

SIMULATION AND CLINICAL DECISION MAKING

The Impact of a Sequential Simulation Experience on the Clinical Decision Making of Novice

Nurses related to the Care of the Morbidly Obese Post-operative Patient:

A Pilot Project

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### Abstract

**Problem:** Errors in healthcare have been linked to new nurses' inability to apply sound clinical decision making/clinical judgment (Dunton, Gajewski, Klaus & Peirson, 2007; Smith & Crawford, 2003; NCSBN, 2009). As more demands are being placed on nurses in the current health care environment, particularly the novice nurse, there is an even greater need for nursing educational strategies that integrate theory and practice for nurses, particularly related to the development of sound clinical judgment, which is often illustrated by the appropriate application of clinical nursing skills. The use of clinical simulation has been proposed as a method that integrates theory, clinical skills application and clinical decision making, thus enhancing novice nurses' clinical judgment.

**Purpose:** The purpose of this Capstone was to implement a program evaluation project that assessed the impact a change in program delivery, the use of a sequential simulation experience, had on the competence of novice nurses' clinical decision making during a nurse residency program in an acute care facility. A sequential simulation experience was created and implemented, and its impact on novice nurses' clinical decision making skills was evaluated. Tanner's Model of Clinical Judgment (2006) was used as the guiding framework and the context was holistic patient care for the morbidly obese post-operative patient.

**Methods:** This project was conducted in three phases:

*Phase I:* Simulation scenarios, case studies, participant surveys, simulation checklists and decision trees, related to the nursing care and associated clinical decision making with the morbidly obese post-operative patient, were developed and reviewed by content experts, with revisions as indicated. Simulation scenarios were piloted with senior nursing students enrolled in an Associate degree nursing program.

**Phase II:** Implementation of project occurred during scheduled nurse residency program.

Participants were randomly assigned to one of two groups: simulation or case study. Sequential simulation scenarios were run with eight participants in the morning session of the nurse residency program. Case study group presentation/discussion occurred in the afternoon session with remaining seven participants. All program participants completed surveys prior to and immediately after the teaching intervention.

**Phase III:** Ten novice nurse participants returned two weeks later to complete a simulation scenario related to the clinical decision making of the morbidly obese post-operative patient to assess competence. Competence was individually assessed using a clinical skills checklist and decision tree.

**Results:** Survey results for both subgroups were similar with all participants indicating an increase in knowledge and a majority indicating confidence in their confidence in their clinical decision making skills after educational intervention. Mean score on the assessment checklist for the simulation subgroup participants was 8 versus a mean score of 7.8 for the case study group, indicative of a slight enhancement in skill for simulation group. Decision tree results were also similar for both subgroups.

**Implications:** A summary of program evaluation results was presented to the acute care facility and all materials created were provided for future use. Although the sample size was small, participant self-assessment related to knowledge and confidence, and the slight improvement in the checklist/decision tree results for the simulation subgroup support the conclusion that simulation may be a valuable tool for enhancing the clinical decision making skills of novice nurses.

### **Dedication**

I would like to dedicate this capstone project to my family and friends for their unwavering support. To my supportive, patient and loving husband, Michael and my wonderful children, Emily and Ben, thank you for being my biggest cheerleaders. All three of you loved me when I was tired and grumpy, motivated me when I needed it, and never complained when I had work to do. The three of you are my inspiration. To my Cecil 'family', especially Dr. Mary Bolt and the Cecil College nursing faculty, thank you for being a sounding board and being so supportive. To all of my extended family and all of my friends, I thank you for your patience and hope to see you all soon. And finally to my classmates in the Doctor of Nursing Practice program, especially Susan, I learned from each and every one of you and I am grateful that I met you. This has been an amazing journey and I could not have done it without you all.

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## Overview

### Introduction

As more demands are being placed on nurses in the current health care environment, particularly the new graduate or novice nurse, there is an even greater need for nursing educational strategies that integrate theory and practice for nurses. In the clinical setting, the integration of theory and practice is often demonstrated by the application of sound clinical decision making. This is critical for the novice nurse as errors in healthcare settings have been linked to new nurses' inability to apply sound clinical decision making/clinical judgment (Dunton, Gajewski, Klaus & Peirson, 2007; Smith & Crawford, 2003; NCSBN, 2009). Therefore, educators in all settings have been challenged to implement strategies that facilitate the development of sound clinical judgment illustrated by the appropriate application of clinical nursing skills. Decker, Sportsman, Puetz, and Billings (2008) propose that clinical simulation is a method that incorporates nursing theory, clinical skills application, and clinical decision making, thus enhancing novice nurses' clinical judgment. Additionally, the Institute of Medicine (IOM) in 2001 recommended that simulation be utilized for improving clinical judgment and psychomotor skills for health care professionals, thus promoting patient safety. An Advisory Board report from 2008 indicates that over 42% of front line nurse leaders do not think new graduates are "fully prepared to provide safe and effective care on my unit" (p. 2). Orsolini-Hain and Malone (2007) add that the "expertise gap" is even more significant than the numerical nursing shortage and that new ways to address this gap are needed.

### Statement of the issue

In the past, the use of simulation has often focused on the medical model and the 'broken system part' or the specific medical illness or symptom that the nurse fixes or addresses; the



focus has been on task-oriented episodic nursing skill performance. While the application of skills can be one aspect of the clinical decision making process, what is often missing is the context of the patient situation and the critical thinking or the development of the thought processes that support clinical decision making. The purpose of this Capstone Project was to validate the impact of incorporating a sequential simulation scenario teaching methodology into the current nurse residency program with the concurrent goal of enhancing the clinical decision making competence of novice nurses associated with the nursing care of the morbidly obese post-operative. A sequential simulation experience was created and implemented, and its impact on the development of clinical decision making resulting in enhanced competence was evaluated. Tanner's Model of Clinical Judgment (2006) was used as the guiding framework and the context was holistic patient care for the morbidly obese post-operative patient. Integrated throughout the simulation experience were the five Institute of Medicine (IOM) core competencies for health care clinicians: providing patient-centered care; working in interdisciplinary teams; employing evidence-based practice; applying quality improvement; and utilizing informatics (2003). This simulation experience will provide an evidence based framework for the development of clinical decision making skills, thus enhancing novice nurses' competence as they enter the practice arena.

### **Conceptual framework**

Tanner's Clinical Judgment Model (2006, 2008), based on the processes of experienced nurses, provided the foundation for the sequential simulation experience. This model describes the process of clinical judgment, often a precursor to clinical decision making. There are four key processes identified that relate to clinical judgment: noticing, interpreting, responding, and reflecting (Tanner, 2006). While the simulation learning experience had all four elements

imbedded in it, particular focus was on the reflecting component. Reflection, in Tanner's Clinical Judgment Model, is the opportunity to review what happened during an experience, assimilate the knowledge acquired, and correlate the nurse's actions or inactions to the patient outcome (Tanner, 2006). Debriefing, a key component in the simulation experience identified by Jeffries (2005; 2007), supports the concept of reflection; the learner or simulation participant reviews and reflects on the experience, clinical decisions and patient outcomes (Jeffries, 2005; 2007; Tanner, 2006). While both correct and incorrect choices by a nurse during any patient care situation invite reflection, the use of simulation creates a unique learning opportunity. High fidelity simulation experiences present the opportunity for participants to make incorrect choices or decisions in the delivery of patient care. During a simulation experience, a facilitator can allow the failure of clinical judgment or inappropriate clinical decision making to occur, resulting in poor or "faulty" patient outcomes. The learner then has the unique opportunity of experiencing the consequences associated with poor clinical judgment. Any situation that requires the application of clinical judgment or a clinical decision, whether correct or incorrect, facilitates the development of the nurses' clinical judgment (Tanner, 2006).

### **Capstone Process**

A systematic literature review was conducted regarding current best practice for the use of simulation to educate nurses. Guided by 'best practice' in education and simulation, as well as the stated need by a local acute care facility, related to the care of the morbidly obese post-operative patient, a sequential simulation experience was created. This simulation experience was facilitated by an experienced educator and utilized simulation scenarios with concepts that built upon each other, creating a sequential simulation experience for the novice nurse. This simulation experience was incorporated into the existing nurse residency program for novice

nurses at a local community hospital. The use of this strategy in the nurse residency program was assessed at two points in time and will provide the basis for an evidence based framework for the ongoing development of the clinical decision making skills of the novice nurse practicing in the medical/surgical setting in this small acute care facility. Incorporated throughout the simulation experience were the IOM core competencies. Participant behaviors were assessed two weeks after the simulation experience with a competency checklist and decision tree related to participant skill acquisition and retention of behaviors impacting competence in clinical decision making and nursing care of the morbidity obese post-operative patient. Results from this project will provide validation for the change in the nursing residency program delivery.

### **Significance/Summary**

The gap between education and practice, particularly related to nurses' clinical decision making, has been documented and continues to be of concern related to the potential impact on patient safety (Advisory Board, 2008; Dunton et al., 2007; Orsolini-Hain & Malone, 2007; Smith & Crawford, 2003; NCSBN, 2009). Aries (2006) and Tanner (2006) postulate that clinical decision making or clinical judgment are essential skills for the nurse, with far-reaching consequences for safe, effective patient care. Several studies have assessed the clinical decision making skills of new graduate nurses and discovered that graduates not only lack in ability but also lack in confidence related to their clinical decision making skills (Berkow et al., 2008; Fink et al., 2008; Marshburn et al., 2009). Although limited in number and descriptive in nature, additional studies indicate that the clinical decision making skills of novice nurses can be enhanced with exposure to clinical decision making situations, through the use of simulation (Beyea et al., 2007; Bremner & Brannan, 2000; Vandrey & Whitman, 2002).

High-fidelity simulation provides a unique opportunity to create and deliver clinical decision making experiences. Utilizing Tanner's Clinical Judgment Model (2006) as a framework for the simulation experience by using the concepts of noticing, interpreting, responding and reflecting, while also incorporating the five IOM core competencies for health care clinicians (2003), clinical decision making experiences can be presented to the novice nurse. This creates a simulated environment that increases the novice nurse's experience while highlighting the skill of clinical decision making. In the simulation setting, with little or no risk to the novice nurse and no risk to the patient, participants can be allowed to make errors in clinical decision making, thus experiencing the breakdown of clinical judgment identified by Tanner (2006) as a time when significant learning takes place. The concept of guided reflection or debriefing, integral to a simulation experience, enhances the learning process, while assisting in creating context for the learner, and potentially improving decision making skills (Jeffries, 2007; Murray, Grant, Howarth, & Leigh, 2008; Tanner, 2006).

The opportunity to impact novice nurses' clinical decision making skills through the use of simulation is evident and Tanner's Clinical Judgment Model provided an evidence-based template for the development of a simulation experience designed to enhance clinical decision making. In this project, although both groups made clinical decisions in a timely manner, the novice nurse participants who participated in the sequential simulation scenarios completed more thorough assessments, facilitating enhanced interdisciplinary communication and potentially, more accurate clinical decisions, than participants who participated in the case study intervention. A simulation experience, designed to emphasize the process of clinical decision making, can assist in the development of the skills vital for today's graduate nurse, thus impacting patient safety and care.

### **Literature review**

This literature review examines the current state of simulation use in facilitating the development of clinical decision making skills in novice nurses. The relationship and value of appropriate clinical decision making to nursing practice and patient safety; the current use of high fidelity simulation in nursing and nursing education, particularly related to clinical decision making; and the role of Tanner's Clinical Judgment Model in effective clinical decision-making are addressed.

### **Statement of the issue**

The use of simulation has focused on the medical model and the 'broken system part' that the nurse fixes; the focus has not been holistic in nature but rather on task-oriented episodic nursing skill demonstration or performance designed to intervene with a specific patient problem. While the application of clinical skills and practice guidelines are components of clinical decision making, what is often missing is the context of the patient situation and the critical thinking or the development of the thought processes that support clinical decision making (Tanner, 2006). The purpose of this Capstone Project was to validate the impact of incorporating a sequential simulation scenario teaching methodology into the current nurse residency program with the concurrent goal of enhancing the clinical decision making competence of novice nurses associated with the nursing care of the morbidly obese post-operative. The current nurse residency program in the community hospital involved in this capstone project, simulation to teach and 'test out' on specific nursing skills, but does not combine teaching and evaluation related to holistic patient care and clinical decision making. A simulation scenario experience was created, implemented, and its' impact on the development of clinical decision making which results in enhanced competence in novice nurses was assessed

during the existing nurse residency program. Tanner's Model of Clinical Judgment was used as the guiding framework and the context was holistic patient care for the morbidly obese post-operative patient. Integrated throughout the simulation experience were the five Institute of Medicine (IOM) (2003) core competencies for health care clinicians: providing patient-centered care; working in interdisciplinary teams; employing evidence-based practice; applying quality improvement; and utilizing informatics. Guided by 'best practice' in education and simulation, as well as the stated need by the acute care facility, the simulation experience provides an evidence based framework for the development of the clinical decision making skills of the novice nurse practicing in the acute care medical/surgical setting, thus impacting the delivery of patient care and patient safety.

The simulation experience was evaluated by use of a survey to assess participants prior experience with simulation; knowledge related to clinical decision making; knowledge of nursing care related to the morbidly obese post-operative patient; and satisfaction with experience. Additionally, a simulation scenario performance decision tree and checklist, that assessed the participants' skill acquisition, retention of information and behaviors, were utilized during the second simulation experience, assessing the novice nurses' competence related to clinical decision making and the morbidly obese post-operative patient. The additional use of a checklist assessed the learner's performance of specific behaviors or skills, while the use of a decision tree reinforced and assessed the performance of optimal behaviors associated with clinical decision making (Campbell & Daley, 2009; Dowding & Thompson, 2004; Jeffries, 2007). This quality improvement project was evaluated based on the participants' response on the second simulation experience checklist and decision tree. The goal of this capstone project

was to validate the impact of incorporating a sequential simulation scenario teaching methodology into the current nurse residency program.

### **PICO question**

Does participation in a sequential simulation experience enhance the clinical decision making behaviors of the novice nurse related to the nursing care of the morbidly obese post-operative patient?

### **Evidence search**

An extensive evidence search was conducted using several electronic data bases (CINAHL, Medline, PubMed). A search of Cochrane Review was also completed. Key words used were: nursing clinical skills; simulation; nursing students; patient safety; novice nurses; graduate nurses; simulation; clinical decision making skills; clinical judgment; and clinical-decision making. These same terms were used as MESH terms for the databases. A search of the reference lists of relevant articles also yielded other pertinent articles.

Initial inclusion criteria related to the abstract review included articles published between January 2000 and March 2010 and information related to the acquisition and performance of clinical nursing skills, clinical decision making or clinical judgment, the novice or graduate nurse, and the use of simulation with human patient simulators (HPS), including low-or high fidelity mannequins. Initial exclusion criteria included articles published before January 2000 and the use of other forms of simulation, such as case study, role-playing, CD-rom, or the use of actors. Related to the paucity of the literature discovered pertaining to clinical decision making and new graduate nurses or novice nurses, the exclusion criteria were revised and all forms of simulation, low-fidelity and high-fidelity patient simulators, case studies, standardized patients, and the use of CD-ROMs were included. Additional exclusion criteria included descriptive

articles related to the development of clinical decision making curriculums and models, and studies assessing graduate nurses' competence that did not include clinical decision making or those related to comparing the role of the novice versus experienced nurse.

### **Clinical decision making and nursing practice**

Maintaining patient safety is a key component of nursing practice. Errors in healthcare were highlighted in the *Institute of Medicine report To Err is Human: Building a Safer Health System* that was released in 1999. A survey of nurses conducted by VanGeest and Cummins (2007) over 95% of the nurses surveyed also identified patient safety as an important issue in health care today, with 97% of the respondents identifying a relationship between patient safety and quality of care (VanGeest & Cummins, 2007).

Clinical decision making is embedded in everyday nursing practice. Safe, appropriate, and accurate clinical decision making is critical in today's challenging and dynamic health care environment (Dunton, Gajewski, Klaus & Peirson, 2007; Orsolini-Hain & Malone, 2007; Smith & Crawford, 2003). In early nursing education and practice, Florence Nightingale established the nurse's observations, interpretations and subsequent actions as characteristics of nursing practice. Nurses face multiple decisions in their day to day practice and must develop the necessary knowledge and skills to meet this daily challenge (Aries, 2006). Nurses are accountable for the decisions they reach and require the tools necessary to facilitate quality decision making (Tanner, 2006; Muir, 2004).

In nursing literature, the terms "clinical decision making", "critical thinking", "clinical reasoning" and "clinical judgment" are often used interchangeably. While they share many similar traits, Tanner (2006) proposes that these are distinct concepts and processes that contribute to each other. According to Tanner, clinical judgment is "an interpretation or



conclusion about a patient's needs, concerns or health problems, and/or the decision to take action" (Tanner, 2006, p.204). Additionally, Tanner defines clinical reasoning as "the processes by which nurses and other clinicians make their judgments" (2006, p. 204). Martin (2002) refers to critical thinking as a significant component of the clinical decision making process, supporting Tanner's hypothesis that critical thinking is a component of clinical decision making. Aries (2006) and Banning (2007) agree that clinical decision making is a process that occurs frequently throughout the nurses' day and is undertaken by the nurse regarding the patient and patient care management issues.

For the purpose of this project, clinical decision making was the concept addressed and was defined as the thoughtful, reasoned and conscious decision a nurse reaches based on the evidence presented and within the holistic context of the patient care situation and the resulting nurse behaviors and/or actions. Clinical judgment, critical thinking and clinical reasoning, based on the previous definitions, all contribute to the clinical decision making process and outcome (Aries, 2006; Banner, 2002; Tanner, 2006).

Several reviews of the literature and studies have established clinical decision making as a distinct process in nursing that has a significant impact on patient care (Bakalis, 2006; Banning, 2007; Lake, Moss, & Duke, 2009; Muir, 2004.) Others have indicated that nursing decisions and actions play a significant role in patient safety (Brady et al., 2009; Johnstone & Kanitsaki, 2008; Orsolini-Hain & Malone, 2007; Smith & Crawford, 2003). New nursing graduates and nursing administrators both acknowledge the 'gap' that exists between education and readiness to practice, particularly related to clinical decision making (Berkow, Virkstis, Stewart, & Conway, 2008; Del Bueno, 2005). Strategies to address this gap have included increased mentoring or nurse residency programs, use of reflective learning techniques and

limited use of simulation (Forneris & Peden-Mcalpine, 2007; Orsolini-Hain & Malone).

Simulation experiences for the novice nurse may be an effective method for addressing this identified gap.

### **Simulation and clinical decision making skills**

The majority of research related to simulation and nursing, has been conducted with nursing students and related to the acquisition of skills. Numerous studies have touted the advantages of simulation in nursing education, many descriptive in nature, documenting a nursing program's experiences or journey with simulation or recommending best practices (Haskvitz & Koops, 2004; Henneman & Cunningham, 2005; Henneman, Cunningham, Roche, & Curnin, 2007; Hyland & Hawkins, 2009; Parr & Sweeney, 2006; Spunt, Foster, & Adams, 2004). The majority of research that has been conducted in regards to the use of simulation or human patient simulators (HPS) has been qualitative in nature, most commonly measuring students' or faculty's' perception of the value of simulation (Baillie & Curzio 2008; Bremner, Aduddell, Bennett, & Vangeest, 2006; Feingold, Calaluca, & Kallen, 2004; Kardong-Edgren, Starkweather, & Ward, 2008; Lasater, 2007; Moule, Wilford, Sales, & Lockyear, 2008; Ramsey, Keith, Ker, & Hogg, 2008; Rhodes & Curran, 2005; Schonening, Sittner, & Todd, 2006; Wellard, Woolf, & Gleeson, 2007). The results of these studies indicate that the vast majority of students and faculty perceive simulation to be a valuable educational strategy, providing a link between theory and practice (Baillie & Curzio; Bambini, Washburn, & Perkins, 2009; Bremner et al. 2006; Kardong-Edgren et al.; Lasater; Ramsey et al.; Rhodes & Curran; Schonening et al.; Wellard et al.). However Feingold et al. found that only approximately one half of the students surveyed felt that HPS improved their clinical competence or better prepared them to practice in the clinical setting.

Several studies also have supported the concept that simulation increases nursing students' self-efficacy and/or self-confidence (Baillie & Curzio, 2008; Bambini, Washburn, & Perkins, 2009; Bremner et al., 2006; Goldenberg, Andrusyszyn, & Iwasiw, 2005; Kardong-Edgren et al., 2008). However a study by Brannan, White and Bezanson (2008) did not find an increase in students' confidence levels after simulation, when compared to traditional lecture style presentation. Bandura's theory of self-efficacy (1977; 1993; 1994) establishes the link between improved self-efficacy and improved performance of a skill or behavior, however little research has been done in nursing education to support that improved self-efficacy effectively translates into improved performance in the clinical setting.

Evidence from six additional studies, that assessed a learning outcome, improvement in cognitive application, or the performance or application of a nursing clinical skill, support the conclusion that the use of simulation, specifically human patient simulators (HPS), is a valuable and effective educational strategy (Alinier, Hunt, Gordon, & Harwood, 2006; Bearson & Wiker, 2005; Brannan et al., 2008; Jarzemsky & McGrath, 2008; Jeffries & Rizzolo, 2006; Radhakrishnan, Roche, & Cunningham, 2007). Although the studies are primarily quasi-experimental or qualitative in nature, the results from all six studies are consistent in demonstrating a positive effect on nursing student performance of clinical or cognitive skills.

Multiple studies have assessed the clinical decision making process of novice and/or graduate nurses and discovered self-perception of deficiency in this area, as well as diminished or poor outcomes (Fink, Krugman, Casey, & Goode, 2008; Higuchi & Donald, 2002; Hoffman, Aitken, & Duffield, 2009; Hoffman, Donoghue, & Duffield, 2004; Lauri & Salantera, 2002; Marshburn, Engelke, & Swanson, 2009; Martin, 2002; & Standing, 2007). Several studies also assessed contributing factors to the development of quality clinical decision making resulting in

positive patient outcomes, and found that experience, area of practice, and age were the most significant factors that contribute to appropriate clinical decision making (Higuchi & Donald, 2002; Hoffman et al., 2004). Marshburn, Engelke, and Swanson (2009) discovered a correlation between new nurses' prior experiences in health care and self-perception of competence to performance based measures of clinical competence, including problem management. In other words, nurses who thought they could manage problems were better able to do so. This is noteworthy related to the relationship between simulation and the potential for improved self-efficacy or self-confidence, leading to improved performance. While Martin (2002) did not find a significant relationship between age and critical thinking, she did find that nurses who had taken a critical thinking course had improved critical thinking scores. Additionally, a study by Forneris and Peden-Mcalpine (2007) indicated that a reflective thinking learning experience had a significant impact on the critical thinking processes of novice nurses. Tanner's (2006) model of clinical judgment supports this conclusion, highlighting the importance and value of reflection in the process. According to Tanner (2006) reflection related to clinical decision making provides context, enhances learning and improves decision making performance in future clinical situations. Jeffries (2007) postulates that debriefing in a simulation experience is as valuable or more valuable than the actual simulation scenario experience, where the participant has the opportunity to see the results of poor performance of a skill or a poor decision. A simulation experience that focuses on the concepts of clinical decision-making, while incorporating the best practice debriefing and reflective concepts presented by Tanner (2006) and Jefferies (2007) connect the concepts of experience, critical thinking practice, self-efficacy and reflective learning, all contributing to enhanced clinical decision making.

Only three articles specifically addressed novice nurses' decision making abilities. A study by Vandrey and Whitman (2002) focused on novice nurses' decision making abilities after exposure to a simulated experience. Vandrey and Whitman describe the development of a simulation experience with HPS for critical care nurses. Student and facilitators responses were positive in nature, but no details related to the student outcomes were presented. In a descriptive narrative, Bremner and Brannan (2000) presented the implementation of a CD rom case study simulation related to clinical decision making with novice nurses. Bremner and Brannan argue that practice in clinical decision making is essential for novice nurses, but no evaluation data is presented.

A third study that addressed nurses' decision making was related to a nurse residency program that focused on critical thinking, patient safety and quality patient care utilizing simulation integrated throughout the new graduate nurse curriculum as described by Beyea, Von Reyn, and Slattery (2007). Integrated throughout the simulation component was the expectation that the new graduate or novice nurse 'problem solve' related to the patient care scenario. Each week the residency program participants rated their confidence, competence and readiness to provide independent nursing care to a group of patients. Although the study relied on the participants self-perception of these qualities, initial findings indicated that the simulation experience promoted self-confidence and increased competence, while facilitating safe decision making (Beyea et al.).

### **Tanner's Model of Clinical Judgment**

Tanner's Model of Clinical Judgment provides an apt framework for a simulation experience focused on clinical decision making (2006). Tanner concludes that there are multiple factors that impact clinical judgment: 1) clinical judgments are often influenced more by what

the nurse brings to the situation versus the objective data from the patient care situation; 2) some degree of clinical judgment relies on ‘knowing’ the patient and his or her response patterns; 3) clinical judgments are influenced by the context of the situation and the culture of the unit or facility; 4) clinical judgments rely on a variety of reasoning patterns such as analytic processes, intuition and narrative thinking; 5) reflection in practice is key to the development of clinical judgment and is often triggered by the breakdown in judgment or poor patient outcomes (Tanner, 2006). While this model describes the clinical judgment of experienced nurses, it provides a structure for student and novice nurses and guidance for educators (Tanner, 2006; 2008).

The Tanner’s (2006) Model of Clinical Judgment relies on four aspects: 1) noticing; 2) interpreting; 3) responding; and 4) reflecting (see Figure 1).

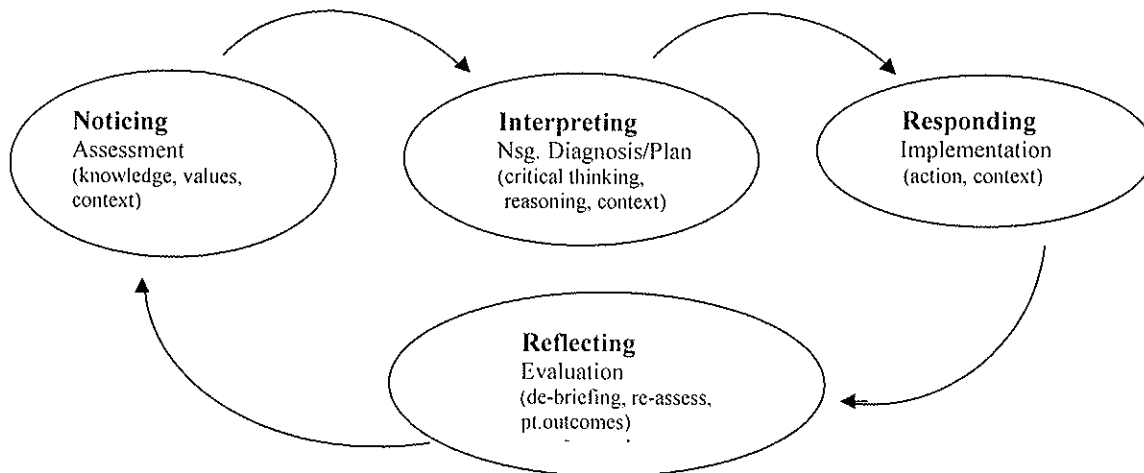


Figure 1. Tanner’s Model of Clinical Judgment and the Nursing process

Each concept builds upon the next, ending in reflection, providing a feedback loop that creates context related to the patient care situation, leading back to noticing. Noticing is more than the assessment of the nursing process, but also incorporates the knowledge that the nurse brings to the situation related to the patient, past experiences and textbook. Values, the nurse’s perception

of professional nursing practice and work environment also impact the noticing stage.

Interpreting and responding refer to the nurse's reasoning or thought processes related to the data presented and/or assessed, and the action taken in response (Tanner, 2006). Multiple factors contribute to these stages, such as the type of reasoning employed, and the eventual nursing decision and action (Tanner, 2006).

The last stage, reflection can be a major contributor to the learning process (Tanner, 2006). Reflection is the process that occurs after the event or interventions and frequently includes an evaluative component (Tanner, 2006). Interventions are assessed and adjusted based on patient response and context, providing an opportunity to learn from the experience (Tanner, 2006). Debriefing, where participants examine what occurred during simulation and what was learned, is a key component in the simulation experience and supports the concept of reflection (Jeffries, 2005; 2007; Tanner, 2006). While all simulation experiences support the concept of reflection, the failure of clinical judgment or inappropriate clinical decision making invites reflection; simulation provides an environment that allows for poor clinical decision making and the associated consequences, creating unique learning opportunities.

### **Conclusion and indications for change in nurse residency program**

The gap between education and practice, particularly related to nurses' clinical decision making, has been documented and continues to be of concern related to the potential impact on patient safety (Dunton et al., 2007; Orsolini-Hain & Malone, 2007; Smith & Crawford, 2003; NCSBN, 2009). Aries (2006) and Tanner (2006) postulate that clinical decision making or clinical judgment are essential skills for the nurse, with far-reaching consequences for safe, effective patient care. Additionally, as identified by the IOM (2003), the ability to communicate and collaborate in an interdisciplinary team as well as provide individualized patient centered-

care are core competencies for health professionals related to patient safety. Several studies have assessed the clinical decision making skills of graduate nurses and discovered that graduates not only lack in ability but also lack in confidence related to their clinical decision making skills (Berkow et al., 2008; Fink et al., 2008; Marshburn et al., 2009). This lack of confidence may also inhibit quality communication from the novice nurse as well as impact clinical decision making (Bambini, Washburn, & Perkins, 2009). Although limited in number and descriptive in nature, additional studies indicate that the clinical decision making skills of novice nurses can be enhanced with exposure to clinical decision making situations, through the use of simulation (Beyea et al., 2007; Bremner & Brannan, 2000; Vandrey & Whitman, 2002).

High-fidelity simulation provides a unique opportunity to create and deliver clinical decision making experiences. Utilizing Tanner's Clinical Judgment Model (2006) as a framework for the simulation experience, and incorporating the five IOM core competencies for health care clinicians, clinical decision making scenarios were presented to novice nurses, by using the concepts of noticing, interpreting, responding and reflecting, thus creating an environment that increases experience and highlights the skill of clinical decision making. With limited risk to the novice nurse and no risk to the patient, participants can be allowed to experience the breakdown of clinical judgment identified by Tanner (2006) as a time when significant learning takes place. The concept of guided reflection or debriefing, integral to a simulation experience, enhances the learning process, while assisting in creating context for the learner (Jeffries, 2007; Tanner, 2006).

The opportunity to impact novice nurses' clinical decision making skills through the use of simulation appears evident. Tanner's Clinical Judgment Model provides an evidence-based framework for the development of a simulation experience designed to enhance clinical decision



making. Bandura's theory of Self-efficacy provides the connection between thought, belief and the potential change or improvement in behavior, creating an avenue for the assessment of effectiveness of the intervention. A sequential simulation experience, designed to emphasize the process of clinical decision making, can assist in the development of the skills vital for today's novice nurse graduate, thus impacting the delivery of nursing care and patient safety.

## Methodology

### Statement of the issue

Errors in healthcare have been linked to new nurses' inability to apply sound clinical decision making/clinical judgment (Dunton, Gajewski, Klaus & Peirson, 2007; Smith & Crawford, 2003; NCSBN, 2009). Decker, Sportsman, Puetz, and Billings (2008) propose that clinical simulation is a method that incorporates nursing theory, clinical skills application, and clinical decision making, thus enhancing novice nurses' clinical judgment. The Institute of Medicine (IOM, 2001) recommended that simulation be utilized for improving clinical judgment and psychomotor skills for health care professionals, thus promoting patient safety.

The purpose of this Capstone Project was to validate the impact of incorporating a sequential simulation scenario teaching methodology into the current nurse residency program with the concurrent goal of enhancing the clinical decision making competence of novice nurses associated with the nursing care of the morbidly obese post-operative patient. The current nurse residency program uses simulation to teach and 'test out' on specific nursing skills, but does not combine teaching and formative and/or summative evaluation related to holistic patient care and clinical decision making. A simulation scenario experience focused on the clinical decision making related to the nursing care of the morbidly obese post-operative patient was created, implemented, and the competence of the novice nurses related to clinical decision making was evaluated. Tanner's Model of Clinical Judgment (2006) was used as the guiding framework and the simulation scenario context was holistic patient care for the morbidly obese post-operative patient

**PICO question**

Does participation in a guided, sequential simulation experience enhance the clinical decision making behaviors of the novice nurse related to the nursing care of the morbidly obese post-operative patient?

**Study design**

This is a program evaluation project that assessed the impact a change in program delivery, the use of a sequential simulation experience, had on the competence of novice nurses' clinical decision making. Currently, the hospital uses simulation for mock code practice and education, and for the assessment of specific 'hands on' clinical skills in its nurse residency program. In an attempt to expand the effective use of simulation to assist in easing the transition of novice nurses into practice, as well as enhancing the competence of the novice nurse, a sequential simulation experience was developed, implemented and evaluated. During this project, one group of novice nurses had a two hour sequential simulation experience related to clinical decision making and the morbidly obese post-operative patient where the components of the simulation experience built or scaffolded on the previous one. This educational practice is supported by Kolb's Theory of Experiential Learning which indicates that learning is a continuous process where knowledge is acquired and expanded upon by experiences (Kolb, 1984; Kolb & Kolb, 2005). The concept of facilitating learning, while scaffolding concepts or experiences created a sequential simulation learning experience. The educational experience was facilitated or 'guided' by the project coordinator, who is a nurse educator with twenty-five years of experience in nursing education, is a certified nurse educator, and has worked with simulation in nursing for the past four years.

The second group of novice nurses received the more traditional two hour lecture and case study format presentation related to clinical decision making and the care of the morbidly obese post-operative patient. Both educational interventions occurred on the same day; with the simulation experience in the morning and the lecture/case study experience occurring in the afternoon.

Project evaluation occurred at two different points in time, immediately upon completion of the initial educational presentation, the sequential simulation experience or the lecture/case study experience, and two weeks after the initial educational experience. Participants completed a brief survey related to retention of information, self-confidence and evaluation of experience at both points in time. Additionally, at the two week assessment point, all novice nurse participants were exposed to a second simulation scenario again focused on clinical decision making related to the nursing care of the morbidly obese post-operative patient. Retention of information is enhanced by testing or evaluation, with spaced retrieval of information having the most significant impact on memory and retention of information (Kromann, Jensen, & Ringsted, 2009; Roediger & Karpicke, 2006). Participant performance was assessed through the use of a competency checklist and decision tree; a validation of competency related to clinical decision making and the care of the morbidly obese post-operative patient.

### **Ethical considerations**

Minimal risk was associated with this study. Participants were novice nurses already participating in a local hospital nurse residency program. All simulation surveys and competencies were numbered and were not associated with individual performance. The educator conducting the program improvement project conducted the initial educational experiences, simulation versus lecture/case study, as well administered all surveys. An

experienced nurse educator, not affiliated with the hospital or the program improvement project, assessed competency related to the final simulation experience. No hospital employees, other than novice nurse participants, were present during the teaching sessions or the assessment sessions. All information will be reported in aggregate format with no individual identifiers.

Study participants had the opportunity to practice clinical decision making in a simulation setting or lecture/case study format without risking harm to patients. Participants received feedback during educational experiences, from the educator in the role of facilitator, with no employee evaluation component. Self-assessment and reflection was encouraged and facilitated during simulation experience, debriefing component, competency assessment and completion of questionnaire.

All survey data was kept in a locked filing cabinet in the project coordinator's office, off-site. Data was reviewed by the educator leading the program improvement project only; no one else had access to the data. Results will be shared with the participating acute care facility upon completion of project and will be reported in aggregate form to help ensure participants anonymity.

This program evaluation project had an expedited Institutional Review Board (IRB) review process. All information was submitted to IRB by summer 2011. IRB determination was received August 29, 2011 and determined that this project was not human research (Appendix K). The use of simulation was already in place at this acute care facility; however the use of a sequential simulation focused on clinical decision making implemented during the nurse residency program required evaluation. All participants were current novice nurses who were participating in the nurse residency program. Participation in the educational experience, simulation or lecture/case study format, was required related to role in hospital setting however

completion of questionnaire was optional and informed consent (Appendix I) was collected from study participants prior to first survey administration. All participants could return blank surveys at any time during the nurse residency program evaluation, without consequences or further coercion.

### **Sample and Setting**

This was a convenience sample of novice nurses at a local acute care hospital, currently participating in the nurse residency program. Participants were novice nurses, as defined by the acute care facility's clinical ladder, based on the work of Benner (1984), novice to expert. Selection criteria includes novice nurses or "clinical ladder 1"s, defined as nurses who have completed their initial nursing education program within the past 12 months and have been employed in the registered nurse role, by the acute care facility 18 months or less (Appendix A). All novice nurses at this facility participate in the nurse residency program that incorporates additional education and skill assessment for one year after the date of initial hire (Appendix B).

Sample size for this pilot study was determined by the number of novice nurses participating in the nurse residency program at the time of the project implementation. There were 27 nurses in the acute care facility designated as novice nurses or clinical ladder "1's" as of September 2011. Of those 27, 18 were present when the project was introduced to them during a presentation that occurred in September of 2011. The consent forms were reviewed and participants had the opportunity to ask questions, as well as decline to participate. Eighteen consent forms were signed and returned in September. On the day of project implementation, in October, only fifteen nurse residency participants were present. This was related to a decrease in nurse residency program attendance.

## Procedures

Initial agreement for acute care facility participation was obtained from the Chief Nursing Officer in 2010. Related to a change in nursing administration, agreement for the project was again obtained in the summer of 2011. Initial proposal of capstone project was presented to hospital research and quality committee in September 2010. Facility letter of approval was submitted with IRB process and with absence of IRB; the acute care facility accepted University Maryland IRB approval which was obtained in August of 2011 (Appendix K).

**Development of simulation scenarios and competencies.** Simulation scenarios, case studies and competencies were developed during the fall of 2010, and spring and summer of 2011. Three simulation scenarios were developed for the nurse residency program. With a growing population of morbidly obese post-operative patients the acute care facility requested simulation scenario and competencies focus on this patient population. The first two scenarios were developed as the educational component of the project and were presented during the initial educational simulation experience. The first simulation scenario focused on clinical decision making related to the nursing care of the post-operative appendectomy patient and introduced the participants to the simulation experience and post-operative nursing care and clinical decision making concepts. The second scenario built or scaffolded on the concepts from the first scenario and added the complexity of the morbidly obese post-operative patient and its associated clinical decision making and nursing care. This created a sequential simulation experience. Again, applying the principles associated with Kolb's Theory of Experiential Learning, repeated concepts or experiences in the simulation experience build upon one another to enhance learning (Kolb, 1984; Kolb & Kolb, 2005).

The lecture and case study educational presentation created, mimicked the simulation scenario presentation, minus the simulation component. It was similar in content and length of time, with the simulation components presented in sequential case study format for class discussion. It was also developed during the spring/summer of 2011.

The second simulation experience mirrored the previous teaching one and was used to validate competency related to clinical decision making and the nursing care of the morbidly obese post-operative patient. All simulation scenarios, competency checklists and decision trees were reviewed by two content experts in the use of simulation and two content experts in the nursing care of the medical/surgical patient (see Appendices C, E, G, J). A nurse educator at the acute care facility also reviewed the simulation scenarios and associated competency decision trees/checklists to assure conformity with the facility policies and procedures. In accordance with published guidelines for simulation development (Jeffries, 2007; Waxman, 2010), all simulation scenarios were assessed related to simulation scenario content, clarity, simulation procedures, debriefing prompts, and current best practice policies and procedures (see Appendix J). Any portion of simulation scenario(s) or competency decision tree/checklist found to be unclear, inaccurate or not current best practice by two or more of the five reviewers was revised and re-submitted for additional review.

Prior to use in the nurse residency program the simulation scenarios were piloted with senior nursing students who are enrolled in the last year of an Associate degree nursing program. A posting on the senior nursing Blackboard® course site, offered the opportunity to participate in simulation scenarios as volunteers, in addition to senior coursework. No coercion or extra course credit occurred. Students were offered free pizza upon completion of simulation scenario



trial run. During this trial run, scenario(s) progression was assessed as well as the elicited behaviors of participants.

Two senior students participated in the simulation scenario(s) trial. All three simulation scenarios were implemented and scenario progression was assessed. Assessment of scenario progression included: amount of time for scenario(s); smoothness of transitions/changes in 'patient' status during simulation; elicited student behaviors; and responses to reflection prompts. Minor adjustments were made to the simulation scenarios to assist in clarity of information presented to participants, but no major revisions were necessary.

**Survey creation and use.** A brief two-page survey was created and administered three times: prior to the initiation of the first simulation or case study teaching presentation; at the conclusion of the teaching (simulation or case study) experience; and two weeks later at the competency assessment. Surveys were reviewed by the same nurse educators who reviewed the simulation scenarios, competency checklists and decision trees. The short survey included information related to demographics, prior experience with simulation; knowledge related to clinical decision making; knowledge of nursing care related to the morbidly obese post-operative patient; and satisfaction with experience if applicable (Appendix H). Surveys were kept brief, with 'yes' or 'no' or 'true' or 'false' responses to simplify and promote completion, as this portion of the project was voluntary for the participants.

Participants were asked to complete one survey prior to starting the educational experience, either lecture and case study or sequential simulation experience, and one immediately following the educational experience. All surveys were collected by a participant attending sessions and placed in a sealed envelope. Participants were asked to bring the third survey with them, along with the copy of the checklist/decision tree when they returned in two

weeks for competency assessment. Participants who forget were able to obtain a survey at the time of assessment; however this may skew survey results and limit comparison to earlier surveys if participants did not recall their identifying number. Prior to initiating the simulation assessment experience, participants completed the third survey and placed it in a sealed, signed, and dated envelope.

**Project implementation.** Project implementation occurred in October of 2011, during a scheduled nurse residency day/presentation. Nurse residency participants met in one large conference room at the start of the day; there were fourteen present. An orientation and plan for the day was provided by the project coordinator and the nurse residency coordinator for the acute care facility.

Numbered packets with color coded and numbered surveys were passed out. To maintain confidentiality related to surveys and participant responses, each participant was asked to choose a randomly numbered envelope with three copies of the survey in the envelope, a copy of the final scenario skills competency checklist/decision tree, and an extra envelope. Participants were informed they could choose not to answer the surveys and opt to return blank surveys. It was explained to the participants that they must participate in the simulation experience as a component of the nurse residency program, but survey completion was optional. Identification numbers associated with surveys and simulation competency checklists/decision trees were known only by the educator conducting the assessment. All documentation related to the project had only the number assigned to the participant; there were no participant names on any documents. Each participant chose a numbered packet and completed the corresponding master list. The master list with participant names and assigned numbers was kept in a locked cabinet in the project coordinator's office, off site. Surveys were color coded: Survey for all participants

prior to any participation in the project was pink; survey for post-participation in case study or simulation teaching experience was green; and survey for after completion of simulation assessment experience, two weeks post-teaching intervention was white. All surveys were identical and were numbered to match the participant.

Novice nurse participants were then randomly assigned to one of two groups by the nurse residency coordinator; the project coordinator was not present when this occurred. Group one was scheduled for the project educational intervention in the morning; group two remained in the conference room for another presentation related to nurse residency content. Group two was scheduled for the project educational intervention in the afternoon; group one attended the presentation from the morning or an alternative one on electronic documentation. Basic knowledge related to post-operative nursing care was assumed for all participants, based on recent completion of entry level nursing educational program and current nursing licensure. Each group, during its time slot, received a brief fifteen minute presentation related to clinical decision making, delivered by the nurse educator conducting the program evaluation. Tanner's model of Clinical Judgment, with its four components of noticing, interpreting, responding and reflecting was reviewed and discussed. Each group also received a brief ten minute orientation to the simulation mannequins, including a demonstration of mannequin capabilities. Both presentations were identical for the two groups.

*Teaching simulation scenario experience.* Group one, after receiving the presentation on clinical decision making and the orientation to the simulation mannequins began the sequential simulation experience facilitated by the project coordinator. An additional mastered prepared nurse educator, not associated with the acute care facility, and who is experienced with simulation and currently conducts educational simulation experiences and assessments in an