Especially if you’ve never had the patient before and you don’t know their baseline.” [8.17] Participants indicated they “Look at the labs to see if there are any big changes or shifts” [10.4] and keep track of vital signs. *Observing* also involves the use of monitoring equipment to augment the nurse’s physical assessment findings. One nurse in the study said, “Maybe the tele [telemetry] is picking up some additional arrhythmias compared to this morning.” [12.13]
Participants discussed various policies that specify when assessments must be performed, but nurses in this study were influenced more by Knowing the population or changes in a patient’s status throughout the shift than policies that dictate assessment. Further, the participants indicated that, while monitoring equipment and test results are helpful, the critical aspect of Observing is seeing the patient. As one participant stated, “I mean, I think that the numbers are important, and we should look at them kind of a picture of the patient. But we can’t completely focus on the numbers, the monitors…they don’t give you the entire picture.” [11.9] Another participant explained why seeing the patient is important:

And getting to know your patient throughout the day. Like, if you’re in there and out of there. Like I said, I do like talking to my 85 year old patients a lot of the time because it really, then I do get to know them; but also, I know when they’re becoming confused. And the doctor’s like, oh, but he’s 85, he’s always confused, he’s 85. No, he is not always confused. [2.17]

Nurses in the study explained that they can get “tied up” with a deteriorating patient and then have to rely on other staff members, instead of seeing the patient. Even though the participants stated that their peers will check on their patients and insure the patients are safe, not seeing the patient generally made the participants uncomfortable. One participant described an emergency situation that prevented her from seeing the other patient assigned to her. “So I hadn’t seen my patient for two hours, and I was like, gosh, I really need to go in there and see how he’s doing…If I could just glance in at him.” [11.13] Another nurse in the study said, “It’s best to go in and look yourself. I
mean, our PCAs are excellent at telling you when things go wrong, or something’s not right, but generally, it’s always better to go in and see it yourself.” [10.16]

Knowing impacts Observing, but Observing patients influences Knowing through a feedback loop. Through Observing, the nurse builds on the picture from report throughout the shift, collecting data that informs knowing the patient.

Cause, I feel like when you first get on there’s a lot. You don’t know this person at all and you have to get to know them, you know, how they adjust to, like medications and things like that. You know, sometimes patients are really touchy; if you turn it up too much or you don’t hit it enough, or things like that. Or even, like sedation. How high does that need to be? So once I get my feel for my patient, then I feel like my day goes better, and then the next day and the next day, it’s even better. [3.9]

The nurses in the study indicated they establish a new baseline at the beginning of every shift they care for a patient, but knowing the patient’s baseline from a previous shift can be helpful on subsequent shifts when they might be assigned to the same patient. One participant explained:

I mean I’ve had experiences where I come in the next day and the patient is completely different. And I’m like, instead of being like does anyone know if this is the patient’s baseline, I know that’s the patient’s baseline or not. [10.5]

In summary, Observing is a category defined by the properties seeing the patient, assessing, and comparing. Data provided by nurses in the study indicate nurses tailor Observing for patients in their care based on Knowing what to look for, Knowing what to expect given an established baseline, and Knowing what warrants attention because of differences between what was Anticipated and what is Observed. In the course of a work shift, nurses Prioritize seeing their patients, which impacts knowing the patient through
assessing and comparing the clinical presentation throughout the shift to the patient’s baseline.

Thinking

Thinking, a category defined by the properties asking why, reasoning, and reflecting, enables the nurse to put what is Observed in context in a clinical encounter. Participants in the study were clear that Thinking must take place while the nurse is Observing in order to interpret data collected and tailor subsequent Observing appropriately. Thinking while Observing often directs the nurse to extend Observing in pursuit of additional data.

Data generated from participant interviews indicate nurses ask why when they do not Observe what was Anticipated in the patient’s clinical presentation. The discrepancy between what is Observed and what was Anticipated may be the result of a change from the patient’s baseline status. For example, one participant said, “No, I know him. He was not like that; he was walking fine. Why is he not able to get up from the chair now?” [13.4] Or, the nurse may not Observe the Anticipated response to an intervention. Another participant described a situation where scheduled medications were given that would be expected to lower the patient’s elevated heart rate. She stated, “I’m like, I’ve given these meds two hours ago, why is he still elevated like this?” [12.15]

Participants provided examples of asking why when they encountered discrepancies between what was Observed and what was Anticipated in a patient’s medical orders or treatment plan. For example, participants explained they would ask why certain medications, considered routine for a patient population, had not been ordered for
a patient. Conversely, participants would ask why medications used to treat conditions a patient did not have would be ordered. Or, a nurse might ask why a medication was not scheduled as Anticipated. One participant explained, “You know, a nurse should know if it is a short acting form, you should see it twice a day, and if you don’t, you need to question why.” [12.20]

Nurses in the study also indicated they would ask why when they did not understand the patient’s treatment plan. One participant explained:

So, it’s not something you learn in nursing school, about whipple procedures and the in depth, you know, parts of it, but it’s something I feel I need to know, why we’re doing certain tests and what we’re looking for in case there’s complications that will develop. [2.13]

Participants in this study indicated asking why when they do not understand the treatment plan or medical orders would prompt them to read the doctors’ progress notes in an attempt to find the answer to their question. One participant said:

I really make it a point, like before midnight, to look at the progress notes between the residents and the fellows, you know, just to kind of see where their plan of attack is too, or like why they started them on this medication. [8.13]

Another participant said, “Oh, I always go to the notes first. If I can’t find it in the notes or somewhere in writing, then I’ll call and ask them.” [5.19]

Asking why was seen by the participants as a way to keep patients safe. One participant said, “If you don’t know why, that’s when mistakes happen.” [6.14]. The participant went on to say that nurses could complete their work by following orders:

They could finish it, but I think mistakes could be made. Or, they might finish it and it was a good day. They gave all their meds and it worked out for them, but they don’t know why and they could have gone sour. [6.14]
Another participant talked about “going through the motions” as opposed to *Thinking*.

A lot of it is just not like getting yourself into a routine of just going through the motions, which can easily happen. And you see it a lot. And if you don’t use your brain, then you are just basically passing medications and you’re not a nurse anymore. [2.13]

Participants in the study gave examples of the *reasoning* used when interpreting data observed in clinical encounters. Several nurses talked about “keeping your eye on the goal.” For example, one participant explained why she was willing to tolerate a patient’s compromised respiratory status instead of pushing the physician to intubate the patient.

And, since he was maintaining his sats [oxygen saturation], and I knew the doctor’s goal was to keep him, you know, to not intubate again, I was ok, well, let’s keep him on this non-rebreather, keep doing the treatments. We’re starting him on his antibiotics, hopefully that will help with the drainage that is coming from his abscess. Let’s give him a chance. [11.12-13]

Another participant talked about *reasoning*, as opposed to rigidly following protocols for post-operative patients:

You don’t have to do it just because it’s on there. Even with the catheter. Say we cannot move them at all and it would be too painful if they have to use the bedpan; the doctors will allow an extra day if you call them. So, it’s not in stone, you know, it’s protocol but it always kind of adjusts. [6.12]

One RN in the study described a situation where nurses had been performing accuchecks on a patient who was on total parenteral nutrition, but not diabetic. The treatment protocol did not require accuchek monitoring, and the patient’s results were consistently within normal limits. After reviewing the medical orders and progress notes, the participant discontinued the accuchecks. She said, “No one had marked ‘needs blood
sugars’ so it isn’t necessary. He doesn’t need unnecessary sticks; that was my reasoning.”

Participants in the study gave examples of their reasoning when administering medications. One participant discussed questions she would ask in report regarding patients receiving diuretics. “Especially diuretics. How much are they getting, and equate it to how much they have taken in, how much they put out.” Another nurse described her reasoning regarding a patient on multiple antihypertensive medications:

So the endocrinologist had started him on dibenzyline, which I had not given before. But, I was reading up on it and noticing it can affect blood pressure based on the adrenal gland. So, he was also on more typical blood pressure medications for his blood pressure, so I was double checking if his blood pressure was ok. I wouldn’t necessarily give all of them at once if his blood pressure was ok. I wouldn’t necessarily give all of them at once. If it was low, I wouldn’t give them at all.

The participant went on to say that she would consider spacing the medications out over time, recheck the blood pressure after each medication was administered, and consult the physician to discuss the scheduling of multiple antihypertensive medications at the same time.

Reasoning requires Knowing. Since nurses differ in their knowledge base depending on learning in school, learning at work, and knowing the patient, two nurses can reason differently in the same clinical situation. A nurse might not Know what to look for so data might be overlooked, a nurse might not know the patient so subtle changes could be missed, or a nurse might not have sufficient learning at work to interpret a situation accurately. One participant in the study talked about nurses who reason incorrectly:
I know there are nurses on our unit that they, you know, they don’t quite understand, you know. When I get report from them they’ll explain things, but in a totally, you know, they’ll think it’s one thing that caused something but it’s something completely different based on the numbers. But it’s just in their minds, that’s how they made sense of it. [1.12]

Participants in the study talked about reflecting during the course of a work shift and outside of the work setting, as well. One participant said, “But if it’s on your shift, I mean that is what your job is to be doing, is to think about what’s going on.” [5.15]

Another participant explained how charting assessment findings provides an opportunity for reflection.

I mean, if I’m charting, you know, my catheter assessment and I look back and I’m like, you know, typically I’m looking for low urine output, but then all of a sudden I charted like 3500 out of a catheter, then I’m like, whoa, that’s kind of weird, so yeah it will kind of help me do critical thinking. [2.12]

However, reflecting requires time, which is not always available. A participant explained:

In an unstable situation, you’ll probably have zero time to think about that. I mean, you try to think quickly, like if you are looking at somebody you try to fit the pieces together. I will try to do that. But, I mean, a lot of times, it will be after the fact, you know, after they are transferred to the unit. You’re like, you know, two hours ago this happened, so this kind of makes sense. But then you take that experience and take it to the next one. [8.16]

For the most part, participants talked about reflecting after the shift when things went poorly, often after a poor patient outcome, or an adverse event. One participant said, “I think that is one of the plagues that nurses carry is when things don’t go the way you want, you do go home and think.” [12.16]

Knowing influences Thinking; nurses have to have an adequate knowledge base to recognize when they need to ask why and to do the reasoning required to interpret
clinical data. However, Thinking also influences Knowing through a feedback loop. When nurses combine Thinking and Observing, the result is learning at work. As one participant said, “I always think about the experiences you have because I feel like that is how you develop your nursing care down the road; because something has happened that educated you. It’s a constant learning experience.” [5.14]

In summary, Thinking involves asking why, reasoning, and reflecting. Thinking insures data are not merely Observed or collected, but interpreted so that the salience of the data can be determined. Thinking takes the nurse beyond the routine completion of tasks, which participants in this study explained is one step necessary in “keeping patients safe.”

Catching Things

Observing and Thinking set the stage for Catching Things, a category in the clinical judgment process defined by the properties checking and noticing changes. All aspects of Knowing contribute to the nurse’s ability to Catch Things, because Knowing enables the nurse to Anticipate the patient’s clinical presentation and essential elements of the treatment plan. Knowing the population will be sufficient for some situations. For example, one participant said, “I see that they have CHF and they’ve got fluids running at 150, you know stuff like that, where it’s like, oh, that probably shouldn’t be happening.” [2.6]

However, to notice changes in a patient, the nurse has to know the patient. Therefore, factors that contribute to the nurse knowing the patient facilitate Catching Things, while factors that prevent the nurse from knowing the patient contribute to “missing things.” As one participant said of knowing the patient, “It’s just so much better
because I think if something goes wrong with the patient you are able to detect it faster, versus, you know, if it’s a nurse who it’s her first day with this patient.” [13.3]

Participants identified bedside report at shift change as key to Catching Things, because it insures patients are seen in a timely fashion at the beginning of the shift. A participant said, “And it works. You find a lot of things that you wouldn’t catch until you go in there two hours later.” [8.3] Bedside shift report also helps the oncoming nurse to put the patient’s clinical presentation in perspective. As one participant explained:

And that is why you have the night nurse with you, too, and you do that, because they could say, well, this is how he has looked since yesterday, if it is stable. Or, you know, they could say, they weren’t like this half an hour ago and we know that right away there is an immediate issue at hand. [5.8]

For participants in this study, bedside report was also seen as helpful to Catching Things because seeing the patient “helps you get a baseline picture of what that patient looks like” [8.3], which is key to noticing changes.

Nurses build their knowledge base relative to a particular patient throughout the course of a work shift by Observing, and all of the participants in the study agreed that frequent checking of patients through hourly rounding facilitated their ability to notice changes. One participant stated, “I like to check on my patients at least hourly, so how they present suddenly changes, I will know about it pretty quickly, that there’s a different presentation.” [5.4]. When nurses “get tied up” because one patient in their assignment is unstable, they are unable to complete their hourly rounding, and this contributes to “missing things.”

And there’s times when you’re like, I haven’t seen this patient for four hours, because you have a patient who’s crashing, and then you get an admit, or giving
blood, things going on, so your most stable patient sometimes gets left in the, on
the side. Sometimes that stable patient can become unstable when you’ve been
with other people. [10.15]

Nurses in the study identified “distractions,” such as high patient turnover, as
barriers to Catching Things. One participant said, “With the high turnover, patients are
supposed to be in and out, it’s very hard to notice the subtleties of their situation.” [5.15]
Multiple admissions and discharges in the course of a work shift were described by many
participants as an obstacle to knowing the patient and Catching Things. As one
participant said:

We have a high turnover on this floor, so our patients get discharged and we get
somebody right back again, so you know, we don’t have a lot of time between one
patient to the next from our recovery room and ICU transfers and ED admits. You
know, one time I went through like nine patients in the 12 hours. Four discharges
and four more admits. [2.5]

According to study participants, another “distraction” and potential barrier to
Catching Things is created when nurses assume the role of the shift charge nurse on the
nursing unit in addition to a patient care assignment. One participant said, “When you are
in charge, you still have a full patient load. That is another distraction.” [13.2]. The
multiple responsibilities associated with the role of charge nurse can decrease the time
available to nurses in that role to check patients in their assignment. It is interesting to
note that participants explained that when the charge nurse has a full patient care
assignment all nurses on the shift are impacted. As one participant said, “When the
charge nurse has patients…you can’t rely on that backup person to kind of keep an eye
out. So, you don’t have that extra set of eyes to be like, hey, can you check this out?”
[15.14]
In addition to conditions on the nursing unit that impact checking and noticing changes, such as staffing, patient turnover, and patient acuity, attributes of the nurse can facilitate or hinder Catching Things. Participants indicated that “getting experience” through learning at work is necessary to Catch Things. As one participant said:

It comes the more you see it. I think those drastic changes, as a new nurse, you’ll know right away. But it’s the subtle things, the little drop in this or the little raise in that you learn over time. [10.10]

Participants in the study were also clear that both Observing and Thinking are necessary to Catch Things; nurses who are merely “going through the motions” are limited in their ability to Catch Things beyond situations where using rules would suffice. As one participant explained:

So, you could get the work done, but in my opinion, that doesn’t mean that it’s always done up to par. So, sure a nurse could have given every single one of her meds on time, charted it within the minute, and then it would be done. But then perhaps you look back and one of the meds wasn’t even supposed to be given. It was maybe a misorder, or, perhaps they got a medication for blood pressure and their blood pressure was extremely low, but they still gave it, so they’re going through the steps, maybe. [6.13]

Checking and noticing changes help nurses keep patients safe. Participants described checking the patient’s environment to be sure necessary items were in reach, equipment was available and functioning, and settings were correct on any machines in use in the patient’s room. As one participant said, “Make sure everything is in order. Then, just like a room safety check.” [14.2]

Nurses described checking IV sites, fluids, and medications, as well as physicians’ orders and laboratory values throughout the shift. A quote that illustrates a common practice is, “But before I administer certain medications, I’ll look at labs and vitals.”
[10.4] Participants also described adjusting their checking based on noticing changes. A participant who was caring for a patient after a procedure said of the incision site, “If it starts oozing that would be a situation where I am going into the room every 15 minutes to check on you, or maybe I’m coming in every couple of minutes now.” [12.5]

Nurses in the study felt they were in a better position than physicians to notice changes because of their constant checking on patients. One participant said, “I think that part of it is that the nurse is at the bedside all of the time, and we are with the patient and we are picking up on things.” [12.14] The nurses in the study also stated that, because of their constant checking that informs knowing the patient, they have a better sense of the patient’s baseline than the physician. A participant said, “So, it’s like we can see when their breathing patterns change, or how they are breathing. Whereas, the doctor might be like, well, that’s different, but I don’t know how different.” [15.14] The participant went on to say that physicians are more likely to rely on laboratory values, while nurses tend to prioritize the patient’s clinical presentation, particularly in situations where the nurse has noticed changes over the course of a work shift. The participant described a situation where the nurse felt intubation was indicated, but the resident physician was satisfied with the patient’s arterial blood gas results. The participant explained:

Like the trend, the downward sort of spiral. It’s like the patient might be kind of like crapping out, and then they get the labwork right here and they’re kind of like, oh, well that’s not that bad. But then, you still see this downward slide and it’s like, no, they’re heading towards intubation. Just do it. [15.14]

In summary, data from participant interviews indicate nurses Catch Things through frequent checking, which enables them to notice changes in the patient and
identify necessary revision of the treatment plan. The surveillance necessary to *Catch Things* depends on the nurse’s availability to *check* patients and review the medical record, as well as the nurse’s knowledge base relative to the situation that requires clinical judgment.

**Figuring Out What’s Going On**

In the stage of *Figuring Out What’s Going On*, the nurse comes to a conclusion about the patient’s status through *connecting signs and symptoms, considering possibilities, investigating, and using resources*. The activities in which the nurse engages in this stage depend on whether or not the nurse *Observes* what was *Anticipated* and the time available to the nurse to *Figure Out What’s Going On*. The time available to engage in activities in this stage of the process of clinical judgment is determined by the nurse’s workload and the risk to the patient inherent in the situation that requires judgment.

The nurse’s need to *Figure Out What’s Going On* depends on whether or not “everything lines up.” One participant explained:

> If I walk in the room and everything lines up and, you know, you’re stable and everything looks good I might put you off to last because everything is fine right now. But if I walk in and you’re not presenting just how I want you to present I’m going to figure out what is going on with you first before I go address somebody that doesn’t have as critical an issue. [5.4]

Participants provided examples of *connecting signs and symptoms* when they encountered a patient where what was *Observed* was not what was *Anticipated*. One participant described her reaction to a change in a patient’s mental status:

> I was noticing the communication, then we started by taking sets of vitals to see if there was something with the oxygen level, which you often see if someone, just, you know begins to deteriorate or stops communicating, oxygen function problem
where it’s lower. Blood pressure can, you know lower can start to make you feel dizzy, so we checked vitals. [6.7]

Another RN in the study said, “It could be that their CVP rises. I know that’s the right side of the heart, so what’s causing the CVP to rise?” [1.19]

Connecting signs and symptoms leads to considering possibilities in order Figure Out What’s Going On. A participant described noticing a change in a patient’s mental status and said, “I think of sodium levels, or they’re going through alcohol withdrawal, or they’re delirious, have dementia, things like that I start thinking.” [9.16]. Another participant noticed a patient’s heart rate had become elevated and said, “If they say they’re not in pain, then, you know, everything that I think they become tachycardic from.” [1.20]

Investigating helps the nurse to rule in or rule out the possibilities considered when trying to Figure Out What’s Going On. As one participant said, “Even though someone tells me something, I mean, I go from my own assessment, you know, the work that I do to try to figure out why they’re this way.” [8.15]. Nurses in the study described situations where they investigated changes in patients’ vital signs. One participant said:

I’ve had patients where their blood pressure was fine for days. Then, all of a sudden, I get my morning vitals and they are elevated. And I’ll look back before I call the doctor to look at the trend to see if this is just a one-time thing; I’ll try taking it with another machine, because we do get variances from one machine to the next. Did they use the right cuff size? Because you know the CNAs are so smart but they may not realize it was too tight a cuff or too loose a cuff on a patient. [12.16]

Another participant described investigating to Figure Out why a patient was so much weaker than he had been the previous day.
Well, I mean, obviously I go in there and assess him; I check the vital signs. I mean, that is the first thing you are going to check, are vital signs. And I see the medications that he got. I mean, maybe he is a little lethargic, maybe he got narcotics or there was a change in the medications; that was not the case. So, then I look at the labs, and I see he hasn’t had labs in a while, so maybe we should get an order for that. [13.5]

*Investigating* directs the search for additional data in an attempt to *Figure Out What’s Going On*. As the participant above noted, “You think of one thing, there’s a problem. Well, maybe this is causing it. So, you know you look at that. Well no, that doesn’t check out, so what’s the next thing?” [13.5]

The participant quotes presented above to illustrate *investigating* represent situations where nurses were assigned to the patient and had some knowledge of the patient’s previous clinical presentation. However, nurses are sometimes called upon to *Figure Out What’s Going On* for patients assigned to another nurse, often in situations where risk is high and time is limited. In those situations, nurses may have very little time to *consider possibilities and investigate*. A participant described responding to a cardiac monitor alarm for a patient assigned to another nurse:

Yeah, because I don’t know the whole thing on that patient, which scares me. Why is her heart rate 200? You know, like I know she’s in pain, she’s telling me she’s in pain, but me just giving her pain medications is not going to bring her heart rate down. Something is going on here and I don’t know what it is. So, I am getting a little panicked thinking, well something, she is about to go into V-tach and I am going to have to code this patient. So, that is what is going through my head, and I am thinking, well I have to call and get them over here so we can get something going so we can get this heart rate back down. [9.14]

Other participants described similar scenarios where further *investigating* did not seem prudent, because a deteriorating patient needed immediate attention. One participant said, “So, we’re just going to do the next best thing, the smartest thing to do, or the safest thing.
to do; call the rapid response.” [13.18] In these situations, even though the nurses are unable to Figure Out What’s Going On, they are still able to Determine What Needs To Be Done, because they recognize the risk inherent in the situation. However, participants in the study agreed the ability to recognize risk is facilitated by learning at work. As one participant stated:

In the heat of the moment when you are being pulled in a thousand different directions, I notice sometimes with our new grads, now that I’m a little more distant from that, that is where our problems come in. Because it is a lot of thinking that needs to be done in a short amount of time and the risk for error is high. [12.12]

When nurses are trying to Figure Out What’s Going On, they often Use Resources, with the most frequent resource used being their peers on the unit. Every participant in the study indicated, if time permitted and they were unsure, they would “ask another nurse” to help them Figure Out What’s Going On. One participant said, “Ask questions. Always ask questions. If you’re not sure about something, ask the nurses around you.” [5.19]. Another participant explained:

When I am kind of doubting myself, I kind of ask other nurses for their opinion. You know, if there is something I feel is not right. Like, can you come in here and take a look at this with me? Do you think that this is ok? I always ask the other nurses, the nurses that have been there longer. [11.20]

Participants indicated if their peers were also uncertain or could not help them to Figure Out What’s Going On, their next step would be to ask a physician. One participant said, “Sometimes the physicians can help connect the dots with you.” [10.10] Another participant referred to “picking their brains” when talking with the resident physicians.

But I’d pick apart the resident’s brains, too, you know? Because they were the ones, they call the shots, especially on nights; we didn’t have the attendings or
anything. It was just the residents. So when, you know I’d tell them I know these numbers are off and I’m not sure why, and they would decide something and I would ask why, you know, why are you making this decision?” [1.10]

*Using resources* also involved “looking things up,” but this was primarily related to medications with which participants were unfamiliar. As one participant said, “So, I’ll look up the med if I don’t know what it is, or look at the notes and see why. I really try to do that; it’s my responsibility.” [8.13]. Nurses in the study did explain that resources are available when questions arise; “Any protocols or policies we have questions about, there’s a whole computer system that you can go in and look.” [10.22] However, for these types of questions participants indicated they were more likely to ask a peer than to search for the information on the computer.

*Figuring Out What’s Going On* takes the nurse beyond following rules and increases the likelihood the nurse’s actions will resolve the patient’s problems. Nurses in the study described many situations that could be addressed simply by following rules or following policy; for example, policy or protocol might dictate a minimum heart rate required to administer a cardiac medication. Appropriate nursing interventions can also be implemented in some cases simply by following accepted practice. A participant commented, “A lot of people are edematous, so keeping their feet elevated, all of the simple things you learn after surgery.” [8.6] However, later in the interview the nurse described actions that would be indicated, beyond elevating the edematous extremities, if edema were *Observed*:

Obviously, listening to them, if they sound a little coarse or crackly. Almost everyone is on Lasix, so you do have the standard, you know, but some people
need more, you know, or you kind of catch things like, this person is on fluids and they have heart failure. You know, you try to think, if this person has this…[8.12]

Going beyond elevating the extremities to look for a cause for the edema, the nurse is investigating and considering possibilities to determine whether there are additional interventions necessary to address the edema or the underlying cause. While elevating the extremities is an appropriate nursing intervention in this scenario, Figuring Out What’s Going On will help the nurse to Determine What Needs to be Done. If the nurse only follows policy or accepted practice without investigating and considering possibilities symptoms will be addressed, but problems might not be resolved.

Determining What Needs To Be Done

The outcome of the clinical judgment process is Determining What Needs to be Done. Based on the conclusion the nurse reaches in the stage of Figuring Out What’s Going On in a clinical situation, the nurse Determines what interventions are necessary to insure progress toward treatment goals and keep the patient safe. If the nurse Observes what was Anticipated in both the patient’s clinical presentation and treatment plan, if “everything lines up”, the nurse “keeps an eye on the goal” and returns to the stages of Observing and Thinking. If the nurse does not Observe what was Anticipated or if the nurse is uncertain about a patient’s status, participants in the study indicated they would implement nursing interventions and “see how the patient responds,” continue to Observe the patient by “keeping a close eye on them”, or “bring it to someone’s attention.”
Several participants gave examples of the impact of Knowing on Determining What Needs to be Done. Nurses in the study talked about being “suspicious” when caring for older patients for the first time. One participant said:

We do get some of the older population who will sundown, you know? So that first night, if I’ve never had them before I am very suspicious. I am very, I kind of keep a very close eye on those people. [8.15]

Participants also explained the need to “keep a close eye” on patients who are “borderline.” One participant described caring for a patient who had an extremely low blood sugar at the beginning of the shift:

So, patients like that, you know, are borderline. She ended up being fine by that afternoon, but you know she is still very drowsy and I really have to go in there and be like, answer my, what’s your name, answer my questions. You know, you just have to keep a close eye on people. [14.15]

Participants also talked about the impact on their workload of “keeping a close eye” on one patient in their assignment. A nurse in the study said, “I’m not distributing my workload throughout five patients anymore; I’m concentrating on one patient. I’m trying to keep a close eye on them.” [2.7]

Participants who described “keeping a close eye” on a patient identified turning points in the course of Observing that led them to Determine that Observing was no longer indicated; action was necessary. One participant described the events leading up to a rapid response for a patient she had been “keeping a close eye on”:

Right at my change of shift at like 7:30, I called a rapid response because she was just super restless; her oxygen was dropping. She was on the highest amount of oxygen I could give her, and so I felt like, you know, it happened kind of suddenly, cause she had just been on a nasal cannula throughout the day. But she seemed, you know, it happened gradually and yet suddenly at the same time.
Because it was a gradual progression throughout the day, and yet there was a sudden turn where, in about ten minutes she required way more oxygen. This lady is not going to make it till tomorrow to have this thoracentesis; she needs attention now. So that’s when I called the rapid. [14.10]

Respiratory distress, chest pain, and changes in mental status were common occurrences where participants in the study agreed *Observing* needed to be replaced by “bringing it to someone’s attention.” Nurses in the study also talked about the need to “bring it someone’s attention” if they *Observed* additional signs indicating a primary problem was becoming more severe. As one participant said, “If there’s more than one thing that’s changing…once I see at least one other component of it start to fit together, then I know it’s more critical.” [1.20] However, many participants indicated that a sense of an impending problem or an inability to *Figure Out What's Going On*, was reason enough to “bring it to someone’s attention”. One participant said:

> It never hurts to call the doctor and just say, I really don’t feel good about this, you know, and they can come and say they look fine. You know, for me, I would say I’m slightly more anal about that. Like I would rather, I mean it’s about the patient, and if you’re not looking good, you’re not looking good. [8.8]

Participants in the study indicated they do not always “get the response we would like right away” [2.4] when they *Determine* intervention is necessary and they notify the physician. Nurses in the study referred to “making my case,” “pushing,” and “persisting.” One participant described a situation where what was *Anticipated* was not what was *Observed*, leading her to *Determine* intervention was necessary; the nurse described “pushing” for the patient to be transferred and intubated:

> She wasn’t doing as well as they had let on in report. So, it was all because she changed her breathing just a little bit and needed more oxygen and I did not feel comfortable with that aspect of it; so it was more pushing the doctors to do
something about it now, and not wait on it. I kept trying to reinforce to the resident at the time that, you know, if I have to bump up her oxygen any more, if she drops any lower, you’re going to be intubating her; this is the last resort; like this is the highest oxygen she is getting and she is still 90%. That number did tell us that there was an issue there. [5.10]

Other participants described “pushing and persisting” as their responsibility as an advocate for their patients. One participant described a scenario involving a lung transplant patient who the nurse felt required too much oxygen to remain on a general care unit:

I mean, I probably called seven times overnight. I think it’s really important to be an advocate for your patient. I mean, maybe they don’t want to go to the ICU; that’s not their goal. But to get the best, to be monitored closely, I kind of, you kind of just have to push. [8.8]

Participants in the study described some scenarios where, even though physicians did respond and intervene when requested to do so, it was still necessary to “go up the chain of command” if a patient’s condition continued to deteriorate or if the situation was “not progressing fast enough.” One nurse described a scenario where resident physicians ordered several laboratory tests, electrolyte replacements, and a blood transfusion for a patient with a new onset of confusion that quickly progressed to extreme lethargy. The scenario is interesting because the nurse was not satisfied with intervention; she wanted the physicians to help her Figure Out What’s Going On.

The vitals were off, then they had us do blood; so then we’re giving blood products, packed red cells, plasma, everything. So, I knew from that point everything that was going in and out of him and at least like maybe four replacements, so I knew, after that, once he stopped talking and all of these things were coming about being ordered, that there was something I didn’t see yet. So, it seems like we, from them [doctors] not being in the room, they were thinking, let’s treat the numbers and see how it progresses, but in my mind, I was thinking, well, we can do that, but we have to kind of figure out what’s going on
now, too. It’s not progressing fast enough, I think. Cause mostly when people are anemic and they need blood, they’re weaker and their vitals are off, but not to the extreme, like it was getting, and it was dropping, dropping, dropping. So, I kept calling the doctors, calling the doctors; had to go above the doctors, call the chief resident; told him, you come in here. You were here this morning, you judge it. So then they were like, no, this isn’t him. Took him to the ICU. It was the beginning stages of septic shock. [6.7]

One participant in the study echoed the comments of many when she discussed “pushing, “persisting,” or going up the chain of command necessary:

But as for learning about having to be a patient advocate, you hear about that so many times in school, but you never actually know how to experience that situation until you’re in it. When you know that patient is not safe, then you kind of have to be like, hey…Their safety comes first and if you ever feel uncomfortable you can’t be afraid to go up the ladder and keep going until you feel like the patient is safe. [2.10]

**Returning to Observing and Thinking: Increasing Knowing**

The outcome of the clinical judgment process, *Determining What Needs to be Done*, takes the nurse back to the stages of *Observing and Thinking*, which influences all subsequent clinical judgments. If interventions are implemented and the patient remains in the nurse’s care, the nurse continues to *Observe* the patient to “see how the patient responds.” For example, participants talked about rechecking vital signs after administering medications, and *Observing* oxygen saturation levels after breathing treatments were administered, suctioning was performed, or oxygen flow rates were increased. As one participant said, “If there’s abnormal signs, you want to recheck vital signs to see how they’re doing.” [13.8] Another nurse in the study who administered scheduled medications early for an elevated heart rate said, “Wait and see if it helps. And, a lot of times it does; the medications might just need to be adjusted.” [12.8]
Nurses in the study also provided examples of returning to the stages of 

*Observing and Thinking* to review the care that was provided in situations where an adverse event occurred, or a code blue or rapid response had to be called. As one nurse said about a situation where a rapid response had to be called, “It comes back to what could we have done differently, you know?” [13.12] Another nurse said:

Should I have pushed the intubation more? I don’t think that even if I had pushed the intubation more they would have intubated him. The only thing I probably would have done is what xxx (name of nurse) did, which was put him on an opti-flow, a different form of oxygen. Because they totally just did not want to intubate him again. [11.19]

Another participant said of a rapid response situation, “I analyzed that situation, what I could have done better, and yeah, I just grew from that.” [11.25] It is of note that several participants indicated that, when a patient was transferred to another unit as a result of a rapid response or code blue situation, they are not updated about the patient’s condition after transfer. Nurses in the study thought it would be helpful if follow up were provided. One nurse said:

I think it would be helpful, because it would give closure to the situation and then it will tell you what happened from that point that they left you and I think that will build a bigger picture than just we called a rapid, they left, the end. I think that would help a lot. [10.13]

Participants also talked about errors in clinical judgment as an opportunity for 

*learning at work*. As one participant said:

As bad as it might be to say, it seems like the best times you learn are sort of when you screw up, you know. Because then, it’s like you see the consequence of the screw up and make certain that you don’t allow that to happen again. [15.6]
Participants indicated they learned from the mistakes of others, as well as their own. One nurse in the study said:

Somebody thought they felt a pulse, but they didn’t, and we didn’t catch it in time, so that really opens my eyes. Seeing other’s mistakes or adverse events, really, you know, I kind of learn the lesson with them that is what could happen, so to be really comfortable with my assessment skills and be sure I heard what I heard and felt what I felt, and know what to look for and what to assess. [1.23]

Participants also recalled scenarios where complications were identified and adverse events were avoided in situations that required clinical judgment; these situations influenced the care provided in subsequent clinical encounters with similar patients. One participant said, “Obviously if this has happened before with one of my patients, now I know if I see a patient acting similarly then I know what might be the problem, what might not be the problem.” [13.5] Another participant discussed going up the chain of command regarding a patient with a change in respiratory status:

I think it’s just experience, knowing that I’ve seen when a minor change has made a big difference, and not being listened to, or maybe having been listened to and seeing what a difference that made, is being more comfortable telling the doctor, you know what, then I am going to call the one above you because you need to pay attention to this. You need to acknowledge this is happening. [5.12]

In summary, the return to the stages of Observing and Thinking after the nurse Determines What Needs to be Done enhances knowing the patient and provides an opportunity for learning at work, both of which will impact future clinical judgments. Nurses build their knowledge base relative to the individual patient for whom they are providing care throughout the course of the work shift by Observing and Thinking about the patient’s response to the care provided. As nurses build their knowledge base relative to each patient in their care, they are learning at work by increasing the knowledge base
available to them in future situations that require clinical judgment. As one participant said, “Clinical judgment, it’s learned. It’s not learned, it’s developed; that’s a better word.” [3.25]

**Trustworthiness of Study Findings**

In qualitative inquiry rigor is evaluated based on trustworthiness (Lincoln & Guba, 1985), which is determined by credibility, confirmability, dependability, and transferability. In a grounded theory study, these measures of rigor can be achieved by careful adherence to the grounded theory method described by Glaser and Strauss (1967).

Credibility refers to the congruence between the participants’ actual experiences in reality and the findings presented (Speziale & Carpenter, 2007). Consistent with the grounded theory method, the criterion of credibility was achieved through sampling that insured participants selected had intimate knowledge of the process used to make clinical judgments; the nurses in the study engage in the process of clinical judgment in the course of their daily work in the acute care setting. Credibility was also supported by the consideration of multiples perspectives, as nurses from a variety of inpatient nursing units and three different hospital settings provided data for the study. Use of the constant comparison method of data analysis insures concepts in the theory are grounded in the data collected in study interviews (Glaser & Strauss, 1967), as the actual words of study participants were used in generating codes from the data and to the extent possible in the presentation of study findings. Theoretical sampling, through simultaneous data collection and data analysis, provided direction for participant interviews as the study progressed; this enabled the researcher to investigate areas of concern to the participants.
instead of limiting the interviews to preconceived or assumed concerns identified by the researcher. Data collection continued until saturation of all categories in the theory was achieved and new information was no longer being provided by study participants, guarding against premature closure. Data saturation was facilitated by the variety of study sites used for recruitment, which added to the scope of the data collected (Morse, Barrett, Mayan, Olson, & Spiers, 2002).

The criterion of confirmability was achieved through recording of theoretical memos throughout the data collection process. The memos provide documentation of how data were linked to emerging categories, properties of categories were developed, and links between categories established. All events related to the study were documented and the emerging list of codes was continually updated to facilitate memoing and theoretical sampling.

In the grounded theory method, the dependability of the theory generated is evaluated based on whether or not the theory fits and works, is relevant and modifiable (Glaser & Strauss, 1967). The substantive theory generated by this study fits, works, and is relevant because study sites selected insure the theory represents the clinical judgment process used by nurses at the point of care with diverse educational preparation employed in a variety of hospital systems. Study participants from a variety of nursing units provided a broader perspective of the process of clinical judgment than would have been possible if sampling were limited to a specific care setting; the theory generated is not limited to one group of nurses, but is abstract of time, place, and people (Glaser, 2001). Interview transcripts were reviewed after the theory was generated to verify the process
of Fitting Things Together works across the multiple situations that require clinical judgment at the point of care. The theory generated explains the process nurses use to make clinical judgments in the course of a work shift and accounts for variance in the process associated with context.

The criterion of transferability is supported by the diverse perspectives of nurses from a variety of settings. However, the goal of grounded theory is not to generalize from one setting to another but to a “transcending process or core variable” (Glaser, 1978, p. 13) that represents a process across groups or settings. The core category, Fitting Things Together, will be understandable to nurses who work at the point of care because it emerged from the narratives provided by nurses who make clinical judgments in the contemporary practice setting. The theory can be modified and adapted to additional practice settings and nurses with a wider variety of clinical experience through further theoretical sampling and the constant comparison method of data analysis.

**Summary**

Data collection and analysis using the grounded theory method (Glaser, 1978; Glaser & Strauss, 1967) yielded the discovery of the process acute care nurses with two to three years of clinical experience use to make clinical judgments in the course of a work shift. The theory generated is represented by a core category, Fitting Things Together, which integrates eight categories in the process of clinical judgment: *Knowing, Anticipating, Prioritizing, Observing, Thinking, Catching Things, Figuring Out What’s Going on*, and *Determining What Needs to Be Done*. Conceptualization of the process of clinical judgment and careful attention to the grounded theory method has yielded a
theory that is abstract of time, people, and place; therefore, the theory fits, works, and is relevant to nurses at the point of care across a variety of acute care settings.
CHAPTER FIVE
DISCUSSION

The purpose of this study was to conceptualize the process of clinical judgment from the perspectives of nurses with two to three years of clinical experience on an inpatient unit in the acute care setting. The substantive theory of clinical judgment that emerged using the grounded theory method (Glaser & Strauss, 1967) contributes to the existing body of nursing literature on clinical judgment by providing support for research previously reported, as well as new insight into the process used by nurses to make clinical judgments at the point of care. The theory of clinical judgment discovered has implications for nursing practice and nursing education, and provides direction for future research that could yield the measurement instruments and evidence-based teaching strategies necessary to develop the skill of clinical judgment at various levels of clinical expertise.

The Clinical Judgment Process: Fitting Things Together

The substantive theory discovered from the narratives of participants in this study indicates the basic social process nurses use to make clinical judgments is Fitting Things Together. Nurses Fit Together the data available in a clinical encounter to reach a conclusion about a patient’s condition in order to identify appropriate interventions (Figure 1).
The clinical judgment process begins with the nurse Fitting Together what is known based on *learning in school, learning at work, and knowing the patient*. Knowing facilitates *Anticipating* the patient’s clinical presentation and the care required. Nurses *Prioritize* the needs of individual patients and rank pressing issues for all patients in their patient care assignment. *Anticipating* and *Prioritizing* influence *Observing*, as nurses tailor observations based on the *Anticipated* clinical presentation of each patient and the *Priorities* established. *Thinking* occurs while *Observing* the patient, which enables the nurse to put what is *Observed* in context in each clinical encounter based on *Knowing*. *Knowing, Observing, and Thinking* facilitate catching discrepancies (*Catching Things*) between what was *Anticipated* and what is *Observed*. *Observing* and *Thinking* set the stage for *Figuring Out What’s Going On*, where the nurse either confirms what was *Anticipated*, or engages further in activities to *Figure Out What’s Going On* to the extent possible given time, *Knowing*, and perceived risk to the patient. Whether or not the nurse
is able to *Figure Out What’s Going On*, the outcome of the clinical judgment process is always *Determining What Needs to be Done*.

After the nurse *Determines What Needs to be Done*, the nurse returns to the stages of *Observing* and *Thinking* to monitor the patient’s response to interventions implemented and evaluate the care provided. In the event the patient does not remain in the nurse’s care after *Determining What Needs to be Done*, the nurse returns to the stages of *Observing* and *Thinking* to review the clinical encounter and the care given. This return to the stages of *Observing* and *Thinking* explains how the outcome of the clinical judgment process in each clinical encounter influences the nurse’s future clinical judgments.

*Observing* and *Thinking* affect *knowing the patient* and *learning at work*, two properties of the category *Knowing*. *Observing* and *Thinking* help the nurse to *know the patient* as the nurse *Observes* the patient’s clinical presentation and the patient’s response to interventions implemented in a clinical encounter. As the nurse builds a knowledge base relative to each patient in the course of a work shift, the nurse is also building a knowledge base that will be used to inform clinical judgments in future situations with similar patients. Thus, each situation that requires clinical judgment provides an opportunity for *learning at work*.

**Comparing Study Findings with Existing Research**

**Models of Clinical Judgment**

Empirically derived theories of clinical judgment in the acute care setting are lacking in the current body of nursing literature. A model of clinical judgment in nursing
has been proposed by Tanner (2006b) and a model of diagnostic practice in nursing has been proposed by Lee et al. (2006); both models were the result of literature reviews of research on clinical judgment and clinical reasoning in nursing. The model of clinical judgment that emerged in this study shares several similarities with the models proposed by Tanner and Lee et al. The knowledge base of the nurse, work experience, and knowing the patient, which correspond with the category *Knowing* in this study, are identified by Tanner and Lee et al. as important influences on clinical judgment. Both Tanner and Lee et al. also identify the effect of the context in which a clinical judgment must be made on the process used by nurses to make judgments at the point of care, a finding also noted in this study.

The stages of the model of diagnostic practice proposed by Lee et al. (2006) are very broadly defined as interaction and communication, information seeking, and cognitive functioning. The description of activities in each step in the model is very limited, but the information seeking stage shares similarities with the category of *Observing* that emerged in this study, and the cognitive functioning stage is similar to the categories *Thinking* and *Figuring Out What’s Going On*. Lee et al. caution that the model they were able to generate was limited by the quality of the studies reviewed and, therefore, provides a limited representation of clinical judgment. The knowledge base of the nurse relative to situations that require clinical judgment, identified as the primary influence on the clinical judgment process by Lee et al., provides the closest link between the Lee et al. model and the findings in this study.
The model of clinical judgment proposed by Tanner (2006b) consists of four stages: noticing, interpreting, responding, and reflecting. Tanner’s (2006b) contention that “Clinical judgments are more influenced by what the nurse brings to the situation than the objective data about the situation at hand” (p. 205) aligns with all properties of the category Knowing in the model that emerged in this study. According to Tanner, what the nurse notices depends on the nurse’s theoretical knowledge, work experience, and knowledge of the individual patient. Similar to the process that was discovered in this study, Tanner reports that noticing is not necessarily the result of seeing or assessing the patient, but is a combination of theoretical knowledge, work experience, and knowledge about the patient that sets up the nurse’s “expectations” (p. 208) for a situation. The nurse’s “expectations” as described by Tanner correspond with the category Anticipating in the model that emerged in this study. The stage of noticing in Tanner’s model leads to the stage of interpreting, where the data available in the clinical encounter are processed by the nurse. This stage of interpreting in Tanner’s model resembles the stage of Figuring Out What’s Going On in the model that emerged in this study. The stage of responding in the Tanner model, where the nurse takes action or deems action unnecessary, is similar to the stage Determining What Needs to be Done in the model in this study. Reflecting in action in the Tanner model corresponds to the feedback loop from Observing and Thinking to Knowing in this study, with the nurse building a knowledge base of the individual patient throughout the shift by noticing or Observing responses to care provided. The nurse’s return to the stages of Observing and Thinking after Determining What Needs to be Done to evaluate the patient’s response to interventions and the care
provided in the clinical encounter is similar to Tanner’s stage of reflection on action that informs future clinical judgments.

The models proposed by Tanner (2006b) and Lee et al. (2006) are based on extensive reviews of the literature on clinical judgment in nursing. Therefore, the similarities noted between the models proposed by Tanner and Lee et al. and the model that emerged in this study provide support for the broad array of research on clinical judgment in nursing used by Tanner and Lee et al. to develop their models. However, since the model that emerged in this study was empirically derived from the narratives of nurses who engage in the process of clinical judgment as they provide nursing care, new insights into the clinical judgment process were discovered that are not evident in the Tanner and Lee et al. models.

The properties of the categories in the model, discovered in this study, provide extensive detail about the strategies nurses use to make clinical judgments in the course of a work shift. For example, an important activity in the stage Figuring Out What’s Going On is using resources; nurses routinely rely on their peers for assistance in interpreting data in a clinical encounter when they are unsure of the significance of what they Observe. This is not addressed in the models developed by Tanner (2006b) or Lee et al. (2006), but has important implications for practice. Detail provided about the activities involved in checking, a property of the category Catching Things, explains both how and what nurses check throughout the course of a work shift to inform their clinical judgments and avoid “missing things.” Participants identified the importance of bedside shift report and hourly rounding in Catching Things, and noted high patient turnover and
lack of experience can contribute to “missing things.” The detail elicited in this study about nurses’ activities as they make and refine clinical judgments provides a clearer picture of the clinical judgment process than was previously available.

The range identified within categories in this model promotes understanding of the factors that facilitate and hinder clinical judgments in the acute care setting. For example, in the category *Anticipating*, nurses *predict* the treatment plan and care required for each patient in their assignment. When nurses are unable to *Anticipate* and *predict*, they must “deal with the unexpected.” Nurses in this study were able to provide insight into factors that facilitate *predicting*, such as an accurate handoff between nurses at transitions of care that takes place at the patient’s bedside, and explained how “dealing with the unexpected” affects clinical judgment, patient safety, and the nurse’s workload. Similarly, range was evident in the category *Thinking* when nurses in this study contrasted *Thinking* with “going through the motions.” Nurses in the study associated *Thinking* with accurate clinical judgments and patient safety; “going through the motions” was associated with nurse burnout or a limited knowledge base, both of which might hinder accurate clinical judgment. While some factors that facilitate or hinder clinical judgment can be inferred from the models of clinical judgment proposed by Tanner (2006b) and Lee et al. (2006), the model that emerged in this study from the narratives of nurses at the point of care identifies more specific personal and environmental factors that impact the clinical judgment process.

In the model that emerged in this study, *Prioritizing* is an important step in the process nurses use to make clinical judgments as they provide care to their assigned
patients in the course of a work shift. *Prioritizing* is not included as a step in the Tanner (2006b) or Lee et al. (2006) models. Since the models proposed by Tanner and Lee et al. are based on literature reviews, the omission of *Prioritizing* as a step in their models may reflect a lack of evidence in the literature linking *Prioritizing* to the clinical judgment process. Many researchers examine the relationship between a single variable, such as experience, and clinical judgment or provide study participants with a simulated scenario involving a single patient when studying judgment. In contrast, the focus of this study was the nurse’s actual work over the course of a work shift with an assigned group of patients, which might make *Prioritizing* more likely to emerge as a step in the clinical judgment process. However, in this study *Prioritizing* was evident not only in ranking the needs of patients within the assigned group, but *Prioritizing* provided direction for *Observing* individual patients in the nurse’s assignment. Nurses tailored their *Observing* of each patient based on *Prioritizing* the patient’s needs. *Prioritizing* also enabled nurses in this study to adjust the plan established at the beginning of the work shift in order to address pressing issues that were not Anticipated. Since nurses must balance competing demands in the acute care setting when caring for a group of acutely ill patients whose status can change quickly, the importance of *Prioritizing* in the clinical judgment process that emerged in this study is a key finding.

*Catching Things* is another category unique to the model discovered in this study. Since the properties of the category are checking and noticing changes, *Catching Things* may be captured in the noticing stage of the Tanner (2006b) model, but Tanner did not identify the specific strategies nurses use to identify discrepancies between what is
noticed and what is expected beyond noticing in general. The participants in this study described in detail the strategies used to Catch Things, as well as the factors that facilitate Catching Things and factors that can lead to “missing things.” For example, study participants identified bedside report as helpful for Catching Things and high patient turnover as a factor in “missing things.” Nurses in the study emphasized the importance of their role in Catching Things because of their unique position as the only provider with a continual presence at the bedside. Since nurses assume primary responsibility for surveillance in the acute care setting, new insight into the strategies nurses use to detect subtle changes in a patient and identify areas of concern in the multidisciplinary plan of care are important findings discovered in this study.

An additional difference between the model of clinical judgment proposed by Tanner (2006b) and the model that emerged in this study is related to Tanner’s stage of reflection in action. Tanner describes reflection in action as the nurse’s ability “to read the patient – how he or she is responding to intervention – and adjust intervention based on that assessment.” (p. 209). Tanner states most of this reflection in action, or reflection during the clinical encounter, is “not obvious” (p. 209) unless the desired response to a nursing intervention is not achieved. This was not the case for the participants in this study, who described returning to the stages of Observing and Thinking repeatedly throughout the clinical encounter to monitor the patient’s status and evaluate the patient’s response to interventions implemented.

Evaluating the patient’s response to intervention is an active and deliberate step in the clinical judgment process in the model that emerged in this study; it is not triggered
only by a failure to observe the intended response to an intervention. The difference in the characterization of reflection during the clinical encounter in the Tanner (2006b) model may be related to the research reviewed to develop the model, which likely represents studies with participants with a wider range of clinical experience than the nurses in this study. Many studies of clinical judgment in nursing focus on the work of nurses who are categorized as experts based on years of experience. The nurses who participated in this study had only two to three years of nursing experience; they are, by their own accounts, still learning at work and building their knowledge base for practice through Observing and Thinking. The nature of reflection during the clinical encounter might change over time as clinical experience is accumulated, which could explain the difference in Tanner’s characterization of reflection in action. However, the conscious and deliberate approach to reflection during the clinical encounter used by nurses in this study to evaluate patients’ responses to interventions benefits both the patient and the nurse.

In summary, the model of clinical judgment that emerged from this study supports the models of clinical judgment proposed by Tanner (2006b) and Lee et al. (2006), but differences do exist between the previously proposed models and the process of clinical judgment discovered through this research. Since the models proposed by Tanner and Lee et al. are based on literature reviews, some differences noted and new insights discovered could be attributed to the research available for review when Lee et al. and Tanner proposed their models in 2006. Changes in the health care system and the patients it serves, as well as advances in technology and the diagnosis and treatment of disorders,
have altered the landscape of the acute care setting. The grounded theory method used in this study to discover the process hospital based nurses use to make clinical judgments provides comprehensive conceptualization about the specific activities in which nurses engage as they make their judgments and the factors that facilitate and hinder clinical judgment in the contemporary practice setting. These new insights into the clinical judgment process become more apparent when each category in the model is examined in light of existing research.

**Categories in the Model Discovered and Existing Research**

**Fitting Things Together**

The core category in the process nurses use to make clinical judgments in the acute care setting that emerged in this study is Fitting Things Together. Participants in the study indicated nurses Fit Together the information available in a clinical encounter to reach a conclusion about a patient’s status and identify appropriate interventions. Fitting Things Together enables the nurse to see the big picture and put the progression of events together that explains the patient’s current condition. Seeing the big picture and understanding the patient’s condition enables the nurse to Anticipate both the patient’s clinical presentation and expected progress toward goals of care, as well as the elements of the multidisciplinary treatment plan that should be in place. Anticipating impacts Prioritizing of patients’ needs and directs Observing the patients in the nurse’s assigned group. As the only provider with a continual presence at the bedside, participants in the study explained that Fitting Things Together is necessary to notice changes and Catch
Fitting Things Together in situations that necessitate clinical judgment requires *Thinking* to interpret data collected by *Observing* the patient, listening to the patient and the family, consulting with other providers, and reviewing the medical record. When nurses are able to Fit Things Together to understand the patient’s clinical presentation they are in a better position to *Figure Out What’s Going On*; this sets the stage for *Determining What Needs to be Done*, the outcome of the clinical judgment process. After nurses *Determine What Needs to be Done*, they continue *Fitting Things Together* as they *Observe* and *Think* about the patient’s response to the care provided; this impacts *knowing the patient*. In future clinical encounters, nurses will *Fit Together* the data in the new situation with *Knowing* that is informed by clinical judgments made in previous patient care situations; therefore, clinical judgments reflect past experience and provide an opportunity for *learning at work*.

Fitting Things Together is consistent with the conceptualization of judgment by psychologists, who have distinguished judgment from decision making by conceptualizing judgment as an assessment that reflects observation of cues and cognitive interpretation of those cues to predict a condition or event (Harvey, 2001). Study participants stressed the importance of *Thinking* while *Observing* cues in a clinical situation that requires judgment. The strategies nurses use in the stages of *Thinking* and *Figuring Out What’s Going On* reflect the cognitive interpretation of data that psychologists contend is necessary for judgment. The outcome of the clinical judgment
process in the model of Fitting Things Together, Determining What Needs to be Done, is consistent with the conceptualization of decision making by psychologists (Harvey, 2001). The nurse combines the likelihood of the event or condition identified in the stage of Figuring Out What’s Going On with the desirability of that event or condition to Determine What Needs to be Done. The model that emerged in this study supports theoretical literature on judgment that distinguishes judgment and decision making as separate steps in the problem solving process; judgment directs decision making (Cioffi, 2002; Maule, 2001, Taylor, 2000).

The process of Fitting Things Together used by nurses in this study to interpret data in situations that require clinical judgment is consistent with information processing theory (Newell & Simon, 1972), which reflects the rational perspective on judgment from psychology. This is an important finding in this study, because information processing theory is in direct contrast to the intuitive model of clinical judgment. Information processing theory is based on the premise that individuals categorize information based on their theoretical knowledge and experience and then apply cognitive processes to understand the data available in a situation. According to the theory, as individuals process data, observations made or conclusions reached become the input for additional information processing; this is reflected in the model of Fitting Things Together as nurses use knowledge gained through Observing and Thinking to direct further Observing in their current situation and inform future clinical judgments with similar patients. Nurses in the study used a hypothesis testing approach to Figure Out What’s Going On by connecting signs and symptoms, considering possibilities, and investigating in situations
that required judgment. Hypothesis testing is in direct contrast to the intuitive model of clinical judgment, which is based on the contention that experienced nurses do not have to rely on analytical reasoning to identify the appropriate action in a situation (Benner & Tanner, 1987). The model of clinical judgment that emerged in this study indicates nurses with two to three years of experience acquired on the same nursing unit use analytical, rather than intuitive, reasoning to make clinical judgments.

In nursing research on clinical reasoning, Simmons et al. (2003) found medical–surgical nurses with two to six years of experience “organize patient assessment information around concepts that they link together” (p. 712) and use a reasoning process consistent with information processing theory to interpret assessment data. The nurses’ activities associated with patient assessment as described by Simmons et al. include clustering data for interpretation, evaluating the significance of data collected, considering previous experiences, and reaching a conclusion; these activities resemble the process of Fitting Things Together that emerged as the core category in this study of clinical judgment. In a study of strategies used by nurse practitioners in the process of identifying patient problems based on assessment data, Offready (1998) found that nurses in the study consciously considered the significance of data as it was observed and questioned the patient to “see if what you are thinking fits” (p. 995). Based on observations of study participants in practice and one on one interviews, Offready determined the thinking strategies used by the nurse practitioners in the study to identify patient problems were consistent with information processing theory; the language
participants used to describe their thinking is also consistent with the process of Fitting Things Together that emerged in this research.

In a report of findings from a study designed to identify the thought processes used by experienced nurses in the course of medication administration, Eisenhauer et al. (2007) did not use the term Fitting Things Together or specifically refer to information processing theory; however, both processes are evident in the findings reported. According to the researchers, nurses in the study combined their theoretical knowledge about a medication with their knowledge of an individual patient’s diagnosis and typical response patterns, pertinent laboratory values, and consultation with other providers to inform their clinical judgment when administering medications. Nurses in the Eisenhauer et al. study also described frequent checking during the medication administration process to insure medication orders were appropriate, dosages and concentrations were correct, and intravenous infusion sites were without signs of infiltration or infection. These activities correspond to the checking nurses used to Catch Things in the process of Fitting Things Together that emerged in this study. The category of Anticipating in the model of Fitting Things Together was evident in the medication administration process described by nurses in the Eisenhauer et al. study, as nurses anticipated side effects and potential adverse events associated with the medications they administered.

Clinical judgment is inherent in the detection and interpretation of clinical cues by nurses. Steps in the process of Fitting Things Together are apparent in a study by Minick and Harvey (2003) of strategies used by experienced nurses to detect early warning signs of potential problems in patients hospitalized on medical-surgical units. Nurses in the
study integrated their theoretical knowledge, clinical experience, and knowledge of the patient when interpreting data to recognize situations where unexpected findings aroused their suspicion that a patient was developing a problem. The discovery of unexpected findings on assessment caused the nurses in the study to extend their search for additional data to confirm or dismiss their suspicions. Minick and Harvey reported that signs and symptoms nurses observed in isolation “took on new significance when considered as a pattern of change” (p. 293). Thus, early detection of patient problems by nurses in the study by Minick and Harvey resembles the process of Fitting Things Together used by nurses in this study to make clinical judgments for patients in their care.

In summary, the process nurses use to make clinical judgments in the acute care setting discovered in this study supports previous research on judgment conducted in psychology (Harvey, 2001; Maule, 2001; Newell & Simon, 1972). The findings in this study are also consistent with previous descriptive studies of clinical judgment in nursing where researchers focused on the clinical reasoning and clinical judgment demonstrated by experienced nurses engaged in a specific nursing task (Eisenhauer et al., 2007; Minick & Harvey, 2003; Offready, 1998; Simmons et al., 2003). The model of clinical judgment that emerged in this study, Fitting Things Together, offers new insight into the process nurses use to make clinical judgments at the point of care because Fitting Things Together conceptualizes clinical judgment beyond a single aspect of nursing work, such as medication administration. Fitting Things Together reflects the process nurses use to make clinical judgments as they fulfill multiple responsibilities associated with care of the patients in their assigned group. In addition, the process of clinical judgment
discovered in this study extends to those situations where nurses are called upon to make clinical judgments for patients assigned to another nurse, which often occurs in time sensitive situations where risk for an adverse event is high.

Fitting Things Together, as the core category in the process of clinical judgment that emerged in this study, integrates the categories of Knowing, Anticipating, Prioritizing, Observing, Catching Things, Figuring Out What’s Going On, and Determining What Needs to be Done. Support for previous research on clinical judgment is evident in each category of the model, but the detail elicited in narratives provided by participants in this study adds new information about the specific strategies used by nurses at the point of care to make clinical judgments. The influence of contextual factors on the clinical judgment process is identified as well.

Knowing

The process of clinical judgment that emerged in this study begins with Knowing, a category defined by the properties learning in school, learning at work, and knowing the patient. Nurses Fit Together theoretical knowledge acquired in school, knowledge gained through the experience of working on the nursing unit, and knowledge of the patient as the first step in the process of clinical judgment. The nurse’s knowledge base relative to situations that require clinical judgment is determined by these three aspects of knowing. Nurses in the study indicated a preference for those situations where they are able to Fit Together knowledge acquired through learning in school, learning at work, and knowing the patient; Fitting Together all three aspects of Knowing increases the nurse’s confidence in clinical judgments made. However, all three aspects of Knowing do
not influence clinical judgment equally across situations that require judgment in the real world of clinical practice.

Theoretical knowledge, acquired through *learning in school*, has not been the focus of nursing research on clinical judgment conducted with licensed RNs. Since licensure is granted based on NCLEX success and most researchers use experienced nurses as study participants, theoretical knowledge may be assumed, but not directly measured, in nursing studies of clinical judgment. For the participants in this study, theoretical knowledge acquired through *learning in school* was incorporated into all clinical judgments, but *learning in school* took on greater significance in those situations where the nurse did not know the patient or had not acquired requisite knowledge to inform clinical judgment through *learning at work*.

The narratives provided by participants in this study related to theoretical knowledge acquired through *learning in school* are consistent with Benner’s (1984) work on the novice to expert model of skill acquisition in nursing. Benner contends novice nurses require clinical experience in the practice setting after graduation to refine theoretical knowledge and use it efficiently and effectively to inform clinical practice. Nurses in this study recalled relying on rules to recognize deviations from established norms and the inability to Fit Things Together by correlating signs and symptoms as new graduates.

The purpose of this study was to discover the process nurses use to make clinical judgments; therefore, the accuracy of the participants’ clinical judgments was not evaluated. By their account, however, *learning at work* is imperative to Fit Things
Together in situations that require clinical judgment. The nurses in this study were very clear that *learning in school* was not sufficient to make the clinical judgments required of them in practice, a finding also reported by Etheridge (2007) based on interviews with new graduates on three separate occasions during their first year of practice. The participants in this study and the nurses interviewed by Etheridge reported their ability to put the “whole picture together” required *learning at work*, because they did not understand the significance of individual clinical cues as new graduates, and clinical experiences in school did not prepare them for the complexity of the practice environment.

For participants in this study, Fitting Things Together was facilitated by *learning at work* and working on the same unit since graduation from nursing school. Experience acquired on a single nursing unit enabled the participants in the study to “know the population” typically cared for on the unit; this facilitated the pattern recognition identified by Benner and colleagues (Benner, 1984; Benner & Tanner, 1987; Benner et al., 1996), Cioffi (2001), Offready (1998), Simmons et al. (2003), and Tanner (2006b) that facilitates clinical reasoning and clinical judgment. Pattern recognition developed over time by caring for similar patients helps the nurse to focus on the salient data in a clinical encounter, organize clinical data, and recognize the relationship between cues available in the clinical situation. The finding in this study that *learning at work* is necessary to Fit Things Together in situations that require clinical judgment also supports research on the early recognition of patient problems by medical-surgical nurses conducted by Minick and Harvey (2003). The researchers found the ability for early
detection of patient problems is acquired through work experience caring for patients with similar problems that enables the nurse to recognize deviations from the clinical progression expected.

While participants in this study identified knowing the population as an important outcome of *learning at work* that facilitates Fitting Things Together, the nurses also identified *learning at work* as essential to the acquisition of clinical judgment skills, because many of the responsibilities required in the staff nurse role are not directly experienced in clinical rotations in basic nursing education. Participants in this study identified specific experiences missing from clinical learning in school that compromised their ability to make clinical judgments as new graduates in practice. *Learning at work* was reported necessary to determine when to contact a physician and what information to provide, recognize signs a patient was deteriorating, interact effectively with multiple providers to coordinate patient care on admission and discharge, and determine the appropriateness of interventions ordered by physicians. These findings support existing literature on readiness of new graduates for practice (Benner, 1984; Burns & Poster, 2008; Dyess & Sherman 2009), research on new graduates’ self-perception of readiness for practice (Etheridge, 2007; Li & Kenward, 2006), and recommendations for formal transition programs for novice nurses (Benner et al., 2010; Dyess & Sherman, 2009; Spector & Echternacht, 2010). It is important to note that many of the skills identified as lacking in new graduates and acquired through *learning at work* are skills essential to effective surveillance by nurses at the point of care.
Participants in this study reported *learning at work* was necessary to develop confidence in clinical judgment skills, a finding that supports Etheridge’s (2007) research with new graduate nurses in the first year of practice. While the development of confidence over time is not a unique finding in this study, participants provided specific details regarding the implications of a lack of confidence in clinical judgment skills. Nurses in this study explained that a lack of confidence in their ability to make accurate clinical judgments caused them to second guess themselves and question their assessment findings, particularly when their assessment findings differed from those previously reported by another provider. Participants also explained the development of confidence in their clinical judgment skills was necessary to call physicians without hesitation, effectively convey assessment findings, question physician orders, and make suggestions to physicians regarding interventions. Since the detection of subtle changes that indicate progress or deterioration is the responsibility of the nurse at the point of care, the implications of a lack of confidence in clinical judgment reported by the nurses in this study is an important finding.

Another key finding in this study regarding confidence in clinical judgment developed based on *learning at work* is that confidence gained is limited to the patient population and the unit where the learning takes place. This finding supports existing research on the link between knowing the population (Cioffi, 2000; Minick & Harvey, 2003; Tanner, 2006b) and accurate clinical judgment; however, it sheds new light on the implications of not knowing the population. Even with three years of clinical experience, nurses in this study reported a lack of confidence in clinical judgment skills and a
tendency to second guess themselves when they are assigned to work on a unit other than their own, or when they have to care for patients on their unit who would normally be admitted elsewhere. Nurses in the study likened these situations to being a new graduate nurse, when their inability to interpret the significance of clinical cues hindered their ability to understand the patient’s clinical presentation, recognize signs of deterioration, or anticipate essential elements of the treatment plan. Of further concern is the reluctance reported by nurses in this study to consult nurses on other units for advice in situations when patients are admitted to units where they would not normally be assigned. Nurses in this study, despite their self-reported lack of confidence, did not routinely seek assistance to interpret a patient’s clinical presentation from nursing colleagues beyond their peers on their own nursing unit.

Benner (1984) proposed the novice to expert model of skill acquisition in nursing 30 years ago; the expectation that new nurses will require experience to transition to practice is not new. However, a unique finding in this study was discovered regarding learning at work. Nurses in the study explained that working the night shift adversely impacts learning at work for newly licensed nurses. The opportunity for interaction with other health care providers, a skill identified as lacking in new graduates (Burns & Poster, 2008), is limited on the night shift. Problems that are not time or risk sensitive are typically deferred to providers on the day shift; therefore, according to the nurses in this study, the development of problem solving skills and familiarity with resources available in the acute care setting are hindered when inexperienced nurses are assigned to the night shift. In addition, study participants explained opportunities to observe procedures and
interventions implemented by other providers, as well as the patient’s response to those procedures and interventions, are limited for nurses who work at night. Interventions ordered based on laboratory and diagnostic tests are typically ordered during the day, and nurses working the day shift, particularly in non-ICU settings, tend to administer the bulk of the patients’ ordered medications. Shift assignment has not been the focus of research on the acquisition of clinical judgment skills. Based on the findings of this study, *learning at work* and the acquisition of clinical judgment skills may be affected by shift assignment. Many of the experiences the nurses in the study identified as limited on the night shift could be instrumental in helping nurses learn to Fit Things Together.

Learning to Fit Things Together would also be enhanced, according to the nurses in this study, if they were provided with the opportunity to review the medical record and care provided leading up to emergencies that result in patient transfer to another level of care, such as an intensive care unit. Nurses who care for a patient prior to an emergency do not have access to the patient’s medical record after the event if the patient is transferred to another unit. Participants said an opportunity to review the medical record after the event would help them to put the progression of events together that led up to the emergency. Nurses in the study viewed the inability to review the medical record after emergency situations as a lost opportunity for *learning at work*.

The final aspect of the category *Knowing* that impacts clinical judgment, according to the nurses in this study, is knowing the patient. Nurses get to know their patients through report provided by another nurse at a transition of care or information provided by the patient or family on direct admission to the acute care setting, physical
assessment of the patient, review of the medical record, and communication with the patient, family members, and other health care providers. Throughout the work shift or clinical encounter, nurses collect additional data through observing the patient and monitoring the patient’s response to interventions implemented. Nurses in the study expressed a clear preference for knowing the patient in situations that require clinical judgment; Fitting Together knowledge about the patient with learning in school and learning at work makes the nurse more confident in the clinical judgments that must be made.

The nurses’ preference for knowing the patient in this study supports previous research by Tanner et al. (1993), Minick and Harvey (2003), and Peden-McAlpine and Clark (2002), who all concluded knowing the patient enhances the nurse’s ability to anticipate and evaluate the patient’s response to interventions and recognize patient problems in a timely fashion. In a grounded theory study of decision making in experienced nurses, Radwin (1998) identified knowing the patient, which involved pattern matching and developing a big picture, as the core category in the model discovered. In Schmidt’s (2010) grounded theory study of the process nurses use to provide surveillance to patients in their care, participants referred to getting “the big picture” as an important aspect of “knowing what’s going on” (p. 403). Nurses in this study also frequently referred to “getting the big picture,” and used pattern matching to help put that picture together.

An interesting finding in this study regarding Knowing was that nurses placed more emphasis on knowing the population, acquired through learning at work, than
*knowing the patient.* While nurses in the study did clearly prefer to *know the patient,* if they had to choose between knowing the patient and knowing the population, study participants indicated they would choose an assignment where they knew the population. Knowing the population, through *learning at work,* enables the nurse to know what to expect in terms of clinical presentation, treatment plan, and expected progress toward goals of care. Knowing the population also increases the likelihood the nurse will be familiar with other providers on the treatment team; nurses in the study expressed a clear preference for working with the same physicians on a regular basis. This strong preference for knowing the population is also explained by the fact that nurses in this study indicated their confidence in their clinical judgment skills is limited to the patient population and the nursing unit where those skills were developed through *learning at work.*

**Anticipating**

*Knowing* sets the stage for the second step in the clinical judgment process, *Anticipating;* the nurse *Anticipates* the patient’s clinical presentation and treatment plan to the extent possible based on *learning in school,* *learning at work,* and *knowing the patient.* While all three aspects of *Knowing* influence *Anticipating,* nurses in this study were clear that *Anticipating* only becomes possible after *learning at work.* Treatment protocols and guidelines for each patient population, as well as the typical trajectory of illness associated with each diagnosis and procedure, must be learned through experience caring for patients from a given population in order for the nurse to *Anticipate.* When nurses are able to *Anticipate* the patient’s clinical presentation and treatment plan, they
are in a better position to *predict* the course of events that will occur over the work shift, *predict* potential problems that might develop, and *be proactive* to facilitate early intervention.

In the process of Fitting Things Together, nurses in this study integrated their general knowledge of the expected disease trajectory acquired through *learning at work* with *knowing the patient* to create expectations for the patient’s clinical presentation and progress throughout the clinical encounter. Participants in this study also indicated the clinical presentation *Anticipated* for each client in their care establishes the baseline for interpretation of assessment data gathered throughout the shift. As described by the participants in this study, the stage of *Anticipating* supports existing nursing research related to *knowing the patient* (Minick & Harvey, 2003; Peden-McAlpine & Clark, 2002; Tanner, 2006b) and knowing the population (Minick & Harvey, 2003; Peden-McAlpine & Clark, 2002; Tanner, 2006b).

Nurses in this study indicated they *Anticipate* the patient’s treatment plan, as well as the patient’s clinical presentation. This is an important point, because this *Anticipating* sets up the nurse’s expectations for medications and diagnostic tests that should be ordered for each patient. Participants in the study indicated they “get a picture” of the medication administration record based on *knowing the patient* through the report provided at the transition of care and knowing the population. If discrepancies are noted between the medications that are *Anticipated* and the medications that are ordered, the nurse investigates the discrepancy. Therefore, *Anticipating* is key to safety and quality, but *Anticipating* depends on *Knowing*. 
The activities associated with predicting potential problems and being proactive described by nurses in this study are similar to those reported by Peden-McAlpine and Clark (2002) in a study of recognition of status changes by experienced nurses and Eisenhauer et al. (2007) in a study of experienced nurses’ thinking during medication administration. Nurses in this study Anticipated side effects of medications by Fitting Together their knowledge of the medications ordered with the patient’s pathophysiology and intervened early, before side effects developed. Similarly, nurses in this study identified patients at risk for mental status changes, falls, and skin breakdown by Fitting Together their understanding of assessment data and pathophysiology and instituted measures to prevent harm.

Nurses with more than five years of clinical experience, who have already acquired the skill of Anticipating, are the focus of most nursing research on clinical judgment; the importance of Anticipating is well established (Benner, 1984; Eisenhauer et al. 2007; Minick & Harvey, 2003; Radwin, 1998; Tanner, 2006b). However, nurses in this study were able to identify specific implications of the inability to Anticipate. Study participants explained that before they learned at work, they were unable to Anticipate information a physician would request when notified of a concern regarding a patient; they were unable to Fit Together the data that would assist the physician to address the concern or Anticipate interventions or medications the physician might order to address the problem. Both situations often made additional phone calls necessary. Also, nurses in the study indicated they did not Anticipate the potential for sudden changes in a patient’s
status until they had “been on the unit”; their ability to predict the course of events that might occur over the work shift was limited until they learned at work.

When nurses cannot Anticipate they must “deal with the unexpected.” Two important findings regarding Anticipating and “dealing with the unexpected” emerged in this study. In previous studies, knowing the patient was primarily associated with continuity of care in patient care assignments; nurses came to know the patient by caring for the patient on several work shifts. Nurses in this study did express a preference for continuity in terms of their assignment; however, high patient turnover and the 12 hour shift scheduling pattern that results in fewer shifts worked per week can interrupt continuity of care. Therefore, study participants identified an accurate report at each transition of care as essential to knowing the patient, Anticipating the patient’s clinical presentation, predicting the events likely to occur over the course of the work shift, and being proactive to address potential problems. Nurses in the study also reported that if at least some aspect of the report takes place at the patient’s bedside, the nurse’s ability to Anticipate is enhanced because the nurse’s baseline picture of the patient is more complete.

When nurses do not get an accurate report at the transition of care, they have to “deal with the unexpected,” which will impact the time and attention available for other patients in their assignment. Nurses in the study acknowledged that “dealing with the unexpected” cannot always be avoided, but they explained it is particularly disruptive when the unexpected occurs at the beginning of the work shift due to an inaccurate report. The nurse may be significantly delayed in seeing other patients, and will likely
have to respond to events as they unfold, instead of being proactive. The importance nurses in this study attribute to an accurate report at transitions of care to facilitate clinical judgment supports existing research by Ebright et al. (2004) who found inaccurate report to be a primary problem in a study of novice nurse near miss and adverse events.

**Prioritizing**

*Anticipating and Knowing* enable the nurse to *Prioritize* the needs of each individual patient and rank the needs of all patients in the assigned group. Nurses develop a *plan* for the work shift that reflects the *Priorities* established, but the dynamic nature of the acute care setting requires nurses to *adjust* their plan frequently in order to *address pressing issues*. Nurses in the study talked at length about the information they want in the report at the transition of care and the manner in which they organize that information as they engage in *planning* for the work shift; *planning* helped the study participants to stay organized, even when it became necessary to *adjust*. Consistent with previous research (Benner, 1984; Etheridge, 2007), nurses in the study indicated *learning at work* had helped them to understand that they needed to be prepared for the unexpected; sudden changes in patients’ status or a patient “going bad” were not directly experienced in clinical rotations in basic nursing education. Organization and *planning* were identified by study participants as essential to being able to *adjust* their *plan* to *address pressing issues*.

Nurses in this study identified common occurrences that require *adjusting the plan*. Some *pressing issues* identified were patient requests for comfort measures in the
form of an analgesic or antiemetic, a discrepancy between the clinical presentation
Anticipated and the clinical presentation Observed in a patient in their assigned group,
sudden changes in a patient assigned to another nurse, physician orders, and
unanticipated patient discharge from the acute care setting. According to the participants
in the study, it is common for multiple pressing issues to arise simultaneously, or in rapid
succession. Study participants explained patient turnover and the responsibility to insure
patients are ready for diagnostic tests significantly influence prioritizing initially and
throughout the course of the work shift. Nurses must accommodate the schedules of
multiple providers and departments, and are under considerable pressure to complete the
discharge process in the first few hours of their shift. According to the nurses in this
study, emergency situations are always given priority, but the time sensitive nature of
patient turnover and diagnostic testing require nurses to prioritize these aspects of care.

In previous research on clinical judgment in nursing, examination of Prioritizing
has been limited to how nurses weight clinical cues in a single judgment task, such as
interpretation of assessment data (Cioffi, 1997; Simmons, 2003), or assign values to cues
to predict risk for an adverse event in simulated scenarios focused on a single patient
(Thompson et al., 2008, 2009). However, research indicates contextual factors influence
judgment (Bucknall, 2003; Newell & Simon, 1972; Lee et al., 2006; Tanner, 2006b) and
nurses at the point of care must balance competing demands for their time and attention
from more than a single patient. Therefore, insight into how nurses adjust to address the
pressing issues that vie for their attention is an important finding in this study, because in
the real world of practice, patient acuity is not always the primary factor that determines

*Prioritizing.*

**Observing**

The stage of *Observing* in Fitting Things Together involves the nurse *seeing the patient, assessing, and comparing*. Nurses in the study indicated they tailor their *Observing* based on *Knowing, Anticipating,* and *Prioritizing*. The study participants explained they “get a baseline” when they first *see* and *assess* the patient; they *compare* what they *Observe* with what they *Anticipated* repeatedly throughout the clinical encounter, using multiple sources of data to insure their picture of the patient is complete and any changes in clinical presentation are quickly detected. While nurses in the study indicated the importance of monitoring equipment and diagnostic tests, they *Prioritized seeing the patient*. Participants explained that they can rely on their peers if they “get tied up” and cannot see their own patients, but *not seeing the patient* makes the nurse very uncomfortable. As nurses *see and assess* their patients throughout the shift, and on subsequent shifts if they continue to care for the same patients, their *Observing* impacts *knowing the patient*. This approach to *Observing* is consistent with research conducted by Schmidt (2010) on the process registered nurses use to “watch over” their patients. Nurses in Schmidt’s study also incorporated multiple sources of data to build their picture of the patient, but prioritized *seeing the patient* regularly throughout the shift. The feedback loop from *Observing* to *Knowing* discovered in this study also supports Schmidt’s findings that registered nurses increase *Knowing* by closely watching patients throughout the shift.
Thinking

In the Thinking stage of Fitting Things Together, the nurse is asking why, reasoning, and reflecting to put all that is Observed in context in each clinical situation. Nurses in the study explained that Thinking is necessary to keep patients safe and tailor Observing throughout the clinical encounter. Participants indicated they would ask why when they did not Observe what was Anticipated in the patient’s clinical presentation; this is consistent with research reported by Simmons (2003) related to patient assessment and Minick and Harvey (2003) in assessment of client status changes. Nurses in this study also indicated they would ask why when they did not Observe what was Anticipated in terms of the treatment plan, medical orders, and expected response to interventions.

According to the nurses in this study, Thinking involves reasoning to adjust protocols based on the individual patient’s progress and evaluate the patient’s response to medications administered. Consistent with previous research on nurses’ thinking during medication administration (Eisenhauer, 2007) reasoning about the patient’s response to medications helped the nurses in this study to evaluate the need for a medication or dosage change. This is an important aspect of nursing work, since medications often have to be adjusted as an acute problem is being resolved and nurses are in the best position to Observe the patient’s response to medications administered. Similarly, nurses in this study explained the need to consider the individual patient’s progress and adjust treatment protocols accordingly, as opposed to rigid application of treatment guidelines.

Nurses in the study provided examples of reflecting during the course of the
work shift to compare the *Observed* clinical presentation with the *Anticipated* clinical presentation and evaluate the patient’s response to interventions implemented. *Reflecting* helped the nurses to recognize discrepancies between what was Observed and what was *Anticipated*; it was a conscious and deliberate step taken in an attempt to Fit Things Together in each clinical encounter, and it was evident in multiple aspects of the nurses’ work. For example, documentation in the medical record provided an opportunity to *reflect* on patient care data as it was recorded to make sure the data recorded matched the data *Anticipated*.

The combined actions of *asking why, reasoning, and reflecting* that represent the category *Thinking* explain how each clinical encounter provides the nurse with an opportunity to *learn at work*. Nurses in the study recognized the influence of each clinical situation on their future clinical judgments, with each situation adding to the nurse’s knowledge base for use in future situations with similar patients or circumstances. The use of experience to inform future clinical judgments supports existing nursing research on the relationship between experience and clinical judgment (Benner, 1984; Caputo & Mior, 1998; Cioffi, 2001; Cioffi & Markham, 1997; Lee et al., 2006; Radwin, 1998; Tanner, 2006b). However, nursing researchers tend to associate clinical experience with the development of intuition and often attribute clinical judgment skills in the experienced nurse to intuition, even though there is no widely accepted definition of intuition in nursing. This makes interpretation of the existing literature on clinical experience and clinical judgment difficult to interpret.
The nurses in this study did not associate Knowing with intuition. The strategies used during Observing (seeing, assessing, and comparing) and Thinking (asking why, reasoning, and reflecting) help them continually build their knowledge base for practice. This is consistent with reflection in action as described in theoretical literature by Schon (1987) and Rolfe (1997). Reflective practice insures the nurse remains focused on the particulars of each situation and facilitates learning at work. Nurses in this study demonstrated reflective practice by reviewing and analyzing clinical encounters to transform experience into knowledge for practice. This is consistent with Benner’s (1984) contention that expert performers develop clinical judgment through reflection that enables them to turn knowledge into wisdom. However, reflective practice requires “mindfulness” (Rolfe, 1997, p. 96) at all levels of performance, in contrast to Benner’s contention that experts do not need to pay attention to the particulars of a situation because of their intuitive understanding. The reflection in action and mindful practice demonstrated by nurses in this study is beneficial because it builds the individual nurse’s knowledge base for practice; reflection in action by nurses at the point of care may contribute to an evidence base for practice, as well.

Two additional findings regarding Thinking emerged in this study, because the narratives of study participants provided range for the category Thinking. Nurses in the study identified “going through the motions” as the opposite of Thinking; “going through the motions” was described as following orders without asking why or using rules to guide nursing care without reasoning to consider the particulars of the clinical situation. Participants associated “going through the motions” with nurse burnout or a limited
knowledge base, both of which could lead to errors in judgment and adverse events.

Nurses in the study noted a difference between getting the work done associated with a patient care assignment and Fitting Things Together to understand a patient’s clinical presentation.

Study participants also recognized that reasoning requires Knowing and explained that factors that affect Knowing will affect reasoning; therefore, nurses do not always reason correctly. Two nurses might Fit Together the cues or data in a clinical situation differently, depending on learning in school, learning at work, and how well they know the patient. Thinking, demonstrated by asking why, reasoning, and reflecting is key to both safety and quality, because nurses can get the work done by “going through the motions” and reasoning can be faulty if Knowing is incomplete.

Catching Things

Observing and Thinking enable the nurse to Catch Things through checking that facilitates noticing changes. Checking involves seeing and assessing the patient and the patient’s immediate environment through frequent rounding, as well as reviewing the medical record and treatment plan frequently to insure the patients’ progress and responses to interventions are appropriately addressed. Noticing changes requires knowing the patient, which is facilitated by frequent checking throughout the work shift and continuity of care in patient care assignments. The surveillance necessary to Catch Things as described by nurses in this study supports existing research on the conditions necessary for monitoring patients and noticing changes in patients’ status during a work shift (Minick & Harvey, 2003; Peden-McAlpine & Clark, 2002; Schmidt, 2010).
Important findings in this study emerged because participants were able to identify attributes of the nurse and the environment that can pose barriers to *Catching Things*; the barriers identified cause nurses to “miss things.” The narratives provided by nurses in this study support previous nursing research on the importance of *knowing the patient* in order to *notice changes* (Minick & Harvey, 2003; Peden-McAlpine & Clark, 2002; Tanner, 2006). However, participants indicated that *Catching Things* also requires *learning at work* in order to detect the subtle changes that indicate a change in status.

Another attribute of the nurse that can pose a barrier to *Catching Things*, according to the nurses in this study, is “going through the motions” instead of *Observing and Thinking* as nursing work is performed. Participants explained that “going through the motions” causes nurses to “miss things” because physicians’ orders and practice routines direct nursing work while the particulars of the situation are overlooked. This supports theoretical literature on the importance of mindful practice and reflective practitioners (Rolfe, 1997; Schon, 1987); it is noteworthy because the complexity of the current practice environment has increased the importance of the nurse as the patient’s last line of defense in the acute care setting.

Attributes of the environment that pose barriers to *Catching Things* were identified by participants in the study as nurse staffing, high patient acuity, high patient turnover, and assuming the role of shift charge nurse in addition to a full patient care assignment. The common denominator in these barriers that results in “missing things” is limited availability for *checking* patients to *notice changes*, *checking* the patient’s environment to insure equipment is present and functioning, and *checking* the medical
record to insure the treatment plan remains appropriate. These findings support existing research in psychology on the concept of bounded rationality (Newell & Simon, 1972; Taylor, 2000) and information processing theory; it has long been recognized that there are limits on what the human brain can attend to at any one time. In previous nursing research, time and attention emerged as necessary for effective surveillance by nurses (Schmidt, 2010), and resource availability has been reported to impact clinical decision making (Bucknall, 2003). The specific barriers to Catching Things identified by nurses in this study extend understanding of the environmental conditions that impact nursing work in general and clinical judgment in particular.

**Figuring Out What’s Going On**

In the stage of *Figuring Out What’s Going On*, the nurse comes to a conclusion about the patient’s clinical presentation through *connecting signs and symptoms*, *considering possibilities*, *investigating*, and *using resources*. The nurse’s actions during this stage of the clinical judgment process depend on whether the nurse *Observes* what was *Anticipated*, the nurse’s workload, and the risk the circumstances of the situation pose to the patient. According to the participants in the study, recognizing the risk in a situation that requires clinical judgment is facilitated by *learning at work*.

In situations that do not pose immediate risk to the patient, nurses *connect signs and symptoms* and *consider possibilities* that might explain the patient’s clinical presentation in an attempt to *Figure Out What’s Going On*. The nurse then *investigates* the *possibilities considered* by searching for additional clinical cues to confirm or rule out the potential problem. The nurse’s interpretation of the data collected during *investigating*
helps the nurse to identify additional data that may be helpful to *Figure Out What’s Going On*. Participants in the study explained that if they were unable to *Figure Out What’s Going On* they would *use resources*, with nursing colleagues on the unit where they work being their first choice for assistance; nurses in the study were inclined to ask questions rather than search the literature for answers. According to the nurses in the study, electronic information resources available in the hospital are used primarily for information on medications. The priority given to nursing colleagues as a source of information by the nurses in this study supports nursing research that indicates nurses prefer experience to evidence (McCaughan et al., 2005; Taylor, 1997) when searching for information.

The activities described by nurses in the study in the stage of *Figuring Out What’s Going On* provide several important insights into the thought processes nurses use to make clinical judgments. First, the strategies *connecting signs and symptoms, considering possibilities, investigating, and using resources* are consistent with information processing theory (Newell & Simon, 1972), which focuses on objective data and hypothesis testing in a rational approach to judgment. However, the fact that nurses adjust their approach to judgment based on the complexity of the judgment task also supports cognitive continuum theory (Harbison, 2006; Standing, 2008; Thompson, 1999), which is based on the premise that different judgment tasks require different cognitive approaches, and previous research that indicates task complexity dictates the nurse’s approach to clinical problems (Bucknall, 2003; Cader et al., 2005; Hamm, 1988; Harbison, 2006; Hughes & Young, 1990; Standing, 2008).
Task complexity is determined by the judge’s knowledge base relative to the situation, the uncertainty inherent in a situation, the cues available, the presence of cues that are associated with more than one problem, the time available to solve the problem, the judge’s ability to decrease the uncertainty inherent in the situation, and the environmental conditions under which the judgment must be made (Bucknall, 2003; O’Neill, 1995; Thompson, 1999). When a nurse Observes signs of rapid deterioration or encounters a situation likely to escalate to an adverse event, task complexity is usually too high to facilitate considering possibilities and investigating. The nurse cannot take the time to Figure Out What’s Going On before Determining What Needs to be Done; therefore, help is summoned emergently. On the other hand, when task complexity is lower because the nurse knows the patient, has knowledge relevant to the presenting problem acquired through learning in school and learning at work, and imminent danger is not a factor, the nurse can take the time to use a more analytical approach to Figure Out What’s Going On.

The cognitive continuum originally proposed by Hamm (1988) was revised by Standing (2008) to more accurately reflect clinical judgment and decision making in nursing. The clinical judgment process that emerged in this study provides support for Standing’s revised cognitive continuum of clinical judgment on the anchors of reflective judgment, patient and peer aided judgment, and system aided judgment, in addition to the support provided for the influence of task complexity on the cognitive approach used in judgment situations. Harbison (2006) contends most nurses operate at the intuitive and peer aided anchors of Standing’s cognitive continuum, but the participants in this study
demonstrated reflective judgment and did not rely on intuition to make their clinical judgments.

In the stage of *Figuring Out What’s Going On*, the nurse moves beyond the use of rules and arbitrary interventions. Fitting Things Together to *Figure Out What’s Going On* increases the likelihood the nurse’s actions will resolve patient problems, because the etiology of the problem is more likely to be identified. According to nurses in the study, it is possible in many situations to get the work done that is associated with a patient care assignment simply by following physician’s orders and rules of practice; however, this approach might only address signs and symptoms while the underlying problem remains unresolved. *Figuring Out What’s Going On* puts the nurse in a better position to *Determine What Needs to be Done*.

Many nurses in the study referred to the actions taken in the stage of *Figuring Out What’s Going On* as critical thinking. However, the theoretical and empirical literature on critical thinking in nursing is difficult to interpret due to a lack of consistency in definition of terms and a lack of discipline specific tools to measure the concept. The disposition, or motivation, for critical thinking (Facione et al. 1994; Rubenfeld & Sheffer, 2001) may be relevant to the strategies used by nurses in this study in the stages of *Thinking* and *Figuring Out What’s Going On*. Activities in these stages include *asking why*, *reasoning*, *reflecting*, *connecting signs and symptoms*, *considering possibilities*, *investigating*, and *using resources*. These activities indicate a spirit of inquiry and a deliberate, analytical approach to clinical judgment that requires motivation to engage in
cognitive work, as opposed to merely following physicians’ orders, practice rules, or one’s intuition.

**Determining What Needs to be Done**

The outcome of the clinical judgment process is *Determining What Needs to be Done* to keep the patient safe and continue progress toward the goals of care. If the nurse *Observes* what was *Anticipated*, the nurse returns to the stages of *Observing and Thinking* to monitor the patient. If the nurse does not *Observe* what was *Anticipated* or if the nurse is concerned about the patient’s status, the nurse implements interventions and monitors the patient’s response, continues to *Observe* the patient by “keeping a close eye on them,” or reports assessment findings to the physician. Participants in the study indicated that all aspects of *Knowing* impact *Determining What Needs to be Done*, but gave priority to *learning at work*, because the nurses in the study recalled their inability to interpret the significance of clinical cues and recognize risk as new graduates.

One option that nurses might select in the stage of *Determining What Needs to be Done* is “keeping a close eye on a patient.” Participants in the study explained that “keeping a close eye” on one patient makes it difficult for them to *Observe* the other patients in their assignment. Since nursing research on clinical judgment has not focused on the nurse’s work with an assigned group of patients over the course of a work shift, the implications of “keeping a close eye” on one patient in an assigned group have not been addressed in research on clinical judgment. However, in a recent review of nursing literature on *knowing the patient*, the nurse’s availability to observe the patient throughout the work shift and opportunities for frequent interaction with the patients in
an assigned group emerged as important factors in knowing the patient (Zolnierek, 2014). Since nurses in this study were clear that their Priority in Observing is seeing the patient and Catching Things requires knowing the patient and frequent checking to notice changes, “keeping a close eye” on one patient has implications for clinical judgments for all patients in the assigned group.

Nurses in the study identified turning points that would indicate Observing was no longer sufficient and action needed to be taken; turning points included changes in respiratory status, chest pain, changes in mental status, significant changes in vital signs, or Observing additional signs that a primary problem was becoming more severe. Routinely alerting the physician to mental status changes is not consistent with the findings of McCarthy (2003), who found nurses’ tendencies to report mental status changes were related to their personal perspective on aging and health in the older adult population. Age was not a factor in determining the relevance of mental status changes for nurses in this study; mental status changes signified risk to the participants in this study and, therefore, warranted action.

Participants in the study talked at length about situations where they did not get the response they thought necessary when notifying physicians about a change in a patient’s status. In those situations, nurses talked about their responsibility to “be an advocate” by persisting in their attempts to persuade the physician of the seriousness of the situation, going up the chain of command if necessary to bring attention to their concerns. Study participants indicated that clinical experience in pre-licensure education did not prepare them for these situations; the responsibility to advocate was discussed in
nursing school, but direct experiences with clinical situations where “making my case” was required were missing.

Feedback Loop: Returning to Observing and Thinking to Inform Knowing

The outcome of the clinical judgment process, Determining What Needs to be Done, takes the nurse back to the stages of Observing and Thinking. Nurses in this study described the process by which Observing and Thinking informs their clinical judgment in each patient care situation, as well as future clinical judgments in similar situations.

The phrase learning at work, used repeatedly by nurses in this study, captures the influence of their daily practice on future clinical judgments more accurately than the phrase “getting experience.” The nurses in this study recognized every patient encounter as an opportunity for learning at work. They returned to the stages of Observing and Thinking after each clinical judgment to evaluate the patient’s response to intervention and the care provided. Study participants talked about “analyzing” incidents, considering “what might have been done differently,” and “developing” from situations that required clinical judgment.

Nurses in the study did not reserve reflection on the care provided for adverse events; however, study participants did refer to learning from their mistakes and the mistakes of their peers, and learning from situations where their actions prevented an adverse event. These findings suggest support for research on the use of heuristics to facilitate judgment in situations where the outcome is uncertain (Cioffi, 1997; Tversky & Kahneman, 1974) and task complexity is high (Cioffi & Markham, 1997). The availability heuristic (Galanter & Patel, 2005) seems particularly relevant to learning
from mistakes and adverse events, but study design precludes firm support for the use of heuristics by nurses in situations that require clinical judgment. However, based on the findings of this study, it is apparent that learning at work does impact Knowing in future situations that require clinical judgment. It is also apparent that Knowing is not acquired by time invested in nursing or performing practice routines repeatedly (Benner, 1984; Radwin, 1998). To develop clinical judgment, nurses must practice reflectively, Fitting Things Together in each clinical encounter to address the current situation and build a knowledge base for future practice.

**Additional Findings**

Several nursing interventions have been introduced in the acute care setting in recent years as a result of the focus on safety and quality. Two such interventions, hourly rounding and bedside shift report, were identified as important by the study participants to knowing the patient and noticing changes, conditions necessary for Catching Things in the model of clinical judgment that emerged in this study. Participants placed a high priority on hourly rounding, because seeing the patient, a property of the category Observing, is key to both knowing the patient and noticing changes. Bedside shift report insures the nurse can “get a baseline picture” of the patient at the beginning of the shift and sets the stage for noticing changes as the shift progresses. Hourly rounding and bedside shift report are two strategies that are typically associated with patient safety; according to the participants in this study, these interventions inform clinical judgment.

Participants in the study did not associate their Knowing with intuition; they attribute the clinical judgment skills they have developed to learning at work and can
describe their analytical thinking process as they Fit Things Together. However, nurses in the study talked about the patient’s “intuition,” and indicated they would not discount a patient’s intuition; they would investigate patient concerns no matter how vague those concerns might be. This reflects the importance nurses in the study place on listening to the patient as a source of data to Fit Things Together.

Unique Findings

Much of the research on clinical judgment conducted in nursing to date has been based on the use of simulated scenarios; nurses are presented with a problem that requires clinical judgment and provided with a variety of cues to assist them in drawing a conclusion about the simulated patient’s status and the interventions that are indicated to solve the problem. Or, nurses are provided with a simulated scenario and asked to assess the risk inherent in the situation and evaluate the necessity to intervene to prevent harm to the simulated patient. Simulated study designs reveal how nurses use and weight the information available in a situation, but do not reveal how the nurse might search for data in the real world of practice. In this study, participants identified the specific actions they would take to search for additional data, as well as the particular data they would search for in clinical encounters that require judgment. Nurses in this study explained how they might enlist the assistance of other providers, patients, family members, and peers to gather and interpret data, as well as the multitude of parameters they check throughout the shift to inform their clinical judgments. In addition, nurses explained how the complexity of the acute care setting affects their search for data over the course of a work shift. The findings of this study provide details of the information seeking strategies used
by nurses in the real world of practice, where Prioritizing is essential to balance competing demands. This study is also unique because the process nurses to make clinical judgments across the spectrum of nursing work emerged, while previous empirical studies have been limited to a single nursing task.

Additional unique findings have been presented throughout the discussion of the process of Fitting Things Togeth-er. These include findings related to confidence and the implications of a lack of confidence in clinical judgment, the impact of shift assignment on learning at work, and personal and environmental barriers to Catching Things.

**Challenges Encountered with Recruitment of Study Participants**

The difficulties encountered in recruitment of participants for this study were not anticipated. In retrospect, the strategies used, the current nursing work environment, and eligibility criteria for participation all adversely impacted recruitment. The use of hospital e-mail systems for distribution of the study flyers was attractive due to the large audience that could be reached at no cost. However, since time and interest in work e-mail impact access, it is likely many RNs who met the eligibility criteria for the study did not read the e-mail invitation to participate. For each RN who expressed an interest in participation, an average of six contacts was necessary before a study interview was scheduled. Participant responses to phone and e-mail messages were slow, even if the researcher obtained a personal e-mail address or phone number for potential study participants. This may be due to work schedules that include shift work and the preference for Facebook® and text messaging over e-mail and phone calls in the age group likely to meet the eligibility criteria for the study in terms of years of experience. Further delays were
encountered when scheduled interviews had to be rescheduled; staff RN work schedules change frequently due to fluctuations in hospital census, thus affecting participant availability for the study interview.

The impact on recruitment of the addition of a cash token of appreciation is difficult to evaluate. Only two of the 15 RNs in the final sample contacted the researcher without any encouragement from a peer, clinical educator, or unit manager; one RN participated before any token of appreciation was offered, and the other responded to the invitation to participate when the token was $10 cash. Adding the cash token of appreciation and later increasing the token likely influenced participation, but the majority of RNs in the sample also required encouragement from another nurse to pursue participation in the study. It is worth noting that after the token of appreciation was increased from $10 to $30 cash, interviews were more easily scheduled and the number of requests to reschedule interviews decreased. However, it is not known whether this was related to a more appealing token of appreciation, or just coincidental. Either way, it is clear that the token of appreciation alone was not sufficient to encourage RNs to respond to the invitations to participate in this study.

The number of RNs employed at the original study site seemed likely to provide a substantial pool of potential participants who met the eligibility criteria in terms of years of nursing experience. However, the turnover rate for registered nurses in the first few years of practice is reported to vary from 35% to 60% in the acute care setting (Halfer & Graf, 2006), and many nurses leave the profession within the first two years of graduation from their pre-licensure program. The substantial number of RNs with two to three years
of clinical experience who had transferred from their original unit of hire reduced the pool of potential participants at the original study site, and likely from the alumni groups at the nursing schools as well. In those nurses who met the eligibility criteria in terms of both years of experience and employment on their original unit of hire, the pool may have been further reduced by a reluctance to participate due to the focus of the study. Confidence is acquired with nursing experience (Smith, Andrusyszyn, & Laschinger, 2010); nurses with several years of experience may be more comfortable discussing their daily work than nurses who are just transitioning to the competent stage of performance (Benner, 1984). Some nurses who participated in the study shared an initial hesitation to participate because they feared their clinical judgments would be called into question; others doubted their ability to explain the process they use to make clinical judgments. A few participants expressed the opinion that nurses would be more willing to participate in focus groups than one on one interviews; however, that feedback represents conjecture and focus groups would not likely produce the rich narratives necessary to discover the process nurses use to make their clinical judgments.

Limitations of the Study

All of the nurses who participated in this study were employed in acute care settings where medical residents are available on site around the clock; therefore, study findings in the stage of Determining What Needs to be Done may not transfer to settings where nurses do not have access to a resident physician on site. For example, nurses who only interact with attending physicians may perceive their ability and their responsibility to go up the chain of command differently than nurses who work with medical residents.
Since the purpose of this study was to discover the process nurses use to make clinical judgments, judgment accuracy and the outcomes of clinical judgment were not addressed. Study findings indicate confidence in clinical judgment is acquired through learning at work and reflection on practice informs future clinical judgments, but the impact of either finding on judgment accuracy or patient outcomes cannot be known based on this study.

Study findings were reviewed in light of research on a variety of cognitive processes, including clinical reasoning, diagnostic practice, decision making, and skill acquisition in nursing practice. However, nursing authors and researchers use these terms interchangeably with the term clinical judgment and often characterize their work as research on clinical judgment. In addition, nursing authors associate certain tasks with clinical judgment, and propose task analysis as research on clinical judgment. Finally, research on clinical judgment in nursing is limited because instruments to measure the concept in nursing practice have not been developed; this is due in large part to the failure to differentiate clinical judgment from related cognitive processes and lack of theory development.

**Implications**

**Implications for Nursing Education**

_Nursing’s Social Policy Statement_ (ANA, 2010) mandates the development of clinical judgment skills as part of nursing education. Decades of research on the readiness of new graduates to practice and the findings of this study would indicate nurse educators are falling short of their charge to prepare new graduates to make the clinical judgments
required of them in practice. If newly licensed nurses are unable to interpret the
significance of basic clinical cues and do not understand how those cues are related, it is
not possible for them to Fit Things Together and *Figure Out What’s Going On*; yet, these
are the difficulties participants in this study recall upon entry into practice. It is clear that
preparing students for NCLEX does not prepare them for practice. A period of
adjustment is to be expected in every field of employment when an inexperienced college
graduate enters the workforce; but the stakes are much higher for new graduate nurses,
their colleagues, and the patients in their care. Nurses who cannot recognize the
significance of clinical data cannot provide the surveillance necessary to keep patients
safe.

At the pre-licensure level, changes are necessary in the design and assessment of
learning. Nurses in this study talked at length about *learning at work*; their narratives
provide insight into gaps that might be bridged by a different approach to *learning in
school*. Memorization and testing of facts should shift to learning and assessment
strategies that promote understanding, as recall is of limited use in the clinical setting. It
is important for students to recognize deviations from established norms, but nurses in
this study did not know what those deviations meant or when the deviations were
significant when they entered practice. This suggests facts were memorized for success
on tests or performance in simulated scenarios, but concepts were not understood. It
further suggests that assessment strategies are falling short of measuring analysis and
application. Since assessment should reflect the learning intended, assessment strategies
in pre-licensure education must measure more than a student’s ability to recall
information, or knowledge acquired through *learning in school* will be of limited use in clinical practice.

The model that emerged in this study identifies what nurses have to do in the real world of practice to Fit Things Together: *Know, Anticipate, Prioritize, Observe, Think, Catch Things, Figure Out What’s Going On* and *Determine What Needs to be Done*. Even though model testing is necessary, the skills represented by the categories in the model are clearly relevant for nursing practice. Furthermore, the properties of several categories, including *predicting (Anticipating)*, *planning (Prioritizing)*, *comparing (Observing)*, *checking (Catching Things)* and *investigating (Figuring Out What’s Going On)*, are a direct match to the cognitive processes that promote transfer of learning identified in the revised Bloom’s Taxonomy (Krathwohl, 2002; Mayer, 2002). Educators are advised to focus learning objectives on these cognitive strategies that go beyond recall and retention to facilitate problem solving in new situations (Mayer, 2002).

Therefore, the categories and properties of the model of clinical judgment that emerged in this study can serve as a guide to the design of learning activities and assessment strategies that will prepare students more effectively for the clinical judgments they will be required to make in practice.

Study participants provided specific examples of clinical learning that were needed but not available in their pre-licensure education, including coordinating care on admission and discharge from the acute care setting, interacting effectively with members of the health care team, recognizing deterioration in a patient’s status, knowing when to notify the physician, and caring for a group of patients. Nurses in the study were clear
that experiences need to be provided more than once in a single clinical rotation or simulation scenario, and care for a single patient does not prepare them for the realities of practice. Providing a more realistic clinical experience will be a challenge for faculty, but new challenges are rarely effectively managed unless new strategies are considered. The length of the clinical day and the placement of clinical learning in the curriculum should be evaluated. The traditional approach to the clinical day should be reconsidered, as the assignment of one student to one patient each day to provide total care may not be the best way to teach the skills of Knowing, Anticipating, Prioritizing, Observing, Thinking, Catching Things, Figuring Out What’s Going On, and Determining What Needs to be Done. The properties of each category in the model should be reviewed to determine which categories and properties could be most effectively taught in the clinical setting and which could be addressed in a simulation experience. To insure simulation scenarios reflect the complexities of the practice setting to the degree possible, actual cases from the practice setting should be used as a basis for scenarios.

Thinking should be addressed in pre-licensure education, including the concepts of metacognition, biases in information processing, the cognitive continuum, and the role of reflection in learning. Students will be in a better position to guard against the biases inherent in information processing if they are aware of the assumptions that influence the way problems are perceived and framed. Since reflection is required for learning at work, reflective practice should be modeled by faculty and incorporated into pre-licensure education. Finally, faculty can promote information seeking strategies, instead of merely providing students with answers to their questions.
Despite decades of concern over the readiness of new graduates to practice, change and innovation in nursing education has been quite minor (NLN, 2005). Nursing education will not change unless nurse educators change their perspective and acknowledge NCLEX pass rates cannot be the sole measure of educational success. The redesign of nursing education cannot be limited to pre-licensure education; program evaluation is needed at the graduate level, as well. The preparation of nurse educators for faculty positions and measures of competency for those educators must be examined for substantive change to take place at the pre-licensure level of nursing education. However, change at either level should not occur simply for the sake of change; an evidence base for nursing education must be developed.

To build an evidence base for nursing practice and nursing education, nurse educators should promote participation in nursing research in ethics, research, evidence-based practice, and professional development courses at every level of nursing education. The challenges experienced in recruiting participants for this study indicate considerable reluctance on the part of nurses with limited experience to participate in nursing research. While the topic may have contributed to nurses’ reluctance to participate and the inclusion criteria may have limited the sample for this study, it is important for nurses to realize that knowledge for practice must come from practice, and those who engage in nursing work are critical to an accurate understanding of nursing work at all levels of practice.
Implications for Nursing Practice

Changes in nursing education may improve the new graduate’s readiness for practice, but patient safety, quality of care, and the importance of job satisfaction to prevent nurse turnover and early exit from the profession require consideration of interventions that might address the findings of this study. Interventions that promote knowing the patient and learning at work could positively impact the performance of nurses at the point of care. Awareness of the environmental factors that complicate nursing work is an important step in reducing barriers to catching things.

Knowing the patient is necessary to detect subtle changes in a patient’s status. Knowing the patient is obviously facilitated by continuity of care in patient assignments, but other factors also promote knowing the patient. Participants in this study indicated knowing the patient depends on an accurate patient handoff at transitions of care that occurs, at least in part, at the patient’s bedside. Therefore, bedside handoff should be presented to nursing staff as an intervention that promotes accurate clinical judgment by providing a firm baseline for interpreting assessment findings throughout the shift. Further, structured formats for report should be encouraged to insure necessary information is routinely exchanged at transitions of care.

Knowing the patient is facilitated by frequent checking on the patient. Since study participants expressed a clear preference for seeing the patient themselves, this strategy does not need encouragement as much as it requires protection. Nurses want to see the patient frequently, but environmental circumstances can inhibit their ability to check the patient on a regular basis. The need to coordinate multiple discharges and admissions on
one shift, being “tied up” with one patient in the assigned group of patients, assuming the role of charge nurse in addition to a full patient load, and short staffing all adversely impact the nurse’s ability to see the patient, which leads to “missing things.”

Strategies to overcome the barriers to seeing and checking patients must obviously focus on those barriers that can be controlled. High patient turnover is a reality of the current health care system, but the challenges associated with patient discharge from the acute care setting can be addressed. Nurses at the point of care are significantly burdened by unanticipated discharges, discharge situations where multiple consulting physicians must be notified, and the need to coordinate multiple discharges in one shift. A collaborative approach that includes nurse managers, case managers, clinical educators, and nurses at the point of care should be used to examine the discharge process and the responsibilities of the staff nurse in that process. Other providers should be involved as indicated by analysis of the process. High patient turnover threatens both safety and quality, because it challenges the nurse’s ability to make accurate and timely clinical judgments. The time sensitive nature of patient turnover forces the nurse to prioritize these aspects of care, limiting the time and attention available for the more acute patients in the nurse’s assignment.

Learning at work is necessary for nurses to know the population, so that they can anticipate the care required, as well as the treatment plan and the medical orders that should be in place for each patient. Knowing the population is essential for prioritizing patient care needs and tailoring observing appropriately for patients in an assigned group. It is important to note that nurses in the study indicated that it is not possible to
Anticipate the care required or Catch irregularities in the treatment plan until learning at work occurs. Novice nurses find treatment protocols particularly helpful when they are trying to get to know the population.

Nurses develop confidence in their clinical judgment skills through learning at work. Confidence in clinical judgment skills is necessary to notify physicians without hesitation, question physicians’ orders, trust assessment findings, and make suggestions to physicians regarding the plan of care. According to the nurses in this study, confidence in clinical judgment, even in nurses with three years of experience, is limited to the patient population and the nursing unit where that confidence was acquired. Nurses explained they find it difficult to determine the significance of clinical cues and assessment data when they are unfamiliar with the patient population. Assigning nurses to units other than their own and to patients with whom they have no experience has implications for safety and quality of care. When such assignments are necessary, nursing supervisors should assist the reassigned nurse to identify clinical resources so that appropriate support is available.

Nurses in the study indicate learning at work is necessary to recognize deterioration in a patient, and to anticipate orders that would be appropriate to resolve the problem. This is likely related to the fact that nurses have difficulty interpreting the significance of assessment data when they first enter practice, and patient deterioration is typically not directly experienced in pre-licensure clinical rotations outside of the simulation setting. Therefore, it would be helpful to incorporate this learning into the
orientation period as early as possible, perhaps with the use of case studies that represent real scenarios that have occurred on the nursing unit where the new graduate is assigned.

Nurses in the study indicated that learning at work is adversely impacted by working the night shift; this perception was shared by nurses who routinely work both the day and night shift. The opportunities for learning on the night shift, according to the nurses in the study, are limited; problem solving skills are not developed because many problems encountered on the night shift are deferred to the day shift for resolution. Nurses on the day shift implement the majority of physicians’ orders and have the advantage of interacting with more members of the health care team, which facilitates their understanding of the interventions implemented by multiple providers. Since learning at work is so crucial to the development of the novice nurse, this finding should be given serious consideration in practice. If learning at work could be accelerated by delayed assignment to the night shift when nurses enter practice, the benefits to the patients, the nurse, and the institution could be substantial.

Since nurses in this study placed so much importance on learning at work, it is essential to educate preceptors and experienced RNs about the learning needs of novice nurses to facilitate the new nurse’s development of clinical judgment skills. If preceptors and co-workers are aware of the situations the new nurse needs to experience, the necessary opportunities for learning are more likely to be identified. In addition, the skills of coaching should be taught to all experienced RNs, so that a culture that facilitates learning at work is established on each unit where new graduates are hired. Experienced nurses should understand that giving the new nurse the answer is helpful, but explaining
the Thinking behind the answer will help the novice to Fit Things Together and develop clinical judgment skills.

Since learning at work is necessary, according to the nurses in this study, to Fit Together clinical cues in a situation that requires clinical judgment, nurse managers should pay particular attention to skill mix on shifts where novice nurses are assigned, so that the necessary resources are available to promote learning at work. In addition, when possible, novice nurses should be followed and preceded by experienced nurses so that transitions of care provide opportunities for learning at work that might otherwise be missed. This practice will also facilitate Catching Things, which is challenging to novice nurses who are still learning at work.

Nurse managers and clinical educators should be alert to opportunities for learning at work and support reflecting. Nurses in the study expressed a desire to review emergency situations, such as rapid response events, in cases where patients are transferred to another unit as a result of the event. Nurses suggested a case study approach to this review, where the entire medical record is presented, as opposed to a review of care provided immediately before the event. Nurses in the study felt this approach would help them to Fit Things Together and inform their future practice. A commitment to support reflection on care provided will help nurses at all skill levels build their knowledge base for practice and support the development of clinical judgment skills.

Adequate resources are essential for all nurses at the point of care to insure they have the time and attention necessary to Fit Things Together in situations that require
clinical judgment. Based on the findings of this study, one resource that should be evaluated at the nursing unit level is the shift charge nurse. Nurses in the study identified the role of charge nurse, in addition to a full patient load, as a “distraction” that challenges their ability to know their patients; and knowing the patient is key to accurate clinical judgment. Nurse managers should note that nurses in this study indicated all nurses on the unit are affected when the charge nurse has a full patient assignment, because the charge nurse is less available to assist other nurses and monitor overall activity on the unit. Checking is compromised, which can pose a considerable risk depending on the skill mix of the nurses and the acuity of the patients. Therefore, the expectations of the shift charge nurse and the responsibilities associated with the role should be examined.

**Implications for Practice and Education: Collaboration**

Nursing education has been designed based on accreditation standards and measured by NCLEX success. Yet, multiple stakeholders contend new graduates are not ready for practice. It would be useful for nurses from both practice and academia to agree on what readiness for practice looks like in the current health care environment. It would also be helpful for nurses from practice and academia to work collaboratively to address the challenges of clinical learning, as constraints exist in clinical agencies and schools of nursing that limit the direct experiences that can be offered to nursing students in the clinical arena. However, there are also strengths and assets in clinical agencies and schools of nursing that might be leveraged more effectively if a collaborative approach to the challenges of preparing nurses for practice were adopted. *Learning in school and*
learning at work are both necessary for the acquisition of clinical judgment skills; a collaborative approach to nursing education might yield a bridge where there is now a gap.

**Directions for Future Research**

This study could be extended to include nurses with a wider range of clinical experience and nurses from community hospitals where resident physicians are not available on site to see if the clinical judgment process discovered fits in contexts not explored in this study. Data collection could be expanded to include direct observation of nurses in the acute care setting; observation of nurses might uncover details of the clinical judgment process that did not emerge in the participant interviews. The categories in the model should be operationalized to facilitate instrument development and model testing.

In nursing practice, factors that affect learning at work should be examined. For instance, the relationship between shift assignment for new graduate nurses and learning at work could be investigated based on the perception of participants in this study that assignment to the night shift negatively impacts learning at work. Another factor that might affect learning at work is the 12-hour shift scheduling pattern, which results in fewer days worked per week. Since participants in this study attributed so much of their Knowing to “being on the unit,” it is possible that increased time on the unit might accelerate learning at work and the acquisition of clinical judgment skills. An eight-hour shift scheduling pattern would increase the number of shifts worked per week and might facilitate learning at work for new graduate nurses.
In nursing education, an evidence-base should be developed for classroom and clinical learning environments. For example, assessment strategies that provide an alternative to the current focus on multiple choice testing could be developed and tested. In the clinical arena, different models of clinical education could be investigated, or specific strategies to increase skills relative to categories and properties in the model of clinical judgment could be developed and piloted. Graduate students in nursing education programs could be enlisted to assist with these projects to provide future nurse educators with research experience and encourage innovation. Finally, although longitudinal studies can be challenging, schools should attempt to follow up with alumni in practice to evaluate the impact of changes in nursing education on readiness for practice.

Summary

The process of clinical judgment that emerged in this study, Fitting Things Together, supports existing research on clinical judgment in nursing and psychology. Fitting Things Together represents an analytical, rather than intuitive, approach to clinical judgment. Consistent with previous theoretical and empirical research, the nurse’s knowledge base relative to the situation, the complexity of the judgment task, and the context in which the judgment must be made all impact the nurse’s ability to Fit Things Together. Unique findings discovered in this research are related to confidence in clinical judgment, shift assignment and the development of clinical judgment skills, and personal and environmental factors that influence clinical judgment. This study also offers new insight into the process nurses with two to three years of clinical experience in the acute care setting use to make their clinical judgments. The categories and properties of the
model discovered using the grounded theory method provide new detail about the specific activities and thinking strategies nurses use to make their judgments. In addition, the model represents the process nurses use to make clinical judgments across the spectrum of nursing work at the point of care in the acute care setting; Fitting Things Together is not limited to one nursing task or one nursing unit. The model of clinical judgment discovered has implications for nursing practice and education, and provides direction for further research to develop instruments to measure clinical judgment and teaching strategies to facilitate the development of clinical judgment skills in nursing practice and education.

**Conclusion**

This research has yielded discovery of the process hospital based nurses with two to three years of experience use to make their clinical judgments in the contemporary practice setting. Fitting Things Together, as a model of the clinical judgment process, illustrates the cognitive work that underlies the visible tasks nurses perform as they make their clinical judgments. The specific strategies nurses use to notice clinical cues, interpret the significance of clinical cues, and reach a conclusion about the patient’s immediate and long term needs have emerged from the narratives of nurses who engage in the process of clinical judgment while they balance competing demands for their time and attention in the complex acute care setting. This conceptualization of the clinical judgment process will facilitate the planned development of clinical judgment skills through education, as opposed to leaving development of the skill to chance in practice after licensure.
APPENDIX A

LETTERS OF APPROVAL
NOTICE OF FULL APPROVAL OF A RESEARCH PROJECT

Investigator: Schmidt, Lee
LU Number: 203890
Title: A Study of Clinical Judgment in Nursing (Dissertation)
Date of Initial Review: 10/13/2011
Type of Review: Expedited
Action of Initial Review: Full Approval

IRB Findings:
1. The study is of minimal risk and qualifies for expedited review 45CFR46.110, b-1, HHS Secretary Category #7).
2. The recruitment materials are approved for use.
2. Refer to conditions of approval.

Informed Consent Document required? YES
# of Participants: 20
Participants Compensated? NO

IRB Number: 203890101311
Date of Approval: 10/13/2011
Frequency of Review: Annual
Date of First Review: 09/11/2012

Conditions of Approval: You are required to use the consent document attached as 203890r3.101311 Version Date: 10/13/2011 (see project summary).

The redlined consent document is attached so that you can easily see the changes we have made.

Please review the consents. If you wish to make changes, submit an amendment.

ITEMS SUBMITTED FOR REVIEW:
10/10/2011 Research Abstract
10/10/2011 Research Study Narrative
YOU HAVE FULL APPROVAL AND YOUR PROJECT MAY BEGIN.

The following is for your information and will help you meet local and federal IRB requirements.

1. You must use the final IRB-approved version of the Consent Document. Spelling and grammatical changes may be made as necessary, but any other changes require prior review and approval.

2. You are required to maintain complete records of this project. Any changes in the protocol and the Consent Document must receive prior IRB approval. Use the online Research Portal's Project Amendment form to report changes. A change to the protocol necessary for the immediate safety and welfare of a research participant may be implemented prior to IRB review and approval.

3. Federal Regulations require that projects undergo periodic review of research activity at least once a year. This review must be substantive. The frequency of review and next scheduled date of periodic review for your project can be found under the "Annual Review" tab in the Research Portal's IRB section. You will receive notification 4-8 weeks prior to the scheduled date of review. At that time, you must provide information regarding the status of the project. If the information is not received, the project will be suspended. It is important that you not let approval lapse.

4. The IRB must be notified any time that the project temporarily or permanently stops enrolling participants along with the reason. Use the online Closure form to submit these notifications.
5. Any notices or advertisements soliciting participation must receive prior IRB approval. Use the online Amendment reporting form.

6. The IRB must be notified PROMPTLY of all serious and any unanticipated adverse events associated with the project (or the device or the drug). This includes any notification received of adverse events occurring at other performance sites. Further guidance on adverse event reporting may be found at the Office for Human Research Protections web site; http://www.hhs.gov/ohrp/policy/AdvEvntGuid.htm#Q5

Reportable events include, but are not limited to:

a) a serious adverse event (including events that produce injury or death, an event leading to hospitalization or lead to prolongation of a current hospital stay);
b) the enrollment of a patient on a study that is no longer enrolling participants;
c) pregnancy occurring on the study where the study excludes pregnancy;
d) any patient reporting a billing problem as a result of project participation;
e) any participant who has voiced a complaint about some aspect of the project or the consent document;
f) any unanticipated, untoward, or unexpected adverse event not covered above including rare adverse events or adverse events that occur at an unexpected rate;
g) protocol deviations
h) investigational drug/device brochures, revisions

Adverse Protocol Events are reported through the online Research Portal.

7. The IRB may suspend the project to new participant enrollment or may suspend the participation of current subjects if there is a perceived safety and/or regulatory issue.

8. Prospective consent must be obtained from all research participants.

9. The IRB may review your records relating to this project, including signed consent documents.

10. The Institutional Review Board of Loyola University Medical Center is appropriately constituted and has been granted Federal Wide Assurance Number FWA00009471.
11. If you are unsure of your reporting requirements or of what is expected of you during the conduct of this research, please call the IRB Office (708-216-4608) or Dr. Kenneth Micetich (708-327-3144).
12. The Loyola Institutional Review Board is appropriately constituted as stipulated in 45cfr46 and is compliance with Good Clinical Practice Guidelines insofar as those guidelines are consistent with the U.S. Food and Drug Administration regulations (21 CFR Parts 50 and 56) and the Department of Health and Human Services regulations (45 CFR 46) pertaining to the protection of human subjects in research.

Elaine Hudson
Director
Human Research Protections Program
Loyola University Health Sciences Division
PROJECT AMENDMENT: NOTICE OF FULL APPROVAL

Investigator: Schmidt, Lee
LU Number: 203890
Title: A Study of Clinical Judgment in Nursing (Dissertation)
IRB Number: 203890101311

AMENDMENT #1: Amendment to IRB Proposal for Project # 203890: A Study of Clinical Judgment in Nursing Subject: Recruitment of Study Participants
The original plan for recruitment of study participants (email invitations to RNs employed at Loyola University Medical Center and flyers posted on inpatient units throughout the medical center) has not yielded any interviews for data collection. Therefore, the following changes to the recruitment plan are proposed: 1. Invitation to participate in the study will be expanded to include students currently enrolled in Niehoff School of Nursing Graduate Courses GNUR401 (Nursing Concepts and Theories) and GNUR450 (Research for Health Professionals). Students in these courses, delivered early in the MSN required course sequence, are most likely to fit the 2-3 year work experience criteria for participation in the study. A letter of support for access to this student population from the Associate Dean for the MSN and DNP programs in the Niehoff School of Nursing is attached. Students will be invited to participate in the study in the following manner: a. Instructors of course sections of GNUR401 and GNUR450 delivered online will post a flyer announcing the study and inviting participation in the Blackboard course shell used for course delivery. A copy of the flyer is attached. b. Mary Wilber, PhD candidate and co-investigator will visit a course meeting for sections of GNUR401 and GNUR450 delivered in the face to face format to announce the study and invite participation, using the same flyer posted in the online course shells. 2. Invitation to participate in the study will be expanded to alumni of the Niehoff School of Nursing through an email announcement from the President of the Niehoff School of Nursing Alumni Association. A copy of the email invitation is attached. 3. Phone and email contact information for Ms. Wilber will be provided on all flyers and email messages distributed to MSN students and Niehoff School of Nursing Alumni. When potential participants contact the investigator details regarding the study will be provided, questions will be addressed, and interviews will be scheduled for those RNs who elect to participate in the study. 4. All study participants will be given a $10.00 (cash) token of appreciation for participation in the study. Notification of this token of appreciation will be included on all flyers and invitations to participate in the study. An updated consent form, reflecting the token of appreciation, is attached.

Type of Change: Administrative
Change in Patient Risk: No Change
| Change to ICD? | YES |
| Inform Past or Current Patients? | YES |
| Review Date | 02/16/2012 |
| Review Type | Expedited |
| Action | Full Approval |
| Comments | Students grades/evaluations must not be at risk if deciding against participation. As such, we have made a minor addition to the alternative section of the ICD. Please review the redlined consent document. Use the revised consent document identified as: 203890am1.021312 Version Date: 02/13/2012 (see project summary). |

**DATE OF APPROVAL**  
02/16/2012

This Amendment Approval has been granted through an Expedited Review. The Full Board will review the Amendment and/or changes to the Informed Consent Document on 03/21/2012.

If the Board does not reaffirm this expedited decision, you will be notified by 03/28/2012.

Elaine Fluder  
Director  
Human Research Protections Program  
Loyola University Health Sciences Division
PROJECT AMENDMENT: NOTICE OF FULL APPROVAL

Investigator: Schmidt, Lee

LU Number: 203890

Title: A Study of Clinical Judgment in Nursing (Dissertation)

IRB Number: 203890101311

AMENDMENT #2: Amendment to IRB Proposal for Project # 203890: A Study of Clinical Judgment in Nursing Subject: Recruitment of Study Participants

In order to recruit sufficient participants for this study, the following additions to the recruitment plan are proposed: 1. Post the previously approved study flyer on the Loyola University Niehoff School of Nursing Facebook page. 2. Distribute the previously approved study flyer via email to members of the Alpha Beta Chapter of Sigma Theta Tau, the Loyola Chapter of the Sigma Theta Tau Nursing Honor Society. 3. Add Lewis University College of Nursing and Health Professions in Romeoville, Illinois as a study site after approval of the study by the IRB of Lewis University. If Lewis University IRB approval is granted, the following recruitment strategies will be utilized: a. Distribution of the previously approved study flyer, via email, to members of the Epsilon Upsilon Chapter of Sigma Theta Tau, the Lewis University Chapter of the Sigma Theta Tau Nursing Honor Society. b. Electronic distribution of the previously approved study flyer to students currently enrolled in core courses in the Lewis University Master of Science in Nursing (MSN) program by course instructors through Blackboard course shells. c. Visits by Mary Wilber, PhD candidate and co-investigator for the study, to MSN courses delivered in the face to face format at Lewis University using the previously approved study flyer to announce the study and invite participation. d. Distribution of the previously approved study flyer to nursing alumni of the College of Nursing and Health Professions at Lewis University, with assistance from the alumni relations department.

Type of Change: Administrative

Change in Patient Risk: No Change

Change to ICD?: NO

Inform Past or Current Patients?: NO

Review Date: 03/22/2012

Review Type: Expedited

Action: Full Approval

Comments: The recruitment strategies are approved. The addition of Lewis University as a performance site is contingent upon IRB approval at that site. You must provide the Loyola IRB with the IRB approval letter once obtained.
DATE OF APPROVAL 03/22/2012

This Amendment Approval has been granted through an Expedited Review. The Full Board will review the Amendment and/or changes to the Informed Consent Document on 04/18/2012.

If the Board does not reaffirm this expedited decision, you will be notified by 04/25/2012.

Elaine Fluder
Director
Human Research Protections Program
Loyola University Health Sciences Division
Investigator: Schmidt, Lee  
LU Number: 203890  
Title: A Study of Clinical Judgment in Nursing (Dissertation)  
IRB Number: 203890101311  

AMENDMENT #3: The request to add Lewis University as a study site was approved in a previous amendment to the original IRB application for this study. The documents submitted today include a revision of the consent form to add Lewis University officials as potential auditors of the study, as well as contact information for the Provost of Lewis University should study participants from Lewis University have questions or concerns. A letter from the IRB at Lewis is also attached to provide documentation of the activities related to the study that will be approved by the Lewis IRB if this amendment and the requested changes to the consent form are supported by the IRB of Loyola University Medical Center. Finally, the flyers and reminder postcards that will be used to invite participation at the Lewis University study site are also attached.

Type of Change: Administrative  
Change in Patient Risk: No Change  
Change to ICD?: YES  
Inform Past or Current Patients?: NO  

Review Date: 06/05/2012  
Review Type: Expedited  
Action: Full Approval  
Comments: The request to expand recruitment to Lewis University is approved. The recruitment flyer and reminder postcard are approved for use.

Use the revised consent document identified as:  
203890am3.060512  
Version Date: 06/05/2012

DATE OF APPROVAL: 06/05/2012

This Amendment Approval has been granted through an Expedited Review. The Full Board will review the Amendment and/or changes to the Informed Consent Document on 06/20/2012.
If the Board does not reaffirm this expedited decision, you will be notified by 06/27/2012.

Elaine Flude
Director
Human Research Protections Program
Loyola University Health Sciences Division
LEWIS UNIVERSITY LRB/IRB DETERMINATION FORM

Proposal/Project Title:
A Study of Clinical Judgment in Nursing

Principal Investigator:
Betsy (Mary Elizabeth) Wilber, RN, MSN
Certificate on file: all on file

Type of review requested:
___ Full Board Review
_X__ Expedited Review
___Exempt Review
___Continuing Review
___Change to Previously Approved Study

Determination:
___ The Institutional Review Board
_X__ Designated member of the Institutional Review Board – Dr. Erin Zimmer

_X__ The Local Review Board of the College of Nursing and Health Professions has determined for the above referenced proposal/project:

___1. This proposal does not require review.

_X__2. Approval is granted as amended

___3. Approval is pending following review of requested changes and/or clarifications:
    ___See following memo.

___4. Approval is not granted for the following reasons:
    ___See following memo.

Date:  May 18, 2012
Reviewing Members: Dr. Erin Zimmer, Dr. Janice Smith, Dr. Stacie Elder,
Dr. Kathleen Fitzgerald, Dr. Daisy Sherry
Investigator: Schmidt, Lee  
LU Number: 203890  
Title: A Study of Clinical Judgment in Nursing (Dissertation)  
IRB Number: 203890101311

AMENDMENT #4: Amendment to IRB Proposal for Project # 203890: A Study of Clinical Judgment in Nursing Subject: Recruitment of Study Participants In order to recruit sufficient participants for this study, the following additions to the recruitment plan are proposed: 1. Add MacNeal Hospital (Berwyn, Illinois) of the Vanguard Health System as a study site. Pending approval of this amendment by the Loyola IRB, approval of the IRB of Vanguard Health System will be pursued. 2. At the MacNeal Hospital site, the following strategies to recruit study participants will be used: a. Flyers explaining the study and inviting participation will be posted on inpatient nursing units and distributed at continuing education events provided for nurses at the study site. b. Registered nurses who meet the eligibility criteria for participation in the study will be identified by unit managers, clinical educators, and members of the Nursing Research Council to facilitate direct distribution of study flyers to potential study participants. The researcher will provide study flyers in envelopes labeled with potential participants’ names for distribution on inpatient nursing units. c. Phone and email contact information for Ms. Wilber will be provided on study flyers. When potential participants contact the investigator details regarding the study will be provided, questions will be addressed, and interviews will be scheduled for those RNs who elect to participate in the study. Recruitment of participants will continue until interviews with study participants elicit no new data, indicating saturation has been achieved. There are no further changes to the study protocol beyond recruitment of potential study participants from this additional site. The proposed revised consent form is attached.

Type of Change: Administrative  
Change in Patient Risk: No Change  
Change to ICD?: YES  
Inform Past or Current Patients?: NO  
Review Date: 09/11/2012  
Review Type: Expedited  
Action: Full Approval  
Comments: Information noted.  
DATE OF: 09/11/2012
This Amendment Approval has been granted through an Expedited Review. The Full Board will review the Amendment and/or changes to the Informed Consent Document on 09/19/2012.

If the Board does not reaffirm this expedited decision, you will be notified by 09/26/2012.

Elaine Fluder
Director
Human Research Protections Program
Loyola University Health Sciences Division
November 12, 2012

Betsy Wilber
Loyola School of Nursing
Lewis University College of Nursing & Health Professions

RE: 2012-0905: A Study of Clinical Judgment in Nursing

Dear Ms. Wilber:

The Vanguard Health Chicago Institutional Review Board Chair has reviewed the request for exempt status for the above mentioned study. The research qualifies as exempt from IRB review as authorized by 45 CFR 46.101 (b) (3).

Category. (3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if:
   (i) the human subjects are elected or appointed public officials or candidates for public office; or
   (ii) federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

If there are modifications to the research that alter the exemption status, please submit an amendment to the Vanguard Health Chicago Institutional Review Board for review and approval.

Please contact Marija Nikin (708-763-6238; email: mnikin@vlshicago.com) if you have any questions or require further information.

Sincerely,

Keith Shulman, MD
Vanguard Health Chicago IRB Co-Chairman
CONTINUING REVIEW OF A RESEARCH PROJECT: NOTICE OF BOARD ACTION

Investigator: Schmidt, Lee
LU Number: 203890
Title: A Study of Clinical Judgment in Nursing (Dissertation)
Date of Initial Approval: 10/13/2011
IRB Number: 203890101311
Date of Continuing/Annual Review: 09/11/2012
Date of Board Meeting: 09/19/2012
Review Action: Approved
Comments: This project continuing re-review is conducted via expedited mechanism; 45CFR46.110 category 8. The information in your report is reviewed. Use the updated consent document(s) (refer to project summary) identified as: 203890ar1.091112 Version Date: 09/11/2012.

The Approval Date of this Continuing/Annual Review (#1) is 09/11/2012.
The scheduled date of the next continuing review of this Project is 09/11/2013.
Note: If the project was suspended and then subsequently approved, the Comments section will indicate the dates of the suspension.

Elaine Fuler
Director
Human Research Protections Program
Loyola University Health Sciences Division
PROJECT AMENDMENT: NOTICE OF FULL APPROVAL

Investigator: Schmidt, Lee
LU Number: 203890
Title: A Study of Clinical Judgment in Nursing (Dissertation)
IRB Number: 203890101311

AMENDMENT #5:
Amendment to IRB Proposal for Project # 203890: A Study of Clinical Judgment in Nursing Subject: Recruitment of Study Participants
The original plan for recruitment of study participants (email invitations to RNs employed at Loyola University Medical Center and flyers posted on inpatient units throughout the medical center) has not yielded enough interviews for data saturation. Therefore, the following change to the recruitment plan is proposed:

- Increase the token of appreciation from the original $10 cash to $30 cash. The token of appreciation will be given to study participants at the end of the study interview.
- All participants who have participated to date will be provided with $20 cash to compensate for the difference between the original token of appreciation provided and the revised token of appreciation now proposed.
- The study flyer is revised to reflect the new token of appreciation for participation and is attached with this amendment.
- The consent form is revised to reflect the new token of appreciation, and is attached with this amendment.
- The methods originally proposed to disseminate the study flyer to potential participants remain unchanged with the following exception: One additional group, students in the RN to BSN program in the Niehoff School of Nursing, will be advised of the opportunity to participate in the research study through email distribution of the study flyer by Dr. Lee Schmidt, Associate Professor and Senior Associate Dean of Academic Affairs and Director of the PhD Program in the Niehoff School of Nursing.

Type of Change: Administrative
Change in Patient Risk: No Change
Change to ICD?: YES
Inform Past or Current Patients?: YES
Review Date: 03/18/2013
Review Type: Expedited
Action: Full Approval
Comments: Revisions to the recruitment and compensation plan are approved. Use the revised consent document identified as: 203890am5.031813
Version Date: 03/18/2013
This Amendment Approval has been granted through an Expedited Review. The Full Board will review the Amendment and/or changes to the Informed Consent Document on 04/17/2013.

If the Board does not reaffirm this expedited decision, you will be notified by 04/24/2013.

Elaine Fluder
Director
Human Research Protections Program
Loyola University Health Sciences Division
LEWIS UNIVERSITY LRB/IRB DETERMINATION FORM

Proposal/Project Title:
A Study of Clinical Judgment in Nursing
Principal Investigator:
Betsy (Mary Elizabeth) Wilber, RN, MSN
Certificate on file: all on file
Type of review requested:
___ Full Board Review
___ Expedited Review
___ Exempt Review
___X Continuing Review
___X Change to Previously Approved Study

Determination:
___ The Institutional Review Board
___ Designated member of the Institutional Review Board
___X The Local Review Board of the College of Nursing and Health Professions has determined for the above referenced proposal/project:

___1. This proposal does not require review.
___X 2. Approval is granted as amended
___3. Approval is pending following review of requested changes and/or clarifications:
   ___See following memo.
___4. Approval is not granted for the following reasons:
   ___See following memo.

Date: March 22, 2013
Reviewing Members: Dr. Gwen Svoboda, Dr. Janice Smith

Note: Dr. Erin Zimmer was consulted. She indicated that since there was not a major change in the research procedures the continuation and amendment review could be completed by the CONHP LRB.
CONTINUING REVIEW OF A RESEARCH PROJECT: NOTICE OF BOARD ACTION

<table>
<thead>
<tr>
<th>Investigator</th>
<th>Schmidt, Lee</th>
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</thead>
<tbody>
<tr>
<td>LU Number</td>
<td>203890</td>
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<tr>
<td>Title</td>
<td>A Study of Clinical Judgment in Nursing (Dissertation)</td>
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<tr>
<td>Date of Initial Approval</td>
<td>10/13/2011</td>
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<td>IRB Number</td>
<td>203890101311</td>
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<tr>
<td>Date of Continuing/Annual Review</td>
<td>08/01/2013</td>
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<tr>
<td>Date of Board Meeting</td>
<td>08/21/2013</td>
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<tr>
<td>Review Action</td>
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<tr>
<td>Comments</td>
<td>This project continuing re-review is conducted via expedited mechanism; 45CFR46.110 category 8. The information in your report is reviewed. Use the updated consent document(s) (refer to project summary) identified as: 203890ar2.080113 Version Date: 08/01/2013.</td>
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</tbody>
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The Approval Date of this Continuing/Annual Review (#2) is 08/01/2013.
The scheduled date of the next continuing review of this Project is 08/01/2014.
Note: If the project was suspended and then subsequently approved, the Comments section will indicate the dates of the suspension.
APPENDIX B

INTERVIEW GUIDE
Interview Guide

Orientation to the study and the interview process

Introduction and purpose of the study.

I am interested in the process RNs on inpatient units use to reach a conclusion, or clinical judgment, about the needs of patients in their care. I hope to get a better understanding of the nurse’s work at the point of care, which will help us to prepare nursing students more effectively for clinical practice and support the professional development of newly licensed nurses entering the workforce. I will be recording your answers and taking notes to help me understand your work and identify areas we should explore further.

Explanation and review of the informed consent document; obtain signature.

Review rights of the participant to withdraw at any time or refuse to answer any question posed.

With consent, begin the interview, collecting demographic information regarding the participant’s nursing experience, pre-licensure educational preparation, type of unit worked, shift pattern, and general description of the types of patients typically admitted to the unit.

Demographic Data

Gender: ______

Age: ______

Graduation date: _________________

Degree earned: _________________

Additional education past initial nursing degree: ______________________
Years in clinical nursing: ____________

Is nursing a second career? ____________

Type of unit: _____________________

Shift: ___________________________

# of patients typically assigned: ______________

Full time    or    Part time

Additional responsibilities beyond patient care: ________________________

**Interview Questions**

If you think about the patients you cared for on the last shift you worked, can you tell me how you reached a conclusion, or made a judgment, about what was going on with each patient in terms of their condition at the beginning of the shift?

In the course of your work on a shift, what helps you to come to a conclusion, or form an impression, about what is going on with your patients?

What kinds of things in the course of your work with a group of patients on a shift might cause you to question or revise your conclusion about the patient’s status or needs? Can you give me an example of a time when you revised your conclusion about a patient you were caring for?

When you find yourself in a situation where you have to revise your original nursing judgment, or perhaps make an initial judgment about a new patient in your care, what kinds of things help you to make that judgment?

What kinds of things make it difficult to form an impression, or make a judgment about the needs of patients in your care?
APPENDIX C

RECRUITMENT MATERIALS
Email Initiation: Nurses employed on inpatient hospital units

Subject line: Invitation to participate in a study of clinical judgment in nursing

Betsy Wilber, a nursing PhD student in the Niehoff School of Nursing, is conducting a study on the process nurses in acute inpatient care use to make clinical judgments as they provide care to their assigned patients in the course of a work shift. A primary purpose of the study is to improve our understanding of the clinical judgment process at the point of care so strategies can be developed to teach the skill more effectively in nursing education and practice. The study will be conducted under the direction of Dr. Lee Schmidt, a faculty member and current director of the PhD in Nursing Program in the Niehoff School of Nursing.

Participation in the study is open to nurses with two to three years of inpatient clinical experience acquired on their original inpatient unit of hire who spend the majority of their time in direct patient care. Nurses employed in the emergency department, outpatient settings, and operating suites are not eligible for participation in this study.

Participation in the study will involve an in-person, audiotaped interview with Ms. Wilber. Interviews should take approximately 30-60 minutes and will be scheduled at a time and location convenient to you.

If you are interested in learning more about participating in this study, please contact Betsy Wilber at 630-941-7646, or mwilbe1@luc.edu
RESEARCH STUDY ON CLINICAL JUDGMENT IN NURSING PRACTICE

- Registered Nurses are invited to participate in a research study on the process nurses use to make clinical judgments in nursing practice.

- Participation in the study is open to Staff Registered Nurses who have graduated within the past 2-3 years and have worked on the same inpatient unit since graduation.

- Participation will involve an in-person, 30-60 minute audiotaped interview with the researcher, scheduled at your convenience.

- If you are interested in learning more about participating in this study, please contact Betsy Wilber, RN, MSN at (630) 941-7646 or email mwilbe1@luc.edu
INVITATION TO PARTICIPATE IN A STUDY OF CLINICAL JUDGMENT IN NURSING

**Background:** Betsy Wilber, a nursing PhD student in the Niehoff School of Nursing, is conducting a study on the process RNs in acute inpatient care use to make clinical judgments as they provide care to their assigned patients in the course of a work shift.

**Purpose:** A primary purpose of the study is to improve our understanding of the clinical judgment process at the point of care so strategies can be developed to teach the skill more effectively in nursing education and practice.

**Eligibility:** Staff RNs who have graduated from their pre-licensure nursing education program in the past two to three years, spend the majority of their time in direct patient care on an inpatient unit, and are currently working on the inpatient where they were originally hired are invited to participate in this study.

**Participation:** Participation will involve an in-person, 30-60 minute audiotaped interview with Ms. Wilber, scheduled at your convenience. *As a token of appreciation for your participation in this study, you will receive $10 cash at the conclusion of the interview.*

**IRB Approval:** This study has been approved by the IRB of Loyola University Medical Center.

**Contact:** To schedule an interview or to learn more about participating in this study, please contact Betsy Wilber at 630-941-7646, or mwilbel@luc.edu
Email Invitation: School of Nursing Alumni

Subject line: Invitation to participate in a study of clinical judgment in nursing

Betsy Wilber, a nursing PhD student in the Niehoff School of Nursing, is conducting a study on the process nurses in acute inpatient care use to make clinical judgments as they provide care to their assigned patients in the course of a work shift. A primary purpose of the study is to improve our understanding of the clinical judgment process at the point of care so strategies can be developed to teach the skill more effectively in nursing education and practice. The study will be conducted under the direction of Dr. Lee Schmidt, a faculty member and current director of the PhD in Nursing Program in the Niehoff School of Nursing.

Participation in the study is open to staff RNs who have graduated from their pre-licensure nursing education program in the past two to three years, spend the majority of their time in direct patient care on an inpatient unit, and are currently working on the inpatient where they were originally hired. Nurses employed in the emergency department, outpatient settings, and operating suites are not eligible for participation in this study.

Participation in the study will involve an in-person, audiotaped interview with Ms. Wilber. Interviews should take approximately 30-60 minutes and will be scheduled at a time and location convenient to you. As a token of appreciation for your participation in this study, you will receive $10 cash at the conclusion of the interview.
This study has been approved by the IRB of Loyola University Medical Center.

If you are interested in learning more about participating in this study, please contact Betsy Wilber at 630-941-7646, or mwilbe1@luc.edu
INVITATION TO PARTICIPATE IN A STUDY OF
CLINICAL JUDGMENT IN NURSING

Background: I am currently a nursing PhD student at Loyola University of Chicago, and I would like to invite you to participate in my dissertation research study on the process RNs in acute inpatient care use to make clinical judgments as they provide care to their assigned patients in the course of a work shift. Study participants will be provided with $10 (cash) as a token of appreciation for participation in the study.

Purpose: The purpose of this study is to improve our understanding of the clinical judgment process at the point of care. I am interested in hearing about the process you use to make clinical judgments as you provide care, as well as factors in the environment that help or hinder you as you make your clinical judgments. The perspectives of nurses at the point of care will help us to develop strategies to teach the skill of clinical judgment more effectively in nursing education, and support the professional development of new graduates in clinical practice.

Eligibility: You are eligible to participate in this study if you have two to three years of acute care clinical experience, spend the majority of your time in direct patient care on an inpatient unit, and are currently working on the inpatient where you were originally hired.

Participation: Participation in the study would involve a single audio-taped interview with me that would last between 30 and 60 minutes, scheduled at a time and location
convenient for you. The cash token of appreciation will be provided at the end of the interview.

**IRB Approval:** This study has been approved by the IRB of XXX University and the IRB of Loyola University Medical Center.

**Contact:** To set up an interview or to learn more about participating in this study, please contact Betsy Wilber at 630-941-7646, or mwilbel1@luc.edu
INVITATION TO PARTICIPATE IN A STUDY OF CLINICAL JUDGMENT IN NURSING

**Background:** I am currently a nursing PhD student at Loyola University of Chicago, and I would like to invite you to participate in my dissertation research study on the process RNs in acute inpatient care use to make clinical judgments as they provide care to their assigned patients in the course of a work shift.

Study participants will be provided with $10.00 cash as a token of appreciation for participation in the study.

**Purpose:** The purpose of this study is to improve our understanding of the clinical judgment process at the point of care. I am interested in hearing about the process you use to make clinical judgments as you provide nursing care, as well as factors in the environment that help or hinder you as you make your clinical judgments. It is hoped that information provided by nurses at the point of care can help us to develop strategies to teach the skill of clinical judgment more effectively in nursing education, and support the professional development of new graduates in clinical practice.

**Eligibility:** You are eligible to participate in this study if you have between two and three years of acute care clinical experience, spend the majority of your time in direct patient care on an inpatient unit, and are currently working on the inpatient where you were originally hired. RNs in outpatient settings, surgical suites, and labor and delivery units are not eligible to participate in this study.
**Participation**: Participation in the study would involve a single audio-taped interview with me that would last between 30 and 60 minutes, scheduled at a time and location convenient for you. The $10 cash token of appreciation for participation in the study will be provided at the conclusion of the interview.

**IRB Approval**: This study has been approved by the IRB of XXX University, the IRB of Loyola University Healthcare System, and the IRB of the XXX Healthcare System.

**Contact**: If you are interested in learning more about participating in this study, please contact me at 630-941-7646, or mwilbe1@luc.edu. Thank you for considering participation in the study.

Betsy Wilber, RN, MSN
INVITATION TO PARTICIPATE IN A STUDY OF CLINICAL JUDGMENT IN NURSING

Background: Betsy Wilber, a nursing PhD student in the Niehoff School of Nursing, is conducting a study on the process RNs in acute inpatient care use to make clinical judgments as they provide care to their assigned patients in the course of a work shift.

Purpose: A primary purpose of the study is to improve our understanding of the clinical judgment process at the point of care so strategies can be developed to teach the skill more effectively in nursing education and practice.

Eligibility: Staff RNs who have graduated from their pre-licensure nursing education program in the past two to three years, spend the majority of their time in direct patient care on an inpatient unit, and are currently working on the inpatient where they were originally hired are invited to participate in this study.

Participation: Participation will involve an in-person, 30-60 minute audiotaped interview with Ms. Wilber, scheduled at your convenience. As a token of appreciation for your participation in this study, you will receive $30 cash at the conclusion of the interview.

IRB Approval: This study has been approved by the IRBs of Loyola University Medical Center, XXX Health System, and XXX University.

Contact: If you are interested in learning more about participating in this study, please contact Betsy Wilber at 630-941-7646, or mwilbe1@luc.edu
Reminder Post Card Sent via USPS to Alumni of XXX University

Below is a graphic representation of the front and back of the reminder card sent on a standard 6” by 4.25” postcard:

Front:

- You were recently invited to participate in a study of clinical judgment in nursing.
- The purpose of the study is to improve our understanding of the clinical judgment process at the point of care.
- You are eligible to participate if you have 2-3 years of acute care nursing experience and work on the inpatient unit where you were originally hired.
- Participation involves one interview (~60 minutes) with the researcher at a location convenient to you.
- As a token of appreciation for participating in the study, you will receive $30 at the conclusion of the study interview.
- This study has been approved by the Internal Review Board of Lewis University.

If you have already responded to this invitation, thank you!
If you have not responded, please contact Betsy Wilber, RN, MSN for more information about the study, or to schedule an interview.

(XXX)XXX-XXX-XXX  XXXX@XXX.edu
APPENDIX D

CONSENT FORMS
Project Title: A Study of Clinical Judgment in Nursing

Researchers: Betsy (Mary Elizabeth) Wilber, RN, MSN & Dr. Lee Schmidt, RN, PhD

THE APPROVAL FOR THIS PROJECT EXPIRES ON 10/13/2012.

Participant Information

Principles Concerning Research: You are being asked to take part in a research project. It is important that you read and understand the principles that apply to all individuals who agree to participate in the research project described below:

1. Taking part in the research is entirely voluntary.

2. You will not benefit from taking part in the research but the knowledge obtained may help others.

3. You may withdraw from the study at any time without anyone objecting and without penalty or loss of any benefits to which you are otherwise entitled.

The purpose of the research and how it is to be done and what your part in the research will be is described below. Also described are the risks, inconveniences, discomforts and other important information which you need to make a decision about whether or not you wish to participate. You are urged to discuss any questions you have about this research with the staff members.

PURPOSE: The purpose of this study is to discover the process hospital based registered nurses with two to three years of clinical experience on an inpatient nursing unit use to make clinical judgments as they provide nursing care.

DESCRIPTION OF PROCEDURES: If you agree to participate in this study, you will be asked to participate in an audiotaped in person interview with Betsy Wilber, one of the co-investigators for this study. You will be asked to answer questions about the
process you use to make clinical judgments as you provide care to the patients assigned to you in the course of a work shift, as well as to identify factors that help or hinder your ability to make clinical judgments. The interview should last between 30 and 60 minutes and will be conducted at a place convenient for you and the interviewer.

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The information obtained during your interview will be combined with information obtained in the other interviews conducted in the course of the study.

**RISKS/BENEFITS:** There are no foreseeable risks to you associated with participation in this study beyond those experienced in daily life.

You will not benefit from participating in this research. It is hoped that the information gained from this study will increase our understanding of the cognitive work associated with clinical judgment, which will fill a significant gap in the nursing literature while providing a pathway to the development of strategies to teach the skill at various levels of clinical expertise and contribute to the efficient use of resources in clinical practice.

**ALTERNATIVES:** You do not have to participate in this research. Your decision about participation will not affect your employment status.

**FINANCIAL INFORMATION:** You will not be paid or receive compensation for participation in this study.

**Confidentiality:** Any identifying information disclosed during the interview will be deleted from the transcribed record of the interview and replaced with generic terms to preserve confidentiality. The signed consent forms will be stored separately from the audiotapes and transcribed interviews. All consent forms, audiotapes, and transcribed interviews will be kept in locked file cabinets.

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If you ever feel that you have been injured by participating in this study or if you have any questions concerning your rights as a research participant, you may contact Dr. Kenneth Micetich, Chairman, Institutional Review Board for the Protection of Human Subjects-Medical Center (708-216-4608).

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Document ID#: 203890r3.101311
Version Date: 10/13/2011
IRB NUMBER: 203890102111

LOYOLA UNIVERSITY CHICAGO
HEALTH SCIENCES DIVISION
MAYWOOD, ILLINOIS
NIEHOFF SCHOOL OF NURSING

INFORMED CONSENT

Project Title: A Study of Clinical Judgment in Nursing

Researchers: Betsy (Mary Elizabeth) Wilber, RN, MSN & Dr. Lee Schmidt, RN, PhD

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ALTERNATIVES: You do not have to participate in this research. Your decision about participation will not affect your employment status at XXXX or any of your evaluations or grades at XXX.

FINANCIAL INFORMATION: As a token of appreciation for participation in this study, you will receive $10 (cash) at the conclusion of the study interview.

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IRB NUMBER: 203890102111

LOYOLA UNIVERSITY CHICAGO
HEALTH SCIENCES DIVISION
MAYWOOD, ILLINOIS
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Researchers: Betsy (Mary Elizabeth) Wilber, RN, MSN & Dr. Lee Schmidt, RN, PhD

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PURPOSE: The purpose of this study is to discover the process hospital based registered nurses with two to three years of clinical experience on an inpatient nursing unit use to make clinical judgments as they provide nursing care.

Document ID#: 203890am3.060512
Version Date: 06/05/2012
DESCRIPTION OF PROCEDURES: If you agree to participate in this study, you will be asked to participate in an audiotaped in person interview with Betsy Wilber, one of the co-investigators for this study. You will be asked to answer questions about the process you use to make clinical judgments as you provide care to the patients assigned to you in the course of a work shift, as well as to identify factors that help or hinder your ability to make clinical judgments. The interview should last between 30 and 60 minutes and will be conducted at a place convenient for you and the interviewer. The interview will be tape recorded. You may refuse to answer any question asked, ask to have the tape recorder shut off at any time, take a break during the interview, or end the interview at any time. After the interview is completed, the audiotape will be transcribed verbatim. Any names or identifying information disclosed during the interview will be deleted from the transcription and replaced with general information. Audiotapes will be destroyed upon completion of the study.

The information obtained during your interview will be combined with information obtained in the other interviews conducted in the course of the study.

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ALTERNATIVES: You do not have to participate in this research. Your decision about participation will not affect your employment status at XXXX or any of your evaluations or grades at XXX or XXX University.

FINANCIAL INFORMATION: As a token of appreciation for participation in this study, you will receive $10 (cash) at the conclusion of the study interview.

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LOYOLA UNIVERSITY CHICAGO
HEALTH SCIENCES DIVISION
MAYWOOD, ILLINOIS
NIEHOFF SCHOOL OF NURSING

INFORMED CONSENT

Participant’s Name: _______________________________________________

PROJECT TITLE: A Study of Clinical Judgment in Nursing

Researchers: Betsy (Mary Elizabeth) Wilber, RN, MSN & Dr. Lee Schmidt, RN, PhD

THE APPROVAL FOR THIS PROJECT EXPIRES ON 09/11/2013.

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Document ID#: 203890ar1.091112
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________________________________________________Date:____/_____/____
Signature: Witness
IRB NUMBER: 203890102111

LOYOLA UNIVERSITY CHICAGO
HEALTH SCIENCES DIVISION
MAYWOOD, ILLINOIS
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INFORMED CONSENT

Project Title: A Study of Clinical Judgment in Nursing

Researchers: Betsy (Mary Elizabeth) Wilber, RN, MSN & Dr. Lee Schmidt, RN, PhD

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___________________________________________ Date:____/_____/____
Signature:  Witness
INFORMED CONSENT

Participant’s Name:

PROJECT TITLE: A Study of Clinical Judgment in Nursing

Researchers: Betsy (Mary Elizabeth) Wilber, RN, MSN & Dr. Lee Schmidt, RN, PhD

THE APPROVAL FOR THIS PROJECT EXPIRES ON 08/01/2014.

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The purpose of the research, how it is to be done, and what your part in the research will be is described below. Also described are the risks, inconveniences, discomforts and other important information which you need to make a decision about whether or not you wish to participate. You are urged to discuss any questions you have about this research with the staff members.

PURPOSE OF RESEARCH: The purpose of this study is to discover the process hospital based registered nurses with two to three years of clinical experience on an inpatient nursing unit use to make clinical judgments as they provide nursing care.
DESCRIPTION AND EXPLANATION OF PROCEDURES: If you agree to participate in this study, you will be asked to participate in an audio taped in person interview with Betsy Wilber, one of the co-investigators for this study. You will be asked to answer questions about the process you use to make clinical judgments as you provide care to the patients assigned to you in the course of a work shift, as well as to identify factors that help or hinder your ability to make clinical judgments. The interview should last between 30 and 60 minutes and will be conducted at a place convenient for you and the interviewer.

The interview will be tape recorded. You may refuse to answer any question asked, ask to have the tape recorder shut off at any time, take a break during the interview, or end the interview at any time. After the interview is completed, the audiotape will be transcribed verbatim. Any names or identifying information disclosed during the interview will be deleted from the transcription and replaced with general information. Audiotapes will be destroyed upon completion of the study.

The information obtained during your interview will be combined with information obtained in the other interviews conducted in the course of the study.

RISKS/BENEFITS: There are no foreseeable risks to you associated with participation in this study beyond those experienced in daily life.

You will not benefit from participating in this research. It is hoped that the information gained from this study will increase our understanding of the cognitive work associated with clinical judgment, which will fill a significant gap in the nursing literature while providing a pathway to the development of strategies to teach the skill at various levels of clinical expertise and contribute to the efficient use of resources in clinical practice.

ALTERNATIVES: You do not have to participate in this research. Your decision about participation will not affect your employment status at XXX or XXX Hospital, or any of your evaluations or grades at XXX or XXX University.

FINANCIAL INFORMATION: As a token of appreciation for participation in this study, you will receive $30 (cash) at the conclusion of the study interview.

CONFIDENTIALITY: Any identifying information disclosed during the interview will be deleted from the transcribed record of the interview and replaced with generic terms to preserve confidentiality. The signed consent forms will be stored separately from the audiotapes and transcribed interviews. All consent forms, audiotapes, and transcribed interviews will be kept in locked file cabinets.

Your records from this study will be considered confidential to the extent permitted by law. Authorized Loyola University Chicago employees, auditors of the Lewis University Institutional Review Board, the Department of Health and Human Services, or other
agencies may review the research records from this study and must follow the same rules of confidentiality.

The results of this study will be submitted for publication and may be presented at professional conferences. Quotations from selected interviews may be used as examples in publications or presentations, but no identifying information will be presented with those quotations.

**VOLUNTARY PARTICIPATION:** Participation in this study is voluntary. If you decide to participate, you can withdraw your participation at any time without penalty, or refuse to answer any question asked during the interview.

If you have questions regarding your participation in this study at any time, you may contact Betsy Wilber (mwilbe1@luc.edu or (630)941-7646) or Dr. Lee Schmidt (lschm3@luc.edu or (708) 216-3573), co-investigators for the study.

If you ever feel that you have been injured by participating in this study or if you have any questions concerning your rights as a research participant, you may contact Dr. Kenneth Micetich, Chairman, Institutional Review Board for the Protection of Human Subjects-Medical Center (708-216-4608) or Dr. Stephanie Schlachter ([schlacst@lewisu.edu or (815) 836-5639]), Provost of Lewis University.

**CONSENT**

You will receive a signed copy of this informed consent document.

You have been fully informed of the above described research program with its possible benefits and risks. Your signature below indicates that you are willing to participate in this research study and agree to the use and disclosure of information about you as described above. You do not give up any of your legal rights by signing this consent document.

________________________________________________Date:____/_____/____
Signature: Participant

________________________________________________Date:____/_____/____
Signature: Witness
REFERENCE LIST


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VITA

Betsy (Mary Elizabeth) Wilber earned her Bachelor of Science in Nursing from the University of Michigan in 1978, and her Master in Science in Nursing from the Niehoff School of Nursing at Loyola University, Chicago in 1986. In her graduate studies, Ms. Wilber’s role focus was nursing education. Ms. Wilber has many years of acute care experience in surgical intensive care, trauma, and renal and cardiac transplant, as well as management experience at the unit manager level in clinical practice. Ms. Wilber has academic teaching experience in undergraduate pre-licensure and RN to BSN programs, as well as RN refresher courses. In addition, Ms. Wilber has extensive experience in the design and delivery of continuing education programs; she developed the continuing education program at Lewis University, Romeoville, Illinois, and served for many years as a reviewer of continuing education programs and continuing education provider units for the Illinois Nurses Association.

Betsy Wilber is currently an Assistant Professor of Nursing at Lewis University, Romeoville, Illinois, where she teaches primarily in the RN to BSN program. In addition to teaching responsibilities, Ms. Wilber serves as a mentor to new faculty and is the Co-Director of the Doherty Center for Aviation and Health Research.