Clinical Judgment and Cue Recognition of Patient Deterioration Among Novice Nurses

Submitted by

Patricia Kim Schmehl

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by

Patricia Kim Schmehl

has been approved

November 24, 2019

APPROVED:

Tabitha Garbart, PhD, DPI Project Chairperson

Linda Seasholtz, MSN, Ed., Committee Member

ACCEPTED AND SIGNED:

Lisa G. Smith, PhD, RN, CNE
Dean and Professor, College of Nursing and Health Care Professions

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Date
Abstract

Experiential learning deficits in newly licensed registered nurses (RNs) may extend to deficits in clinical judgment, particularly in recognizing cues of patient deterioration. The purpose of this quantitative, pretest posttest quality improvement project was to determine if and to what degree the implementation of QSEN education with simulation for nurses impacts clinical judgment and frequency of documentation of deterioration parameters in an acute care hospital in southeastern Pennsylvania. Benner’s novice to expert theory and Tanner’s clinical judgment model supported the framework for this project. Thirty-three nurses in residency participated in a didactic session on the QSEN competencies and an unfolding high-fidelity simulation scenario featuring a deteriorating patient. The Lasater Clinical Judgment Rubric (LCJR) was used to evaluate clinical judgment ability during the simulation. Correlational analysis using Pearson’s r with two pairs of data points established a relationship between project interventions and the impact on clinical practice. The first pair included a post-test score completed after simulation and the tallied LCJR score (p = .000, r-value = 1, and the coefficient = .950). The second pair reflected a practice change by correlating an increased frequency of documentation of specific deterioration parameters prior to and after project interventions (p = .000, r-value = 1, and the coefficient = -.510). Based on the findings, the integration of a mandated competency devoted to cue recognition is recommended at the project site.

Keywords: clinical judgment, cue recognition, LCJR, novice nurse, novice to expert, nurse residency, high-fidelity simulation, QSEN
Dedication

My decision to make this journey was not an easy one for a variety of reasons. Ultimately, my passion for promoting understanding of the art of nursing fueled my desire to proceed. Concepts such as empathy, holism, and appreciation of the worldviews of others comprise this art and have their origins in the earliest beginnings of our noble profession. They are as important in modern times as they were in times past and signify a dedication and commitment to patients that transcend the science of nursing.

This manuscript is dedicated to the profession’s founders, whose courage to forge a pathway barred by many obstacles continues to inspire nurses today. Their impact on the nursing profession has endured throughout time and will continue to inspire the profession’s evolution. This manuscript is also dedicated to current and future nurses. Your dedication and commitment to continued nursing excellence, merging both the art and science of nursing, allows the light of the nursing lamp to continue shining. Hold it high and shine it brightly.
Acknowledgments

Confidence, inner strength and belief in oneself are essential elements guiding a successful journey to doctoral degree completion. I feel very fortunate to have many people supporting me who have actively contributed to the development of those core elements through their continual support, encouragement, and belief in me. I could not have completed this journey without them.

First among those is my partner Mike. His unconditional love and guidance have always been there no matter what. He truly has the patience of a saint and is my best friend. There are few people I respect as much as this man. I will spend the rest of my days thanking him.

Many nursing colleagues also championed my cause, serving as mentors, cheerleaders, and guides. There are too many to name, but each has a special place in my heart. My mentor, Linda is a very special mentor and nursing leader who truly made this project possible. She has walked this journey with me and was my pillar of strength. She became as excited about this project as I was and was committed from the very beginning. I am unable to express or show enough gratitude for all she has done.

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Chapter 1: Introduction to the Project

Newly graduated nurses are often expected by employers to transition smoothly to licensed practice after successfully completing an accredited nursing program and passing the national licensure examination. However, research has demonstrated that this expectation is unrealistic for a variety of reasons. One of the key reasons cited in the literature is that the full scope of practice for a registered nurse differs from that of the student nurse scope of practice as regulated by a state’s nurse practice act (Loughran, 2017). The newly licensed nurse’s sudden expectation of competence relative to previously restricted clinical skills often serves as a barrier to the registered nurse role fulfillment and the provision of safe quality care (Silvestre, Ulrich, Johnson, Spector, & Blegen, 2017; Zittel, Moss, O’Sullivan, & Siek, 2016). This experiential learning deficit creates knowledge gaps and negatively impacts the novice nurse’s readiness to practice.

Deficits in experiential learning extend beyond procedural skill acquisition. Deficient experiential learning has been associated with underdeveloped clinical judgment skills necessary for clinical decision-making that is compliant with best practice standards (Bennett, Grimsley, Grimsley, & Rodd, 2017). The literature now recognizes poor clinical judgment as one of the root causes of undesirable patient outcomes relative to an inability to recognize cues related to actual or potential patient condition deterioration (Lasater, Nielsen, Stock, & Ostrogorsky, 2015). Kalisch (2016) noted that failure to recognize or anticipate patient compromise equates to missed and omitted care. In essence, significant early cues of deterioration go unrecognized and failure to rescue results.

In response to this clinical problem, supported by researched data and disseminated by the Institute of Medicine (IOM), major stakeholders of the nursing
profession are collaborating to form an action plan (Lyle-Edrosolo & Waxman, 2016). Professional organizations such as The Joint Commission (TJC), the Quality and Safety Education for Nurses Institute (QSEN), and the American Nurses Credentialing Center (ANCC) are advocating for a competency-based framework which facilitates the practice transition of newly licensed nurses and narrows existing knowledge gaps (Lyle-Edrosolo & Waxman, 2016; Sherwood & Zomorodi, 2014). The overall goal of this author’s project was to promote consistent incorporation of QSEN graduate level competencies as well as the accompanying knowledge, skills and attitudes (KSAs) into nursing care to serve as a framework for cue recognition of patient deterioration. The QSEN graduate competencies include patient-centered care, safety, informatics, quality improvement, evidence-based practice, and teamwork and collaboration (QSEN, 2018). All competencies and KSAs can be viewed on the website listed in the reference section for QSEN. A copy of the QSEN framework can be found in Appendix A.

The narrower focus of this project was to integrate such a framework within a high-fidelity simulation scenario. Clinical judgment behaviors reflecting cue recognition of the decompensating patient were assessed and measured. Theoretical foundations included Benner’s novice to expert theory, Tanner’s clinical judgment model, and the LCJR (Dolansky & Moore, 2013; Hart et al., 2015; Lasater et al., 2015). The LCJR can be found in Appendix C.

This chapter presented foundational information describing the clinical problem. This included the root causes identified in scholarly literature as well as potential solutions. The formulated clinical question originated from this information and enabled the creation of a quality improvement project significant to clinical nursing practice. The entire project was addressed in detail within subsequent chapters.
**Background of the Project**

Research investigating unsafe nursing care is not a new phenomenon. The IOM has been researching and reporting on this clinical problem and its relationship to undesirable patient outcomes for more than a decade (IOM, 2011). Continued research over time has resulted in dissemination of multiple follow-up reports calling for stakeholder support of the nursing profession and active solutions to the problem (IOM, 2011). One area of focus originating from continued research is that of nursing errors directly related to ineffective decision-making (Kalisch, 2016; VanFosson, Jones, & Yoder, 2016). One root cause of nursing care-related errors resulting in preventable harm is that of poor clinical judgment.

Eventually, poor clinical judgment, as it related to the stated problem in this manuscript, was more clearly defined in the literature to include overall clinical decision-making skills. This deficient clinical judgment was also demonstrated through the situational ability to recognize cues of patient deterioration evident during nursing assessments as well as other patient-related data such as laboratory tests (Burbach & Thompson, 2014; Lasater et al., 2015). Quantitative and qualitative studies indicated that deficiencies in cue recognition and clinical judgment were strongly evident in the newly licensed registered nurse population (Bennett et al., 2017; Gillespie & Peterson, 2009). As student nurses transition from academia to the licensed practice setting, knowledge gaps associated with a lack of experiential learning opportunities and independent decision-making result in under-developed clinical judgment skills relative to the acute care practice environment. Such knowledge gaps further result in missed cues, incomplete care, and errors causing patient harm (VanFossen, Jones, & Yoder, 2016; Bennett et al., 2017). A collaborative approach is necessary to address this multi-faceted
Current research on resolving this clinical problem focused on facilitating the adjustment of inexperienced registered nurses to licensed practice through the utilization of strategies and pedagogies such as structured mentoring and preceptorship programs, nurse residency programs, and simulation using a clinical judgment framework (Brykczynski, 2014; Hart et al., 2015; Nielsen, Lasater, & Stock, 2016). A combination of these strategies has frequently been studied in more current literature (Cazzell & Andersen, 2016; Flores, Hickenlooper, & Saxton, 2013; Letourneau & Fater, 2015). Successful outcomes have been achieved by integrating QSEN competencies as well as simulation during the orientation period (Ashcraft et al, 2013; Lasater et al, 2015). Supportive and structured programs allow for mentored experiential learning, which promotes confidence and competence in newly licensed nurses with limited clinical experience.

The project integrated a QSEN-based clinical judgment framework with high fidelity simulation in newly licensed registered nurses enrolled in a nurse residency program. All nurses had less than two years of licensed practice experience. The simulation scenario was designed to enhance practice change through application of a clinical judgment framework to assist in recognizing cues signaling patient deterioration. Specific cues included within the simulation, which will also eventually be used to demonstrate practice change are those of oxygen saturation, measured via pulse oximetry, and respiratory rate to address the clinical problem.

**Problem Statement**

The main focus of this project was to prevent patient harm and undesirable outcomes associated with the deficient ability of newly licensed registered nurses to
recognize cues representative of actual or potential patient condition decline. This was accomplished through the use of QSEN graduate competencies serving as a framework for promoting cue recognition and efficient clinical decision-making. The current QSEN graduate competencies, along with the accompanying KSAs, were originally created by the IOM, with a goal of adoption as national practice standards (IOM, 2011). The QSEN Institute was then formed to revise and expand on the competency framework (QSEN, 2018). The QSEN Institute continues to actively seek solutions to this clinical problem.

Although research demonstrates the need for and effectiveness of standard competencies to ensure safe, quality care, universal integration of the competencies has not occurred (Hirsch, 2016; Melnyk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). The formulated problem statement for this project was: It was not known if and to what degree the implementation of QSEN education with simulation for nurses impacts clinical judgment and frequency of documentation of deterioration parameters in an acute care hospital in southeastern Pennsylvania.

It is not known how the integration of a QSEN-based framework in nursing care, compared to not using the framework for three weeks, improves clinical judgment skills and patient outcomes by promoting the nurse’s ability to recognize cues of patient deterioration, as evidenced by documentation of oxygen saturation and respiratory rate more frequently than every hour.

The project was theoretically supported by Benner’s novice to expert theory, as well as the seminal work of Tanner in identifying characteristics and behaviors of clinical judgment (Benner, 1984; Davis & Maisano, 2016; Dolansky & Moore, 2013; Tanner, 2006). Integration of simulation was supported by the well-known work of Lasater (2011), who created the LCJR.
Multiple studies employing this tool with simulation had demonstrated support for its use in this project (Lasater, 2011; Lasater, Johnson, Ravert & Rink, 2015; Nielsen, Lasater, & Stock, 2016). Quantifying clinical judgment behaviors encompassing cue recognition during high-fidelity simulation focused on a decompensating patient and provided a structured framework for improved clinical decision-making relative to the stated problem. This followed a didactic session on the QSEN competencies as a framework used to aid situational cue recognition. Interactive case studies were used during this time to correlate clinical judgment-based decision-making with patient safety.

**Purpose of the Project**

The purpose of this quantitative, pretest posttest quality improvement project was to determine if and to what degree the implementation of QSEN education with simulation for nurses impacts clinical judgment and frequency of documentation of deterioration parameters in an acute care hospital in southeastern Pennsylvania. The term novice nurse in this project referred to the newly licensed nurse with two years or less of licensed experience and currently enrolled in a nurse residency program. This timeframe aligns with current registered nurse residency program eligibility requirements (Ackerson & Stiles, 2018; Bittner et al., 2017). Cue recognition of the patient experiencing deterioration secondary to impaired oxygenation was observed and evaluated during high-fidelity simulation.

The phrase, “related aspects of clinical judgment” refers to Tanner’s identified clinical judgment characteristics (Tanner, 2006). These are noticing, interpreting, responding and reflecting. All are incorporated into the aforementioned LCJR, which was used to evaluate nurse residence responses during the simulation scenario. Each broad category within the LCJR also addresses corresponding sub-categories of behaviors and
characteristics, which allowed quantification of clinical judgment behaviors.

The resident cohort of 33 first received one hour of didactic education of the QSEN competencies and their use as a framework for clinical decision-making pertaining to cue recognition. Project participants then proceeded with a twenty-minute simulation scenario, which included pre-briefing and debriefing sessions. The interactive scenario focused on a patient with established lung disease who was newly admitted with pneumonia. This scenario integrated the cues which would eventually be measured to determine if a practice change was evident statistically.

A gradual change in the patient’s condition promoted interaction by the nurse residents with the high-fidelity mannequin and multiple opportunities to recognize both subtle as well as more overt cues of deterioration throughout the scenario and respond accordingly. The independent variables are the established QSEN competencies and associated KSAs, as well as the simulation scenario (QSEN, 2018). Dependent variables include the nurse residents’ current level of clinical judgment, the ability to recognize assessment and observational cues of patient status change and acknowledgement of those changes via documentation. Active recognition of patient deterioration was ongoing throughout the simulation, which reflected the frequent occurrence of such events in clinical practice.

**Clinical Question**

The formulated clinical question originated from research and literature reviews concerning the clinical problem of the nurse’s ability to recognize cues signaling patient compromise, particularly among the population of newly licensed registered nurses (Bennett et al., 2017; Burbach & Thompson, 2014). The question aligned with Benner’s
novice to expert theory as it pertained to the need for gradual experiential learning and various types of skill acquisition in the transition from academia to licensed nursing practice (Benner, 1984; Davis & Maisano, 2016; Murray, Sundin & Cope, 2019). Alignment was also evident with current research and literature reviews proposing a solution to a clinical problem which adversely affects safe care and can result in harm to patients. Simulation is one such solution, as it has been demonstrated to provide structured realism and experiential learning in a safe environment (Hart et al., 2015; Lasater, 2011; Lasater et al, 2015; Maxwell & Wright, 2016). Another viable solution, and one which is undergoing active research, is the integration of QSEN competencies into the licensed practice setting.

Use of a QSEN-based framework along with simulation has been cited in scholarly literature as a viable solution to address the stated clinical problem (Hart et al., 2015; Miraglia, & Asselin, 2015). Integration of QSEN competencies into licensed practice is also supported by major stakeholders (Dolansky & Moore, 2013; Sherwood & Zomorodi, 2014; Sherwood, G., Horton-Deutsch, S., & Sigma Theta Tau, 2015). Clearly, the solution is multi-faceted yet feasible. The following clinical question guided this quantitative project:

Q1: How does a QSEN competency framework, combined with simulation, positively affect cue recognition of patient deterioration in clinical practice, as evidenced by documentation of oxygen saturation and respiratory rate more frequently than every four hours?

This frequency of documentation had a dual alignment. First, strong recommendations were noted in current nursing and medical literature for patient safety initiatives to anticipate and prevent patient deterioration. Continual surveillance and
frequent monitoring of vital signs, even as frequently as every 15 minutes ensures a continued bedside presence of the nurse and allows monitoring and trending of data (Dalton, 2018; Quinten, van Meurs, Olgers, Vonk, Ligtenberg, & Maaten, 2018). Use of multiple linear regression in various studies had demonstrated a positive correlation between frequency of vital sign measurements and reduced incidences of rapid response and code blue situations (Dalton, 2018; Fasolino & Verdin, 2015). This strategy has proven to be valuable when further correlated with diagnoses known to frequently result in deterioration of patients’ conditions (Dalton, 2018; Fasolino & Verdin, 2015; Quinten et al., 2018). Examples of this include sepsis and chronic obstructive pulmonary disease (COPD) exacerbation.

Secondly, the clinical facility policy guiding the frequency of assessments and vital signs on medical-surgical units is every four hours until patient condition is stable and then every eight hours. The policy did emphasize that a nurse’s clinical judgment was to be used to follow up more often when indicators of patient deterioration were present (Hospital Policy, 2018). The clinical practice guidelines placed a stronger emphasis on the potential causes of patient deterioration based on medical diagnosis (Elsevier, 2016). An overall random review of documentation frequency on medical-surgical units by the content expert found that the majority of assessments were not performed more frequently than every four hours, despite noted patient condition changes.

This aligned with findings in the nursing literature noting that in current practice, physical assessments and documentation of vital signs performed by nurses may range in frequency from every 4 to every 12 hours in acute care facilities, despite patient acuity, diagnosis or potential for decline (Brice, 2014, Fasolini & Verdin, 2018). The literature
also noted that nurses’ reliance on early warning scores may replace clinical judgment and result in premature alerts to rapid response teams (Della Ratta, 2016; Fasolino & Verdin, 2018). The literature noted that while it is appropriate to recognize and acknowledge alterations in early warning scores as indicators of patient decompensation, sole reliance on scores may result in missed cues relative to correlated factors of patient condition change (Quinten et al., 2018). The end result is deficient cue recognition and harm to patients which can easily be prevented.

The resultant problem, intervention, comparison, outcome and time (PICOT) question effectively combines the noted clinical problem with theoretical underpinnings of professional nursing practice and approaches accepted as evidence-based solutions to address it in a way that supports safe quality care which is patient-centered and does not lead to patient harm. This includes an established valid and reliable tool to quantify clinical judgment characteristics, especially within simulation experiences. The LCJR has been instrumental in enhancing the benefit of simulation as it applies to the stated clinical problem (Ashcraft et al., 2013; Lasater, 2011; Lasater et al., 2014; Lasater et al., 2015). (P) Among nurses who care for cardiovascular patients on a nursing unit at an acute care nursing facility, does (I) education regarding recognition of anticipated patient deterioration using high-fidelity simulation guided by a QSEN-based framework, (C) compared to not using the framework in current practice, (O) result in increased anticipation of patient deterioration as measured by documentation of oxygen saturation and respiratory rate more frequently than every four hours (T) after three weeks?

Simulation was the evidence-based intervention used to promote a practice change (International Nursing Association for Clinical Simulation and Learning (INACSL)Standards Committee, 2016). The unfolding scenario, utilizing a National
League for Nursing template designed by Jeffries (2012) featured a commonly encountered clinical situation leading to patient deterioration. The specific cues signaling deterioration were respiratory rate and oxygen saturation measured via pulse oximetry. The scenario also served as a foundation for integration of the QSEN framework, as well as the quantification of the nurse residents’ clinical judgment.

**Advancing Scientific Knowledge**

Much of the nursing research over the past twenty years or so has focused on maintaining safe practice standards in the provision of nursing care, as it aligns with both the science and art of nursing. This research was essential considering the rapid growth of technological integration into care, along with a multitude of new medications, treatment modalities and the advent of computerized physician order entry (CPOE), care bundles and protocols, and a stronger emphasis on collaboration (Lyle-Edrosolo & Waxman, 2016; Turpin, 2014). Increased care complexity can result in a risk for more errors. The continued expansion of research into safe nursing care illuminated the scope of errors resulting from unsafe care.

Data demonstrated significant errors resulting in preventable patient harm and undesirable patient outcomes. A correlation was established between deficient clinical judgment skills and these adverse outcomes (Benner, 2015; Miller et al., 2014). Although unsafe care can be attributed to registered nurses with practice experience at any point along the novice to expert continuum, a gap was especially evident in newly licensed registered nurses transitioning from academia into licensed practice (Kalisch, 2016; Silvestre et al., 2017). Many studies also clarified that more complex nursing care required a revision in the orientation of newly licensed registered nurses (James, Patrician, & Miltner, 2017; Mansfield, 2014). The synthesis of data presented correlates
with a newly licensed registered nurse’s incomplete readiness to practice and is supported by Benner’s theory (Benner, 1984). Data and literature synthesis also support the need for facilitation and support of newly licensed nurses in the transition to independent practice.

The value of the project is that it addressed a proposed solution for skill acquisition of clinical judgment skills necessary in the provision of safe, quality, patient-centered care. Providing experiential learning through simulation and a structured framework of QSEN-based competencies focused on clinical judgment skills assisted newly licensed registered nurses in cultivating the necessary mindset needed for recognizing risks of patient condition deterioration (Altmiller & Hopkins-Pepe, 2019; Gillespie & Peterson, 2009; Lasater et al., 2014). It also assisted in facilitating the novice nurse’s adaptation to the level of complex decision-making required in acute care settings. The project served as a positive contribution to narrowing the knowledge gap regarding clinical judgment in newly licensed nurses, while simultaneously assisting in structuring a framework for applying that knowledge in the provision of safe patient care.

**Significance of the Project**

The foundation of this project’s significance was the avoidance of harm to patients secondary to missed and omitted care. Failure to recognize signs and symptoms of patient deterioration, whether overt or subtle, equates to missed care and serves as a barrier to a safe culture of care (Kalish, 2006; Kalish, 2015). Subsequent inaction equates to omitted care (Kalish, 2006). Since 2006, Kalisch has continued to research this problem in attempts to quantify and clarify all aspects of it (Kalisch & Aebersold, 2006; Kalisch, Landstrom & Williams, 2009). Missed and omitted care has been correlated with lack of cue recognition and poor patient outcomes and correlates strongly with the previously presented information.
Recognition of cues signaling impending or actual deterioration requires higher level cognitive synthesis of multiple factors, often simultaneously (Brice, 2014). The specific outcomes chosen for measurement in this project exemplified this process. Alterations in both oxygen saturation measurements, measured via pulse oximetry, along with those in a patient’s respiratory rate are commonly trended and audited values (Dalton, 2018; Chuang, Huang & Su, 2015; Quinten et al., 2018). These alterations are noted to be early signs of patient condition change and associated with chronic disease, worsening acute clinical problems and metabolic derangements (Angel, Ghneim, Song, Brocker, Tipton, & Davis, 2016; Miller, Owens & Silverman, 2015). Both are included within evidence-based guidelines for this reason.

This clinical problem has been specifically associated with inadequate adaptation and readiness to practice in the novice registered nurse population (Maloney, Fend & Hardin, 2015; McMullen, 2017). Focused research and initiatives for resolution of this clinical problem are now supported by TJC as well as the American Nurses Association (ANA) and other professional stakeholders (Kalisch, McLaughlin & Dabney, 2012; Kalisch, 2015). These facts emphasize the severity of the problem and the collaborative efforts required to address it. This project promoted awareness of professional accountability and the direct impact of the nurse’s clinical judgment on patient safety and positive patient outcomes.

Each QSEN competency includes a knowledge, skill and attitude which blends nursing care standards with applied clinical knowledge as well as professional attitudes (Kelly, Vottero, & Christie-McAuliffe, 2014; Quality and Safety Education for Nurses, 2018). Inclusion of the QSEN competencies and the KSAs into the project supported use of the nursing process, patient surveillance, collaborative decision-making and
professionalism (James, Patrician, & Miltner, 2017). The competencies were designed to serve as a standardized framework that promotes patient-centered care, patient safety and professional accountability (QSEN, 2018). They also support and promote a competency-based mindset in clinical practice (Lewis, Stevens, & Ciak, 2016; Sherwood & Zomorodi, 2014). Facilitating the transition to a complex acute care environment aids in overall retention as well as job satisfaction.

According to Benner’s novice to expert theory, experiential learning occurring within professional nursing practice includes all aspects of patient care provision (Benner, 1984). Core emphasis of the theory is placed on competency achievement and maintenance of those competencies in order to practice safe patient care independently. While a newly licensed registered nurse, according to Benner’s original theory, would be considered an advanced beginner, research indicates that this is not necessarily the case (Benner, 1984; Lasater et al., 2015; Murray, Sundin, & Cope, 2019). The gap between academia and the complexity of licensed clinical practice has placed demands on new graduates to rapidly transition, in opposition to the degree of readiness of those graduates to assume the licensed professional role (Kalisch, 2015; Zittel et al., 2016). Incorporating Benner’s theory into the project supported competency achievement using a structured, QSEN-based framework. The addition of simulation focused on cue recognition of the decompensating patient aligned all portions of the project with potential demonstration of quality improvement related to enhance clinical judgment.

Literature synthesis indicated that nurse residency programs are demonstrating positive outcomes relative to the transition of graduate registered nurses to licensed practice (Letourneau & Fater, 2015; Walsh, 2018). They allow for a period of structured, mentored guidance to ease anxiety throughout practice transition and promote readiness
to practice (Walsh, 2018). Many nurse resident programs are beginning to utilize simulation on a regular basis to promote experiential learning in a safe environment where reflective practices are incorporated before and after simulation (Lasater et al., 2015; Truglio-Londrigan, M., 2016). This is the current practice at the author’s clinical site.

This process aids in cue recognition and promotes the need for vigilance and surveillance through a bedside presence of the nurse so that signs of potential deterioration are recognized (Burbach & Thompson, 2014; Turpin, 2014). Simulation is an accepted modality in demonstrating practice change (Lasater, Johnson, Ravert, & Rink, 2014; Lavoie, Pepin, & Boyer, 2013; Wood, 2016). This project assisted in demonstrating the multi-faceted approach necessary in proposing a resolution to the stated clinical problem. Overall, it contributed to increased opportunities for reinforcing the need for a culture of safety in all care settings (Hirsch, 2016; Ulrich & Kear, 2014). This project was a form of advocacy for the nursing profession and patients.

**Rationale for Methodology**

Although a variety of methodologies may be useful in evaluating the problem of deficient cue recognition and clinical judgment in newly licensed nurses, quantitative studies enable statistical measurement of clinical judgment behaviors and characteristics (Astroth & Chung, 2018; Hoare & Hoe, 2013). Relying on subjective or reflective reporting among nurse residents obtained via qualitative or mixed studies does not provide the data necessary to address all factors contributing to the current knowledge gap (Hallin, Haggstrom, Backstrom, & Kristiansen, 2015; Victor-Chmil, & Larew, 2013). The project employed a quantitative methodology that allowed analysis of a linear relationship between its interventions and any degree of statistical significance. It also
promoted alignment throughout the project.

The Doctor of Nursing Practice (DNP) project is designed to result in a practice change through demonstrated application of course and program competencies, DNP practice essentials and evidence-based practice (Lusk, Melnyk, & Ford, 2015). The author’s project aimed to collect observed data relative to registered nurse residents’ recognition of a simulated patient deterioration based on clinical judgment behaviors. This was then correlated with a potential for practice change based on documentation frequency of the previously mentioned specific clinical indicators of patient deterioration. The project actively demonstrated competency achievement and the registered nurse’s professional accountability in following evidence-based nursing practice guidelines.

Facets of clinical judgment are noticing, interpreting, responding and reflecting, based on Tanner’s clinical judgment model (Tanner, 2006). The four categories have been incorporated into the LCJR (Lasater, 2011). The rubric utilizes a Likert scale along with the following ratings and values (see Appendix C): 1- beginning, 2- developing, 3- accomplished, and 4- exemplary (Lasater, 2011). This allowed data collection which correlated with and supported the theoretical and scientific underpinnings of the project and permission for its use was obtained from its creator.

**Nature of the Project Design**

The design type chosen was non-experimental and correlational. A non-experimental design aligns with quality improvement projects, as evidence-based knowledge is used (Hoare & Hoe, 2013; Pickard, 2017). The stated clinical question specific to this project could only be addressed thoroughly when comparative data was collected and analyzed. A previously performed power analysis supported a participant number of 31. The population was comprised of registered nurse residents with less than
two years of licensed practice experience and 33 registered nurse residents agreed to participate, from a total of 38 in the residency program.

The group first participated in a one-hour didactic session on QSEN competencies and their use as a framework for clinical judgment and cue recognition. This education was created by this author for the project and was designed to be interactive, correlating cue recognition with instances of missed and omitted care. During this time participants also completed a 15-point pre-test, serving as a baseline representing current clinical judgment abilities of the cohort related to cue recognition. A self-reflection survey was included with the pre-test (see Appendix C).

Answers to the pre-test questions were based on a scenario similar to that of the simulation, using a patient situation with a main problem of altered oxygenation, which was the basis for patient deterioration in the simulation scenario. A post-test using the identical question set was administered after simulation was completed. The use of non-identical patient situations was avoided to prevent data inaccuracy when comparing the mean results of both tests. This methodology also prevented prompting prior to the simulation and skewness related to LCJR scoring.

Subsequently, participants proceeded to simulation in groups of three or four. Although smaller groups were planned, the scheduled nurse residency activities and unequal attendance on the days nurse residents were available required adjustments to allow full project completion. The education and scenario were completed over two days. Ten nurses attended on the first scheduled project day and 23 attended on the second day.

The simulation scenario was completed using three high-fidelity mannequins and was centered on a patient admitted with COPD and pneumonia. All mannequins were in working order and had the ability to communicate and cough. All could be auscultated.
for adventitious breath sounds and heart sounds along with the ability to display
continuous cardiac monitoring and vital signs, including pulse oximetry. Props included
an oxygen setup, wall suction setup, an oral suction catheter, use of moulage simulating
cyanosis of the nailbeds and lips, plus a stethoscope and blood pressure cuff.

The scenario began with a mildly decompensated patient who continued to
gradually deteriorate over the 20-minute simulation session. The desired outcome was for
the nurse residents to respond comprehensively within the registered nurse scope of
practice, alerting the rapid response team only when necessary. Residents were observed
for the ability to respond to subtle and overt cues of compromise and deterioration such
as confusion, tachypnea and altered oxygen saturation via pulse oximetry. They were
instructed to verbalize rationales for all observations and actions, which enabled
comprehensive evaluation of cue recognition and scoring of the LCJR. A debriefing
session and completion of the post-test finalized that portion of the project.

The data obtained assisted in answering the previously stated clinical question.
The PICOT question was answered in several ways. These included recognition of the
selected indicators of a change in patient oxygenation and respiratory rate when
completing the pre-test and post-test, during the simulation, and in real-time
documentation of these assessments in bedside care provision. This demonstrated a
relationship between the QSEN competencies and recognition of cues of patient
deterioration. Baseline data of the frequency of documentation of the stated parameters
was collected for two weeks prior to the project date by the content expert. Identical data
was collected for three weeks after simulation for comparison and correlational analysis.

While simulation was used for many years in academia, it has become an
evidence-based method for enhancing practice change within registered nursing practice
(Crowe, Ewart, & Derman, 2018). The organized structure of simulation in all types of fidelity integrates current standards of practice, use of KSAs in patient care, and specifically addresses patient safety through enhancing practice change relative to cue recognition (Cooper et al., 2016). The literature notes that practice change has resulted when this intervention is used (Aebersold & Tschannen, 2013; Cooper et al., 2016; Crowe, Ewart, & Derman, 2018). This was the case in this project and is explained throughout the manuscript.

**Definition of Terms**

Terminology used within this document and the project reflects professional phraseology related to key concept and themes, as well as sub-themes related to the stated clinical problem. Appropriate sub-themes will be expanded upon in subsequent sections. The terms noted, cited and referenced herein are found throughout scholarly nursing literature. They reflect currently accepted practice standards and the overall concept of patient safety.

The following list of terms is central for clarity and comprehensive understanding of the clinical problem as well as the project itself. Essential terms include:

**Clinical judgment.** Clinical judgment is the nurse’s conclusion and interpretation of a patient’s needs, concerns and health problems as well as the subsequent actions taken or not taken in response (Tanner, 2006).

**Cue recognition.** Cue recognition refers to the acknowledged presence of both subjective and objective patient data by the nurse (Burbach & Thompson, 2014).

**Experiential learning.** Experiential learning in nursing refers to the acquisition of skills and understanding of patient care over time. It aligns with proficiency and competency levels in clinical practice (Benner, 1984).
**High fidelity simulation.** High fidelity simulation is use of a structured framework designed to evaluate clinical judgment. An electronic manikin is utilized to provide realistic patient responses, symptoms and vital signs, requiring participant interaction (Hansen & Bratt, 2016).

**Institute of Medicine.** The Institute of Medicine advocates for the health of the public and reports to the federal government on issues concerning medical care, research and education (Institute of Medicine, 2011).

**Lasater Clinical Judgment Rubric.** The LCJR is a rubric created to describe dimensions of clinical judgment. It provides a common language for promoting and measuring scholarly thinking (Lasater, 2011).

**Missed nursing care.** Missed nursing care refers to any aspect of required care that is omitted or delayed. The definition further specifies types of missed nursing care as assessments, cue recognition and failure to act (Kalisch, 2016).

**Newly licensed registered nurse.** The newly licensed registered nurse is one who has graduated from an accredited academic program and passed the national licensure exam and is entering the workplace for the first time. The newly licensed nurse is also referred to in scholarly literature as a novice (Benner, 1984; Murray, Sundin, & Cope, 2019).

**Novice to expert theory.** The Novice to expert theory is a nursing theory detailing the progressive proficiency of a nursing student and licensed nurse as both hands-on and cognitive skills are acquired through gradual experience (Benner, 1984).

**Nurse residency.** A nurse residency is a structured program with a planned period of time during which new nursing graduates can acquire skills to deliver safe quality care (Institute of Medicine, 2011).
**Patient deterioration.** Patient deterioration is the inability of a patient to maintain homeostasis and compensation. The signs exhibited may be subtle or overt (Burbach & Thompson, 2014).

**QSEN.** Quality and Safety Education for Nurses is an institute dedicated to the provision of safe quality care via a standardized competency framework. A major goal of the institute is to bridge the knowledge gaps between the academic setting and licensed practice (Quality and Safety Education for Nurses, 2018).

**QSEN KSAs.** The acronym KSA represents knowledge, skills and attitudes. Each of the six QSEN competencies includes a group of knowledge, skill and attitude which define how the competency is incorporated into nursing practice (Quality and Safety Education for Nurses, 2018).

**Scope of practice.** The scope of practice for nurses is a legal contract of accountability and responsibility that guides nursing care. It is determined by individual state nurse practice acts (Loughran, 2017).

**Transition to practice.** The transition to practice is the period of time between nursing student graduation and the beginning of licensed practice (Murray, Sundin, & Cope, 2019).

**Assumptions, Limitations, Delimitations**

Recognition, consideration and identification of assumptions, limitations and delimitations is important in any project. Although all are inherent to some degree, each has the potential to serve as a barrier within the alignment, data collection and results of a project and may generally contribute to uncertainty (Helmich, Boerebach, Arah, & Lingard, 2015). Assumptions are beliefs and perceptions that a person defines as realistic and truthful, but which is not confirmed by evidence (Cannon & Boswell, 2011).
Limitations are factors not recognized or planned for which can ultimately weaken or skew project results.

Examples can include attrition, malfunctioning equipment and incomplete data collection, among others (Cannon & Boswell, 2011). In contrast, delimitations are factors constructed to guide a project to consider alignment of it. Examples include cohort size and population sample (Cannon & Boswell, 2011; Helmich et al., 2015). Adequate organization and planning assists in alignment of a project and supports a framework that avoids flaws.

**Assumptions.** The following assumptions were recognized within this author’s project. It was assumed that each nurse resident had the desire to be an active participant in the project to enhance safe patient care practices. Nurse residency programs assist in closing the gap between the academic and licensed practice environment and contribute to professional growth and competence and nurses apply to these programs (Letourneau & Fater, 2015). It was assumed that the nurse residency program enhanced the situational and experiential learning occurring during actual patient care.

It was also assumed that the project population had the ability to recognize knowledge gaps serving as current barriers to safe care and were familiar with the meaning and purpose of reflective practice to address acknowledged gaps. Reflective debriefing was included post simulation in the project and has been demonstrated to be a valuable contributor to safe nursing practices (Lavoie, Pepin, & Boyer, 2013; Truglio-Londrigan, 2016). Participants were able to demonstrate use of reflective practice at a comfortable level through engagement during debriefing and through completion of the self-reflection questions included on the pre-test and post-test.

The assumption existed that nurse residents had at least an awareness of QSEN
competencies and their potential significance to nursing practice. The competencies and KSAs have been integrated into prelicensure education, required program texts and professional publications (QSEN, 2018). A show of hands during the didactic session demonstrated that over one-half of the cohort acknowledged a familiarity with the competencies and KSAs. Providing an interactive discussion of applied use of the competencies and KSAs in nursing care assisted in closing any knowledge gap in this process. The nursing residents demonstrated familiarity with key QSEN concepts through dialogue with observers during debriefing.

The simulation scenario featured a commonly occurring clinical situation. It was strongly assumed that nurse residents were familiar with high-fidelity simulation and would have no difficulty following directions in completing the project. The cohort of participants was currently enrolled in the nurse residency program and had been actively participating in simulation. Nurse residents demonstrated and reported feeling comfortable with the simulation procedure and expectations.

**Limitations.** Several limitations were recognized. One minor limitation was the potential concern for inter-rater disagreement in the scoring of the LCJR. Three simulations were run simultaneously. However, all observers who completed the scoring were familiar with high-fidelity simulation. One pre-simulation meeting with observers was held to explain the LCJR and instruct observers in its use.

A second meeting was held to complete a practice simulation and review scoring of the LCJR throughout the scenario. This provided a valuable opportunity for observers to become more familiar with the rubric and have all questions answered. The meeting also included those who would operate the simulation equipment. Finally, a post-briefing meeting was held after simulations on both project days to discuss scoring.
Another potential limitation initially identified was the relatively small sample size. However, given the limited timeframe available to complete the simulation, 33 participants enabled easier management of the simulation and its associated activities. The flow was smooth, and everyone worked synergistically to comprehensively complete the simulation and provide a valuable experience to the nursing residents. Ultimately, this author felt that the number of participants was adequate to enable statistical analyses.

This misperception of having decreased responsibility in clinical situations based on care setting provided opportunities for discussion. Observers initiated a conversation regarding the scope of practice of the registered nurse. This included an emphasis on the legal and ethical responsibilities of all registered nurses, no matter the care setting. The nurse residents expressed appreciation for this activity. The observers included the content expert and nurse educators, all of whom expressed the need for additional simulations for all facility nurses in the future.

**Delimitations.** Delimitations within the author’s project are important to mention. Selecting the simulation setting is an important component in replicating current practice relative to providing experiential learning opportunities (Lasater et al., 2014; Maxwell & Wright, 2016). The nurse resident simulation lab setting provided a unique opportunity to demonstrate the potential of the QSEN framework in clinical practice. Simulation frameworks promote customization of content along with specified timeframes for demonstrating competency (Jeffries, 2012; Jeffries, Rodgers, & Adamson, 2015). This assisted in controlling the progression of the simulation.

Selective use of a nurse resident cohort was another delimitation. Although members of this cohort were practicing independently for the most part, all would still be considered novices per Benner’s theory (1984). The project provided a valuable
opportunity for situational learning within an experience that emphasized patient-centered care, patient safety, teamwork and collaboration, and cue recognition. It also provided an opportunity to reinforce concepts relative to professional accountability and scope of practice.

**Summary and Organization of the Remainder of the Project**

The factors attributed to unsafe care as demonstrated in scholarly research are many. While all cited reasons are certainly important and must be addressed by the nursing profession, this project was most concerned with preventable harm to patients due to the inexperienced nurse’s deficient clinical judgment skills (Davis & Maisano, 2016; Sherwood & Zomorodi, 2014). Benner’s novice to expert theory figures prominently in explaining the crucial role of experiential learning, practice readiness, and clinical judgment as major contributing factors to the stated clinical problem as well as potential solutions for it (Benner, 1984; Benner, 2015). Cue recognition of patient deterioration was clarified as an essential component of clinical judgment and a key contributing factor resulting in patient harm as well as poor patient outcomes (Burbach & Thompson, 2014; Lyle-Edrosolo & Waxman, 2016). Subsequent sections in chapter one demonstrated project alignment through a detailed explanation of the clinical problem’s background and other supporting information.

Key terms, supporting concepts and theoretical as well as scientific underpinnings were presented and detailed in response to various facets of the stated clinical problem. Knowledge synthesis was demonstrated through presentation of a wide scope of research. Potential solutions to the stated clinical problem were proposed according to synthesized information reflective of stakeholder advocacy, the seminal work of major contributors to potential solutions, and current efforts. Examples included advocacy and professional
support by TJC, the ANA, and the IOM (IOM, 2011; Lyle-Edrosolo Waxman, 2016). This support is essential in resolving the stated clinical problem in a broader scope beyond this project.

Supportive and theoretical underpinnings also included Benner’s novice to expert theory to support and promote practice change, as well as the incorporation of QSEN graduate competencies into licensed practice (Davis & Maisano, 2016; Murray, Sundin, & Cope, 2019; QSEN, 2018). Additional support of the foundational concepts originated from use of a valid and reliable rubric to quantify behaviors and characteristics of clinical judgment, specifically during simulation (Lasater et al., 2015; Nielsen, Lasater, & Stock, 2016). Reference to nurse residency programs used to facilitate transition to practice for newly licensed nurses, using combined pedagogies as previously mentioned align with all other supportive concepts (Letourneau & Fater, 2015; Miller et al., 2014). All emphasize a multi-faceted and collaborative approach to the problem.

Chapter 2 provides a synthesized literature review which addresses all themes and sub-themes related to the clinical problem and its potential solutions. Chapter 3 provides detailed information on the project’s methodology and design, demonstrating alignment throughout the project. The focus of Chapter 4 will be the presentation of data analysis and results. One of the goals of the project was that it can easily be replicated in the future. Finally, the purpose of Chapter 5 is to summarize, discuss the impact of and interpret all findings.
Chapter 2: Literature Review

The modern acute care nursing environment requires skillful navigation by the nurse in order to ensure safe care provision to patients. The complexity of collaborative care models, high patient acuity, frequent patient care transitions and the integration of technology into all aspects of care can be overwhelming for even the most seasoned nurse (Benner, 2015). While the evolution of nursing practice in response to these changes has been required to ensure a sustained safety culture, nursing responsibilities and workload have exponentially increased (Lyle-Edrosolo & Waxman, 2016). Simultaneously, the acute care patient population presents with multiple comorbidities and a great potential for deterioration (Bennett et al., 2017; Mansfield, 2014; Zittel et al., 2016). The risk for errors occurring is high.

Competent clinical judgment and cue recognition skills are required to prioritize care and avoid preventable harm (Benner, 2015; Kalisch, McLaughlin, & Dabney, 2012). Although the initiation of evidence-based practices such as medication reconciliation, electronic documentation of assessments and electronic methods of medication administration-related documentation promote nurse-patient interaction, they often draw a nurse’s attention away from patients (McMillan, 2017; Turpin, 2014). A decreased bedside presence as well as patient surveillance has resulted in missed and omitted care (Kalisch, 2016; VanFosson, Jones, & Yoder, 2016). The paradoxical effect of safe care protocols on increased incidences of preventable patient harm is concerning.

The newly licensed nurse does not easily transition into such a complex environment. The level of clinical judgment has been noted to be underdeveloped in this population and therefore deficient (Bennett et al., 2017). Role expectations and
competencies specific to the student nurse level do not equate with those required in licensed practice. A lack of exposure to various types of experiential learning at the student level leads to an incomplete ability of the inexperienced registered nurse to provide complete care using sound clinical judgment (Benner, 2015; Kalisch, 2016; Lasater et al., 2015). These factors contribute to overall gaps in knowledge and clinical decision-making which directly and negatively impact patient safety and patient outcomes (Benner, 2015; Ulrich & Kear, 2014). The result of this is preventable patient harm.

Cue recognition is a component of clinical judgment and is essential in preventing patient deterioration and poor outcomes (Burbach & Thompson, 2014; Tanner, 2006). Lack of cue recognition has been a noted deficit among newly licensed registered nurses transitioning to licensed practice. Patient changes signaling potential decline and the need for interventions are missed or not fully addressed (Kalish, 2016; Lyle-Edrosolo & Waxman, 2016). Delayed adaptation to a complex care environment as previously explained, in combination with deficient clinical judgment skills and failure to recognize important patient cues signaling deterioration have been attributed to poor patient outcomes (Benner, 2015; Monagle, Lasater, Stoyles, & Dieckman, 2018). Despite orientation programs, preceptor guidance and a more consistent integration of nurse residence programs, literature reviews indicated a lack of standardization and meaningful structure in new nurse orientation programs (Hirsch, 2016; Letourneau & Fate, 2015). A revision of the orientation process for new graduate nurses is needed.

There is also inconsistent use of frameworks promoting professional growth and development specifically related to a novice nurse’s clinical judgment skills (Ackerson & Stiles, 2018; VanPatten & Bartone, 2019). A standardized framework focusing on
essential clinical judgment skills can facilitate the transition to practice. The QSEN competencies serve as such a framework as they are comprised of major components necessary for safe quality care (QSEN, 2018). Each competency incorporates the knowledge, skills and attitudes which align with the clinical judgment characteristics of noticing, interpreting, responding and reflecting (Cappelletti, Engel, & Prentice, 2014; Tanner, 2006). Competencies with accompanying KSAs promote synthesis-level cognitive skills fostering clinical judgment development and clinical competence.

The competencies are presented in a table format. Each competency is broadly defined. Vertical columns beneath each definition then provide detailed components of the knowledge, skills and attitudes necessary for use in nursing practice. For example, the QSEN competency of safety is defined generally as preventing patient harm (QSEN, 2018). The competencies and KSAs can be viewed in their entirety on the website included in the reference section.

The components in the knowledge column require the nurse’s active incorporation of these standards into each patient care situation, based on both baseline academic knowledge and experientially acquired knowledge. Components listed in the skills column align with the corresponding characteristics in Tanner’s clinical judgment model relative to noticing, interpreting and responding to patients’ needs. Finally, components included in the attitude column correlate with reflective practice and professional accountability. Consistent use of a QSEN framework promotes use of the nursing process, bedside presence and vigilance of cues related to patient status change (Altmiller & Hopkins-Pepe, 2019; Tanner, 2006; Turpin, 2014). The framework’s emphasis of clinical judgment and cue recognition benefits reflective, experiential learning in the new nurse graduate.
The purpose of the author’s project was to utilize a QSEN-based clinical judgment framework and a high-fidelity simulation scenario focused on patient deterioration to demonstrate improved clinical judgment skills among newly licensed nurses enrolled in a nurse residency program. Active integration of graduate QSEN competencies into licensed practice is a major goal of the QSEN Institute and other stakeholders (QSEN, 2018; Sherwood et al., 2015; Stout, Short, Aldrich, Cintron, & Provencio-Vasquez 2015). The original impetus for this initiative began with the IOM (IOM, 2011; Quality and Safety Education for Nurses, 2018; Stout et al., 2015). Merging QSEN competencies with simulation, especially within nurse residency programs, has been increasingly noted in scholarly literature as an effective approach in addressing the aforementioned knowledge and practice gaps (James, Patrician, & Miltner, 2017; Lewis, Stevens, & Ciak, 2016; Prion, Burman, Karshmer, Van, Wallace, & West, 2015). This evidence reinforces the need for new standards in the orientation of new graduate nurses.

A comprehensive literature synthesis conducted over one and one-half years identified the main themes and sub-themes correlated with the clinical problem of deficient cue recognition and clinical judgment among novice nurses. The initial keyword list included QSEN, clinical judgment, simulation and graduate nurses. This list was eventually expanded to include novice nurses, transition to practice, clinical competency, clinical decision-making, newly licensed nurses, novice nurse orientation and nurse residency programs. Databases used for research and synthesis included ProQuest Education Journals, Elton B. Stevens Company (EBSCO) healthcare databases, Google Scholar, and Education Research Complete.
Articles meeting inclusion criteria were those evaluated as empirical, those which featured research on novice nurse populations within the United States (U.S.), except for those globally validating the LCJR, and those containing one or more of the keywords. Articles excluded were those later determined to be non-empirical and foreign articles featuring novice nurse populations incongruent with those in the U.S. Scholarly articles written within the past five years were reviewed. The majority of articles met that time frame, although supportive and seminal works beyond that time frame were utilized where appropriate to strengthen and support main conceptual ideas. One hundred fifty were reviewed and 100 were retained.

This comprehensive compilation of literature emphasizes the clinical problem’s scope as well as feasible practice changes. A total of six main themes were researched, each with three associated sub-themes. Table 1 outlines the foundation theme, six main themes directly correlated to the foundation theme, and the 18 sub-themes. The table assists in examining the complexity of this clinical problem.
Table 1

*Literature Synthesis Topics*

<table>
<thead>
<tr>
<th>Foundation Theme: Clinical Judgment and the Novice Nurse</th>
<th>Main Theme 1: Novice Nurse</th>
<th>Main Theme 2: Clinical Judgment &amp; Assessment</th>
<th>Main Theme 3: The novice nurse knowledge gap</th>
<th>Main Theme 4: QSEN</th>
<th>Main Theme 5: Simulation</th>
<th>Main Theme 6: Nurse residency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-theme 1: Experiential learning</td>
<td>Sub-theme 1: Role enculturation</td>
<td>Sub-theme 1: Safe care practice</td>
<td>Sub-theme 1: Clinical decision-making</td>
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<tr>
<td>Sub-theme 2: Novice to expert theory</td>
<td>Sub-theme 2: Clinical judgment development</td>
<td>Sub-theme 2: Competency framework</td>
<td>Sub-theme 2: Competency development</td>
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<tr>
<td>Sub-theme 3: Transition to practice</td>
<td>Sub-theme 3: Mentor support</td>
<td>Sub-theme 3: KSAs</td>
<td>Sub-theme 3: Reflective briefing</td>
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<td>Sub-theme 3: Critical thinking</td>
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<td>Sub-theme 3: Facilitated transition</td>
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</tbody>
</table>

*Note.* Comprehensive list of themes and sub-themes.

**Theoretical Foundations**

Nursing theories support the rationale for all nursing care standards and include four main concepts. These include patient, health, environment and nurse which define both the art as well as the science of nursing (Duffy, Donnell, & Snowden, 2014). Within each specific nursing theory, they provide a framework which guides care planning and clinical decision-making. Patient needs are the central focus of any nursing theory (Duffy, Donnell, & Snowden, 2014). Theoretical principles specific to each nursing theorist then define the meaning of health, the environmental impact on health, and care.
provision guidelines used by the nurse to comprehensively and holistically address
patient needs. This section will be used to discuss theoretical underpinnings related to the
author’s project, aligning them with the PICOT question as well as associated scientific
underpinnings associated with PICOT question components based on empirical evidence.

Tanner’s clinical judgment model provides the foundation for the entire project.
The core components of Tanner’s model encompass the concepts of clinical judgment,
clinical decision-making, cue recognition and bedside presence (Bennet et al., 2017;
Tanner, 2006; Hines & Wood, 2016). Clinical judgment competencies have historically
been part of the nursing process and safe care provision. However, prior to the creation of
Tanner’s model, specific characteristics and behaviors of clinical judgment were not
clearly identified (Tanner, 2006). This resulted in confusion and uncertainty in how to
specifically define clinical judgment competence. This led to difficulties in educating
nurses with any level of experience about the importance of clinical judgment as well as
the ability to quantify it (Dolansky & Moore, 2013; Monagle et al., 2018; Tanner, 2006).
Defining the characteristics and behaviors of clinical judgment was a pivotal moment in
nursing history.

In addition to clarifying clinical judgment, these definitions aligned the nursing
process with safe care provision, emphasized the nurse’s accountability in safe care
provision, and also identified critical thinking and clinical reasoning as essential
foundational principles in clinical judgment development (Cazzell & Anderson, 2016;
Georg, Karlsgren, Ulfvarson, Jirwe, & Welin, 2018; Tanner, 2006). Each principle noted
has its own specific behaviors and characteristics.

The behaviors and characteristics of clinical judgment as defined by Tanner
(2006) are noticing, interpreting, responding and reflecting. These behaviors and
characteristics are representative of cognitive thought processes using application, analysis, synthesis and evaluation (Dickison et al., 2016; Leslie, 2018). Noticing is used by the nurse to evaluate the patient responses and data relative to compensatory ability. The ability of the nurse to differentiate normal patient responses and data from abnormal responses and data is required to recognize subtle cues of deterioration (Benner, 2015; Turkel, Marvelous, Morrison, & Singletary, 2016). Interpreting and responding then require higher level cognitive reasoning to prioritize patient needs based on compensatory ability and to intervene appropriately to ensure patient safety and positive outcomes (Dickison et al., 2016; Leslie, 2018; Tanner, 2006). Prioritization is a component of clinical judgment.

This entire process aligns with that of the nursing process, the theoretical principles of patient, health, environment and nurse, and the nurse’s scope of practice as part of evidence-based nursing practice (Melnyk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). Clinical judgment and its behaviors and characteristics, as well as the nursing process align and correlate with the KSAs of the QSEN competencies and promote a culture of safety (Dolansky, Schexnayder, Patrician, & Sales, 2017; Hirsch, 2016). Reflecting is an essential element of self-evaluation and progressive skill acquisition and competency achievement as it relates to clinical judgment, cue recognition and clinical decision-making (Monagle et al., 2018; Tanner, 2006). The cyclical pattern of Tanner’s model emphasizes the importance of ongoing assessment of a patient’s compensatory ability.

Benner’s novice to expert theory incorporated Tanner’s model and demonstrated alignment between clinical judgment as it is defined within the model and competence in clinical judgment via skill acquisition over time. The theory focuses on guided
Benner defined progressive stages of clinical competence to compare situational learning that occurs in the academic environment with that of the licensed practice environment (Benner, 1984; Benner, 2015; Walton, 2016). Benner’s defined stages are novice, advanced beginner, competent, proficient, and expert.

Benner recognized a novice nurse as one without prior clinical experience and therefore lacking clinical judgment skills. Achievement of advanced beginner status was stated as occurring upon entry into licensed practice. The gradual progression of experience and knowledge led to the ultimate goal of expert (Benner, 1984; Sherwood & Zomorodi, 2014; Walton, 2016). The theory did recognize that this progression occurred linearly, yet not according to any specific timeframe. Since its formulation, Benner’s theory has been used and referred to often in scholarly research and literature to guide models for successfully transitioning novice nurses to practice while building clinical judgment skills (Bryksynski, 2014; Lasater et al., 2015; Sherwood & Zomorodi, 2014). Benner’s work has been invaluable to the nursing profession.

Although originally the focused setting for application of Benner’s theory was academia, current applications have evolved to more strongly focus on licensed clinical practice, specifically the new graduate nurse’s transition to practice (Hansen & Bratt, 2015; Hart et al., 2015). Multiple applications of the theory are used in various pedagogical approaches facilitating the newly licensed nurse’s transition to practice. Some examples are simulation, nurse residency programs, and clinical judgment frameworks and rubrics, all of which assist in quantifying clinical judgment ability (Everett-Thomas et al., 2015; Lasater et al., 2015; Nielsen, Lasater, & Stock, 2016). Benner’s contributions to the nursing profession continue to the present day.
It is to be noted that while Benner’s original language defines the novice nurse as one without experience; a student nurse, current literature redefines the term as a nurse with one to two years of licensed practice experience and limited clinical judgment skills (Bittner, Gravlin, MacDonald, & Bourgeois, 2017; Fenske, Harris, Aebersold, & Hartman, 2013). This definition recognizes the knowledge and practice gap of newly licensed nurses (Benner, 2015). This has assisted in customizing the needs of new graduate nurses relative to adaptation to clinical practice, resilience and clinical judgment development. This entire process, as well as the appropriate phraseology, will most likely continue to evolve and be redefined.

Simulation is not necessarily a theory or a model in and of itself. It is however an evidence-based methodology that lends realism and opportunities for situational learning in nursing. Historically, simulation took place with mannequins that had no ability to interact with learners. Over time, simulation technology has evolved dramatically. Modern mannequin simulators have the capability to interact verbally with learners, receive and respond physiologically to medications administered to them, display vital signs and cardiac rhythms, and can even be intubated (Sanko, 2017). This has not only enabled more consistent use of simulation throughout all levels of nursing education but has also enabled directed situational learning relative to specific situations and encounters that a novice nurse may face.

In the early 21st century Pam Jeffries, working with and supported by the National League for Nursing (NLN), created a framework for use of simulation in nursing education (Adamson, 2015; Jeffries, 2007; Truglio-Londrigan, 2016). The creation of this framework was pivotal in further defining and clarifying clinical judgment characteristics and behaviors as previously defined by Tanner (2006) and methods for incorporating
these concepts into customized simulation scenarios (Adamson, 2015; Durham, Cato, & Lasater, 2014; Tanner, 2006; Sanko, 2017). The research subsequently inspired by Jeffries’s seminal work defined the important concepts of simulation models as well as various stages of simulation necessary to afford meaningful learning (Adamson, 2015; Jeffries, 2007; Jeffries, 2012). Key terms associated with his author’s project are fidelity, pre-briefing and reflective debriefing.

Fidelity refers to the amount of realism incorporated into simulation design and is accomplished through the use of a sophisticated mannequin (high-fidelity), as well as the specifically structured design of the scenario (Jeffries, 2012). Pre-briefing has been found to decrease anxiety during simulation and allow participants to mentally prepare for the scenario (Adamson, 2015, Sanko, 2017). Reflection as part of the debriefing stage of simulation was an addition inspired by ongoing research. Reflection allows both verbal and cognitive self-evaluation by participants and aligns with Tanner’s (2006) clinical judgment model (Jeffries, 2012; Jeffries, Rodgers, & Adamson, 2015; Lavoie, Pepin, & Boyer, 2013). Use of simulation within this author’s project focuses on cue recognition of the decompensating patient.

Lasater continued to build on the research of Jeffries, with a goal to further customize simulation to the needs of novice nurses and clinical judgment development (Lasater, 2007). Thus, the Lasater Clinical Judgment Rubric was developed. The rubric was based on Tanner’s clinical judgment model and also incorporated experiential learning tenets within Benner’s novice to expert theory (Lasater, 2007; Tanner, 2006). The rubric can be found in Appendix B.

Dissemination of Lasater’s research and rubric resulted in its application in a variety of academic and non-academic settings, both nationally and globally (Lasater,
2015; Nielsen, Lasater, & Stock, 2016). Although early efforts focused on the nursing student, the established validity and reliability of the rubric in multiple studies over time has led to its use in clinical practice, incorporating use of the QSEN graduate competencies (Everett-Thomas et al., 2015; Koffel, Burke, McGuinn, & Miltner, 2017; Prion et al., 2014). A QSEN competency-based clinical judgment framework, incorporating the LCJR was employed in this author’s project. One goal of the project was to demonstrate potential practice change relative to clinical judgment skills when the LCJR and QSEN were merged with simulation. Practice change was statistically demonstrated through documentation of altered oxygen saturation and respiratory rate in clinical practice.

The concept map in Figure 1 below is this author’s interpretation of the correlation between Tanner’s model and the QSEN competencies and KSAs. The construction demonstrates the interrelationship between clinical judgment behaviors and characteristics, the KSAs and the QSEN competencies. The overall framework unites all concepts. The relationships and associations are a reflection of this project’s theoretical underpinnings and the literature synthesis (Dolansky & Moore, 2013; Lasater et al., 2015; Lyle-Edrosolo & Waxman, 2016; Sherwood & Zomorodi, 2014).
Figure 1. Correlation between QSEN competencies and Tanner’s model, author’s perception.

Review of the Literature

The applicable major themes (concepts) and sub-themes have been previously identified and organized in Table 1. All literature reviewed was based on the following PICOT question: (P) Among nurses who care for cardiovascular patients on a nursing unit at an acute care facility, does (I) education regarding recognition of anticipated patient deterioration using high-fidelity simulation guided by a QSEN-based framework, (C) compared to not using the framework in current practice, (O) result in increased anticipation of patient deterioration as measured by documentation of oxygen saturation and respiratory rate more frequently than every four hours (T) after three weeks?

As previously stated, the foundational theme supporting the author’s project was
clinical judgment and the newly licensed (novice) registered nurse. The identified and researched sub-themes were novice nurses, clinical judgment and patient assessment, the novice nurse knowledge gap, QSEN, simulation, and nurse residency programs. Within the current heading, a detailed literature synthesis is presented which explains the rationales and comprehensive inclusion of themes and sub-themes pertaining to the stated clinical problem and the components of the PICOT question. It is essential to note that although each theme and sub-theme has a separate definition and impact on clinical judgment in nursing, all interrelate and correlate to safe nursing care and safe patient outcomes.

**Novice Nurse.** It is important to note that in this author’s project, as well as in the current literature, the novice nurse is defined as a licensed graduate with two years or less of licensed practice experience (Ackerson & Stiles, 2018; Crimlisk, 2017). As mentioned previously, this differs somewhat from Benner’s definition of novice (Benner, 1984). An evolution in academic curricula since the time of Benner’s theory ensures that new graduates are deemed to be competent in clinical judgment skills to some degree (Al-Dossary, Kitsantas, & Maddox, 2014; Hart et al., 2015; Stinson, 2017). The deficiency is demonstrated in complex and unfamiliar situations.

As novice nurses transition from academia to the licensed care practice setting, knowledge gaps exist which contribute to incomplete decision-making and inefficient clinical judgment. Such knowledge gaps result in missed cues and incomplete care (VanFossen, Jones, & Yoder, 2016; Bennett et al., 2017). Knowledge gaps have been associated with incomplete experiential learning overall, as well as decreased situational experience in independent problem solving and decision-making. The sub-themes directly correlate with the novice nurse experience when entering licensed practice.
**Experiential Learning.** Experiential learning is an important component in developing competent clinical judgment skills. The authors of, “A framework to support preceptors’ evaluation and development of new nurses’ clinical judgment” (Nielsen, Lasater, & Stock, 2016) asserted that experiential learning with the support of preceptors is essential to newly licensed nurses. Experiential learning in a collaborative and supportive relationship with a mentor enabled growth of clinical judgment skills. The authors questioned whether a framework and rubric developed to guide the process of clinical judgment development would facilitate a successful transition to practice.

This study utilized a mixed methodology. The focus of this article was on seven preceptors and their experiences with 200 newly graduated nurses during orientation periods over a one-year time span. All preceptors were familiarized with Tanner’s clinical judgment model prior to utilizing the LCJR during the orientation periods. Quantitative data were not reported.

Qualitative data were collected via focus groups of preceptor comments. Preceptor comments noted common clinical judgment deficits among newly licensed nurses similar to those previously mentioned. Some examples were poor cue recognition, delayed response time in addressing patient problems, and a lack of confidence in general. It was noted repeatedly by the preceptors that the LCJR provided a structured framework to guide them during orientation of the newly graduate nurse and to be able to anticipate barriers to safe care.

Noted limitations pertaining to this article and the study results were the small sample size and the patient assignment loads of the preceptors interfering with providing optimal feedback to the novice nurses at times. Otherwise, the authors concluded that the
framework and rubric allowed evaluation, feedback and measurement of clinical judgment growth. Recommendations were suggested to repeat the study with larger groups and extend it into pre-licensure settings to better close the gap between academia and licensed practice (Nielsen, Lasater & Stock, 2016). These findings correlated with the need for this author’s project as previously identified.

**Novice to expert.** Benner’s novice to expert theory was the foundational theory in a scholarly article with a focus on safe care ability among new graduate nurses. Murray, Sundin and Cope (2018) presented an article titled, “Benner's model and Duchscher's theory: Providing the Framework for Understanding New Graduate Nurses' Transition to Practice”. The authors conducted a study with a goal of demonstrating the necessity of incorporating both nursing as well as scientific theories into newly graduated nurses’ transition to practice periods to better understand this process and to customize goal-setting for new graduate nurses. The sub-theme directly correlating to this goal was safe quality care provision in the novice nurse population.

In comparison to Benner’s theory, which focused on accumulating skills which assisted in clinical judgment development, Duchscher’s theory concentrated on the emotional and behavioral adjustment phases of student nurses entering licensed practice (Duchscher, 2008; Murray, Sundin, & Cope, 2018). The foundational concepts within this theory were that emotional and behavioral adaptation to the role of a newly licensed nurse occur over a one-year period of time, with full adaptation achieved after approximately nine months of licensed practice (Duchscher, 2008). During this time frame, the emotional shock experienced by the novice nurse served as a barrier to situational learning and the ability to assume full role responsibilities (Murray, Sundin, & Cope, 2018). When aligned with Benner’s theory, correlation can be seen between the
novice registered nurse and unsafe patient care practices.

A mixed methodology was used so that qualitative data could be collected relative to self-reflection and perceptions among novice nurses of their ability to provide safe care, although statistical data was not reported. However, interview statements from novice nurses were included in a narrative format. A summary of overall statements demonstrated the cognitive adaptation based on Benner’s identified novice to expert stages, as well the perceptual adaptations occurring in the first year as licensed nurses. No limitations were disclosed. The authors reported that comments obtained from new graduate nurses correlated with both theoretical concepts and it was recommended that collaborative efforts between nurse managers, preceptors and novice nurses utilize both theories as frameworks to facilitate adaptation and skill acquisition in the first year of licensed practice (Murray, Sundin, & Cope, 2018). This supported this author’s use of Benner’s theory in the project.

**Transition to practice.** Monagle, Lasater, Stoyles & Dieckmann (2018), acknowledged that new graduate nurses exhibit a deficiency in clinical judgment skills as they transition to practice. In the article, “New graduate nurse experiences in clinical judgment: What academic and practice educators need to know”, they questioned whether an organized framework focusing on clinical judgment would assist in supporting practice transitions while also supporting growth of clinical judgment skills. The LCJR was used to obtain data. New graduate nurses participated in a mixed methods study of didactic education and simulation. These focused on the use of clinical judgment required in various nursing roles.

The cohort was a convenience sample of 74 new nursing graduates from three hospitals on the east coast and one on the west coast. All were beginning their first year
of practice. The use of surveys, reflective questionnaires, and face-to-face structured reflection sessions were held after five and 12 months of practice. The cohort reported a greater awareness of clinical judgment related behaviors and a positive impact on cue recognition and patient safety. However, one acknowledged limitation was a 32% attrition rate which affected data collection and results. A recommendation was made for collaboration and collaborative studies related to clinical judgment between clinical educators and nursing faculty (Monagle, Lasater, Stoyles and Dieckmann, 2018). Research in this area is lacking.

In summary, this section has elaborated on some of the factors impacting clinical judgment in the novice nurse stemming from both cognitive as well as emotional adaptive responses upon entry into licensed practice. Evidence based research indicates potential resolutions to this problem. Research data indicate that a focused approach on clinical judgment in the academic setting can carry over to clinical settings and licensed practice (Davis & Maisano, 2016; Nielson, Lasater & Stock, 2016). Clearly, collaboration between academic and clinical educators is an area to focus on.

**Clinical Judgment.** The term clinical judgment may be defined differently within scholarly literature and research studies. However, Tanner’s clinical judgment model defined it as, “the nurse’s conclusion and interpretation of a patient’s needs, concerns and health problems as well as the subsequent actions taken or not taken in response”, (Tanner, 2006, p. 204). Critical thinking is one of the foundational concepts a novice nurse develops. Clinical reasoning and clinical judgment then follow (Cappelletti, Engel, & Prentice, 2014). Relative to this author’s project, development of clinical judgment skills is directly applicable to a newly licensed nurse’s ability to provide safe quality care.

**Cue recognition.** The concept of cue recognition was explored by Burbach &
Thompson, (2018) via a systematic literature review of 20 studies sampling over 200 nurses. The authors questioned the cause for missed cues by novice nurses and how cue recognition differs between novice and expert nurses. Cue recognition within the article encompassed cues originating for objective and subjective sources. Cues were further defined by the authors as both subtle and overt (Burbach & Thompson, 2018). An integrative review of 27 articles of both quantitative and qualitative studies was conducted using both Benner’s and Tanner’s theories as guides.

The Quality Assessment Tool for Quantitative Studies was used to appraise the reviewed literature. Phenomenology, grounded theory and ethnography were used in qualitative study evaluation. Methods noted within the review used to obtain data on cue recognition included case studies, simulation, real-time observations and reflective journaling. Studies comparing novice with expert nurses consistently demonstrated strong cue recognition skills. The only noted limitations were the lack of in-depth research on cue recognition, and a lack of clarity in defining the term.

Their conclusions were that cue recognition is under-developed in the novice nurse and is incomplete. This leads to under-recognized or unrecognized signs of patient decline as well as incorrect nursing actions in addressing patient problems. The only limitation noted was the lack of studies on this topic, which they recommended be resolved by conducting future studies (Burbach & Thompson, 2018). The ability to accurately recognize signs of change in a patient’s condition is vital to patient safety.

**Bedside presence.** Closely related to cue recognition is that of bedside presence. In,” State of the Science of Nursing Presence Revisited: Knowledge for Preserving Nursing Presence Capability” (2016), Turpin synthesized a literature review after questioning how bedside presence is defined and positively impacts patient outcomes.
Multiple studies of various methodologies were reviewed, covering a time frame between 1986 and 2012. Over one thousand nurses were part of the various cohorts. Two tools identified as measuring nursing presence were the Measurement of Presence Scale and the Presence of nursing Scale. Findings demonstrated a direct link between bedside presence and the ability to recognize cues of potential status changes.

The literature synthesis demonstrated that a nurse’s presence at the bedside promotes interaction with the patient and aligns with Tanner’s (2006) clinical judgment concept of noticing and increases opportunities for the detection of clinically relevant patient data (Tanner, 2006). Overall findings were similar to the preceding sub-theme in that clear definition of the term is not consistent throughout the literature. A general summation by the author was that presence of a nurse at the bedside can be measured, but the significance of it in safe care provision is under-recognized and under-valued. The only limitations noted were the wide scope of studies and in some cases a small cohort. Recommendations included replication of more focused studies in larger populations (Turpin, 2016). More studies are definitely needed.

**Critical thinking.** Critical thinking is a necessary component in the development of clinical judgment skills, according to Cazzell and Anderson (2016) who conducted a study to question how critical thinking development impacts and relates to that of clinical judgment. The study employed a quantitative, descriptive correlational methodology and included a cohort of 160 senior nursing students in a baccalaureate program over a two-year period. Structured simulation using the LCJR was used. The simulation served as a structured clinical examination.

It was concluded that understanding definitions and characteristics of both concepts aided in their development and application in practice. Critical thinking was
defined in the study according to types of reasoning such as inductive and deductive per
the Health Sciences Reasoning Test (HSRT). Clinical judgment was defined by its
characteristics as previously defined by Tanner (Tanner, 2006). Clinical judgment
abilities were able to be evaluated with the LCJR.

Acknowledged limitations were the small sample size from a single university
and ethnic diversity among the students where English was a second language and may
have affected responses. Recommendations were made for educators to adopt a universal
definition for critical thinking and clinical judgment to enable skill development in the
transition to practice. As with similar studies previously cited, replication was
recommended. Replication across student groups as well as in licensed practice can
enable distinct definitions of the two terms and better guide students in the transition to
practice (Cazzell & Anderson, 2016). Clarification of terminology and practical
applications is required for sustainability of safe care.

In summary, assessment skills using efficient clinical judgment must be
emphasized in all educational settings. Actual and simulated learning experiences
contribute to competent skill achievement. Self-reflection by the novice nurse is as
important as formal or experiential instruction and this concept should be a core
component of academic nursing curricula. The habits of mind necessary for professional
role development can then continue into licensed practice.

**Novice Nurse Knowledge Gap.** The root causes for knowledge gaps in the newly
licensed nurse have yet to be fully determined. However, a full literature synthesis as
described in this chapter, identifies multi-factorial origins. It is clear from a review of
these sources that root causes originate from deficits related to applied skills, cognitive
reasoning abilities and emotional adaptation to the nursing role (Flores, Hickenlooper, &
Saxton, 2013; Hallin et al., 2015). Socialization into the nursing culture as well as the ability to establish mentoring relationships with others have also been mentioned in the literature and being more fully explored. As previously mentioned, both nursing as well as scientific theories assist in further explaining and defining the problem, as well as proposing viable solutions.

**Role enculturation.** Adaptation and enculturation have been noted to occur in various ways as a nurse enters licensed practice. Facilitation of this process has been recognized as essential to the assurance of safe patient care as well as retention of newly hired graduate nurses (Lalonde & Hall, 2016; Maryniak, 2017). These concepts were further explored in the article, “A Newly Licensed Nurse Orientation Program Evaluation: Focus on Outcomes” (Bittner, Gravlin, MacDonald, & Bourgeois, 2017). The purpose of the study was to explore an alternate design for a novice nurse orientation program.

The premise of the study was that it be collaborative between academic educators, students and licensed nursing staff. The Nurse of the Future Nursing Core Competencies (NOFNCC) were a main foundational principle of the study. These competencies are similar to QSEN competencies but also include specific competencies for leadership, professionalism and communication. Each competency includes corresponding KSAs.

The mixed methods study included 46 senior nursing students transitioning to licensed practice. The entire program duration was one year and included a framework composed of didactic sessions, preceptor engagement, simulation and periodic follow-up to evaluate critical thinking and clinical judgment skills. A total of 400 hours of activities were provided and quantitative data was collected using a valid critical thinking diagnostic (CTD) tool. Qualitative data was collected via evaluations during and at the
conclusion of the program, as well as during verbal exchanges between newly licensed nurses and preceptors.

Both quantitative and qualitative data supported findings of critical thinking and clinical judgment growth, along with facilitated enculturation and nursing role adaptation. Success was attributed to the varied pedagogical framework, as well as the use of simulation. A noted limitation was a significant attrition rate, with only 24 nurses completing the full program. The authors asserted that a main implication of this study was that a well-organized, collaborative design is necessary to facilitate both cognitive and emotional adaptation of the novice nurse to licensed practice (Bittner, Gravlin, MacDonald, & Bourgeois, 2017). This assertion is supported by previously stated findings within the literature synthesis.

Clinical judgment development. It has been established within this literature review that clinical judgment skills incorporate cognitive evaluation of a patient situation. It has also been established that adaptive ability of a novice nurse from an emotional perspective can negatively impact cognitive decision-making skills (Wardrop, Coyne, & Needham, 2019). Thus, role modeling of clinical judgment by mentors and preceptors can assist in its development in new nursing graduates. Lasater, Johnson, Ravert and Rink (2014) assert that passive modeling may not be sufficient and studied a more active approach.

The authors explored the potential for expert modeling of clinical judgment characteristics and behaviors within simulation. A mixed methods study included over 200 student nurses in two countries. All participated in simulations and then self-reported via questionnaire. Quantitative data were acquired via use of the LCJR. Although participants were geographically separated, all experienced identical pre-briefing and
debriefing procedures, as well as an identical simulation scenario.

Findings indicated that modeling promoted awareness of clinical judgment behaviors and the effect of clinical judgment development on subsequent actions taken in response to patients’ changing needs. Limitations did occur in the response rate, but overall there was strong clinical significance. A recommendation was made for future studies (Lasater, Johnson, Ravert & Rink, 2014). Modeling of professional behaviors is valuable at all stages of professional development and this work has great potential in new graduate residency education, as well as in mentoring.

**Mentor support.** A synthesis of scholarly literature clearly identifies the value of mentoring relative to the previous themes, sub-themes and principles of this author’s project. Mentoring is valuable for emotional support, its contributions to experiential learning, and overall adaptability of the novice nurse to the licensed nurse role (Williams, Scott, Tyndall, & Swanson, 2018). Formal mentoring during the transition to practice was studied by Killian (2015). The article was titled,” Examining Mentoring Relationships for Nurses: A Pilot Study (Killian, 2015). The qualitative study was conducted to gain a perceptual perspective on the relationship between novice nurse and mentor and was based on Benner’s (1984) novice to expert theory.

This study matched new graduates with mentors and obtained data via questionnaires at regular intervals for the first year. There were 37 new graduates and 21 mentors. No specific structure guided the relationship or the orientation. Both mentors and orientees completed questionnaires to yield data regarding the relationships. While newly graduated nurses reported that it was generally beneficial to have an assigned mentor, inconsistent contact and communication with that mentor did not result in a satisfying relationship.
A noted high attrition rate and poor design did not indicate strong statistical or clinical significance. A recommendation was made to redesign the study and repeat it with a larger sample (Killian, 2015). While this study may be interpreted by some as meaningless, it was valuable in further clarifying the need for revisions in transition to practice orientation programs. Findings also emphasized the emotional components of enculturation and adaptation to the licensed nurse role.

In summary, the novice nurse knowledge gap is negatively impacted by many factors. It is clear that more studies focused on the roles of the nurse and the graduate nurse perspective is a valuable component in resolving the issue. Mentoring is important and need not be a formally assigned role. All nurses have a responsibility to mentor others.

**QSEN.** The QSEN competencies originated for use in academia, although graduate competencies were formulated at the same time (Lewis, Stephens, & Ciak, 2016). Although there are six competencies, the recurrent theme throughout all competencies and KSAs is safe quality care. In light of the evidence presented within this literature review, it is essential that integration of the competencies into clinical practice occurs (Dolansky & Moore, 2013; James, Patrician, & Miltner, 2017). This author incorporated the competencies into simulation within a nurse residency program for the purpose of potentially enhancing clinical judgment in the newly licensed nurse.

**Safe care practice.** Safe care practices of the registered nurse utilizing QSEN competencies as a framework begins in an academic, pre-licensure setting at the current time. However, scholarly literature within the past few years demonstrates advocacy for a move of this initiative to licensed practice so that safe quality care is more strongly
reinforced throughout practice transition (Dolansky et al., 2017; Miller et al., 2014; Walton, 2016). James, Patrician, and Miltner (2017) assert that quantifying quality and safety can be demonstrated when QSEN competencies are integrated into a structured orientation program for newly licensed nurses. Their article was titled,” Testing for Quality and Safety Education for Nurses (QSEN): Reflections from Using QSEN as a Framework for RN Orientation” (James, Patrician, & Miltner, 2017). It presented quantitative data post-integration of all QSEN competencies into the year-long orientation program among four groups of new graduate nurses.

The orientation program was structured to allow for time with preceptors, scheduled didactic sessions, group work sessions and clinical time. The QSEN competencies and KSAs were presented on different days to enable an isolated focus on each one. Various pedagogical approaches were used to promote active participation. Some examples included journal article reviews, case studies and in-class debriefing. The majority of the 153 participants had one year or less of licensed practice experience. A smaller percentage of nurses with between two and 15 years of licensed experience served as a control group.

A multiple-choice examination was used to collect quantitative data at the conclusion of the orientation program. Results were compared to the same test administered as a pre-program examination. Statistical significance was not strong. However, increased scores were evident on the post-program examination. The authors claimed that the results indicated an inadequate knowledge among newly licensed nurses of QSEN-based applications in clinical practice. No limitations were disclosed. The authors recommended continued integration of QSEN competencies into academia as well as new graduate nurse orientation programs (James, Patrician, & Miltner, 2017).
These findings correlate with other sources included in this literature review.

**Competency framework.** An article by Hansen and Bratt (2015) presented a literature synthesis on use of simulation in evaluating clinical competence among nursing students. The authors’ hypothesis was that simulated learning contributed to experiential learning, along with skill acquisition. They additionally hypothesized that an organized, structured framework, such as one utilizing QSEN competencies and KSAs would assist in setting clear learning outcomes. This process would enable quantification of competency.

A review of 36 studies focusing on nursing students and novice nurses supported the hypothesis and the value of simulation in developing clinical competence. Throughout the synthesized review, the works of Benner (1984), Tanner (2006), and Jeffries (2012) were repeatedly emphasized in their use as foundational frameworks for achieving simulation-based learning outcomes. The authors then sought to create a proposed framework of their own to serve as a guideline for simulation structure. The guideline contained was titled Competence Acquisition using Simulated Learning Experiences (Hansen & Bratt, 2015). It incorporated the needs of both students as well as faculty when operationalizing simulation, including KSAs.

The framework considered phraseology for simulation phases, known within the framework as antecedents, attributes and consequences. The term antecedent equates to pre-simulation planning and includes factors such as defining learning objectives and choosing the degree of fidelity to be used. The term attribute refers to environmental realism used in the simulation and the method of performance evaluation. Finally, consequence relates to post-simulation outcomes for the learner.
Noted limitations were the limited availability of nursing research in this area. The implications stated by the authors were that this framework serves as a starting point and they advocated for integration of it. Continued research of frameworks in simulation as well as new studies using the authors’ framework were recommended (Hansen & Bratt, 2015). Efforts such as these strengthen evidence used in resolving the theory to practice gap.

**KSAs.** The knowledge, skills and attitude categories that accompany each QSEN competency enable a multidimensional application of the competencies in nursing practice (Sherwood & Zomorodi, 2014). In the article “A New Mindset for Quality and Safety: the QSEN Competencies Redefine Nurses’ Roles in Practice”, Sherwood and Zomorodi (2014) detailed the historical significance of QSEN competency development and their role in establishing a sustained culture of safety. The authors maintain that KSAs are not simple guidelines, but an expectation in the provision of safe quality care and are part of nursing’s accountability in patient care. The importance of the graduate QSEN competencies was stressed, along with the fact that their integration facilitates practice transition.

Important points were made regarding how KSAs enhance the competencies and reinforce holistic care, promote nurse-patient interaction, and involve the patients’ support systems in nursing care planning. They also promote reflective practice and professionalism. Examples of thorough integration and consistent application of the QSEN competencies and KSAs in nursing care provision were provided (Sherwood & Zomorodi, 2014). A noted strength within the article was the demonstrated integration of these vital competencies into current care standards.
One example provided was the use of the teamwork and collaboration competency during multi-disciplinary rounds, team huddles and shift reports.

This article continually stressed the importance of clinical competency, clinical judgment competence as defined by Tanner (2006) and stressed that the KSAs strongly contribute to a nurse’s development of a mindset that prevents patient harm. While the entire article was filled with examples of QSEN competency applications in nursing care, a case study was also used to reinforce the main points (Sherwood & Zomorodi, 2014). This article supports all foundational components of this author’s project and how it will impact practice change. Educating nurses on QSEN and the KSAs is not sufficient. They must be presented in a dynamic and meaningful way so that their importance and necessity to patient safety and overall practice standards is clarified.

In summary, the QSEN competencies are not new, but they have been under-used. While their applied use in academia is improving, integration into practice has been extremely lacking (Benner, 2015; Mansfield, 2014). This trend is changing as major stakeholders are advocating and even requiring their integration (Kelly, Vottero, & Christie-McAuliffe, 2014; Koffel et al., 2017; Lyle-Edrosolo & Waxman, 2016). This author’s project is a form of advocacy in support of this practice change.

**Simulation.** Simulation has expanded in both popularity as well as sophistication over time, leading to its recognition as an evidence-based intervention for enhancing practice change (International Nursing Association for Clinical Simulation and Learning (INACSL)Standards Committee, 2016). Currently, the availability of varying fidelity in simulators allows nurse educators of all levels to provide an extreme level of realism which accurately replicates clinical situations (Hines & Wood, 2016; Jeffries, Rodgers, & Adamson, 2015; Lasater et al., 2015). This provides exciting opportunities for blending
educational opportunities with clinical judgment development in a safe environment. The establishment of valid simulation frameworks, along with valid evaluative rubrics has also been instrumental in quantifying clinical competence (Lasater, 2011; Miraglia & Asselin, 2015; Nielsen, Lasater, & Stock, 2016). Simulation in nursing actively promotes and enhances safe quality care.

**LCJR.** The LCJR was created in 2007 and designed using Tanner’s clinical judgment model as a foundation (Lasater, 2011; Tanner, 2006). The original goal for use of the tool was to evaluate clinical judgment behaviors and characteristics of pre-licensure nurses during simulation (Lasater, 2011). Since that time the rubric has been deemed valid and reliable and due to its psychometric properties, which align with KSAs as well as clinical judgment, has been used in a variety of prelicensure and post-licensure situations (Miraglia & Asselin, 2015; Sanko, 2017; Victor-Chmil, & Larew, 2013). This rubric will be used in a simulation scenario for this author’s project.

In 2015, the author of the LCJR and several other authors completed a quantitative study using the rubric to assess practice readiness in newly hired nurses. While not all were novice nurses, use of the LCJR in an acute care licensed practice setting was a landmark moment for use of it beyond academia. The results are presented in the article, “Evaluating the Clinical Judgment of Newly Hired Staff Nurses” (Lasater, Nielsen, Stock, 2015). The purpose and goal of the study was to evaluate clinical judgment skills and emphasize the difference between critical thinking, clinical reasoning and clinical judgment.

A total of 202 newly hired nurses participated in the year-long study. The heterogeneous cohort was comprised of nurses from various academic backgrounds and licensed practice experience levels from less than one year to six years. Case studies were
administered at various times throughout the year and scored using the LCJR. One-way analyses of variance (ANOVAs) were used to interpret results. There was statistical as well as clinical significance from the methodology used and all aspects of clinical judgment were measured. The authors determined that the transition to practice was facilitated and that this program assisted in promoting retention (Lasater, Nielsen, Stock, 2015). These findings support the use of the LCJR, both in simulation as well as alternative settings for the purpose of quantifying clinical judgment skills.

**Realism.** Realism is a main component of simulated learning in nursing and also promotes experiential learning, no matter the setting (Aschcraft et al., 2013; Fenske et al., 2013; Hart et al., 2015). Realism in the time of practice transition can be employed in a variety of ways to promote development of problem solving and clinical decision-making. Realism is supported through use of the NLN Jeffries Simulation framework, which is the subject of the article,”A Systematic Review of the Literature Related to the NLN/ Jeffries Simulation framework” (Adamson, 2015). The author presents a literature review to support use and further development of the framework.

A comprehensive review of 153 articles over 10 years were reviewed in terms of several key themes which would support the use of this framework. Those themes were positive learning outcomes, fidelity and debriefing. Qualities and characteristics within the three themes were interdependent on one another. Learning outcomes noted throughout the literature review were the fact that learning outcomes were generally achievable to a higher degree with simulation as compared with other methodologies for learning. Also, participants reported feeling more confidence and competence after simulation scenarios.

Fidelity was a consistently noted factor in the ability to deliver a realistic scenario
reflective of clinical practice (Adams, 2015). Although much of the literature does favor high-fidelity simulation as being able to best accomplish this, the authors discovered that fidelity should align with specific learning objectives. Complexity of any simulation is recommended to be aligned with level of education and cognitive abilities of the participants. Debriefing provides valuable opportunities for reflective learning, feedback, evaluation of KSAs and goal-setting. No limitations were disclosed, and a recommendation was made for research on expanded use of the framework.

**Reflective debriefing.** Bedside presence fosters engaged interaction with patients, allowing opportunities to recognize cues and act accordingly. Lavoie, Pepin and Cosette (2015), hypothesized that a tool could be created to assist the novice nurse transitioning to licensed practice in creating a thought framework for maintaining a bedside presence and appropriately recognizing signs of deterioration. The authors conducted this study in acknowledgement of the fact that recognition of patient deterioration is a core component of nursing practice (Lavoie, Pepin, & Cozette, 2015). Unsafe and substandard care is a main contributor to preventable patient harm.

The process began with a review of 19 articles and a systematic process to create a tool based on strong theoretical foundations which included Tanner’s clinical judgment model and a high-fidelity simulation framework. It was designed for use with a simulated patient deterioration scenario and aptly named Reflective Debriefing After a Patient Deterioration Simulation (REsPoND). In addition to providing guided experiential learning and clinical judgment development opportunities, use of REsPoND incorporated a strong focus on teamwork and collaboration in the nurse’s response to a deteriorating patient. The only limitation, which was also a recommendation, was that the tool would need to be used in studies to prove its worth, as well as to determine validity and
reliability (Lavoie, Pepin & Cosette, 2015). The valuable focus on the debriefing phase of simulation cannot be undervalued as it promotes self-reflection.

In summary, the sub-themes presented in this section demonstrate the value and adaptive uses of simulation. Realistic situations in a simulation promote awareness of both individual and collaborative efforts in maintaining and sustaining safe quality care (Everett-Thomas et al., 2015; Georg et al., 2018; Ouellette & Blount, 2015). Simulation exercises also promote enculturation and socialization of the newly licensed nurse during orientation to licensed practice (Lalonde & Hall, 2016; Sherwood et al., 2015). Excellent opportunities result for narrowing the novice nurse knowledge gap as well as integrating QSEN competencies into licensed practice.

**Nurse Residency.** The inspiration and recommendation for creation and use of nurse residency programs originated with the IOM (Institute of Medicine, 2011). Various research and reports generated by the IOM recognized a need for more structured facilitation of the student nurse to licensed practice (VanPatten & Bartone, 2018). Orientation programs utilized at that time did not efficiently promote smooth transitions, socialization or a focus on the need for clinical judgment development. Nurse residency programs provide these essential elements and can aid retention rates of newly licensed nurses.

**Clinical decision-making.** Clinical decision-making is a core component of safe quality care which requires continual development through mentor support and situational learning. Crimlisk et al (2017) found that role stress of newly licensed nurses during practice transitions created barriers to learning (Crimlisk et al., 2017). This impaired achievement of clinical judgment skills and resulted in an overall lack of confidence. Similar findings were evident in the literature (Letourneau & Fater, 2015;
Williams et al., 2018). Clinical judgment development must be supported through nurse residency programs.

The article, “Nurse Residency Program Designed for a Large Cohort of New Graduate Nurses: Implementation and Outcomes” detailed a quality improvement study to address the dual problems of ineffective decision-making and retention rates among newly hired, inexperienced graduate nurses (Crimlisk et al., 2017). The study took place in an acute care hospital with a cohort of 46. Weekly orientation and socialization sessions were completed each weekday for one month. These sessions utilized didactic sessions and simulation pedagogies to cover core competencies, policies and protocols, and aspects of safe care provision using clinical judgment. Socialization lunches with preceptors and other nurses were also scheduled.

All participants then proceeded to their assigned units and preceptors. Total orientation time was six months. Participants completed surveys at six months and one year timeframes. This qualitative data yielded positive results in confidence, but only modest confidence related to critical thinking skills.

Quantitative data were calculated using Fisher’s Exact Test based on results from a skills assessment survey, but detailed statistical analysis was not included in the article. The authors summarized the results narratively and reported that technical skills related to hands-on skills did not necessarily improve over time. Quantitative data revealed a 91% retention rate at one year of employment. Overall, more positive results were achieved due to a close working relationship with preceptors, rather than skill acquisition (Crimlisk et al., 2017). It can be concluded from this article that providing newly licensed nurses with preceptors is beneficial, yet a prolonged orientation time frame and guided situational learning may lead to increase clinical confidence and critical thinking skills.
Competency development. Experiential learning begins in the academic setting and then continues into orientation periods in licensed practice. This was the topic in an article written by Letourneau & Fater (2015) titled “Nurse Residency Programs: An Integrative Review of the Literature”. Although this process has been noted to result in a degree of competency development, the degree of competency achieved in academia does not necessarily equate to practice readiness in the acute care arena. Letourneau and Fater (2015) questioned the relationship between the use of nurse residency programs and competency development. A specific question the authors posed was whether nurse residency programs truly serve as bridges in the transition to practice (Letourneau & Fater, 2015). Established evidence would more strongly support the use of such programs.

The authors sought to answer this question in light of the strong recommendation for nurse residency programs by the IOM as well as TJC (Letourneau & Fater, 2015). A literature review of 25 articles spanning seven years applicable to novice nurses in residency was conducted. The latest year referenced was 2013. The authors concluded that a well-designed nurse residency can build on the experiential learning begun in academic settings, incorporating gradually more complex situations with a resultant positive impact on clinical judgment development. This also results in improved job retention rates.

Frequent mention throughout the articles reviewed were the positive emotional outcomes relative to decreased work-related stress and improved job satisfaction. No explicit limitations were disclosed. Recommendations were made to conduct future research into practice preparation specific to educational program type as well as future studies on clinical judgment development as residency design evolves (Letourneau &
More current research has shown acceptance and validation of nurse residency programs as well as research dedicated to optimal designs of these programs (Van Patten & Bartone, 2019; Walsh, 2018; Williams et al., 2018). There is clearly established evidence of their positive effects on practice transition.

**Facilitated transition.** It is fairly well-established in scholarly evidence that nurse residency programs assist newly licensed nurses in their readiness for practice in a variety of ways. The final article in this literature review does not dispute that fact. It continues to validate the use of all theoretical models previously mentioned as supportive foundations for positive psycho-social as well as cognitive competency outcomes (Prion et al., 2015). The purpose of the article was to present a newly developed tool which aligns with the previously established theoretical foundations and allows evaluation of KSAs and QSEN competencies.

The Quality and Safety Education for Nurses Competency Evaluation Tool included all QSEN graduate competencies, each with accompanying behaviors drawn from the KSAs (Prion et al., 2015). Scoring was completed using a four-point Likert scale according to the categories of: 0- not applicable, 1- beginner, 2- developing, and 3- accomplished. This is similar to the LCJR classifications (Miraglia & Asselin, 2015). The tool was tested on 111 junior and senior nursing students in a baccalaureate program and also with 193 newly licensed nurses. Use of statistical analysis using Cronbach’s alpha confirmed internal consistency and reliability of the tool. The ability to measure QSEN competencies was determined by the authors and other experts to be successful, especially from a perspective of being able to provide feedback and promote self-reflection of clinical performance among new graduate nurses (Prion et al., 2015).
In summary, nurse residencies are an evidence-based way for assisting the adaptation of newly licensed nurses into licensed practice. Programs can be designed in a customized format based on the needs of novice nurses and effectively merge didactic content with mentoring and various types of simulation (Stout et al., 2015). The literature indicates such programs contribute to newly licensed nurse retention and decrease monetary loss from orientation program expenditures (Williams et al., 2018). The ability to integrate QESN competencies will definitely serve as a catalyst for rubric and tool development to better enable statistical measurement of nurse residency program outcomes (Altmiller, 2019). The evidence presented within his literature review supported the need for this author’s project, feasibility for it and the fact that it will potentially result in practice change.

Summary

Although academic nursing education provides experiential learning and competencies commensurate with the preparation for licensed nursing practice, nursing research indicates obvious gaps in readiness to practice. A synthesis of scholarly literature provides evidence that the root causes are multi-factorial, with contributing factors applicable to the academic setting as well as the orientation process in the licensed practice setting. This author’s project focuses on the gap in clinical judgment exhibited by newly licensed nurses. Clinical judgment skills in opposition to the level required to avoid preventable patient harm have created a crisis within nursing (Benner, 2015). This author’s project was a response to that crisis.

The project utilized established theoretical and scientific principles as a foundation which supported viable quality improvement. These principles aided in defining clinical judgment, both cognitively and psychometrically so that they could be
quantified (Lasater et al., 2015). Use of the LCJR and high-fidelity simulation allowed this measurement, while also promoting a reflective practice in newly licensed registered nurses. This procedure was an evidence-based one and also provided valuable feedback about clinical competence to preceptors and others who were responsible for mentoring newly licensed nurses (Cochran, 2017). Use of a nurse residency population in a setting of simulation as well as actual practice was appropriate as it allowed the application of multiple pedagogies. The methodology followed currently accepted practices applicable to the clinical problem of deficient clinical judgment and ensured evidence-based support for such a project.

Chapter three presents a discussion of the methodology used for the project. A detailed explanation of the project design was also included. Alignment within the project continued to be demonstrated. This enhanced the impact of the project.
Chapter 3: Methodology

A clinical problem identified in scholarly nursing research is that of under-developed clinical judgment in new registered nurse graduates. As members of this population become employed as licensed nurses for the first time, it is often reported that the level of clinical judgment required for safe care provision is in opposition to the level demonstrated (Burbach & Thompson, 2014; Lasater et al., 2015; Murray, Sundin, & Cope, 2019). This negatively impacts the ability of a novice nurse to recognize patient cues signaling deterioration and thus results in poor patient outcomes and is also recognized as missed or omitted care (Kalisch, 2015; VanFosson, Jones, & Yoder, 2016). Obviously, this problem has many contributing factors.

Potential solutions to this clinical problem noted in the literature are revised orientation frameworks and extended timeframes of nurse residency programs (Letourneau & Fater, 2015; Walsh, 2018). Other proposed solutions are those that combine realism with the ability to quantify clinical judgment behaviors and characteristics. In much of the literature this is achieved using simulation frameworks, along with QSEN competencies and KSAs (Altmiller & Hopkins-Pepe, 2019; Nielsen, Lasater, & Stock, 2016; Lasater et al., 2015). This author’s project combined all of these in some way and this will be described in detail.

Based on these factors the purpose of this quantitative, pretest posttest quality improvement project was to determine if and to what degree the implementation of QSEN education with simulation for nurses impacts clinical judgment and frequency of documentation of deterioration parameters in an acute care hospital in southeastern Pennsylvania.
The determination of a high probability of enhance practice change was based on data collection of the real-time documentation of oxygen saturation and respiratory rate more frequently than every four hours. This chapter was used to explain the methodology and design of this author’s project in detail. The rationale for each project component was included and directly correlated with the theoretical foundations chosen.

The literature synthesis supported the planned methodology and design to answer the PICOT question. Alignment is demonstrated throughout the project design. Support for these statements included sections addressing the specific population, the data collection tool, validity and reliability, and ethical concerns. A detailed presentation of data collection and analysis, along with limitations was also included.

**Statement of the Problem**

The main focus of this project was to prevent patient harm and undesirable outcomes associated with the deficient ability of newly licensed registered nurses to recognize cues representative of actual or potential patient condition decline. This was accomplished through the use of QSEN graduate competencies serving as a framework for promoting cue recognition and efficient clinical decision-making. The current QSEN graduate competencies, along with the accompanying KSAs, were originally created by the IOM, with a goal of adoption as national practice standards (Institute of Medicine, 2011). Subsequently, the QSEN Institute was formed. The goal of the QSEN Institute was to revise and expand on the competency framework (QSEN, 2018). Although research demonstrates the need for and effectiveness of standardized competencies to ensure safe, quality care, universal integration of the competencies has not occurred (Hirsch, 2016; Melnyk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). Scholarly research is ongoing. The formulated problem statement for
this project was: It was not known if and to what degree the implementation of QSEN education with simulation for nurses impacts clinical judgment and frequency of documentation of deterioration parameters in an acute care hospital in southeastern Pennsylvania.

**Clinical Question**

The clinical question listed below originated from research and literature reviews concerning the clinical problem of the nurse’s ability to recognize cues signaling patient deterioration, particularly among the population of newly licensed nurses (Bennett et al., 2017; Burbach & Thompson, 2014). The question aligned with Benner’s novice to expert theory as it pertained to the need for gradual experiential learning and various types of skill acquisition in the transition from academia to licensed practice (Benner, 1984; Davis & Maisano, 2016; Murray, Sundin & Cope, 2019). Alignment was also evident with current research and literature reviews proposing a solution to a clinical problem which adversely affects safe care and can result in harm to patients. Simulation is one such solution, as it has been demonstrated to provide structured realism and experiential learning in a safe environment (Hart et al., 2015; Lasater, 2011; Lasater et al., 2015; Maxwell & Wright, 2016). Another viable solution, and one which is undergoing active research, is the integration of QSEN competencies into the licensed practice setting.

Use of a QSEN-based framework along with simulation has been cited in scholarly literature as a viable solution (Hart et al., 2015; Miraglia, & Asselin, 2015). Integration of QSEN competencies into licensed practice is also supported by major stakeholders (Dolansky & Moore, 2013; Sherwood & Zomorodi, 2014; Sherwood, G., Horton-Deutsch, S., & Sigma Theta Tau, 2015). Clearly, the solution is multi-faceted yet
feasible.

The following clinical question guided this quantitative project:

Q1: How does a QSEN competency framework, combined with simulation, positively affect cue recognition of patient deterioration in clinical practice as evidenced by documentation of oxygenation and respiratory rate more frequently than every four hours?

The PICOT question effectively correlated the noted clinical problem with theoretical underpinnings of professional nursing practice. This was reflected in interventions accepted as evidence-based solutions to address it in a way that supports safe quality care which is patient-centered and does not lead to patient harm.

The identified independent variables for this author’s project were QSEN education and high-fidelity simulation. The QSEN competencies figured prominently in addressing the clinical question as well as answering the PICOT question. It could not be assumed that all nursing graduates in the nurse residency program had the same awareness and understanding of this variable. Therefore, QSEN education was provided in an interactive format for the purpose of demonstrating applicability of the competencies as part of clinical judgment during patient care. This assisted in answering the clinical question as well as the PICOT question.

Simulation, which in this case was high-fidelity, was used as an evidenced-based intervention to provide experiential learning based on a realistic situation typically encountered in clinical practice and enhance practice change (Cooper et al., 2016; Crowe, Ewart, & Derman, 2016). It was also instrumental in providing a structured and organized framework within which to utilize the LCJR. This process, within the planned design, allowed for collection of quantitative data relative to clinical judgment characteristics and
behaviors (Lasater et al., 2015; Nielsen, Lasater, & Stock, 2016). A simulation scenario based on the NLN/Jeffries simulation framework and integrated with QSEN competencies was used. Appendix D provides a detailed plan of the simulation scenario.

The unfolding simulation scenario provided a situational learning opportunity during which participants would actively recognize and respond to a patient who demonstrated signs of deterioration. Initially those signs were subtle, but quickly became overt. The nurse’s ability to establish the relationship between recognition and action was measured using the LCJR. Events and symptoms were written into the simulation scenario by time of occurrence once the simulation began. This sequencing required rapid recognition of the unfolding events and active response to those findings by the nurse.

Instances of patient deterioration related to impaired oxygenation were frequently noted in the literature (Chang, Huang, & Su, 2015). Their common occurrence in clinical practice requires the nurse’s use of clinical judgment, specifically cue recognition, to rapidly recognize such deterioration to prevent undesirable outcomes. The nurse’s assessment of oxygenation saturation, respiratory rate and other indicators of distress are instrumental in preventing complete decompensation and a code blue (Angel et al., 2016; Miller, Owens, & Silverman, 2016). The nurse’s specific findings must then be appropriately reported and documented, which is of course valuable in quality improvement and evaluating patient outcomes.

The first dependent variable was the intrinsic degree of clinical judgment ability of each participant. This directly related to the second dependent variable of cue recognition relative to patient deterioration. The third dependent variable was the nurse’s acknowledgement of patient deterioration through documentation of the cues. Since the goal of the project was to result in a practice change regarding specific nursing actions
and decision-making, quantitative methodology provided the best alignment and correlation of all variables.

According to scholarly research, the clinical judgment competence of newly licensed nurses is developed gradually and situationally. The developmental process is influenced by multiple factors including educational methods during the transition to practice, degree of exposure to experiential application of clinical judgment skills, and the preceptor relationship, among other factors (Benner, 2015; Killian, 2015; Monagle et al., 2018). A pre-test was necessary to establish baseline clinical judgment ability. This process strengthened data comparing the influence of the stated interventions of QSEN education and simulation on post-testing.

The post-test score was then specifically correlated with the LCJR tally to statistically evaluate cue recognition and clinical judgment skills. These steps were necessary in order to establish a correlation between the project interventions and evidence determining the degree of clinical practice change. As previously mentioned, a practice change can be evaluated by collecting baseline documentation of patients’ oxygen saturation and respiratory rate by participants for two weeks prior to the simulation and for three weeks after. The actions of documenting the noted parameters of oxygen saturation and respiratory rate with greater frequency than the required standards would indicate recognition of either actual or potential patient deterioration (Angel et al., 2016; Fournier, 2014; Miller, Owens & Silverman, 2016). These actions would also correlate with behaviors consistent with noticing, interpreting and responding as stated in the LCJR.

Current practice policies related to documentation of these measurements within the clinical facility used for this project is every four or eight hours, dependent upon
patient stability. The only units requiring more frequent monitoring in the absence of acute decompensation are specialty units (Hospital Policy, 2018). However, the adoption of evidence-based clinical practice guidelines requires increased frequency of assessment and documentation based on anticipated deterioration, especially that related to impaired oxygenation for any reason (Elsevier, 2016). These include cardiac impairment, decreased cardiac output, sepsis, and septic shock, and any cause of decreased oxygenation, among others (Elsevier, 2016; Hospital Policy, 2018). Thus, increased frequency of documentation would be an indicator of practice change and supported tracking this data to determine an improvement in patient outcomes.

**Project Methodology**

Although a variety of methodologies were useful in evaluating the problem of deficient cue recognition and clinical judgment in newly licensed nurses, quantitative studies enable statistical measurement of clinical judgment behaviors and characteristics (Astroth & Chung, 2018; Hoare & Hoe, 2013). Relying on subjective or reflective reporting among nurse residents obtained via qualitative or mixed studies would not provide the data necessary to address all factors contributing to the current knowledge gap (Hallin, Haggstrom, Backstrom, & Kristiansen, 2015; Victor-Chmil, & Larew, 2013). The project employed a quantitative methodology that was able to provide valuable information relative to both clinical as well as statistical significance. It also promoted alignment throughout the project.

Action-based decision-making observed during high-fidelity simulation requires an organized structure and valid tools (Jeffries, 2012; Sommers, 2018). This has been noted to be especially important in quantifying clinical judgment (Foo, Tang, Vimala, Chui, & Chong, 2017; Sommers, 2018). This process allows for differentiation between
behaviors and characteristics of clinical judgment, with those of critical thinking and clinical reasoning. While the latter two serve as building blocks for clinical judgment, their operationalization within clinical practice is different (Almeida et al., 2018; Cappelletti, Engel, & Prentice, 2014). This author’s project focused on clinical judgment. A quantitative structure with specific goals and objectives was essential for the alignment of all project components and variables.

A review of current research indicated that use of quantitative methodologies for evaluating clinical judgment is increasing (Almeida et al., 2018; Strickland, Cheshire, & March, 2017). Simulation using varying levels of fidelity is now considered to be evidence-based, not only because its framework employs evidence-based pedagogies, but also because it can be used to educate nurses on use of evidence-based practice, thus reinforcing the current standards of safe quality care (Almeida et al., 2018; Kelly, Hager, & Gallagher, 2014; Strickland, Cheshire, & March, 2017). Blended pedagogies in simulation address multiple aspects of realism within nursing care (Ashcraft et al., 2013; Hart et al., 2015). A noted benefit has been the emergence of opportunities to address specific gaps in both knowledge and clinical judgment (Lasater et al., 2015; Foo et al., 2017). This beneficial aspect of simulation using multiple approaches was instrumental in identifying additional root causes relative to the stated clinical problem.

An example which supported the aforementioned statements is the use of the LCJR, used within the NLN/Jeffries Simulation framework. The LCJR categorizes clinical judgment according to Tanner’s model and also includes specific behaviors which enable quantitative measurement (Everett-Thomas et al., 2015; Lasater et al., 2014; Lasater et al., 2015; Miraglia & Asselin, 2015). The NLN/Jeffries Simulation framework easily enables QSEN competency integration, which allows correlation with
multiple variables within a project (Koffel et al., 2017; Lewis, Stephens, & Ciak, 2016). A quantitative methodology was preferred to satisfy the PICOT question as well as the clinical question.

**Project Design**

The design type chosen was non-experimental and correlational. The clinical question specific to this project was only able to be addressed when comparison between interventions and nurse resident responses was completed. The comparison could then potentially demonstrate a degree of clinical as well as statistical significance. Quality improvement projects utilize comparison to demonstrate practice change when evidence-based interventions are employed (Mansfield, 2014). Comparison occurred in several ways which are explained in more detail in subsequent paragraphs:

- clinical judgment ability assessment at baseline via written test, compared with assessment post simulation via written test,
- scoring of clinical judgment behaviors and cue recognition during simulation compared to the results of a written post-test, and
- baseline comparison of documentation of oxygen saturation and respiratory rate in clinical practice, prior to and after all stated interventions.

To partially summarize, interventions within the project included didactic education on use of the QSEN framework, and an unfolding high-fidelity simulation scenario progressing rapidly from simple to complex. A written pre-test and post-test, which included self-reflection questions, completed the interventions. The desired outcome was improved cue recognition of patient deterioration. Evidence used to determine the project outcome originated from collection of the specific parametric data
of oxygen saturation and respiratory rate, completed more frequently than required by facility policy.

The stated comparisons allowed for subsequent correlations to be established between the collected data and cue recognition of patient deterioration by the novice registered nurse. The clinical question sought to correlate use of clinical judgment behaviors and characteristics with use of a QSEN-based framework. The six QSEN competencies and associated KSAs provided a framework which promoted bedside presence, vigilance, cue recognition and nursing decision-making to prevent patient harm (Altmiller & Hopkins-Pepe, 2019; Dolansky et al., 2017; James, Patrician, & Miltner, 2017). This allowed comprehensive evaluation of dependent variables.

Theoretical support for answering the clinical question occurred when a QSEN-based framework was applied within a simulation. The simulation, which utilized the NLN/Jeffries simulation framework, featured a scenario during which a patient’s condition deteriorated secondary to impaired oxygenation. This allowed for observation, measurement and evaluation of cue recognition and other clinical judgment behaviors (see Appendix G). The stated design incorporated the independent variable of simulation.

The independent variable of QSEN education was addressed via a one-hour didactic session incorporating case examples, lecture and discussion, as well as a QSEN-based framework checklist as previously referred to and included in Appendix A. The checklist was also available to the nurse residents as a handout and during the simulation. This session served as part of the project intervention, as mentioned in the PICOT question, and promoted active reflection of clinical judgment skills, which is a principle in Tanner’s model as well as the LCJR (Lasater, 2007; Tanner, 2006). During that time a 15-point pre-test was completed, based on a common clinical situation similar to that of
the simulation scenario. Test items were fill in the blank, multiple choice and a second section which included a self-reflection survey (see Appendix C).

Questions were used with permission of Lasater, the point of contact for the source material in the originating article (Lasater et al., 2015). The question framework aligned and correlated with aspects and behaviors noted within the LCJR, which strengthened project alignment. The pre-test question set served as a pre-simulation baseline of current clinical judgment ability. The identical question set was used in a post-test after simulation.

The simulation began with a 10-minute pre-briefing to explain objectives and participant roles/expectations. Directions during the pre-briefing were given by the observer for each group, following a script so that instructions and preparation for the simulation were consistent. Participants were provided with a facsimile of a patient chart which included all pertinent information necessary for evaluating the patient and responding to events in the scenario without overt prompting of the desired nursing actions/responses. The actual scenario was 20 minutes in duration. During the scenario participants were continually presented with both subtle as well as overt cues signaling patient deterioration.

A 10-minute debriefing session concluded the simulation. Reflective debriefing questions were utilized as seen below (see Appendix J for permission for use). The question set stimulated discussion to emphasize main points of cue recognition and also stimulated participants’ active self-reflection. The questions were:
• I can identify abnormalities from the collected patient information.
• I can recognize possible early signs or symptoms when a patient’s health deteriorates.
• I can explain the mechanism and development associated with the early signs and symptoms when a patient’s health deteriorates.
• I can accurately evaluate and identify whether a patient’s condition has improved.
• I know the follow-up steps to take if a patient’s condition does not improve (Johnston, Nash, & Coyer, 2019).

These questions, in a survey form utilizing a Likert scale, were also completed by participants on the pre-test and post-test. This allowed evaluation of the LCJR category of reflection. Reflection is an essential component of professional growth related to clinical judgment and a key element in both Tanner’s model, the LCJR and alignment with all aforementioned theoretical underpinnings of this project and evidence-based practice (Tanner, 2006; Lasater, 2007; Benner, 2015). The entire interventional component of this author’s project provides an exciting opportunity for advocacy, role modeling and mentoring.

Each simulation group included three or four participants collaborating in the care of the deteriorating patient. Three simulation scenarios were conducted simultaneously, with a pair of observers assigned to each simulation group. One observer scored the LCJR for each participant and the other oversaw the mannequin functions. All observers were registered nurses and academic educators familiar with simulation. The LCJR was scored according to its Likert scale. The procedure addressed all variables in addition to the clinical question and the PICOT question.
As previously mentioned, cue recognition is a specific component of clinical judgment and can be evaluated using the LCJR. All aspects included in the tool are an expectation within professional nursing practice and are an essential element in avoiding preventable patient harm (Hansen & Bratt, 2016; Monagle et al., 2018). The clinical facility used for this project implemented evidence-based policies and clinical practice guidelines to reinforce these expectations (Elsevier, 2016). These policies and guidelines correlate with expected nursing behaviors relative to cue recognition, such as surveillance, anticipation of deterioration, and frequent documentation and follow-up of patient status changes.

Quality improvement and practice change relative to patient outcomes can be demonstrated in the subsequent collection of documentation data as it relates to cue recognition (Brice, 2014; Crimlisk et al., 2017; Della Ratta, 2016). Documentation is a subsequent nursing action of trending patient-related events and creates an audit trail to examine patient outcomes (Turpin, 2014; Zittel et al., 2016). This directly relates to cue recognition. This project was designed in a way that would capture this type of data and potentially demonstrate practice change.

**Population and Sample Selection**

The population for this author’s project was a cohort of 33 newly licensed registered nurses of various academic educational backgrounds and similar ages. As previously defined, all had less than two years of licensed practice experience and were enrolled in a nurse residency program within the acute care facility where they were employed. Each was employed in a variety of units and working a variety of shifts throughout the hospital. The relatively homogeneous group completing the second portion of a year-long residency program and met every other month. Specific
demographic information was collected when voluntary consent was obtained (see Appendix K).

Group size was originally determined via power analysis. Project-based data was entered for a paired $t$-test into an online calculator, using the following variables (University of California, San Francisco: Clinical and Translational Science Institute, 2019):

- Probability for rejecting the null hypothesis - 0.05%
- Probability for not rejecting the null hypothesis - 0.2%
- Effect size - 0.5%
- Standard deviation - 1

In this case, the power analysis result was 31. This number represented the number needed to potentially demonstrate statistical significance. The final number of registered nurses participating was 33.

Participants were randomly assigned to simulation groups by this author’s content expert, who was also the coordinator of the nurse residency program. Since the content expert was familiar with the nurse residents, the role of controlling mannequin functions was assumed by this person during simulation. Each participant was identified by wearing a sticky badge with a letter and no names were recorded or associated with any data collected. Observers used one LCJR for each participant, labeled only with each participant’s assigned letter. This method was appropriate given the relatively small sample population as well as the mentor’s familiarity with participants as the director of the nurse residency program.

Participants were approached by this author prior to the planned project start in the nurse residency classroom to provide information, recruit for voluntary participation
and to obtain informed consent. A 15-20- minute presentation was used to explain the objectives, process, time requirements, and purpose of the project. Sufficient time was allotted for questions. During that time participants were made aware that continuing education credits would be earned with complete participation. The randomization process was disclosed, and it was emphasized that all data, observations, verbal exchanges and results would not be shared with others in the facility.

All project interventions were conducted in the nurse residency educational setting. Documentation data sources relative to the specific parameters of oxygen saturation and respiratory rate originated from real-time documentation within the provision of patient care. These data were collected by the content expert and completely deidentified. Didactic QSEN education was presented in a classroom during which time the QSEN framework checklist was introduced. The framework was subsequently utilized by participants during simulation as a guide to decision-making and also at the bedside in that segment of the project.

The high-fidelity simulation took place in the simulation laboratory. This large room contained three simulation stations, each separated by approximately 12 feet. Since simulations were occurring simultaneously in one large relatively open space, screens were used where possible to contain areas. This decreased noise and allowed each group of nurse residents to focus appropriately while also protecting participant privacy. Those who were awaiting their turns to participate were assigned to a separate room and did not converse with those who had completed the simulation.

Portable simulation equipment was used to control mannequin functions. A laptop computer or iPad was used to provide a continual display of the electrocardiogram (EKG) and heart rate, blood pressure, pulse oximetry, and respiratory rate. The nurse residents
were able to converse with the mannequin, note its harsh cough, and auscultate adventitious breath sounds.

**Instrumentation or Sources of Data**

**Demographic questionnaire.** Demographic questionnaires are vital to characterizing the population for a project as such data may impact both effects as well as the overall results of a project (Astroth & Chung, 2018; Hoare, & Hoe, 2013). The population cohort for this project was relatively homogeneous, according to general information provided by the content expert. Therefore, only basic information was necessary, and the only information requested was the age, academic background and duration of licensed practice time of each nurse resident. The latter factor was determined to be the most important information as it pertained to this quality improvement project and the correlation of practice experience with clinical judgment ability.

It was recognized that other influences on experiential learning would be contributory to the cohort’s clinical judgment skills. In addition to the time spent participating in class and simulation activities, each novice nurse was also paired with a preceptor and working a full schedule on an assigned nursing unit. Thus, preceptor influence was most likely impactful on cue recognition, but would be difficult to measure quantitatively. Other potential contributing factors to both experiential learning as well as cue recognition were determined to be the assigned care setting, the degree to which a nurse resident was expected to practice independently, and the nurse residents’ spirit of inquiry to seek out situational learning. These may be valuable to consider in mixed studies of longer duration.

**Lasater Clinical Judgment Rubric.** The LCJR was developed in 2006 for the express purpose of evaluating clinical judgment development in nursing students.
(Lasater, 2006; Lasater, 2011). Tanner’s clinical judgment model was used as the foundation for the rubric. The main categories of clinical judgment behaviors and characteristics created by Tanner (noticing, interpreting, responding and reflecting) were then further defined by Lasater to create distinctive and action-based qualities reflective of clinical judgment application (Lasater, 2006; Tanner, 2006). These are constructed similarly to the QSEN competencies and KSAs. While these changes assisted with rubric construction and use with simulation, they also promoted a familiarity with and deeper understanding of clinical judgment by nursing educators and students (Lasater, 2006; Lasater, 2011; Miraglia & Asselin, 2015). This knowledge is essential to addressing this author’s clinical question as it applies to licensed clinical practice.

The distinct categories added by Lasater have been instrumental in the ability to evaluate clinical judgment (Lasater, 2011; Miraglia & Asselin, 2015). For example, the category of noticing became more descriptive with the addition of focused observation, recognizing deviations from expected patterns, and information seeking. The simulation in this quality improvement project required participants to care for a patient who was in mild distress initially. On entering the room, the patient was found lying flat in bed with evident hypoxia on the monitor, and oxygen therapy in place despite a physician order for oxygen. Prioritization of these findings, correlation of their origins, and recognition of the potential for further patient deterioration was the desired response.

The category of interpreting was subdivided to include further prioritization and making sense of data. The unfolding simulation required participants to correlate the patient history and knowledge of the chest x-ray results with the exacerbation of COPD. Prioritization of assessments and use of KSAs relative to impaired oxygenation were evaluated. The patient’s increasing fatigue and inability to completely expectorate thick
sputum made airway maintenance a priority.

Responding was revised by Lasater (2006) to include the headings of calm and confident manner, clear communication, well-planned interventions and being skilled. These directly related to QSENs safety, teamwork and collaboration and patient-centered care competencies. The participants needed to work cohesively to communicate an effective plan to prevent patient harm. This required consistency of prioritization as the patient status continued to deteriorate.

Finally, reflecting was further defined as evaluation/self-analysis and commitment to improvement (Lasater, 2006). These changes added a depth of applicability to clinical practice. Participants in the project were directed to verbalize during the simulation to explain rationales for actions and to state potential actions which could be taken. This process assisted in evaluating reflecting.

A copy of the LCJR can be found in Appendix C. Each previously described revision was further clarified over time to describe specific behaviors within each main category and the subcategories. Competence level was determined by the headings of exemplary, accomplished, developing and beginning (Lasater, 2006). Use of the original rubric required a moderate learning curve as scoring was generally determined by a specific number of observations within the various categories and columns (Lasater, 2006; Lasater, 2011). This was sometimes a cumbersome process.

Subsequent use of the tool led to the addition of a Likert scale to achieve more accurate grading and limit inter-rater reliability (Ashcraft et al., 2013; Miraglia & Asselin, 2015). Since the time of its creation, multiple studies have led to expanded use of the LCJR beyond academia and its translation into several languages for global use (Ashcraft et al., 2013; Georg et al., 2018; Lasater et al., 2015; Victor-Chmil & Larew,
This process was instrumental in the growth and expanded use of the tool. Replication of its use has led to the rubric’s validity and reliability (Adamson, Gubrud, Sideras, & Lasater, 2012). The sources cited in this section indicated that both content as well as construct validity was demonstrated. It is an accepted tool for evaluating and reflecting on clinical judgment behaviors and characteristics.

**Test of Clinical Judgment Ability.** Establishing the current clinical judgment ability among the participant population was an important first step in data collection. Baseline abilities of the novice registered nurses were then compared to the post-simulation test scores and also used in correlation with other data to answer both the clinical question and the PICOT question. Selected questions originated from the work of Lasater and were used and adapted with permission (Lasater et al., 2015). These questions were fill in the blank, short answer and multiple choice and were constructed by their original author to align with the LCJR categories (see Appendix F). The questions reflected use of complex cognitive processes necessary for recognizing actual or potential patient deterioration.

**Validity**

Valid data collection is the result of many factors. Internal validity in a study is determined to a great degree by alignment of the design and methodology (Heale & Twycross, 2015). Quantitative data that demonstrated an effect or causal relationship with the clinical questions and the PICOT question was accurately achieved when design and methodology correlated with measurable variables (Goodman et al., 2018). Use of the Standards for Quality Improvement Reporting Excellence (SQUIRE) Guidelines throughout the planning of this project, supported by its foundational principles and literature synthesis, demonstrated validity from these perspectives (Goodman et al.,
Clinical judgment characteristics are quantifiable data and the LCJR has demonstrated both generalizability as well as internal validity (Román-Cereto et al., 2018; Shin, Park, & Shim, 2015; Vreugdenhil, & Spek, 2018). Validity is sound. 

External validity of this author’s project is not completely known at this time, although a thorough synthesis of both seminal as well as current studies incorporating the major themes and subthemes indicated that similar projects have been completed, all with valid results (Nielsen, Lasater, & Stock, 2016; Monagle et al., 2018; Prion et al., 2015). Similar studies in the graduate nurse population are noted in the literature more frequently, including studies incorporating QSEN competencies (Lewis, Stephens, & Ciak, 2016). It was presumed that replication of similar projects will occur. The expansion of nurse residency programs, along with the use of blended pedagogies within them will promote practice change relative to clinical judgment (Letourneau & Fater, 2015). Based on the previously stated facts, this project will demonstrate potential clinical significance.

**Reliability**

The concept of reliability relative to conducting quality improvement projects has multiple definitions, although generally this term refers to consistency in results related to a tool or rubric (Astroth & Chung, 2018; Heale & Twycross, 2015). Internal consistency is one such definition and refers to how data interrelate within a study or project. External consistency applies to replicability of data measurement across studies (Goodman et al., 2018; Heale & Twycross, 2015). Cronbach’s alpha is frequently used to determine reliability of a rubric or other instrument (Astroth & Chung, 2018). Multiple studies have demonstrated internal consistency of the LCJR, demonstrating a Cronbach’s alpha ranging from 0.897 to 0.93 (Morais, Nunes, Lasater, deBarros, & Carvalho, 2018;
Román-Cereto et al., 2018; Shin, Park, & Shim, 2015; Vreugdenhil, & Spek, 2018). These results apply to national as well as global studies and also reflect consistency among categorical components of the LCJR.

It must be noted here that in some instances, as noted in the literature, validity and reliability can be negatively impacted by inter-rater reliability. This occurs when factors such as educational background, unfamiliarity with an evaluation tool, or perceived expectations of a participant’s performance affect scoring (Lasater, 2011). Most of these occurrences were noted prior to rubric revision and resulted in the addition of the Likert scale (Adamson, Gubrud, Sideras, & Lasater, 2011; Lasater et al., 2015). However, the possibility must be considered when multiple observers are used (Ashcraft et al., 2013; Adamson et al., 2011). This concern was addressed in the project.

Observers assisting in this author’s project were familiar with simulation, along with its phases and procedures within the various fidelities available. All were not completely familiar with the LCJR. In preparation for the project a meeting was convened with the content expert and all observers to review all components of the simulation, QSEN competencies and the LCJR. A practice simulation session was also completed with this group, complete with an explanation of scoring as the simulation unfolded. Scoring was also reviewed during observer debriefing on both project days to ensure scoring alignment prior to statistical calculation.

From one perspective, the benefit of the LCJR was its variation of interpretation when scoring. This allowed for an appreciation of the nuances of clinical judgment and the adaptability of the tool for specifically guided situational learning (Cappelletti, Engel, & Prentice, 2014; Cazzell & Anderson, 2016). However, in a simulation with varied objectives, inter-rater reliability needed to be directly addressed (Adamson et al., 2011).
Choosing competent observers, reviewing the rubric and conducting practice scenarios were strategies used to avoid confounders.

**Data Collection Procedures**

The first point in the data collection process occurred with scoring of the pre-simulation questions, otherwise known as the pre-test. The pre-test was completed during the didactic session, after an interactive case study was used, similar to that used in the simulation scenario. A non-identical but similar case study prevented confounders such as prompting or disclosing desired clinical judgment responses (Ali & Bhaskar, 2016; Pickard, 2017). This session and the test assisted in preparing the participants for the simulation scenario. The pre-test included a self-reflection survey using the simulation debriefing questions, strengthening the inclusion of reflection in the project.

The second step of data collection occurred during the simulation, where participants were scored by an observer using the LCJR. As previously described, the cohort was randomly assigned to simulation groups and identified solely through an assigned letter as an identifier. The determined sample size to demonstrate statistical significance was 31 and the participant cohort numbered 33. Some components of data collection were previously explained. More detail is included in this section.

Descriptive quantitative data was collected for statistical analysis. The pre-briefing session of the simulation was provided as part of the NLN/Jeffries simulation framework and was used to orient participants to the simulation scenario and to decrease any anxiety experienced by participants (Durham, Cato, & Lasater, 2014). During this time the participants were given a report on the virtual patient and initial role expectations. Assigned roles were those of primary and secondary nurse. No data was collected in this phase, or the debriefing phase. Data collection relative to clinical and
statistical outcomes began when the scenario began.

The simulation scenario includes that of an elderly patient with a diagnosis of COPD exacerbation due to community acquired pneumonia. The unfolding scenario utilized a valid NLN scenario adapted for this situation and followed an evidence-based NLN design template (National League for Nursing, 2010). High-fidelity simulation was used to enable both subtle and overt signs of patient compromise. This included subjective and objective information sources. This degree of fidelity also required participant interaction and the ability to evaluate the “responding” category in the LCJR.

Observers began scoring as the participants began to interact with the mannequins. One observer was assigned to each scenario group and graded all participants using a separate LCJR, identifying each only by letter. A separate person controlled functional features of the mannequins. To prevent any bias, the content expert did not score the nurse residents. Any of the nurse residents who were past students of this author were assigned to a different simulation group.

Participants worked as a team in caring for the patient, although one was randomly assigned as the primary nurse and the others as secondary nurses. Teamwork and collaboration is a core QSEN competency as well as a role expectation of the licensed registered nurse (Lasater et al., 2014; Loughran, 2017; QSEN, 2018). Clear communication is also a clinical judgment characteristic, as noted by Tanner’s model and the responding category within the LCJR (Tanner, 2006; Lasater, 2007). A collaborative approach was essential in anticipating and responding to rapid patient deterioration and employing the QSEN framework checklist in simulated clinical decision-making.

Once the simulation had ended, participants completed the aforementioned post-test. This contained the same questions as the pre-test, allowing correlational data
collection and maintaining alignment within the project. Post-test questions were based on the simulation scenario. Debriefing questions in a survey format were again included to assist in measuring reflection. The test was proctored and administered in a classroom setting.

The final points of data collection focused on participant documentation within the electronic medical record in use by the clinical facility. This author’s content expert had permission to view and collect this data and was the only one to do so, deidentifying all data. Baseline documentation of patient oxygen saturation via pulse oximetry and respiratory rate was collected for two weeks prior to the project, solely for those participating in the project. This data was examined to evaluate for frequency of documentation and correlated with other vital signs and abnormal findings related to deterioration. This included corresponding progress notes detailing patient status changes, indication of physician notification and any nursing or physician interventions.

The same data was then collected using the same parameters (oxygen saturation and respiratory rate) and correlated information for three weeks post simulation. As per the PICOT question, collection focused on a timeframe of more frequently than every four hours. The facility protocol for this documentation is normally required every four hours or once per eight-hour shift (Hospital Policy, 2018). More frequent documentation is completed based on a variety of factors, such as unit placement, patient diagnosis, actual or impending patient deterioration, post procedure care or a code blue event (Elsevier, 2016; Hospital Policy, 2018). Documentation more frequently than every four hours signals the recognition of anticipated or unexpected patient deterioration and subsequent nursing interventions.

The clinical practice guidelines in use at the clinical facility used for this project
set a standard for ongoing correlation between diagnosis, vital sign alterations and
decreased oxygenation with active surveillance by the nurse (Elsevier, 2016). The clinical
policy for assessment and vital signs also emphasizes use of clinical judgment to prevent
patient deterioration and that increased frequency of assessments and vital signs is to be
performed and documented as needed (Hospital Policy 2018). Dependent upon the degree
of decompensation, these assessments may need to be repeated every 15 minutes. These
policies and guidelines are evidence-based.

It was emphasized during pre-briefing that confidentiality of performance and
competence would not be shared with unit managers or anyone in the facility. All scored
LCJR forms will remain in the possession of this author and only completed statistical
data will be shared with the content expert. Participants were further reassured that results
and performance would not impact their employment or unit-based evaluations in any
way. Once the project was completed, the scored LCJR forms remained in this author’s
possession, contained in a locked file.

Data Analysis Procedures

The first point of data analysis occurred with comparison of pre-test and post-test
scores using a paired $t$-test. Use of this analytical test was appropriate as all assumptions
pertaining to it were satisfied and it measured the same dependent variable at different
points in time (Ali & Bhaskar, 2016; Pickard, 2017). The results of this analysis can be
found in Chapter 4, reported in tabular format and expressed as a $p$-value. This provided
statistical information on the effect of QSEN-based education on baseline clinical
judgment skills and represented the degree of statistical effect of the stated intervention.

A frequency table was used to display computed scores of the LCJR. Tabulation
of scores were completed by category, according to the Likert scale included in the
headings of the rubric. A score total for the entire rubric was also computed. No participant identifiers were used.

Pearson’s r was applied to analyze the correlational relationship between the reflective survey questions on the pre-test and post-test. Use of this statistical method enabled a comprehensive assessment of reflection, as it is a core concept of the LCJR. This analysis also strengthened project alignment relative to analyzing the effects of all stated interventions. Results of this analysis are detailed in chapter four.

Pearson’s r was also applied to analyze the correlational relationship between the post-test results and the LCJR tally scores. The rationale for this was that the post-test scores demonstrated subjective knowledge of patient deterioration and cue recognition after simulation completion. The LCJR tally scores, which were combined categorical scores, demonstrated objective knowledge of those factors as observed during simulation. Analysis of this relationship was essential in being able to answer the clinical and PICOT questions and to demonstrate the degree of impact of the stated interventions.

Frequency tables were utilized to display the frequency of documentation of pulse oximetry and respiratory rate prior to the simulation and after. Pearson’s r was then applied to analyze a linear relationship in documentation between those two timeframes. The frequency was coded using the timeframes of every eight hours, every four hours, every two hours, every hour, or more frequently than every hour. This enabled correlation with vigilance and ongoing surveillance of patient progress when actual or potential deterioration occurred.

All combined results did demonstrate a degree of statistical relevance pertaining to noticing, interpreting, responding and reflecting characteristics as well as cue recognition. A degree of clinical significance was also demonstrated. The degree of
categorization within the LCJR and its alignment with the QSEN KSAs assisted in the establishment of a causal relationship between QSEN competencies and clinical judgment behaviors used in practice. This author was excited to analyze the results.

Although the participant cohort was relatively small, the goal of demonstrating statistical significance was met. The clinical and PICOT questions were answered, and the project demonstrated alignment per the SQUIRE guidelines (Goodman et al., 2018). Project methodology and design aligned with the stated variables, use of the LCJR and the clinical problem. All analysis was completed using Statistical Packages for Social Sciences (SPSS) software, version 25 and Microsoft® Excel for accurate calculation.

Microsoft® Excel was utilized to create charts and frequency tables. SPSS-25 software was used for determining paired $t$-test results, as well as the Pearson correlation results. The level of significance for both was 5%. Raw data was entered into SPSS-25 after being coded. Paired $t$-tests were appropriate for comparing responses of a single group at two different points in time, while Pearson’s $r$ was necessary to correlate interventions with practice change (Ali & Baskhar, 2016). This process ensured accuracy of data analysis.

**Ethical Considerations**

Ethical considerations may serve as barriers to a project if not addressed. Although this project was non-experimental, novice registered nurses could be considered to be a vulnerable population. No coercion or deception was used, and all participants were given the autonomy to voluntarily participate or to decline to participate. Participation and all data were coded and protected so that the privacy of information was assured. These measures as well as those previously mentioned protected and respected the rights of all participants and meet provisions of the Belmont
report (Salganik, 2014; Shivayogi, 2013). High-fidelity simulation normally has an added element of filming the scenario, but this aspect of simulation was not utilized, and this was disclosed to participants.

This author had met with the DNP project review committee at the facility and permission to use the facility was granted. A written report outlining the quality improvement project was submitted and accepted as part of the aforementioned approval. A formal letter was also received from the facility’s Internal Review Board (IRB), stating that the project did meet the standards for a quality improvement project and thus no IRB review was needed. An identical outcome letter was received from Grand Canyon University. All ethical requirements of the project were met.

Potential conflicts of interest were minimal. The first to be considered was that the content expert was the coordinator of the nurse residency program and had an established relationship with the participants. Since this person assigned the residents to simulation groups, potential bias was reduced by using blind randomization of the cohort after they had been re-identified by letter instead of name. The content expert was also given an indirect role in the simulation scenarios, which negated any impact of the prior relationship with participants.

The second potential conflict was that three previous students of this author were members of the nurse resident cohort. Thus, there was a degree of familiarity with the clinical performance of those particular residents. This potential conflict was resolved in several ways. Contact between the author and these residents was minimal during the project, no names were used on the pre-test and post-test, and the direct observation and scoring of these specific participants were completed by one of the other observers.
Limitations

Limitations were perceived to be few within the project, as determined by the author in collaboration with the content expert and observers. The broad topic area aligned well with the PICOT question and was supported by the foundational principles and the literature synthesis. The project was well-received by the content expert and the DNP project review committee. It was also well-received by the nurse residents.

A minor limitation was believed to exist relative to contextual knowledge of the QSEN competencies and their impact on patient outcomes. This was ameliorated through the inclusion of the didactic session. Application of the competencies and KSAs were strongly integrated into the simulation scenario as well as in the debriefing. Handouts of the QSEN framework checklists were provided for use within the simulation as well as at the bedside post-simulation.

One limitation discovered by observers during the simulation is that the nurse residents requested the assistance of the rapid response team early on, versus considering all of the presented cues, responding within the registered nurse scope of practice, and relying on clinical judgment for decision-making. This reaction could have shortened the duration of the scenario and prevented adequate scoring of the LCJR. The potential for this was anticipated prior to the simulation. The nurse residents were told by observers that the rapid response team was delayed in arriving. This finding underscored the importance of this project.

No limitations were determined to exist relative to the methodology. The sample size, although determined to be adequate via power analysis, was somewhat small. However, this number of participants was well-managed within the proposed design.
Only two registered nurses did not participate, due to illness, so attrition was not a limitation.

An initial perception of limited cohort availability and being able to complete the project in the allotted timeframe was ultimately not a huge limitation. Although there were schedule conflicts, all barriers were surmounted, and data collection processes were thorough and accurate. Adequate exposure to the cohort allowed project objectives to be met. All portions of the project were completed.

While the need for multiple observers might be perceived by some as a limitation, this was not the case. All were well-versed in simulation as nurse educators. Those not familiar with the LCJR were oriented to the tool as previously described in detail. No problems were verbalized relative to scoring of the tool. Debriefing discussions on scoring revealed that there was consensus in scoring.

Data analysis was crucial in obtaining accurate results. SPSS and Excel were used along with consultation with colleagues to ensure rigor. Otherwise, data gathering, compilation and organization was not a difficult process. The work schedule of the registered nurse residents and patient conditions did not enable large amounts of documentation data. However, an adequate amount was collected to facilitate statistical analysis and potentially demonstrate clinical significance.

**Summary**

A serious clinical problem negatively impacting patient safety has been identified and well researched from many perspectives. Several root causes of clinical judgment deficiency among novice nurses have been identified and have several points of origin. Research did clarify some potential solutions, although more work is needed to promote awareness of the problem and implement viable solutions. This author’s perspective is
that an initiative featuring strong collaboration and sharing between academic and clinical educators is a viable starting point. Both settings focus on safety, clinical judgment and role responsibilities. A collaborative effort could simultaneously address these aspects and provide future directions for research and solutions.

Current research supported this perspective. Original research relevant to the stated clinical problem through the IOM was further supported by major nursing stakeholders (IOM, 2011). Advocacy-based initiatives from nursing stakeholders such as the NLN, TJC, QSEN and the ANA supported additional research as well as collaborative efforts to close the knowledge and clinical judgment gaps of newly licensed registered nurses (Lyle-Edrosolo & Waxman, 2016; VanFosson, Jones, & Yoder, 2016). This included the establishment and expansion of nurse residency programs along with multiple pedagogical approaches to bridge acknowledged gaps in occurrences of preventable patient harm (Kalisch, McLaughlin, & Dabney, 2012; Stout et al., 2015).

Synthesizing this evidence became the foundation for this project.

Through completion of the literature synthesis, support for all components of this author’s project was validated. Although seemed somewhat complex, the methodology and design aligned with current research and similar quality improvement projects. Data collection methods also aligned with all parts of the project and accuracy of collected data was ensured. Clinical judgment aspects are interrelated, as are the QSEN competencies and KSAs. Components of Tanner’s model in the LCJR are reflected in the KSAs and vice versa.

Aspects and components of all of these factors have become part of the nurse’s role responsibility and integrated into acute care policies and clinical practice guidelines as well as the data collection and statistical analyses relative to cue recognition and
improved patient outcomes (Angel et al., 2016; Elsevier, 2016; Miller, Owens & Silverman, 2015). Chapter four was used to provide detailed statistical analysis for this author’s project. Statistical analysis was designed to establish a correlation between the project interventions and improved clinical judgment. A specified documentation timeframe of specific parameters noted to be frequent indicators of patient deterioration represented potentially improved cue recognition.
Chapter 4: Data Analysis and Results

Use of clinical judgment skills is necessary in every aspect of patient care. Such skills contribute to safe and effective decision-making by the nurse and have a direct correlation to patient outcomes (Cappelletti, Engel, & Prentice, 2014). Development of these crucial skills occurs experientially. Despite the improvements in new graduate orientation programs, a literature synthesis has identified that clinical judgment development is often challenging to newly licensed graduates, whose pre-licensure experience is not completely congruent with the role responsibilities of the licensed registered nurse (Della Ratta, 2016; Herron, 2018; James, Patrician, & Miltner, 2017). These factors result in ineffective use of clinical judgment skills and undesirable patient outcomes.

This clinical problem is compounded by the fact that there are multiple aspects of clinical judgment, which may all develop at varied rates over time (Benner, 2015; Lasater et al., 2015; Lewis, Stephens, & Ciak, 2016). As noted by Tanner (2006), clinical judgment behaviors and skills are categorized according to a nurse’s ability to notice or recognize abnormal or unexpected findings, interpret their meaning and respond within the nurse’s scope of practice accordingly, and actively reflect on situational clinical decision-making (Melnyk et al., 2014; Monagle et al., 2018; Truglio-Londrigan, 2016). Cue recognition is a specific component of clinical judgment noted to be essential in avoiding undesirable patient outcomes relative to patient deterioration. Multiple findings in the literature review correlate deficient cue recognition among nurses with missed and omitted care, errors in care and instances of preventable harm, including incidences of preventable code blue events (Brice, 2014; Kalisch, 2015). The problem statement appropriate for this clinical problem is It was not known if and to what degree the
implementation of QSEN education with simulation for nurses impacts clinical judgment and frequency of documentation of deterioration parameters in an acute care hospital in southeastern Pennsylvania. As previously mentioned, alterations in these values occur commonly in the acute care setting. Both have been associated with untoward patient outcomes and part of the problem related to missed cues (Chuang, Huang & Su, 2015; Herron, 2018; Kalisch, 2015). The untoward outcomes have been noted to be preventable when these cues are recognized and responded to in a timely manner (Miller, Owens & Silverman, 2015). This project’s interventions and data analysis correlated these key factors and demonstrated potential practice change through the documentation of cue recognition as specifically related to the parameters previously mentioned.

The purpose of this quantitative, pretest posttest quality improvement project was to determine if and to what degree the implementation of QSEN education with simulation for nurses impacts clinical judgment and frequency of documentation of deterioration parameters in an acute care hospital in southeastern Pennsylvania. A QSEN-based framework, in the form of a checklist created by the QSEN institute incorporated the knowledge, skills and attitudes used in clinical decision-making and supported use and development of clinical judgment behaviors (Dolansky et al., 2017; Koffel et al., 2017; Sherwood & Zomorodi, 2014). Simulation, as noted in the literature, combined realism and situational learning to promote the habits of mind relative to cue recognition and other aspects of clinical judgment (Lavoie, Pepin, & Cossette, 2015; Miraglia & Asselin, 2016). The methodology for this author’s project combined QSEN and an unfolding simulation to focus on recognition of a patient’s gradual clinical deterioration.

A quantitative methodology was used to answer the following clinical question: How does a QSEN competency framework, combined with simulation, positively affect
cue recognition of patient deterioration in clinical practice as evidenced by
documentation of oxygenation and respiratory rate more frequently than every four
hours? The more specific PICOT question used to analyze and correlate data was as
follows: (P) Among nurses who care for cardiovascular patients on nursing units at an
acute care facility, does (I) education regarding recognition of anticipated patient
deterioration using high-fidelity simulation guided by a QSEN-based framework, (C)
compared to not using the framework in current practice, (O) result in increased
anticipation of patient deterioration as measured by documentation of oxygen saturation
and respiratory rate more frequently than every four hours (T) after three weeks?
Registered nurses (n=33) participated in an interactive, QSEN-based learning session
followed by a high-fidelity simulation focused on a deteriorating patient secondary to
impaired oxygenation. Real-time documentation of the specific indicators of clinical
deterioration, as described above, were collected prior to the project and for three weeks
afterward.

High-fidelity simulation is an evidence-based intervention often cited in scholarly
literature to address the clinical problem of deficient cue recognition and poor patient
outcomes (Aebersold, & Tschannen, 2013; Cazzell & Andersen, 2016; Cooper et al,
2016; Lasater et al., 2015; Lavoie, Pepin, & Boyer, 2013). The nursing care standards
reinforced and utilized via a structured framework within simulation were noted in
literature to translate into practice (International Nursing Association for Clinical
Simulation and Learning (INACSL)Standards Committee, 2016). This was demonstrated
in this project through documentation of cue recognition by registered nurse residents at
the bedside. The specific parameters of respiratory rate and oxygenation were
documented more frequently in response to patient changes signaling deterioration.
Supportive data in the form of nursing responses and repeat assessment and monitoring of the specific parameters was also noted consistently.

The purpose of this chapter is to further detail project alignment through the presentation of data. All data have been analyzed utilizing comparisons and correlations related to both dependent and independent variables. Comprehensive data from all project phases has been included. All have been presented in tables and figures, along with narrative interpretation.

**Descriptive Data**

Descriptive statistics enable organization of data types in quality improvement projects. These variables can then be expressed as measures of central tendency and frequency used to describe, clarify and explain the identified variables (Pickard, 2017). Information is also yielded on data distribution. Describing statistics was an important first step in establishing relationships between variable data.

**Demographic data.** Descriptive data for this author’s project originated from several sources. An important starting point was gathering participant demographics. Since the cohort was relatively homogeneous, data collection of demographics was limited to participants’ academic education, age and months of licensed practice (See Figures 2-4). All of the participants \( n=33 \) met the previously stated parameters for inclusion in the quality improvement project.
Figure 2. Population demographics specific to academic program.

Figure 3. Population demographics specific to age.
The majority of the project participants (67%) had completed a Bachelor of Science in Nursing (BSN) degree program as indicated in Figure 2. The remainder had completed either a diploma nursing program or an associate degree (ADN) nursing program. Although this data indicated an unequal distribution among participants relative to educational background, all attended the same orientation program. All participants were also enrolled in the nurse residency program and benefitted from guided preceptorship as well.

A slight degree of unequal distribution among the cohort was also noted relative to their reported ages (See Figure 3). Among all participants, 75% reported an age of less than 30 years. This was determined to be of little significance relative to project outcomes since the participants received similar post-academic education within the clinical facility and similar experiential learning opportunities. Also, performance of all participants within the simulation and on the pre-test and post-test was similar. More detail on the pre-test and post-test results is addressed in subsequent paragraphs.
Months of licensed practice time, as displayed in Figure 4, was the most consistent demographic variable. The original demographic form included two other choices for months of practice time. These were 0-6 months and 13-18 months. None of the participants selected these options. This indicated that there were no significant outliers which could potentially skew statistical results in some way.

**Data Analysis Procedures**

Statistical analysis was completed after carefully choosing the appropriate test to demonstrate statistical significance relative to the clinical question and PICOT question. This included satisfying the assumptions of the selected tests. All results were entered into either SPSS 25 or Excel® so that accurate and appropriate analysis was able to be performed and presented.

All data from all sources was completely deidentified and remains in the possession of this author. Saved electronic data is to be maintained in a password encoded file and any hard copy data will be shredded. Data relative to demographics was also deidentified. Documentation data collected by the content expert for each nurse resident in the project cohort was completely deidentified.

**Pre-test and Post-test.** The pre-test and post-test were hand graded by this author. All results were entered into Statistical Package for the Social Science using coded data to differentiate between the two tests. The pre-test was coded as 1 and the post-test as 2. Coded data was also entered for each score, which ranged from 63 to 100. There were 12 different scores in this range, coded from 1 to 12, respectively.

Frequency tables and descriptive statistics were applied to the data. This detailed measure of central tendency, as well as results for skewness and kurtosis to fully evaluate data distribution (see Table 2 and Table 3). Figures 5 and 6 display histogram data. Both
the pre-test and the post-test demonstrated moderate skewness and a slight platykurtic pattern. The pre-test included 32 responses, as one nurse arrived late and did not take the test. All 33 nurses completed the post-test.

**Survey questions.** Survey questions were important in addressing reflection as a core component of clinical judgment and professional accountability in preventing patient harm. Surveys were included as part of the pre-test and post-test to ensure completion and simplify project paperwork for the nurse residents. Survey histograms were created using Microsoft Excel®, using the labels of the Likert scale: rarely, sometimes, frequently, and always. Refer to Figure 7 and Figure 8.

In order to create a correlational relationship between the pre-test survey questions and those on the post-test, SPSS was also used. Numerical data was coded using a scale of 1, 2, 3, and 4 respectively to represent the labels of rarely, sometimes, frequently, and always respectively. These were then entered according to their specific frequency in columns for each question, by pre-test and post-test. Pearson’s $r$ was performed on each pair of questions, assigned according to pre-test and post-test. The resultant data is displayed in Table 4 and Table 5.

**LCJR scores.** The LCJR was used during the simulation scenario and initially scored by observers, with one form assigned to each participant. As mentioned previously, preparatory sessions with observers as well as a post project meeting were conducted to align scoring among observers. This avoided inequities in interrater reliability and barriers to valid collection and analysis. Each categorical section of the rubric was hand scored by observes and this author. Tallies were completed by this author and data entered into SPSS.
Categorical scores as well as total tally scores were carefully reviewed for accurate computation. The scores according to category were entered into Microsoft Excel® according to frequency of occurrence according to the LCJR Likert scale. Label headings were used and were beginning, developing, accomplished and exemplary. The summative scores for all participants from each category were then entered in whole numbers. This data was presented in Figures 9 through 12. This presentation was chosen to display trends in responses.

A narrative analysis was used to correlate events during simulation with those scores and frequencies. This enabled determination of clinical significance relative to deficient clinical judgment ability concerning cue recognition. Total tally scores for the LCJR were used to correlate a statistical relationship to the post-test. Both scores were entered into SPSS according to actual numerical value. A scatterplot was run to determine the linear relationship between these variables. Pearson’s r was then applied and determined to demonstrate statistical significance. See Table 9.

**Documentation.** Documentation in real-time of both respiratory rate and oxygen saturation as measured via pulse oximetry was collected for two weeks prior to the simulation. This was done by the content expert and tabulated according to documentation of each parameter (respiratory rate and oxygen saturation via pulse oximetry), as well as overall frequency of documentation. This data enabled complete and comprehensive data analysis, allowing full interpretation of the project’s impact.
A correlation was completed to demonstrate a linear relationship between the frequency of documentation before and after project interventions. Frequency tables were used to demonstrate whether either of the stated parameters were included or omitted in documentation. Documentation data entered for correlational analysis used the following parameters of frequency:

- “1” = every 8 hours
- “2” = every 4 hours
- “3” = every 2 hours
- “4” = every hour
- “5” = more frequently than every hour.

These values were specifically chosen to align with current facility policy and facilitate meaningful data collection.

The current frequency of assessment and vital signs followed specific policy created in-house as well as per Elsevier clinical practice guidelines (Elsevier Incorporated, 2016; Hospital Policy 2018). The in-house policy directed the nurse to obtain full assessments and vital signs (blood pressure, pulse, respiratory rate and pulse oximetry) every four hours until stable, then every eight hours. Within higher acuity units such as intermediate care and critical care, the frequency is directed to be every 1-2 hours or more frequently based on the patient’s condition. Data originated only from medical-surgical units.

This policy also directed nurses to reassess and re-evaluate, “more frequently based on patient condition” in any care setting within the facility (Hospital Policy, 2018). Active correlation of all contributing factors to deterioration, along with monitoring and trending of assessment and vital signs was the expectation based on scope of practice.
The Elsevier clinical practice guidelines (2016) emphasize, complete assessments, airway management, frequent monitoring and trending of assessments and vital signs based on diagnosis, and vigilance for anticipated decompensation. To assist in the process of identifying rationales for the frequency of documentation, associated data will be collected. This included progress notes documenting patient deterioration. It also included any evidence of the need for either rapid response or code blue teams in response to patient deterioration.

**Results**

All phases of this quality improvement project were completed. Data was analyzed previously from multiple perspectives as correlated with the foundational principles of the project. This section presents and clarifies project results. Detailed reports are included in the section below, viewed from a perspective of interventional effects.

**Pre-test data.** Descriptive data was instrumental in comparing pre-test and post-test results relative to the simulation and was one of the first comparisons to be made. It was a preliminary step essential in being able to answer the clinical question, and ultimately the PICOT question. Ideally, such tables and graphs should not contain missing data which can skew results (Pickard, 2017). The results displayed in Table 6. represented the frequency relative to the pre-test, which was administered after the didactic intervention and prior to simulation. The missing item indicated in that table represents an uncompleted pre-test due to one participant’s late arrival.

The pre-test was instrumental in establishing the baseline clinical judgment ability of participants prior to influence from the project’s interventions. It was acknowledged that the clinical judgment demonstrated was a culmination of academic, post-academic
and licensed practice experience up to this point in time. The pre-test can be found in Appendix F. Answers were based on participants’ interpretation of a case study.

Clinical judgment specific to cue recognition was evaluated using questions from a scholarly article (Lasater et al., 2015). All were used with permission. The open-ended questions prompted use of noticing, interpreting, evaluating and reflecting and a total of 15 points were possible. Scores were converted to percentages by dividing the number of earned points by 15.

Percentage scores, as indicated in Table 6, ranged from 63-93%. These scores resulted in a mean, median and mode of 81, 83 and 87 respectively. The histogram in Table 6 demonstrated data dispersion. Although it appears as though there is wide dispersion, a higher number of participants scored 80% or greater. Skewness and kurtosis will be addressed in detail in the section on inferential statistics when comparing results of the pre-test and post-test.

Common themes correlating with incorrect answers and which reflected deficient cue recognition were:

- The inability to accurately identify the primary cause of potential deterioration,
- The inability to distinguish between an urgent and emergent situation,
- Weak rationales between abnormal pathophysiology and manifestations of deterioration,
- A lack of monitoring and trending data relative to deterioration,
• Limited awareness of scope of practice and the nurse’s accountability in responding to patient deterioration, and

• Incomplete responses related to making recommendations when reporting patient condition changes to the physician.

In terms of clinical judgment behaviors, these noted deficiencies are summarized as incomplete noticing of significant patient status changes which led to incorrect or incomplete interpretation of symptoms and omitted or missed care. This in turn led to an incorrect or delayed response by the nurse. Without full recognition or awareness of these deficiencies, reflection became an incomplete process.

These preliminary findings were supported by the literature review previously presented, validating evidence of the incomplete use of knowledge, skills and attitudes in clinical decision-making among novice registered nurses. These findings supported the need for this quality improvement project. Use of a competency-based framework, such as the QSEN-based framework utilized in this project was also supported. This framework integrated KSAs into the cognitive reasoning used in clinical judgment to ensure a more comprehensively vigilant response relative to cue recognition of patient deterioration.
Table 2

*Frequency Table: Pre-test*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
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<th>Skewness</th>
<th>Kurtosis</th>
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*Frequency Table: Pretest*

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</tbody>
</table>

*Note.* Pertinent pre-test data.
Figure 5. Histogram of pre-test score ranges.

Post-test data. The post-test was based on the case study used in the simulation scenario and contained the same questions as the pre-test. The main cause of deterioration was the same in both tests. The post-test was administered on the completion of simulation and debriefing. No missing data was identified ($n=33$). Percentage scores ranged from 67-100% with a fairly even distribution. The resultant mean, median and mode was 84, 85 and 87 respectively.

Complete data is presented in Table 3 below. The data indicated that the majority of participants (52%) had scores of 80, 83 and 87. Common themes in the incorrect answers reflecting deficient cue recognition and clinical judgment skills were the same or very similar to those previously identified. Other themes which emerged were:
- Lack of detail when explaining the cause of actual or potential patient deterioration,
- Failure to completely answer questions,
- Avoiding use of nursing terminology in communication.

These findings were correlated with the simulation scenario events in subsequent paragraphs.

Table 3

*Frequency Table and Histogram: Post-test*

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<th>Minimum</th>
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<th>Std. Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
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<td>Std. Error</td>
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</table>

**Note.** Pertinent post-test data.
Figure 6. Histogram of post-test score ranges.

**Self-reflection survey.** Section two of both the pre-test and post-test incorporated self-reflection questions. These were presented previously in Table 5 and can also be found in Appendix D. They have been included again for ease of interpretation of the following tables. Table 4 below displays a frequency table for each question’s responses. Figure 7 displays the accompanying histogram.

Question 1: I can recognize possible early signs or symptoms when a patient’s health deteriorates.

Question 2: I can explain the mechanism and development associated with the early signs and symptoms when a patient’s health deteriorates.

Question 3: I can accurately evaluate and identify whether a patient’s condition has improved.

Question 4: I know the follow-up steps to take if a patient’s condition does not improve.
Table 4

Self-Reflection Survey Results: Pre-test

Section 2 Frequency Tables: Pre-test Survey

<table>
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<th>Question1</th>
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<td></td>
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</tbody>
</table>

Note. Self-reflection data prior to simulation.
Figure 7. Histogram representing participant answers to pre-test survey questions.

No missing data was identified although not all of the cohort completed this section \((n=29)\). Three participants submitted a blank survey and one participant arrived late and did not complete a pre-test. The data indicated that the majority of respondents were confident in their ability to recognize and respond to patient deterioration, although few selected the option for “always”, which indicated inconsistent cue recognition. These findings are somewhat incongruent with actual pre-test performance and have been more thoroughly analyzed in the section on correlation.

Section two of the post-test contained an identical survey of self-reflection questions. Results are presented in Table 5 and Figure 8. While self-reflection is an integrated element within the LCJR, it was based on observed performance during simulation within this project. Obtaining self-reflection data from participants assisted in establishing the clinical significance of this quality improvement project.
All participants completed the post-test survey ($n=33$) and there were no missing data. A similar pattern emerged in which the novice nurses self-reported confidence in recognizing and responding to cues of patient deterioration. This may appear as a positive finding from some perspectives, although it demonstrates a lack of consistency in observed responses to patient deterioration within the simulation and on testing.
### Self-Reflection Survey Results: Post-test

#### Frequency Tables: Post-test Survey

**Question 1**

<table>
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<th>Frequency</th>
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<tr>
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**Question 2**

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**Question 3**

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**Question 4**

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**Note.** Self-reflection data post-simulation.
Figure 8. Histogram representing participant answers to post-test survey questions.

The LCJR. Descriptive statistics related to LCJR scores enabled categorical quantification of clinical judgment behaviors which included cue recognition. Quantifying these scores assisted in answering the clinical question through examination of specific aspects of clinical judgment. LCJR categories align with QSEN KSAs, enabling correlation of outcomes with use of the QSEN-based framework. During pre-briefing, participants were instructed to clearly state rationales for all observations and decision-making. Figures 9 through 12 display the final scores from each category, emphasizing all sub-categories.

Scores were completed during the simulation by observers. Each simulation group contained 3-4 participants in the assigned roles of primary nurse and secondary nurses. This design reinforced the importance of teamwork and collaboration, as well as the other QSEN competencies and KSAs. Observers met for debriefing to promote
interrater reliability of scoring and to discuss common themes, considerations and concerns. The patient was a high-fidelity mannequin.

The unfolding simulation scenario required the newly licensed nurses to rapidly assess, recognize and respond to patient deterioration in a set timeframe. Appendix D contains a detailed event timeline as well as other pertinent simulation details. The end-point of the scenario was the deterioration of the patient to a point where the rapid response team was called and carefully designed to proceed for 15-20 minutes. The timeline was designed to promote independent decision-making by the nurse, promoting accountability as in the LCJR and the QSEN KSAs. The design also allowed adequate time to accurately score the LCJR.

Figure 9 highlights the results obtained from scores in the category of noticing. As noted in the detailed timeline in Appendix D, this skill was first required when encountering the patient. The nurses were expected to notice that the patient was tachypneic and flat in bed, with noted hypoxia via pulse oximetry. Patients experiencing inadequate oxygenation are encountered frequently in clinical practice for a variety of reasons (Brill, & Wedzicha, 2014; Gamache, Harrington, & Kamangar, 2019). It was essential for nurses to recognize preventable cues of patient deterioration relative to impaired oxygenation.
Figure 9. The majority of participants were scored as accomplished in this category.

The simulation scenario required the use of interpreting through collaborative analysis of patient data from a variety of sources. These included subjective and objective data from direct patient interaction. It also included alterations in physical assessments and vital signs, and correlation of the patient medical record contents with actual or potential deterioration. The medical record provided was a paper chart inclusive of the chief complaint, history of present illness, past medical history, physician orders, lab values, chest x-ray image and chest x-ray report. Results are displayed in Figure 10.
Figure 10. No participants were scored as beginners on the LCJR.

Desired responses of and actions by the nurse residents were included on the detailed event plan. Some examples of the desired responses, based on noticing and interpreting were to place oxygen on the patient, raise the head of the bed, and use oral suctioning to maintain a clear and patent airway. Other desired actions were to interpret the physician orders. This was then to lead to collaboration with the respiratory therapist to administer an aerosol treatment, as a response to the patient’s continued wheezing. Details from scoring related to responding are displayed in Figure 11.
Figure 11. Consistency was observed in the developing and accomplished categories. During the simulation, participants were encouraged to collaborate and communicate with each other. This enabled observation and evaluation of reflecting, and these scored results are displayed in Figure 12. As the scenario progressed, self-analysis became more evident as the residents verbally reflected on their choices and reasoned through when to call for the rapid response team. The self-reflection questions previously presented were also used in the debriefing phase.
Figure 12. Reflecting was observed to be somewhat inconsistent.

The simulation scenario. Although this group of newly licensed registered nurses had experienced various types of situational learning in supportive environments, few demonstrated consistency in performance at the exemplary level. Pertinent results, as noted in the preceding figures were determined to align with Benner’s theory (Benner, 1984). Consistency in performance at the developing and accomplished levels for the majority of the cohort, based on months of licensed practice, follows the pathway of Benner’s experiential learning progression. Noted variations in this pattern originated from indeterminant causes and would require further study.

Common themes identified relative to performance and as evidenced in the literature review were observed during simulation. The first is that actions taken during the simulation aligned with both pre-test and post-test responses. There was often a noted lag between participants’ recognition of a status change reflecting deterioration and an
appropriate response to it. A decreased ability to correlate pathophysiology with symptomatology was also noted.

This led to commonly noted missed cues and omitted care. Poor oxygenation was determined by the majority of participants to be secondary to COPD. There was incomplete recognition of acute exacerbation of this chronic condition due to acute pneumonia. These examples demonstrated a deficiency in clinical judgment skills.

The majority of participants were unable to recognize the need for oral suction to maintain the patient’s airway. Suction equipment was available but infrequently referred to or used. The majority of participants attempted to correct the patient’s hypoxemia, as manifested through pulse oximetry, with increasing amounts of oxygen therapy. Oxygen therapy was rapidly titrated upward to 10 liters, with no correlation between flow rate, the device used, or the consideration to limit oxygen flow rates in the patient with COPD.

Moulage was used to show evidence of thick yellow sputum in tissues, but this was not consistently acknowledged. Moulage was also used to indicate skin and nailbed cyanosis. This was not acknowledged verbally or used as part of clinical judgment-based decision-making. Very few participants verbalized about or tested capillary refill, despite the notation of prolonged capillary refill in the bedside chart by the physician.

Average time of each scenario was 15 minutes. There was a noted trend by participants to involve the rapid response team very early on. This resulted in inaction or indecision by the participants. It demonstrated evidence of an automatic decision-making process that is devoid of clinical judgment and which does not promote accountability of the nurse’s scope of practice.

**Pre-simulation documentation data.** Collection of documentation data was completed by the content expert. Random sampling of real-time documentation from
among those residents participating in the project was used. As previously explained, a limitation in data collection was recognized. This occurred secondary to shift schedules of the participants during the collection timeframe. Ultimately 12 occurrences of documentation were collected as displayed in Table 6.

Table 6

*Frequency Table: Pre-simulation Documentation Data*

<table>
<thead>
<tr>
<th>Respiratory Rate</th>
<th>Oxygen Saturation</th>
<th>Frequency of Vital Sign Monitoring/Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>92</td>
<td>8</td>
</tr>
<tr>
<td>16</td>
<td>98</td>
<td>8</td>
</tr>
<tr>
<td>Not documented</td>
<td>98</td>
<td>8</td>
</tr>
<tr>
<td>18</td>
<td>96</td>
<td>8</td>
</tr>
<tr>
<td>Not documented</td>
<td>93</td>
<td>8</td>
</tr>
<tr>
<td>17</td>
<td>99</td>
<td>8</td>
</tr>
<tr>
<td>16</td>
<td>97</td>
<td>8</td>
</tr>
<tr>
<td>20</td>
<td>92</td>
<td>8</td>
</tr>
<tr>
<td>18</td>
<td>98</td>
<td>4</td>
</tr>
<tr>
<td>20</td>
<td>92</td>
<td>4</td>
</tr>
<tr>
<td>Not documented</td>
<td>96</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>99</td>
<td>4</td>
</tr>
</tbody>
</table>

*Note.* Specific deterioration parameters were not included in three cases.

The overall frequency of documentation was either every four or every eight hours. This trend aligned with the findings from scholarly literature as previously presented. Evidence of undocumented data were evident, supporting the previously noted findings of missed or omitted care. Associated data collected indicated that the four patients assessed every four hours were admitted to a heart failure unit. Two of those patients were receiving oxygen therapy, one was on room air and for one patient there
was no documentation relative to oxygen use. Three were noted to have abnormal breath sounds.

The remaining patients had been admitted to a medical-surgical unit. Although several of these patients had abnormal breath sounds and one patient was placed on oxygen during that shift, frequency of documentation did not change. These findings equate to missed care based on the policies and guidelines previously referenced (Elsevier, 2016; Hospital Policy, 2018). These findings strongly supported the need for this project.

**Post-simulation documentation data.** Limitations in collection of this data were similar to those collected during the pre-simulation timeframe. Random selection of those data available originated from 12 occurrences from a separate group of project participants. Although some data was not documented, associated data from progress notes indicated a trend of more frequent documentation (see Table 7). This equated to greater frequency of surveillance, the initiation of nursing interventions, follow-up and collaboration with the physician, and reassessment of the patients’ compensatory ability.
These findings demonstrated consistent use of clinical judgment, more frequent initiation of nursing actions in response to patient deterioration, and recognition of cues related to actual or potential deterioration. This was a noted contrast to data collected pre-simulation, inferring a positive effect on clinical judgment. No progress notes were noted during the pre-simulation data collection. Detailed progress notes were evident in the majority of incidences post-simulation.

**Inferential Data.** Inferential data was instrumental in establishing relationships and varying degrees of comparison and correlation (Ali & Baskhar, 2016; Pallant, 2016; Pickard, 2017). In this author’s quality improvement project an inferred relationship was analyzed between pre-test and post-test results using a paired t-test. This statistical analysis compared the means between baseline clinical judgment skills of all nurses in the cohort at a point prior to project interventions and clinical judgment skills of all nurses.
nurses in the cohort post interventions. The interventions included QSEN-based education and use of the QSEN-based framework during high-fidelity simulation.

**Pre-test and post-test means.** Table 8 displays the paired t-test results. The significance (p-value or probability value) of .000 indicates a strong significance between the means and the rejection of a null hypothesis (Pallant, 2016). The mean value demonstrates equitable data distribution. The range of the confidence interval from a lower value to a higher one also contributes to a positive statistical effect between the pre-test and post-test. Overall, this data indicated that scores improved on the post-test.

Table 8

*Analytical Comparison: Pre and Post-testing*

<table>
<thead>
<tr>
<th>Paired Samples Test</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paired Differences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>Std. Error Mean</td>
<td>95% Confidence Interval of the Difference</td>
</tr>
<tr>
<td>Pair 1 Pretest - Posttest</td>
<td>-.71875</td>
<td>.72887</td>
<td>.12885</td>
<td>-.98154</td>
</tr>
</tbody>
</table>

*Note.* The p-value = .000

**Correlational data.** Correlational data is necessary in examining the strength of a relationship between variables and enables the demonstration of causality between interventions and desired quality improvement project outcomes (Pickard, 2017). The first correlation analysis utilized two of the project variables. These were the post-test scores (section 1 only), and the LCJR tally scores; the sum of all categories. Establishing a linear relationship between the two assisted in the final correlation, which will answer both the clinical question and the PICOT question.
Pearson’s $r$ was applied, and the statistical results are demonstrated in Figure 13 and Table 9. Prior to analysis completion, all assumptions of normality were satisfied. The scatterplot within Figure 13 demonstrated a linear relationship between the two variables. No missing values were identified. The Pearson correlation value of less than 0.01 and a $p$-value of less than .001 indicated a significant linear relationship between both variables.

Figure 13. Demonstration of a linear correlation via scatterplot between the LCJR Tally and Post-test scores was noted.
Table 9

*Correlational Results: Post-test and LCJR Tally*

<table>
<thead>
<tr>
<th></th>
<th>Post-test score</th>
<th>LCJR tally</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Post-test score</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>.950**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td><strong>LCJR Tally</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.950**</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>33</td>
<td>33</td>
</tr>
</tbody>
</table>

*Note.* Correlation is significant at the 0.01 level (2-tailed).

Pearson’s $r$ was also used to establish a statistical relationship between the pre-test and post-test survey questions. Tables 10 through 13 display the output from this data. In the tables Q1 signifies question 1, Q2 signifies question 2, Q3 signifies question 3, and Q4 signifies question 4. These findings indicated a positive effect on the participants’ perceived clinical judgment knowledge after QSEN framework education and simulation.
Table 10

Correlational Results: Survey Question 1

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Q1pre</th>
<th>Q1post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1pre-test</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>29</td>
</tr>
<tr>
<td>Q1post-test</td>
<td>Pearson Correlation</td>
<td>.668***</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>29</td>
</tr>
</tbody>
</table>

*Note.* Correlation is significant at the 0.01 level (2-tailed).

Table 11

Correlational Results: Survey Question 2

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Q2pre</th>
<th>Q2post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2pre-test</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>29</td>
</tr>
<tr>
<td>Q2post-test</td>
<td>Pearson Correlation</td>
<td>.678***</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>29</td>
</tr>
</tbody>
</table>

*Note.* Correlation is significant at the 0.01 level (2-tailed).
Table 12

*Correlational Results: Survey Question 3*

<table>
<thead>
<tr>
<th></th>
<th>Q3pre</th>
<th>Q3post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3pre-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>.875**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Q3post-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.875**</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>29</td>
<td>33</td>
</tr>
</tbody>
</table>

*Note.* Correlation is significant at the 0.01 level (2-tailed).

Table 13

*Correlational Results: Survey Question 4*

<table>
<thead>
<tr>
<th></th>
<th>Q4pre</th>
<th>Q4post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4pre-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>.855**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Q4post-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.855**</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>29</td>
<td>33</td>
</tr>
</tbody>
</table>

*Note.* Correlation is significant at the 0.01 level (2-tailed).

Use of the Pearson’s $r$ was again employed to analyze a linear relationship in documentation frequency in the post-simulation period versus the pre-simulation period. Analyzing this correlation assisted in evaluating the effects of project interventions on
cue recognition and clinical judgment. A simple comparison of means would not yield this information, which greatly contributed to answering both the clinical and PICOT questions. Figure 14 below details these results.

![Comparison of Documentation Frequency](image)

*Figure 14.* The scale used in creating this table is as follows: 1= every 8 hours, 2= every 4 hours, 3= every 2 hours, 4= every hour, and 5= more frequently than every hour.
Table 14

*Documentation Correlation Pre-simulation and Post-simulation*

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation Frequency Pre-simulation</td>
<td>1.4167</td>
<td>.51493</td>
<td>12</td>
</tr>
<tr>
<td>Documentation Frequency Post-simulation</td>
<td>3.6667</td>
<td>1.15470</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Correlations</th>
<th>PRE</th>
<th>POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation Frequency Pre-simulation</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>12</td>
</tr>
<tr>
<td>Documentation Frequency Post-simulation</td>
<td>Pearson Correlation</td>
<td>-.510</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.091</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>12</td>
</tr>
</tbody>
</table>

*Note.* A total of 12 entries were analyzed.

The comparative data displayed in Table 14 definitely demonstrated an increased frequency of documentation after project interventions. As explained in the table, a higher scale value equates to increased frequency of documentation. This is reflected in the correlation table by the negative number and a correlation coefficient of 1. In simpler terms, increased knowledge and awareness of cue recognition resulted in a greater degree of vigilance, documentation, nursing intervention, and follow-up. While it was recognized that the entire participant cohort was not represented, a practice change was evident.
**Interventional Results of Post-testing.** All results correlated with one or more parts of the clinical question. The clinical question was: How does a QSEN competency framework, combined with simulation, enable improved recognition of patient deterioration in clinical practice, as evidenced by documentation of oxygen saturation and respiratory rate more frequently than every four hours? Obtaining post-test results was the first step in answering the clinical question. The post-test was administered after two interventions were employed. The first was education of the QSEN-based framework and the second was an unfolding high-fidelity simulation scenario.

Desired results were statistical significance as well as clinical significance. Statistical significance was demonstrated as previously presented in Table 1, although mean scores on the post-test were not significantly higher than those of the pre-test. Figure 15 below illustrates the mean, median and mode values for both tests. A strong clinical significance was not evidenced according to post-test results.

Post-test answers lacked depth, demonstrated errors of omission, and were incomplete at times. In some cases, there was a noted lack of professional language used to express the clinical problem. One example given in response to a question of the main clinical problem was, “trouble breathing.” In general, correlation between patient presentation and deterioration due to a main problem of inadequate oxygenation was not demonstrated.
Interventional Results of Survey Questions. Survey question results on the post-test as displayed in Figures 7 through 10 were useful in partially answering the clinical question via self-reflection. Correlation was demonstrated to be statistically significant. Although these results did not necessarily strongly align with performance on the post-test or during the simulation, the results can be interpreted in a positive light from a perspective of novice nurse self-reflection. This was interpreted as aligning with the “attitude” within the KSAs.

Interventional Results of LCJR Scoring. The LCJR scores were important in evaluating the impact of QSEN-based education and use of a QSEN-based framework to enhance clinical judgment skills. Although some participants self-disclosed a familiarity with QSEN, none reported being strongly aware of the impact of the competencies in preventable patient harm. Correlational analysis of the LCJR tally scores with post-test scores demonstrated a significant statistical effect. The measures addressed in this section up to this point have answered the first portion of the clinical question.
**Result Correlation to Clinical Question.** Project methodology and design were carefully chosen to align the interventions with the ability to potentially demonstrate enhanced practice change of cue recognition with a resultant improvement in patient outcomes. The final detail enabling the ability to completely answer the clinical question and demonstrate a degree of practice change was actual documentation of oxygen saturation measured via pulse oximetry and respiratory rate. Both are common contributors to patient deterioration noted thematically throughout scholarly literature and the guidelines (Brill & Wedzicha, 2014; Fournier, 2014; Gamache, Harrington, & Kamangar, 2019). Documentation did demonstrate a degree of both statistical as well as clinical significance, thus the clinical question was answered.

The full PICOT question was: (P) Among nurses who care for cardiovascular patients on a nursing unit at an acute care facility, does (I) education regarding recognition of anticipated patient deterioration using high-fidelity simulation guided by a QSEN-based framework, (C) compared to not using the framework in current practice, (O) result in increased anticipation of patient deterioration as measured by documentation of oxygen saturation and respiratory rate more frequently than every four hours (T) after three weeks? The specific data points used to potentially answer this question reflected each project phase and were identified as:

- A pre-test and post-test reflective of clinical judgment and cue recognition,
- Clinical simulation which allowed direct observation of those abilities in a realistic environment, and
- Real-time documentation reflective of cue recognition and clinical judgment.

Analysis of various data points demonstrated consistency in the incorporation of all theoretical principles, as well as evidence-based practice. Alignment of data analytical
methods with data type along with use of self-reporting from participants strengthened the evidence for data correlation between interventions and outcomes.

Summary

Project data analysis has resulted in the determination of statistical significance as it relates to the clinical problem, the clinical question, and the PICOT question. This signifies a definite practice change after use of simulation as an evidence-based intervention (Cooper et al., 2016; Crowe, Ewart & Derman, 2016). Ultimately, a degree of clinical significance was also demonstrated. While this chapter analyzed details of separate project components, chapter 5 will summarize the overall impact of this quality improvement project. Although a focused view of the project’s impact has been demonstrated, the next and final chapter will discuss the impact from a perspective of practice change.

While this cohort represented a small portion of the registered nurses employed at the clinical facility, the content expert believed that this project potentially impacted nursing practice of other registered nurses. Data collected by the content expert for the project yielded information relative to a decreased incidence of both code blue and rapid response events throughout the hospital post-simulation. Other factors could certainly explain this finding, as other patient safety initiatives are in place to assist in the recognition and prevention of patient deterioration. It is this author’s hope that this project, at least partially, played an influential part in this finding.
Chapter 5: Summary, Conclusions, and Recommendations

Ensuring patient safety during the provision of nursing care is a standard within the nursing profession. The use of evidence-based clinical practice guidelines, protocols and policies abound to ensure that patients are safe from harm (Hirsch, 2016; McMullen, 2017). Review of nursing literature indicated that it is often challenging to consistently maintain those standards in the acute care setting when multiple factors vie for a nurse’s time and attention (Turkel, Marvelous, Morrison, & Singletary, 2016; Ulrich & Kear, 2014). While seasoned nurses have had the advantage of cumulative situational experience and can easily navigate this complex environment, newly licensed nurses are at a disadvantage in this respect.

A comprehensive literature review serving as the foundational base of evidence for this project established a correlation between lack of situational learning in the licensed practice arena and the novice nurse’s clinical judgment abilities (Kalisch, 2015; VanFossen, Jones, & Yoder, 2016). This in turn correlated with incidences of missed and omitted care and preventable patient harm among this population of nurses (Maloney, Fend, & Hardin, 2015; Monagle et al., 2018). A specific aspect of clinical judgment pertaining to these findings was that of cue recognition of the deteriorating patient (Brice, 2014; Burbach & Thompson, 2014). Both overt and subtle cues signaling actual or potential deterioration were noted to be missed.

The types of cues signifying deterioration were associated with diseases causing decompensation in specific body systems as well as diagnoses leading to decompensation of systemic processes such as oxygenation and perfusion (Miller, Owens & Silverman, 2015). Each patient may experience this differently. A nurse’s recognition of deterioration and its cues occurs via collection of subjective data as well as
comprehensive objective data from the physical assessment, as well as documentation, trending and reassessment of that data.

The design of this quality improvement project focused on the evidence-based utilization of both simulation and QSEN competencies to demonstrate practice change of cue recognition related to patient deterioration. The specific parameters of oxygen saturation obtained via pulse oximetry, and respiratory rate were comprehensively incorporated into the simulation and measured in real-time documentation for two weeks prior to the simulation. This documentation data was also collected for three weeks after simulation to demonstrate a correlation with interventions as well as practice change. The population of participants was comprised of licensed registered nurses with less than two years of practice experience. A didactic session on use of the QSEN competencies and KSAs as a framework for nursing care preceded high-fidelity simulation.

A pre-test of clinical judgment questions was completed after the didactic session, which also included a survey of self-reflection questions. The unfolding simulation scenario required recognition of and response to both subtle and overt cues of deterioration. The high-fidelity simulation featured progressive deterioration which required rapid recognition and nurse response. This reflected the standards of safe quality care in efforts to prevent patient harm (Kalisch, 2015; Hansen & Bratt, 2016). Statistical significance was demonstrated.

A post-test was completed after simulation using the same question set as that of the pre-test, including the survey. The real-time documentation data of specific parameters frequently associated with patient deterioration in the acute care setting were collected. The specific parameters were oxygen saturation and respiratory rate, both frequently correlated with actual and potential patient deterioration (Chuang, Huang &
Su, 2015; Brice, 2014). The sequential design and flow of the project provided an aligned structural framework which simulated clinical practice and optimized data collection. The remaining portion of this chapter summarizes pertinent factors of this project.

**Summary of the Project**

This author’s quality improvement project was guided by one clinical question as well as the PICOT question. The clinical question was: How does a QSEN competency framework, combined with simulation, enable improved recognition of patient deterioration in clinical practice, as evidenced by documentation of oxygen saturation and respiratory rate more frequently than every four hours? This question correlated ineffective clinical judgment skills with a need for more situational learning experience with the variables of a QSEN-based framework and simulation. A lack of experiential learning among newly licensed nurses has been associated with an ineffective framework guiding decision-making (Benner, 2015; Dolansky et al., 2018). The QSEN competencies and KSA’s provided that framework, while the simulation enabled situational learning in a safe environment.

The PICOT question was used to identify the specific variables and parameters to ultimately demonstrate practice change. Any practice change is normally the result of multiple interventions. As previously noted, these included guided orientations, use of nurse residency programs and simulation, and strategies strengthening the novice nurse-preceptor partnership (McMullen, 2017; Prion et al., 2015; Silvestre et al., 2017). The specific variables utilized to show practice change in improved cue recognition and therefore a reduction in preventable harm were those of oxygen saturation and respiratory rate.
The evidence-based intervention leading to practice change was that of a high-fidelity simulation scenario. The use of a valid, evidence-based framework within a scenario which was often encountered in nursing practice enabled the reinforcement of specific parameters signaling patient decompensation (Aebersold, & Tschannen, 2013; Cooper et al., 2016). This scenario also enabled participants to make clinical decisions in response to patient deterioration using clinical judgment, according to expected practice standards (Elsevier, 2016). This was translated into practice in the form of more frequent documentation of specific parameters as well as associated information relative to the registered nurse scope of practice.

**Summary of Findings and Conclusion**

The conclusions presented demonstrated how this project addressed the defined clinical problem. Both data and observations supported the findings noted throughout the literature review. Methodology and design were appropriate to demonstrate results which answered the clinical question. This section concludes with a discussion of overall results.

**Clinical question.** One clinical question that guided this quality improvement project is: How does a QSEN competency framework, combined with simulation, enable improved recognition of patient deterioration in clinical practice as evidenced by documentation of oxygen saturation and respiratory rate more frequently than every four hours? The PICOT question was: (P) Among nurses who care for cardiovascular patients on a nursing unit at an acute care facility does (I) education regarding recognition of anticipated patient deterioration using high-fidelity simulation guided by a QSEN-based framework, (C) compared to not using the framework in current practice, (O) result in increased anticipation of patient deterioration as measured by documentation of oxygen
saturation and respiratory rate more frequently than every four hours (T) after three weeks?

**Inferential correlations.** Several statistically significant correlations resulted from data analysis. A relevant and significant relationship was inferred between the integration of a QSEN-based framework and the use of pre-testing and post-testing. The valid design of the test and its questions required high level cognitive skills aligned with clinical judgment. The questions required analysis and synthesis of prior nursing knowledge with experiential knowledge to make optimal clinical decisions.

While this was correlated statistically, full clinical correlation was not demonstrated during the simulation. Realism was integrated through the sequencing of the unfolding scenario, a focus on practice standards, and a nurse’s scope of practice. Many of the participants stated that the most appropriate action to take in response to the patient’s presentation was to call for the rapid response team. In many ways this signified missed care as it delayed treatment.

Since the LCJR categories reflect both overall as well as specific clinical judgment behaviors, inferential relationships were made between the various subcategories and overall performance during simulation. Generally, scores reflected consistency of performance at the developing and accomplished levels. This is consistent with literature synthesis and Benner’s theory (Benner, 1984; Dolansky et al., 2017). It also supported a strong foundation for conducting this quality improvement project to address preventable patient harm.

**Specific correlational findings.** Initial correlational findings were obtained when LCJR tally results were statistically correlated with the written post-test using Pearson’s $r$. This demonstrated a liner relationship between the interventions and clinical
performance during simulation. This was the first step in being able to fully address the clinical and PICOT questions. Analysis emphasized the degree of clinical judgment change or improvement after the project interventions. This methodology and the statistical results were supported by literature synthesis identifying a need for such a project.

Correlation was also utilized to evaluate documentation prior to and after the project interventions. Three-point correlation and comparison were then completed to determine the degree of statistical significance as well as clinical significance. The three points were data comparing pre-test and post-test results, correlation of the post-test results and the LCJR tally, and correlational relationship of documentation frequency of the stated parameters before and after simulation. Both were demonstrated to a degree.

**Conclusion.** The interrelationships of interventions and results has demonstrated project alignment and appropriateness. Solid relationships have been established and supported between the purpose and problem statements, as well as the clinical and PICOT questions. The project was timely and relevant, aligned with current quality improvement projects and supportive of future projects. The project and its results are a form of advocacy, both for patients as well as nurses.

**Implications**

The implications for this quality improvement project are manifold. Nursing practice always has and always will require clinical judgment to ensure the provision of safe, quality care. Current literature consistently demonstrates that cue recognition and clinical judgment are skills that are deficient for a variety of reasons. Projects such as this will always be timely as nursing practice continues to evolve.
The content expert will be integrating a QSEN-based framework into the nurse residency program, as well as other facets of this project based on the achieved outcomes. While this is partially due to a mandate for QSEN competency integration as continued accreditation for the nurse residency program, the content expert was excited about the project outcomes.

**Theoretical implications.** Theoretical implications within this project were those which supported the transition of newly licensed nurses along with appropriate maturation and development of clinical judgment skills. Two nursing theories were used to support the rationale for use within this project, as well as project feasibility. Benner’s theory (1984) is useful and continues to be referenced in a host of modern scholarly research. Benner’s continued work with the ANA will hopefully inspire future integration of her theory (Benner, 2015).

Tanner’s (2006) focus on clinical judgment is more necessary than ever given the complex care environment nurses must navigate in. This project has demonstrated the impact of clinical judgment on patient safety. The multiple factors contributing to a patient’s deterioration demand a consistent approach to care which consistently applies clinical judgment. Early recognition of cues of deterioration prevents patient harm, reduces the instance of missed care and prevents errors.

**Practical implications.** Practice change is often multi-faceted out of necessity. Change takes time, adaptability, cost effectiveness and a comprehensive recognition of all contributing factors (Silvestre et al., 2017; Walsh, 2018). Most clinical problems noted within scholarly literature were approached with a combination of strategies which considered the needs of everyone. This author’s project aligned with multiple points of evidence-based care within the referenced care facility.
While the project was multi-faceted and may perceived as complex, it did comprehensively address a clinical problem which responded to theoretical and evidence-based interventions to result in practice change. The advantages were that the stated interventions are being used often in practice. Simulation of varying fidelity is commonplace in academia as well as clinical practice environments (Ashcraft et al., 2013; Lasater et al., 2015). Lasater’s work on the LCJR (2007) has been instrumental in these findings (Kim, Park & Shin, 2016; Miraglia & Asselin, 2015). Simulation is a powerful tool for situational learning.

Simulation is also evidence-based and promotes best practice standards while also enabling the collection of measurable outcomes (Aebersold, & Tschannen, 2013; International Nursing Association for Clinical Simulation and Learning (INACSL)Standards Committee, 2016; Jeffries, Rodgers, & Adamson, 2015). This includes the integration of KSAs, which were integrated into the simulation. The LCJR is also evidence-based and was an essential component in data collection during the simulation. A practice change in documentation was evident after the intervention of simulation.

A noted disadvantage was the time necessary to research for valid questions and tools appropriate for interventions. Time and organizational planning were necessary to align the correct tool with the objectives and clinical questions related to the project. Subsequently, weeks of time were necessary to obtain permission to use these items. A special challenge was overcoming the schedule challenges limiting exposure to the nurse residents.

**Future implications.** This project demonstrated the essential role of cue recognition in preventing patient harm. Recognizing cues leads to reporting and
documentation (Brice, 2014; Miller, Owens & Silverman, 2015). In turn, this process prompts follow-up assessment and use of ongoing clinical judgment skills to prevent further deterioration and decompensation. The KSAs within the QSEN framework support and guide this process. One future implication is for the QSEN framework to be integrated into electronic medical records.

This process would incorporate a usable framework into a system that is currently in use and which nurses are familiar with. Integration of all competencies as well as the KSAs would promote habits of mind relative to clinical judgment. Continual and simultaneous use of the KSAs would also promote professionalism. Finally, nursing scope of practice and accountability would be reinforced.

Clinical judgment behaviors and the specific mention of cue recognition would be extremely beneficial if integrated into clinical practice guidelines more strongly. Although higher levels of cognitive reasoning are necessary for clinical judgment, integrating related prompts into tools consistently used by the nurse would strengthen the development of integrative thought processes leading to more consistent use of cue recognition (Dickison et al., 2016; Wood, 2016). This promotes accountability of the nurse and ensures optimal patient outcomes.

**Recommendations**

Recommendations included in this section include those recommended for future projects and those recommended for practice. Both are valuable in supporting the transition of novice nurses to practice. Supporting this process provides advocacy and aids in retention (Ackerson & Stiles, 2018). It also assists in providing professional development opportunities for all nurses.
**Recommendations for future projects.** Many possible recommendations could be considered, based on the clinical problem of deficient clinical judgment. Four are presented. One recommendation is to further explore the use of the QSEN framework at the bedside through a mixed study. An example of a PICOT would be: (P) Among medical-surgical nurses caring for newly admitted patients, does (I) the use of a QSEN-based framework in initial care planning, (C) compared to the current care planning method, (O) result in improved recognition of patient values in care, by formulating a specific diagnosis related to patient values and preferences in care as evidenced by documentation of the diagnosis on the care plan, (T) within two hours of admission. Limiting the patient population may improve adherence and consistency.

Major stakeholders are advocating QSEN competency integration into practice (Lyle-Edrosolo & Waxman, 2016; Mansfield, 2014). This is occurring in various ways, although multiple possibilities exist, and some will require formal research which will take time. Basing quality improvement projects on established studies would build the current evidence base. Publishing such projects will also be helpful.

A second recommendation would be to use a qualitative design incorporating Tanner’s model into code blue simulation with new graduate nurses. An example PICOT question would be: (P) Among a population of newly licensed nurses in orientation in an acute care facility, (I) does simulation of a code blue scenario based on Tanner’s model, (C) compared to not using the model, (O) result in demonstration of clinical judgment competence by verbalizing four specific strategies for early recognition and prevention of a code blue, (T) immediately after simulation and a repeat simulation two weeks later. This project could be approached from various perspectives. As Brice noted (2014), novice nurses verbalize nervousness and discomfort when faced with a code blue
situation. However, this is one approach that provides reflection, opportunities to practice and receive feedback while simultaneously addressing clinical judgment skills.

A third recommendation would be to conduct a quantitative project stressing accountability of cue recognition through the documentation progress notes along with other parameters of cue recognition. This would be an extension of this author’s project since the content expert observed that there was a noted absence of this type of documentation. Documentation of specific parameters is definitely significant for cue recognition. Extending that documentation to include a progress note would add more value. An example PICOT question would be: (P) Among nurses in the acute care medical-surgical setting, (I) how does the documentation of progress notes detailing patient deterioration, (C) compared to documentation of specific parameters alone, (O) increase collaborative communication in responding to patient needs, as evidenced by documentation of reassessment and interventions, (T) after six weeks.

A final project recommendation would be one specific to the QSEN competency of safety relative to medication reconciliation. An example PICOT question would be: (P) Among medical-surgical nurses in an acute care facility, (I) how does the prompt of the QSEN competency of safety correlated with review of the medication reconciliation form, (C) compared to not receiving the prompt, (O) result in consistent review and completion of the form on discharge, as evidenced by documentation of completion prior to discharge with every discharge, (T) after one month. A quantitative design would best provide statistical analysis of adherence to the intervention. This example is brief yet emphasizes the varied ways QSEN competencies can ensure safe, quality care in practice. Integration of the competencies into care would most likely work best when they align with currently used tools and documentation methods.
**Recommendations for practice.** One valuable practice recommendation would be integration of the Rothman index for early recognition of patient decompensation (Finley, Rothman & Smith, 2014). The Rothman index is able to be integrated into electronic documentation systems and monitors multiple values to assess for and warn nurses of impending or actual decompensation. Although this index does measure oxygen saturation and respiratory rate as two of the prime indicators of patient deterioration, it cross-tabulates values such as physical assessment findings and diagnosis. This recommendation is made because as this author’s project has stated, multiple sources of a patient’s status change must be evaluated using clinical judgment.

This index, combined with the QSEN competencies and Tanner’s model, would provide multiple prompts to nurses. Consistency of prompts, just as in CPOE systems, promote recognition of safety standards and assist in avoiding occurrences of preventable harm. The use of multiple strategies is congruent with current approaches at all levels of nursing education (Hart et al., 2015). Advocacy for patient safety and improved outcomes requires well-planned and customized strategies. It forces the nurse to monitor and trend multiple parameters implicated in potential deterioration.

Another recommendation would be to use reflective debriefing in situations other than simulation. Reflective debriefing provides opportunities to mentor, role model, educate and reinforce evidence-based practice standards (Lavoie, Pepin & Boyer, 2013; Lavoie, Pepin & Cossette, 2015). It has been included in simulation for many years but does not necessarily need to be limited to that situation. Experiential learning requires feedback and self-reflection to enable professional growth as well as clinical judgment development (Jeffries, Rodgers & Adamson, 2015). The advantage of debriefing is that it can be as simple as a short conversation or more complex and accomplished via survey.
A final recommendation would be to incorporate simulation more regularly into all levels of practice. Positive feedback on the project was verbally received from the nurse residents. Many possibilities exist for customizing simulations according to practice area, reviewing new procedures and skills, and addressing integration of QSEN competencies into clinical practice (Bitner et al., 2017). This practice inspires and promotes a collaborative practice and communication. As nursing leaders, all nurses must continue to strive for consistency and maintenance of the highest care standards.
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## Appendix A

### QSEN Competencies and KSA Checklist for Simulation Experiences

<table>
<thead>
<tr>
<th>Quality and Safety Education For Nurses (Chose applicable QSEN Competencies)</th>
<th>‘QSEN Coordinated’ Student Learning Objectives for Simulation Experience (KSA’s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient-centered Care:</strong></td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td>Recognize the patient or designee as the source of control and full partner in providing compassionate and coordinated care based on respect for patient's preferences, values, and needs.</td>
<td>1. Integrate understanding of multiple dimensions of patient-centered care: Patient / family / community preferences, values; Coordination and integration of care; Information, communication, and education; Physical comfort and emotional support; Involvement of family and / or friends; Transition and continuity</td>
</tr>
<tr>
<td></td>
<td>2. Examine how the safety, quality, and cost-effectiveness of healthcare can be improved through the active involvement of patients and families</td>
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<tr>
<td></td>
<td>3. Describe strategies to empower patients and families in all aspects of the health care process</td>
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<tr>
<td></td>
<td>4. Discuss principles of effective communication</td>
</tr>
<tr>
<td></td>
<td>5. Examine nursing roles in assuring coordination, integration, and continuity of care</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td><strong>Attitude</strong></td>
</tr>
<tr>
<td>1. Provide patient centered care with sensitivity and respect</td>
<td>1. Respect and encourage individual expression of patient values, preferences and expressed needs</td>
</tr>
<tr>
<td>2. Assess presence and levels of pain as well as physical and emotional comfort</td>
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<tr>
<td>3. Engage patients and surrogates in active partnerships that promote health, safety and well-being and self-care management</td>
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<tr>
<td>4. Communicate care provided and needed at each transition in care</td>
<td></td>
</tr>
<tr>
<td><strong>Teamwork and Collaboration:</strong></td>
<td><strong>Knowledge</strong></td>
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<tr>
<td>---------------------------------</td>
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</tr>
<tr>
<td>Function effectively within nursing and interprofessional teams, fostering open communication, mutual respect, and shared decision-making to achieve patient care.</td>
<td>1. Recognize contributions of individuals and groups to help patients / family achieve health goals</td>
</tr>
<tr>
<td>2. Discuss effective strategies for communicating and resolving conflict</td>
<td></td>
</tr>
<tr>
<td>3. Describe examples how team functioning impacts safety and quality of care</td>
<td></td>
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<tr>
<td>4. Identify barriers and facilitators of effective team functioning</td>
<td></td>
</tr>
<tr>
<td>5. Examine strategies for improving systems to support team functioning</td>
<td></td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td>1. Act with integrity, consistency, and respect for differing views</td>
</tr>
<tr>
<td>2. Assume the role of team member or team leader based on the situation</td>
<td></td>
</tr>
<tr>
<td>3. Integrate the contributions of others who play a role in helping patient / family achieve goals</td>
<td></td>
</tr>
<tr>
<td>4. Solicit input from other team members to improve individual, as well as team performance</td>
<td></td>
</tr>
<tr>
<td>5. Follow communication practices that minimize risks associated with handoffs among providers and across transitions in care</td>
<td></td>
</tr>
<tr>
<td><strong>Attitude</strong></td>
<td>1. Respect the unique attributes that members bring to a team</td>
</tr>
</tbody>
</table>
| Quality and Safety Education For Nurses (Chose applicable QSEN Competencies) | 'QSEN Coordinated'
Student Learning Objectives for Simulation Experience (KSA's) |
|---|---|
| **Evidence-based Practice:** Integrate best current evidence with clinical expertise and patient/family preference and values for delivery of optimal health care. | **Knowledge**
1. Demonstrate knowledge of basic scientific methods and processes
2. Describe reliable sources for locating evidence reports and clinical practice guidelines
3. Discriminate between valid and invalid reasons for modifying evidence based practice based on clinical expertise or patient/family preference

**Skills**
1. Base individualized care plan on patient values, clinical expertise and evidence
2. Locate evidence reports related to clinical practice topics and guidelines
3. Question rationale for routine approaches to care that result in less-than-desired outcomes

**Attitude**
1. Value the concept of evidence-based practice as integral to determining best clinical practice
2. Value the need for continuous improvement in clinical practice based on new knowledge |
<table>
<thead>
<tr>
<th>Quality Improvement:</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use data to monitor the outcomes of care processes and use improvement methods to design and test changes to continuously improve the quality and safety of health care systems.</td>
<td>1. Recognize that nursing students are parts of systems of care and care processes that affect outcomes for patients and families</td>
</tr>
<tr>
<td></td>
<td>2. Explain the importance of variation and measurement in assessing quality of care</td>
</tr>
<tr>
<td>Skills</td>
<td>Skills</td>
</tr>
<tr>
<td>1. Use tools (such as charts cause-effect diagrams) to make processes of care explicit</td>
<td>1. Use tools (such as charts cause-effect diagrams) to make processes of care explicit</td>
</tr>
<tr>
<td>2. Use quality measures to understand performance</td>
<td>2. Use quality measures to understand performance</td>
</tr>
<tr>
<td>3. Use measures to evaluate the effect of change</td>
<td>3. Use measures to evaluate the effect of change</td>
</tr>
<tr>
<td>Attitude</td>
<td>Attitude</td>
</tr>
<tr>
<td>1. Appreciate that continuous quality improvement is an essential part of the daily work of all healthcare professionals</td>
<td>1. Appreciate that continuous quality improvement is an essential part of the daily work of all healthcare professionals</td>
</tr>
<tr>
<td>2. Value own and others' contributions to outcomes of care in local care settings</td>
<td>2. Value own and others' contributions to outcomes of care in local care settings</td>
</tr>
<tr>
<td>3. Value measurement and its role in good patient care</td>
<td>3. Value measurement and its role in good patient care</td>
</tr>
<tr>
<td>4. Appreciate the value of what individuals and teams can do to improve care</td>
<td>4. Appreciate the value of what individuals and teams can do to improve care</td>
</tr>
<tr>
<td>Quality and Safety Education For Nurses (Chose applicable QSEN Competencies)</td>
<td>'QSEN Coordinated' Student Learning Objectives for Simulation Experience (KSA's)</td>
</tr>
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</tbody>
</table>
| **Safety:** Minimize risk of harm to patients and providers through both system effectiveness and individual performance. | **Knowledge**
1. Describe factors that create a culture of safety
2. Discuss potential and actual impact of national patient safety resources, initiatives, and regulations
3. Examine human factors and other basic safety design principles as well as commonly used unsafe practices

**Skills**
1. Demonstrate effective use of strategies to reduce risk of harm to self or others
2. Communicate observations or concerns related to hazards and errors to patients, families, and the health care team
3. Use national patient safety resources for own professional development and to focus attention on safety in care settings

**Attitude**
1. Value the contributions of standardization / reliability to safety
2. Value own role in preventing errors |
<table>
<thead>
<tr>
<th>3. Value vigilance and monitoring (even of own performance of care activities) by patients, families, and other members of the health care team</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Value relationship between national safety campaigns and implementation in local practices and practice settings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Informatics:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use information and technology (IT) to communicate, manage knowledge, mitigate error, and support decision-making.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explain why information and technology skills are essential for safe patient care</td>
</tr>
<tr>
<td>2. Describe examples of how technology and information management are related to the quality and safety of patient care</td>
</tr>
<tr>
<td>3. Recognize the time, effort, and skill required for computers, databases, and other technologies to become reliable and effective tools for patient care</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apply technology and information management tools to support safe processes of care</td>
</tr>
<tr>
<td>2. Employ communication technologies to coordinated care for patients</td>
</tr>
<tr>
<td>3. Respond appropriately to clinical decision-making supports and alerts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Appreciate the necessity for all health professionals to seek lifelong, continuous learning of information technology skills</td>
</tr>
<tr>
<td>2. Value technologies that support clinical decision-making, error prevention and care coordination</td>
</tr>
<tr>
<td>3. Value nurses' involvement in design, selection, implementation, and evaluation of information technologies to support patient care</td>
</tr>
</tbody>
</table>

(Alfes, 2010).
# Appendix B

Lasater Clinical Judgment Rubric

<table>
<thead>
<tr>
<th>EFFECTIVE NOTICING</th>
<th>Exemplary = 4</th>
<th>Accomplished = 3</th>
<th>Developing = 2</th>
<th>Beginning = 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focused Observation</strong></td>
<td>Focuses observation appropriately; regularly observes and monitors a wide variety of objective and subjective data to uncover any useful information</td>
<td>Regularly observes and monitors a variety of data, including both subjective and objective; most useful information is noticed; may miss the most subtle sign</td>
<td>Attempts to monitor a variety of subjective and objective data but is overwhelmed by the array of data; focuses on the most obvious data, missing some important information</td>
<td>Confused by the clinical situation and the amount and kind of data; observation is not organized, and important data are missed, and/or assessment errors are made</td>
</tr>
<tr>
<td><strong>Recognizing Deviations from Expected Patterns</strong></td>
<td>Recognizes subtle patterns and deviations from expected patterns in data and uses these to guide the assessment</td>
<td>Recognizes most obvious patterns and deviations in data and uses these to continually assess</td>
<td>Identifies obvious patterns and deviations, missing some important information; unsure how to continue the assessment</td>
<td>Focuses on one thing at a time and misses most patterns and deviations from expectations; misses opportunities to refine the assessment</td>
</tr>
<tr>
<td><strong>Information Seeking</strong></td>
<td>Assertively seeks information to plan intervention: carefully collects useful subjective data from observing and interacting with the patient and family</td>
<td>Actively seeks subjective information about the patient’s situation from the patient and family to support planning interventions; occasionally does not pursue important leads</td>
<td>Makes limited efforts to seek additional information from the patient and family; often seems not to know what information to seek and/or pursues unrelated information</td>
<td>Is ineffective in seeking information; relies mostly on objective data; has difficulty interacting with the patient and family and fails to collect important subjective data</td>
</tr>
</tbody>
</table>

**INTERPRETING**
<table>
<thead>
<tr>
<th>Prioritizing data</th>
<th>Focuses on most important, relevant data for the patient’s condition</th>
<th>Generally, focuses on the most important data and seeks further relevant information but also may try to attend to less pertinent data</th>
<th>Makes an effort to prioritize data and focus on the most important, but also attends to less relevant or useful data</th>
<th>Has difficulty focusing and appears not to know which data are most important to the diagnosis; attempts to attend to all available data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making sense of data</td>
<td>Even when facing complex, conflicting, or confusing data, is able to (a) note and make sense of patterns in the patient’s data, (b) compare these with known patterns (from the nursing knowledge base, research, personal experience, and intuition), and (c) develop plans for interventions that can be justified in terms of their likelihood of success</td>
<td>In most situations, interprets the patient’s data patterns and compares with known patterns to develop an intervention plan and accompanying rationale; the exceptions are rare or in complicated cases where it is appropriate to seek the guidance of a specialist or a more experienced nurse</td>
<td>In simple, common, or familiar situations, is able to compare the patient’s data patterns with those known and to develop or explain intervention plans; has difficulty, however, with even moderately difficult data or situations that are within the expectations of students; inappropriately requires advice or assistance</td>
<td>Even in simple, common, or familiar situations, has difficulty interpreting or making sense of data; has trouble distinguishing among competing explanations and appropriate interventions, requiring assistance both in diagnosing the problem and developing an intervention</td>
</tr>
</tbody>
</table>

**RESPONDING**

<p>| Calm, confident manner | Assumes responsibility; delegates team assignments; assesses patients and reassures them and their families | Generally, displays leadership and confidence and is able to control or calm most situations; may show stress in particularly difficult or complex situations | Is tentative in the leader role; reassures patients and families in routine and relatively simple situations, but becomes stressed and disorganized easily | Except in simple and routine situations, is stressed and disorganized, lacks control, makes patients and families anxious or less able to cooperate |</p>
<table>
<thead>
<tr>
<th>Performance Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear communication</td>
<td>Communicates effectively; explains interventions; calms and reassures patients and families; directs and involves team members, explaining and giving directions; checks for understanding</td>
</tr>
<tr>
<td></td>
<td>Generally, communicates well; explains carefully to patients; gives clear directions to team; could be more effective in establishing rapport</td>
</tr>
<tr>
<td></td>
<td>Shows some communication ability (e.g., giving directions); communication with patients, families, and team members is only partly successful; displays caring but not competence</td>
</tr>
<tr>
<td></td>
<td>Has difficulty communicating; explanations are confusing; directions are unclear or contradictory; patients and families are made confused or anxious and are not reassured</td>
</tr>
<tr>
<td>Well-Planned Interventions/ Flexible</td>
<td>Interventions are tailored for the individual patient; monitors patient progress closely and is able to adjust treatment as indicated by patient response</td>
</tr>
<tr>
<td></td>
<td>Develops interventions on the basis of relevant patient data; monitors progress regularly but does not expect to have to change treatments</td>
</tr>
<tr>
<td></td>
<td>Develops interventions on the basis of the most obvious data; monitors progress but is unable to make adjustments as indicated by the patient’s response</td>
</tr>
<tr>
<td></td>
<td>Focuses on developing a single intervention, addressing a likely solution, but it may be vague, confusing, and/or incomplete; some monitoring may occur</td>
</tr>
<tr>
<td>Being Skillful</td>
<td>Shows mastery of skills</td>
</tr>
<tr>
<td></td>
<td>Displays proficiency in the use of most nursing skills; could improve speed or accuracy</td>
</tr>
<tr>
<td></td>
<td>Is hesitant or ineffective in using nursing skills</td>
</tr>
<tr>
<td></td>
<td>Is unable to select and/or perform nursing skills</td>
</tr>
<tr>
<td><strong>REFLECTING</strong></td>
<td></td>
</tr>
<tr>
<td>Evaluation/ Self-Analysis</td>
<td>Independently evaluates and analyzes personal clinical performance, noting decision points, elaborating alternatives, and accurately evaluating choices against alternatives</td>
</tr>
<tr>
<td></td>
<td>Evaluates and analyzes personal clinical performance with minimal prompting, primarily about major events or decisions; key decision points are identified, and alternatives are considered</td>
</tr>
<tr>
<td></td>
<td>Even when prompted, briefly verbalizes the most obvious evaluations; has difficulty imagining alternative choices; is self-protective in evaluating personal choices</td>
</tr>
<tr>
<td></td>
<td>Even prompted evaluations are brief, cursory, and not used to improve performance; justifies personal decisions and choices without evaluating them</td>
</tr>
<tr>
<td>Commitment to Improvement</td>
<td>Demonstrates commitment to ongoing improvement; reflects on and critically evaluates nursing experiences; accurately identifies strengths and weaknesses and develops specific plans to eliminate weaknesses</td>
</tr>
</tbody>
</table>

(Lasater, 2007)
Appendix C

Clinical Judgment Ability Assessment Questions (Pre-test/Post-test)

Pretest : Complete both sections.

Section 1

Read through the following scenario and answer each question as directed.

The nurse is caring for a 70 year old female patient who has just returned to the unit after undergoing an EGD (esophageal-gastro-duodenoscopy) with conscious sedation. She is slightly difficult to arouse and has snoring respirations. She is lying flat in bed and has oxygen infusing via nasal cannula at 2 L/minute.

Current vital signs are: BP 98/50, P 88, R 10, oxygen saturation 84%, and T 37 orally. Her capillary refill is prolonged. The admitting diagnosis is GERD and her PMH includes: CAD with prior MI, and mild COPD.

<table>
<thead>
<tr>
<th>Question</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the primary problem for this patient? (List 1)</td>
<td></td>
</tr>
<tr>
<td>2. What data suggests this is the primary problem (List 2)</td>
<td></td>
</tr>
<tr>
<td>3. Aside from the primary problem you have already identified above, what other current clinical findings require attention and/or intervention? (List 3)</td>
<td></td>
</tr>
<tr>
<td>4. What nursing assessments would you want to perform now, and what additional information would you like to gather in order to plan your interventions? (List 3)</td>
<td></td>
</tr>
<tr>
<td>5. How urgent is this situation? Circle the best answer:</td>
<td></td>
</tr>
<tr>
<td>a. Routine (1-4 hours)</td>
<td></td>
</tr>
<tr>
<td>b. Urgent (30-60 minutes)</td>
<td></td>
</tr>
<tr>
<td>c. Emergent (immediate)</td>
<td></td>
</tr>
<tr>
<td>6. Based upon your knowledge of pathophysiology, why did you select this urgency? (Write 1 sentence)</td>
<td></td>
</tr>
</tbody>
</table>
7. Using SBAR, what specific findings will you communicate to the physician? (Briefly summarize)
   a. Assessment
   b. Recommendation

8. What independent nursing actions do you need to take? (List 3)

(Lasater et al., 2015).

Section 2

Please read each statement below and circle your response based on the following Likert scale:

1= rarely    2= sometimes    3= frequently    4= always

I can recognize possible early signs or symptoms when a patient’s health deteriorates.

1 2 3 4

I can explain the mechanism and development associated with the early signs and symptoms when a patient’s health deteriorates.

1 2 3 4

I can accurately evaluate and identify whether a patient’s condition has improved.

1 2 3 4

I know the follow-up steps to take if a patient’s condition does not improve.

1 2 3 4

(Johnston, Nash, & Coyer, 2019).
Post-test: Complete both sections.

Section 1

Read through the following scenario and answer each question as directed.

Base your answers on the simulation scenario.

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
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<tr>
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Section 2

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<tr>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can recognize possible early signs or symptoms when a patient’s health deteriorates.</td>
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<td></td>
<td></td>
<td></td>
</tr>
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<td>I can explain the mechanism and development associated with the early signs and symptoms when a patient’s health deteriorates.</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>I can accurately evaluate and identify whether a patient’s condition has improved.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know the follow-up steps to take if a patient’s condition does not improve.</td>
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<td></td>
</tr>
</tbody>
</table>
# Appendix D

Detailed Simulation Plan

<table>
<thead>
<tr>
<th>Time</th>
<th>Mannequin Presentation</th>
<th>Mannequin Verbal Response</th>
<th>Desired Nurse Response</th>
<th>QSEN/LCJR Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 minutes</td>
<td>NO oxygen in place</td>
<td>&quot;I can't stop coughing.&quot;</td>
<td>Acknowledge and verbalize abnormal symptoms.</td>
<td>Focused observation</td>
</tr>
<tr>
<td></td>
<td>Mannequin flat in bed</td>
<td></td>
<td>Need for oxygen therapy recognized.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulse oximetry 84%</td>
<td>&quot;Oh my I am having such problems breathing.&quot;</td>
<td>Raises head of bed to at least 45 degrees.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dyspnea coughing - wet</td>
<td></td>
<td>Recognition of pattern deviation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cyanosis</td>
<td>&quot;Why is my breathing bad?&quot;</td>
<td>Reassure the patient.</td>
<td>KSA’s: safety, patient-centered care, EBP</td>
</tr>
<tr>
<td></td>
<td>Make lung sounds rhonchi-LOW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NO overt distress at this point</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Patient able to converse and oriented</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cyanotic nailbeds with prolonged capillary refill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-5 minutes</td>
<td>Vital signs: 100/50-98-24 Temp 38.5</td>
<td>Patient has more difficulty answering questions, but can reply</td>
<td>Notes code status of patient.</td>
<td>Makes sense of data</td>
</tr>
<tr>
<td></td>
<td>Increase Dyspnea</td>
<td>&quot;I feel a bit better with my head up&quot;</td>
<td>Obtains further history.</td>
<td>Prioritizes</td>
</tr>
<tr>
<td>Time</td>
<td>Symptom Description</td>
<td>Action</td>
<td>KSA's</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Coughing - wet</td>
<td>&quot;Maybe I should use oxygen at home&quot;</td>
<td>Reviews chart.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Verbalizes rationales for symptoms and nursing actions.</td>
<td>KSAs : safety, pt. centered care, informatics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase rhonchi and wheeze</td>
<td>&quot;I feel a little sweaty&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continue to monitor and trend data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase pulse oximetry to 91% if oxygen has been applied</td>
<td>Comfort patient and explain the plan of care.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-10 minutes</td>
<td>Worsening SOB, increased cyanosis O2 sat now 87% on 2L NC</td>
<td>&quot;My Chest is tight.&quot;</td>
<td>Calm and Confident</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increased coughing &amp; fatigue</td>
<td>Verbalize assessment changes and review chart data.</td>
<td>Well planned</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collaborate with respiratory therapist.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breath sounds-coarse rhonchi and wheezing</td>
<td>&quot;I need to get up and feed my cat.&quot;</td>
<td>Clear communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>KSA’s: teamwork/collaboration</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Restless and slightly confused</td>
<td>&quot;How did I get here?&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patient-centered care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At 10 minutes</td>
<td>BP 118/64, P-128, R-28</td>
<td>Verbalize need for increase in oxygen therapy.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Verbalize need to call MD.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-15 minutes</td>
<td>All symptoms continue</td>
<td>Call MD- provide SBAR report.</td>
<td>Clear communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vital signs unchanged</td>
<td>Recommend: MD to see patient, ABGs, blood cultures.</td>
<td>Being well-planned</td>
<td></td>
</tr>
</tbody>
</table>
Continues with frequent, productive cough | Recognize need for suction. | Being skillful KSAs: all
--- | --- | ---
**At 12 minutes** | DuoNeb administered by respiratory therapy | “I feel a little better.” |
| More fatigued | “I just cannot stop coughing.” |
More dyspneic |

**15-20 minutes** | BP 150/90, P-135 NSR, R- 32 | “I just cannot catch my breath.” |
| Patient is more fatigued | Recognizes need for additional collaboration. |
| MD has not arrived | Recognizes need for rapid response. |
| Continue with coarse rhonchi | LCJR-all |
| Continue with wheezing | |
| Weak cough | |

**END**

**Debriefing/Guided Reflection Questions for This Simulation**

I can identify abnormalities from the collected patient information.

I can recognize possible early signs or symptoms when a patient’s health deteriorates.

I can explain the mechanism and development associated with the early signs and symptoms when a patient’s health deteriorates.

I can accurately evaluate and identify whether a patient’s condition has improved.

I know the follow-up steps to take if a patient’s condition does not improve.