

**THE APPLICATION OF CASE-BASED LEARNING ON THE DEVELOPMENT OF
CLINICAL JUDGMENT SKILLS IN UNDERGRADUATE NURSING STUDENTS**

Beverly Wilgenbusch

Submitted to the faculty of the School of Education
in partial fulfillment of the requirements
for the degree
Doctor of Education
in the Department of Instructional Systems Technology,
Indiana University
November, 2021

Accepted by the School of Education Faculty, Indiana University, in partial fulfillment of the requirements for the degree of Doctor of Education.

Doctoral Committee

Krista Glazewski, PhD

Thomas Brush, PhD

Daniel Hickey, PhD

October 20, 2021

Acknowledgements

I would like to express my gratitude to my research committee members for their guidance, patience, and support. Dr. Glazewski, Dr. Brush and Dr. Hickey were very patient with the “nurse” in education and took additional time to assist me in understanding the nuances of how to apply an Instructional Systems Technology theory to the real-world of nursing education and practice.

I would also like to recognize the support and assistance of my peers and the students at Indiana University Purdue University Columbus (IUPUC), where implementation and data collection through the Division of Health Sciences was completed. Dr. Rebekah Knauer and Dr. Lisa Homer were wonderful resources for my many questions and the practical application of my ideas. Professor Meredith Stewart and the students enrolled in her course were very engaged and supportive of the intervention.

My family’s encouragement was, without question, unwavering and vital to my success. My husband, children, parents, and extended family were both understanding and reassuring as I plodded through this experience. To Matt, I thank you for your unconditional love and patience. I am so blessed to have you and our family in my corner. Finally, and most importantly, I thank God for the bountiful gifts of perseverance, forgiveness, and love that he has shown me. I would not be at this point in my life without all of you.

THE APPLICATION OF CASE-BASED LEARNING ON THE DEVELOPMENT OF CLINICAL JUDGMENT SKILLS IN UNDERGRADUATE NURSING STUDENTS

One of the key attributes of professional nurses is the skill of clinical judgment. In recent years, there has been significant attention paid to new nurse's readiness for practice and their ability to reason through unique clinical situations. This attention is driven by issues of safety and the increased complexity when providing nursing care. While clinical judgment skills are a key component of nursing practice, they have proven to be difficult to develop and assess. Because of this difficulty, educators have engaged in a variety of instructional approaches and assessment strategies to better understand how clinical judgment is taught and captured. To both facilitate and assess clinical judgment, instructional and assessment strategies like case-based learning (CBL) and the Lasater Clinical Judgment Rubric (LCJR) have been considered in different contexts, but not together. These approaches have been supported through various studies but have not been studied in tandem for impact or student interest.

A descriptive study was conducted to appreciate the impact of an abbreviated CBL intervention on clinical judgment competencies, as well as to better understand how participants perceive CBL as an instructional strategy. Quantitative data collection instruments included a pretest and posttest, the modified LCJR data, and responses to Likert-style items on a questionnaire. Qualitative data was collected through open-ended items on the questionnaire.

The results demonstrated a statistically significant difference between the pretest and posttest, suggesting that CBL strategies can positively impact knowledge and clinical judgment skills. The modified LCJR data did not show a statistically significant overall difference between cases. However, considering the brevity of the intervention, this was not entirely surprising. It was interesting to note that the LCJR can be modified and applied to CBL strategies, with the

ability to provide quantitative data to the abstract concept of clinical judgment. Participants overwhelmingly found the CBL experience enjoyable and valuable to their learning experiences.

Krista Glazewski, PhD

Thomas Brush, PhD

Daniel Hickey, PhD

Table of Contents

Chapter One: Introduction	1
Safe Entry to Practice.....	1
Clinical Judgment	2
Instructional Strategies for Clinical Judgment.....	2
Assessment Tools	3
Research Questions.....	5
Chapter Two: Literature Review	6
Entry to Nursing Practice.....	6
Clinical Judgment	7
Case-Based Learning	9
Assessment Strategies.....	13
Chapter Three: Method	17
Context.....	17
Proposed Procedures.....	18
Facilitation	21
Case Selection.....	22
Sample Population	22
Data Sources	24
Data Collection Methods	24

Data Analysis	33
Chapter Four: Results	34
Research Question One.....	34
Research Question Two	37
Chapter Five: Discussion, Implications, Limitations, and Conclusion.....	40
Discussion.....	40
Research Question One.....	40
Research Question Two	44
Implications.....	45
Limitations	49
Conclusion	50
References.....	51
Appendices.....	59
Appendix A: Preparatory Assignment.....	59
Appendix B: Diagnostics Primer	60
Appendix C: Pretest Posttest Assessment.....	62
Appendix D: Case Worksheet – Jorge Alvarez	66
Appendix E: Case Worksheet – Janique Johnson.....	69
Appendix F: Instructor’s Guide	72
Appendix G: Participant Questionnaire	75

Appendix H: Case #1 – Jorge Alvarez..... 80

Appendix I: Case #2 – Janique Johnson 83

Appendix J: Adapted LCJR – Jorge Alvarez..... 86

Appendix K: Adaptive LCJR – Janique Johnson 90

Curriculum Vitae

CHAPTER ONE: INTRODUCTION

The nursing profession, through various organizations, has identified key attributes for safe and effective practice with both the novice and experienced nurse (American Association of Colleges of Nurses [AACN], 2020; American Nurses Association [ANA], 2015; National Council of State Boards of Nursing [NCSBN], 2015). Included in these attributes are the concepts of critical thinking, clinical reasoning, and clinical judgment. Some have suggested that clinical judgment is one of the most vital skills for those practicing in the nursing profession (AACN, 2020; NCSBN, 2019).

Safe Entry to Practice

The importance of graduate nurses' safe entry into practice cannot be understated. The regulatory bodies of each state or jurisdiction in the United States are responsible for confirming that nurses are competent to practice safely and effectively (NCSBN, 2007). Nurses have a responsibility to protect the public, provide safe and effective care, and improve the overall health and wellness of individuals and communities (ANA, 2010). Nurses are considered one of the most trusted professions in the United States (Saad, 2020), where consumers of health services expect safe and appropriate nursing care. Because of the increasing complexity of healthcare, new graduate nurses are often faced with unique and complex environments that change quickly, and skills like critical thinking and clinical judgment become invaluable (Spector et al., 2015).

Safe and effective nursing practice incorporates the competent application of the nursing process, which “includes the components of assessment, diagnosis, outcomes identification, planning, implementation, and evaluation” (ANA, 2015, p. 4). This process is applied within a variety of environments and client situations, as well as in association with the standards of

nursing practice. These standards include application of the nursing process, but also reflect professional performance standards such as collaboration, effective communication, ethical considerations, and quality of practice (ANA, 2015). To successfully apply the nursing process within the performance standards of the profession, nurses need to use a variety of skills, including critical thinking and clinical judgment.

Clinical Judgment

Clinical judgment is one of the skills deemed valuable to the profession of nursing (Manetti, 2019). While it has been difficult to define, the following definition has been utilized by nursing education institutions in recent years.

“Clinical judgment is defined as the observed outcome of critical thinking and decision making. It is an iterative process that uses nursing knowledge to observe and assess presenting situations, identify a prioritized client concern and generate the best possible evidence-based solutions in order to deliver safe client care” (NCSBN, 2019, p. 1).

Clinical judgment skills are an important component of nursing professional behavior because of its inherent involvement in the observation, prioritization, and implementation of care. It is a compilation of the observation and collection of unique situational data, prior nursing knowledge and experiences, and limitations that exist within the immediate environment. Defining and assessing clinical judgment skills in nursing has been a serious topic of interest in recent years because of concerns regarding healthcare quality and the future requirements of nursing in the United States (Institute of Medicine [IOM], 2011).

Instructional Strategies for Clinical Judgment

The difficulty of teaching and assessing clinical judgment skills has been well documented (Dickison et al., 2019; Klenke-Borgmann et al., 2020; Lasater, 2011; Miraglia &

Asselin, 2015). A variety of instructional strategies have been utilized to assist students in developing clinical judgment skills in nursing education, including experiences in an actual clinical environment, simulation, and case-based learning (CBL) (Andreassen & Holmsen, 2018; Kim et al., 2016). While actual clinical experiences provide excellent opportunities for learners to apply knowledge, the foremost concern of both educators and learners is the safety of the client. Concerns for safety significantly limit a learner's ability to try uncertain approaches when treating clients. Simulation has been found to contribute to the development of nursing skills (Kim et al., 2016), but maintaining adequate resources and space for simulation can be costly (McIntosh et al., n.d.). Inquiry based instruction (such as CBL) in its various forms, however, has been utilized throughout healthcare education and rarely requires the use of simulation equipment that can be expensive to purchase and maintain (Walker et al., 2015).

Assessment Tools

A component of developing clinical judgment skills includes the ability to evaluate student progress. Assessment is a fundamental component of the teaching learning paradigm because educators need to gain an understanding of how students are mastering and applying the knowledge, skills and attitudes of the course or program (Popham, 2017). The nursing profession has invested significant resources in recent years to assess learners for competency and safety prior to entry into practice (Oermann & Gaberson, 2014). Assessing skills like clinical judgment are challenging, as students need to demonstrate how to apply knowledge and skills in real world situations where decisions can impact the health and safety of others (Kantar, 2014).

Clinical judgment is an important skill for nursing students because it is an essential skill used to assess, intervene, and evaluate the care of a client or population (AACN, 2020; ANA, 2015; NCSBN, 2015). Clinical judgment has been a difficult skill for nursing professionals to

define and assess because it is a concept that is abstract and often not easily visualized (Dickison et al., 2019; Lasater, 2011; Manetti, 2019). Various instructional strategies have been utilized to develop clinical judgment in nursing students such as direct clinical experiences, simulation, lecture, and CBL (Bussard, 2018; Cazzell & Anderson, 2016; Kantar & SAILIAN, 2018; Klenke-Borgmann et al., 2020; Lavoie et al., 2017; Li et al., 2019; Victor, 2017; Victor-Chmil et al., 2015).

One possible instructional strategy to improve nursing knowledge, skills, and attitudes that many nursing programs have used are CBL interventions. CBL is a good match because it is a student centered, collaborative approach focused on a specific case where students reflect on their interpretation and decision-making processes and is generally less expensive to implement than direct clinical experiences or simulation strategies (Cattaneo, 2017; Kantar & SAILIAN, 2018; Li et al., 2019). Mixed results exist regarding the process and effectiveness of objectively assessing the impact of CBL interventions in developing clinical judgment in nursing students (Thistlethwaite et al., 2012). Intentional reflection within case-based learning strategies may be purposefully facilitated and experienced by learners to have an impact on the development of clinical judgment skills, as reflection is a valuable component of clinical judgment (Lasater, 2011; Rico & Ertmer, 2015).

There is an assessment tool, the Lasater Clinical Judgment Rubric (LCJR), that purposefully measures the development of clinical judgment skills in nurses and nursing students, but there is insufficient evidence to accept or reject it as an effective tool to measure clinical judgment skills in case-based learning (K. Lasater, personal communication, October 25, 2020). There is limited evidence that the LCJR can be applied with multiple instructional strategies to measure clinical judgment (Ashcraft et al., 2013; Georg et al., 2018; Kim et al.,

2016; Miraglia & Asselin, 2015; Morais et al., 2018). Gathering data regarding the ability of adapting the LCJR to CBL interventions could add valuable information to nursing knowledge. Exploring the reliability of the LCJR with CBL strategies aimed at developing clinical judgment skills can add to the knowledge base of CBL as a strategy to develop clinical judgment skills, as well as the effectiveness of the LCJR as an assessment tool to evaluate clinical judgment.

Research Questions

The purpose of this study is to investigate the impact of CBL on clinical judgment competencies in nursing students as well as how participants perceive CBL as an instructional strategy. Clinical judgment skills are considered a vital component of competent nursing care. In the United States, there has been a recent trend placing higher emphasis on teaching and assessing clinical judgment in nursing students prior to entry to practice (Dickison et al., 2019; NCSBN, 2019). Given the importance of clinical judgment skills in the practice of nursing, it is important to understand what tools can be used to develop these skills as well as how to assess them. A better understanding of how the design of case-based learning strategies and assessment tools for improving and analyzing clinical judgment skills impacts nursing students would add to the knowledge base of nursing education. By learning more about how to develop and assess the thoughts and behaviors associated with clinical judgment, instructional opportunities can be designed to promote stronger clinical judgment skills.

1. What is the impact of experiences in CBL on clinical judgment competencies and content knowledge?
2. How do nursing students characterize their experiences in CBL with intentional reflection designed to impact clinical judgement skills?

CHAPTER TWO: LITERATURE REVIEW

Strong clinical judgment skills in new graduate nurses can have a huge impact on the safety and effectiveness of the delivery of nursing care in any environment. Gathering information on how clinical judgment can be developed and assessed can significantly impact the healthcare decisions and actions made for individual clients and communities.

Entry to Nursing Practice

The nursing profession differs from many other academic degrees in its application to practice. A newly prepared accountant can learn through experiences in practice just as a new graduate nurse. The difference, however, lies within the risks and responsibilities nurses have to the clients and populations they serve (Benner, 2001). Delivering safe and effective nursing care presents complex, variable, and unique challenges (AACN, 2020) and preparing graduates to successfully respond to these challenges has been difficult. One of the noted theorists of nursing knowledge, Patricia Benner (2001) applied the Dreyfus Model of Skill Acquisition to the development of how new nurses advance to become efficient and effective in unique healthcare environments. According to Dreyfus (2004), an adult learner moves through five stages when learning a new set of skills (novice, advanced beginner, competence, proficiency, and expertise). Benner's Novice to Expert Theory (2001) applied these stages to nurse development.

The key stage for nurse educators is the novice stage, which has generally been defined by stakeholders as safe and competent generalist practice for all new graduates (AACN, 2020; ANA, 2015; NCSBN, 2015). In the novice stage, new graduate nurses struggle to understand how the knowledge, skills, and attitudes they have learned relates to the context of a specific situation or clinical environment (Benner, 2001). New graduate nurses need to have sound thinking skills to assist with the application of these attributes to unique client demands.

Thinking skills like clinical judgment must be developed and performed prior to practice to prepare the new graduate nurse with the tools to be both safe and competent. The novice stage can exist at different points in a nurse's career, especially when transitioning to a new environment (Benner, 2001).

Clinical Judgment

Some have advocated that clinical judgment skills within healthcare are extremely difficult to define, assess, and teach. Research has been conducted in more depth to obtain a better understanding of clinical judgment (Benner et al., 2009; Dickison et al., 2019; Lasater, 2011; Manetti, 2019; Victor-Chmil, 2013). It has also been suggested that for clinical judgment to transpire, critical thinking and clinical reasoning have been components of the process. Clinical judgment occurs specifically within the context of a clinical situation, where unique characteristics of the environment, resources, and needs of a specific client or group of clients exist. Clinical judgment is important for nurses because the application of this skill occurs through every phase of the nursing process. The nursing process is a nonlinear approach to the assessment, analysis, planning, implementation, and evaluation of care for a client or population (ANA, 2015). Through the application of clinical judgment skills, nurses apply the nursing process to unique clinical situations involving a specific client or population.

According to Tanner's Clinical Judgment Model (Figure 1), clinical judgment includes four components: the act of noticing data and cues, the capacity to interpret and synthesize gathered information, the ability to respond within the unique environment, and reflection on these decisions and actions to improve future decisions (Manetti, 2019). Recent research has supported the assessment of clinical judgment in nursing environments, with assessment

strategies applied to both a variety of instructional strategies and international nursing settings (Ashcraft et al., 2013; Georg et al., 2018; Miraglia & Asselin, 2015; Morais et al., 2018).

Figure 1

Tanner's Clinical Judgment Model (Tanner, 2006, p. 208)

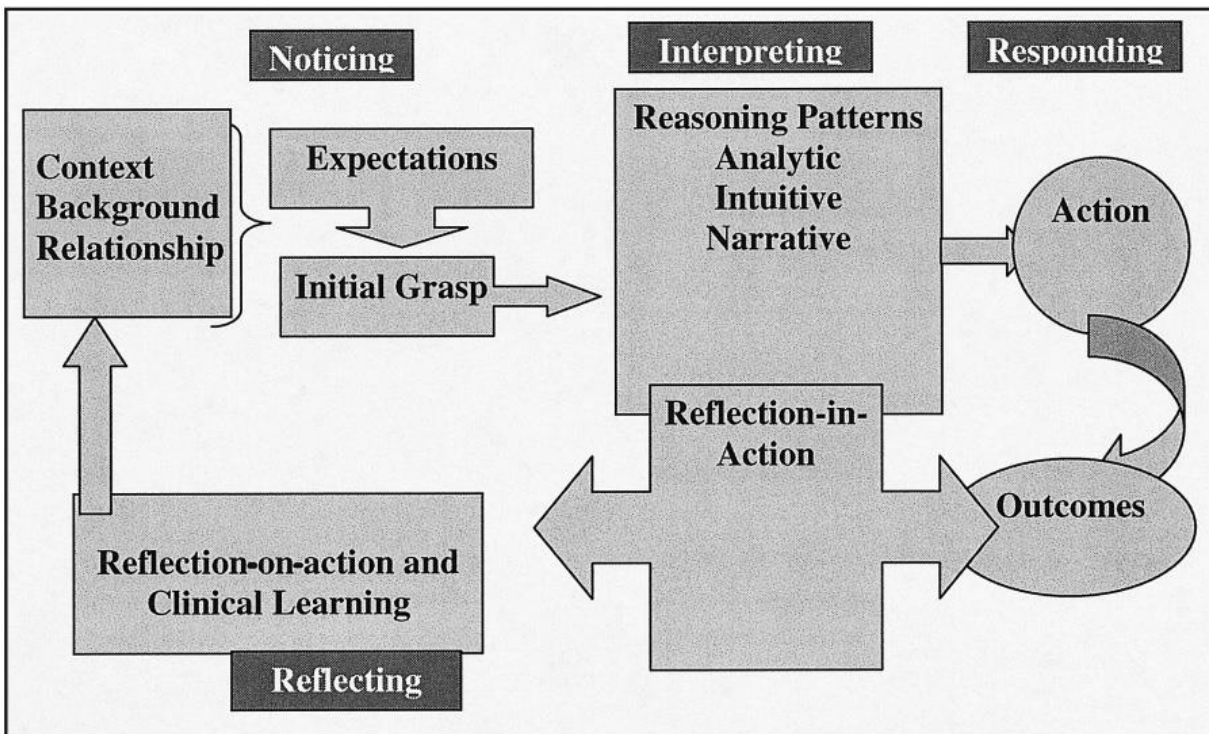


Figure. Clinical Judgment Model.

Investigating the thought processes and behaviors nursing students experience in reaching clinical judgment decisions can contribute significant knowledge to the development of clinical judgment within a learning or practice environment. This knowledge can provide direction to nurse educators and practitioners who want to cultivate strong clinical judgment skills. A variety of strategies have been employed in an attempt to develop clinical judgment. Two of these strategies, simulation, and case-based learning, seem to have increasing relevance concerning clinical judgment in nursing education.

Simulation is an instructional strategy designed to create an environment that mimics the eventual environment where students will apply knowledge and skills (Reigeluth & Carr-Chellman, 2009). Simulation is often described as a safe space for learners to practice and refine skills. Simulation has been demonstrated to have a positive effect in nursing education over a variety of domains (Kim et al., 2016), and has been coupled with the development of higher order thinking skills like clinical judgment (Ashcraft et al., 2013). However, it is important to note successful implementation of simulation strategies is dependent on the availability of dedicated environmental and design resources (NCSBN, 2016). For many institutions, limited simulation space and lack of dedicated personnel and resources may be a significant concern.

Case-Based Learning

In recent years, case-based learning strategies have attempted to create environments where clinical judgment can be examined and fostered (Kantar et al., 2018). CBL is often associated within a broader umbrella of instruction known as inquiry-based learning (IBL). Under IBL, approaches such as problem-based learning (PBL), project-based learning (PjBL), and CBL all strive to offer authentic learning experiences that help mirror real world elements of a discipline or profession (Ertmer & Glazewski, 2018). While each of these strategies differs in how the authentic task is structured and how a solution is reached, each approach is based on the idea that the learner will actively engage in reaching a solution with the instructor acting as more of a facilitator or guide. IBL approaches encourage collaboration and communication; key skills future nurses need to develop. The reason CBL has been applied more frequently in nursing programs lies within the final product or solution. With CBL, the final solution is an in-depth analysis of the case, where usually the solution is known to the facilitator and has significant structure (Ertmer & Glazewski, 2018).

CBL has its roots in fields outside of health education and has been adopted in multiple disciplines. In a systematic review on CBL in healthcare education, Thistlethwaite et al. (2012) attempted to better understand the effectiveness of CBL in health professions education. In this review, 104 articles were analyzed with the intent of providing a definition of CBL as well as to gain a better understanding of the benefits and weaknesses of CBL as a learning strategy. Because of the huge variations across studies, a narrative methodology was chosen to better understand how CBL was implemented and evaluated. The consensus of this review found inconclusive results regarding its effectiveness in meeting learning objectives but was overwhelmingly found to be an instructional strategy valued by both instructors and learners (Thistlethwaite et al., 2012).

While the results of the Thistlethwaite et al. study (2012) were ambivalent towards the determination that CBL can meet learning goals, the researchers found that this approach does facilitate incorporation of material into actual settings. In fields where learning on the job may lead to catastrophic consequences, student participation in learning activities that enhance their ability to translate this content into clinical practice provides valuable benefits. When considering instructional approaches that facilitate student's application to practice with the added advantage that students enjoy this method, it is difficult to discount CBL as a viable instructional strategy. It is also important to note that CBL fosters collaboration and teamwork (both important skills in the nursing profession), which adds to the appeal of CBL as an instructional tool worth considering.

It was also interesting to note that Thistlethwaite et al. (2012) found some distinct advantages for both multidisciplinary learning activities as well as the use of CBL instead of PBL. With a CBL intervention, multiple disciplines can be involved in the case leading to the

experience of interprofessional collaboration. CBL was also found to be more efficient than traditional, small-group size PBL, with the ability to tackle multiple objectives in shorter timeframes (Grauer et al., 2008).

Since 2012, studies have continued to explore the effectiveness of CBL specifically in nursing education and have demonstrated promising results in meeting learner objectives (Andreassen & Holmsen, 2018; Kantar & Sailian, 2018; Li et al., 2019). In Andreassen & Holmsen's research (2018), nursing student perceptions about the benefits of case-based learning were studied. The majority of students agreed that gains in comprehension of patients with multiple diagnoses were noted with this activity, and approximately half of those surveyed felt the experience equipped them for actual practice (Andreassen & Holmsen, 2018). While this data does not conclusively support the development of clinical judgment through CBL, it does warrant additional investigation. Kantar and Sailian (2018) compared the effectiveness of CBL to lecture based learning and found CBL to be significantly more effective than lecture when developing clinical judgment skills. A multiple-choice examination (somewhat similar to the national licensure exam format) was used to assess both content knowledge and clinical judgment skills with questions specifically designed to correlate with the Tanner Clinical Judgment Model. Li et al. (2019) considered critical thinking skill development through CBL and demonstrated that CBL was effective in cultivating higher order thinking skills. This study provides additional support for the development of skills like clinical judgment. The researchers felt that the CBL approach considered nursing education as a multidimensional experience, which assimilates the clinical practice of nursing in the field (Li et al., 2019). The potential benefits of relating learning experiences to future practice through CBL is worth further exploration.

Within CBL interventions, facilitator strategies have been explored to better understand the role of the facilitator in meeting learner objectives. Research has shown that modeling behaviors of the facilitator can enhance the learning environment and encourage these same behaviors in students (Rico & Ertmer, 2015). Creating a positive environment and leading with expertise can also be beneficial for student learning in inquiry-based learning strategies (Ertmer & Koehler, 2018). When leading a CBL intervention, Yew and Yong (2014) refer to three key components of a good facilitator: social congruence, cognitive congruence, and discipline experience. Social congruence refers to how the facilitator is perceived within the learning environment, to include a welcoming approach, relationship development and professional and respectful discourse. Cognitive congruence can be described as identifying the relationship between the case and actual practice, with experience reinforcing a certain level of expertise within the discipline itself. Creating a positive environment will be foundational in the success of the CBL intervention.

Modeling intentional reflection can have a positive impact on the ability of the participants to reflect on personal growth. Intentional reflection is a strategy where facilitators purposefully demonstrate the act of reflecting on a situation and encourage engagement and discussion with the learners in this process (Ertmer & Koehler, 2018). Intentional reflection may be a valuable component in developing clinical judgment skills through CBL strategies. The importance of reflection is highlighted in both the role of the facilitator and in the development of clinical judgment skills. Reflection is one of the key components of the Tanner Clinical Judgment Model (Lasater, 2011) and has been a valuable tool to promote personal growth and professional development in nurses.

Assessment Strategies

A significant area of concern in the profession of nursing has been how to assess the development of clinical judgment skills (NCSBN, 2019). It is remarkable to note that the method of assessment can play an integral role in how the effectiveness of an instructional strategy is perceived (Gijbels et al., 2005). At present, standardized assessments have been a primary tool in evaluating student readiness for the national licensure exam (NCSBN, 2014). Throughout nursing programs, multiple approaches to assessment are highly recommended (Oermann & Gaberson, 2014) but tests and quizzes are one of the most frequently used assessment tools in nursing education. Tests can be utilized to identify student strengths and weaknesses in all three domains of learning (cognitive, affective, and psychomotor) (Oermann & Gaberson, 2014).

It has been well documented in the literature that standardized assessments have improved outcomes for students preparing for national licensure exams (Quinn et al., 2018). These types of multiple choice or multiple response question format assessments have been a staple in the assessment of nursing knowledge and higher order thinking for several years (NCSBN, 2014). While this type of testing does provide objective data regarding an individual's choices when completing the assessment, there has been concern in recent years regarding its ability to measure readiness for practice (Bailey et al., 2012).

Work has begun on developing and studying an assessment tool designed to evaluate clinical judgment in nursing. The Lasater Clinical Judgment Rubric (LCJR) "offers language that describes dimensions of clinical judgment that form trajectories for student development" (Lasater, 2011, p. 86). The LCJR (Figure 2) has been examined and found to be a reliable instrument when assessing clinical judgment during simulation scenarios (Adamson et al., 2012).

The rubric is based on Tanner's Clinical Judgment Model and its four key components of noticing, interpreting, responding, and reflecting (Lasater, 2011).

The rubric has descriptions for each category based on exemplary, accomplished, developing, and beginning performance (Miraglia & Asselin, 2015). Each category is divided into further subcategories, identifying detailed characteristics to describe student performance more accurately. There are no quantitative values assigned within the rubric. The rubric was originally designed to assess clinical judgment of prelicensure students over the length of the curriculum and offer common terms regarding clinical judgment for educators and students (K. Lasater, personal communication, October 25, 2020). The LCJR has been adapted to assess clinical judgment in settings outside of simulation (Georg et al., 2018) as well as with global populations of nursing students and nurses (Ashcraft et al., 2013; Kim et al., 2016; Miraglia & Asselin, 2015; Morais et al., 2018).

Figure 2.

The LCJR

LASATER CLINICAL JUDGMENT RUBRIC

Noticing and Interpreting

Effective NOTICING involves:	Exemplary	Accomplished	Developing	Beginning
Focused Observation	Focuses observation appropriately; regularly observes and monitors a wide variety of objective and subjective data to uncover any useful information	Regularly observes/monitors a variety of data, including both subjective and objective; most useful information is noticed, may miss the most subtle signs	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	Confused by the clinical situation and the amount/type of data; observation is not organized and important data is missed, and/or assessment errors are made
Recognizing Deviations from Expected Patterns	Recognizes subtle patterns and deviations from expected patterns in data and uses these to guide the assessment	Recognizes most obvious patterns and deviations in data and uses these to continually assess	Identifies obvious patterns and deviations, missing some important information; unsure how to continue the assessment	Focuses on one thing at a time and misses most patterns/deviations from expectations; misses opportunities to refine the assessment
Information Seeking	Assertively seeks information to plan intervention; carefully collects useful subjective data from observing the client and from interacting with the client and family	Actively seeks subjective information about the client's situation from the client and family to support planning interventions; occasionally does not pursue important leads	Makes limited efforts to seek additional information from the client/family; often seems not to know what information to seek and/or pursues unrelated information	Is ineffective in seeking information; relies mostly on objective data; has difficulty interacting with the client and family and fails to collect important subjective data
Effective INTERPRETING involves:	Exemplary	Accomplished	Developing	Beginning
Prioritizing Data	Focuses on the most relevant and important data useful for explaining the client's condition	Generally focuses on the most important data and seeks further relevant information, but also may try to attend to less pertinent data	Makes an effort to prioritize data and focus on the most important, but also attends to less relevant/useful data	Has difficulty focusing and appears not to know which data are most important to the diagnosis; attempts to attend to all available data
Making Sense of Data	Even when facing complex, conflicting or confusing data, is able to (1) note and make sense of patterns in the client's data, (2) compare these with known patterns (from the nursing knowledge base, research, personal experience, and intuition), and (3) develop plans for interventions that can be justified in terms of their likelihood of success	In most situations, interprets the client's data patterns and compares with known patterns to develop an intervention plan and accompanying rationale; the exceptions are rare or complicated cases where it is appropriate to seek the guidance of a specialist or more experienced nurse	In simple or common/familiar situations, is able to compare the client's data patterns with those known and to develop/explain intervention plans; has difficulty, however, with even moderately difficult data/situations that are within the expectations for students, inappropriately requires advice or assistance	Even in simple of familiar/common 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 in developing an intervention

© Developed by Kathie Lasater, Ed.D. (2007). Clinical judgment development: Using simulation to create a rubric. *Journal of Nursing Education*, 46, 496-503.

January 2007

LASATER CLINICAL JUDGMENT RUBRIC
Responding and Reflecting

	Exemplary	Accomplished	Developing	Beginning
Effective RESPONDING involves:				
Calm, Confident Manner	Assumes responsibility; delegates team assignments, assess the client and reassures them and their families	Generally displays leadership and confidence, and is able to control/calm most situations; may show stress in particularly difficult or complex situations	Is tentative in the leader's role; reassures clients/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, making clients and families anxious/less able to cooperate
Clear Communication	Communicates effectively; explains interventions; calms/reassures clients and families; directs and involves team members, explaining and giving directions; checks for understanding	Generally communicates well; explains carefully to clients; gives clear directions to team; could be more effective in establishing rapport	Shows some communication ability (e.g., giving directions); clients/families/team members is only partly successful; displays caring but not competence	Has difficulty communicating; explanations are confusing; directions are unclear or contradictory, and clients/families are made confused/anxious, not reassured
Well-Planned Intervention/Flexibility	Interventions are tailored for the individual client; monitors client progress closely and is able to adjust treatment as indicated by the client response	Develops interventions based on relevant patient data; monitors progress regularly but does not expect to have to change treatments	Develops interventions based on the most obvious data; monitors progress, but is unable to make adjustments based on the patient response	Focuses on developing a single intervention addressing a likely solution, but it may be vague, confusing, and/or incomplete; some monitoring may occur
Being Skillful	Shows mastery of necessary nursing skills	Displays proficiency in the use of most nursing skills; could improve speed or accuracy	Is hesitant or ineffective in utilizing nursing skills	Is unable to select and/or perform the nursing skills
Effective REFLECTING involves:				
Evaluation/Self-Analysis	Independently evaluates/analyzes personal clinical performance, noting decision points, elaborating alternatives and accurately evaluating choices against alternatives	Evaluates/analyzes personal clinical performance with minimal prompting, primarily major events/decisions; key decision points are identified and alternatives are considered	Even when prompted, briefly verbalizes the most obvious evaluations; has difficulty imagining alternative choices; is self-protective in evaluating personal choices	Even prompted evaluations are brief, cursory, and not used to improve performance; justifies personal decisions/choices without evaluating them
Commitment to Improvement	Demonstrates commitment to ongoing improvement; reflects on and critically evaluates nursing experiences; accurately identifies strengths/weaknesses and develops specific plans to eliminate weaknesses	Demonstrates a desire to improve nursing performance; reflects on and evaluates experiences; identifies strengths/weaknesses; could be more systematic in evaluating weaknesses	Demonstrates awareness of the need for ongoing improvement and makes some effort to learn from experience and improve performance but tends to state the obvious, and needs external evaluation	Appears uninterested in improving performance or unable to do so; rarely reflects; is uncritical of him/herself, or overly critical (given level of development); is unable to see flaws or need for improvement

© Developed by Kathie Lasater, Ed.D. (2007). Clinical judgment development: Using simulation to create a rubric. *Journal of Nursing Education*, 46, 496-503.

January 2007

(K. Lasater, personal communication, October 25, 2020)

CHAPTER THREE: METHOD

The literature supports the research problem concerning the development and assessment of clinical judgment skills in prelicensure nursing students. Clinical judgment skills are considered a vital component of competent nursing care. To address this problem, two questions have been identified. What is the impact of experiences in CBL on clinical judgment competencies and knowledge? How do nursing students characterize their experiences in CBL with intentional reflection designed to impact clinical judgement skills?

This descriptive study used a mixed-methods research design (Fraenkel et al., 2012) to gain a better understanding of any potential benefits with the application of a CBL instructional strategy and assessment practices on clinical judgment skills in nursing students. Participants were asked to provide quantitative and qualitative data on their experiences with the CBL instructional strategy. The CBL approach was designed with learning objectives specifically targeting the use of clinical judgment skills. One of the biggest concerns in nursing education today is that students are ill-prepared for practice, specifically in relationship to clinical judgment skills (Dickison et al., 2019). The Lasater Clinical Judgment Rubric (LCJR) was designed to provide a common language for clinical judgment in nursing, as well as guidelines for assessing clinical judgment in nursing students and professionals over time. The LCJR was adapted and utilized as one of the assessment tools, along with pretest and posttest assessments to provide additional data regarding the development of clinical judgment. Participants provided feedback on their experiences through a questionnaire.

Context

The study took place in a university setting, where a prelicensure nursing program was offered. The university of choice was Indiana University Purdue University Columbus (IUPUC),

as the investigator has an established relationship with this institution. The Indiana University School of Nursing (IUSON) at IUPUC is independently accredited but has a relationship with the IUSON at all other Indiana University campuses. This relationship provided large campus resources for students and faculty at IUPUC but allowed for a small campus environment. The nursing program at IUPUC is nationally accredited and offers a bachelor's degree at its completion. When compared to other programs in the United States, IUSON at IUPUC offers a similar structure for nursing students as any other nationally accredited Bachelor of Science Nursing program. One unique feature of IUPUC's nursing program is its mission to preferentially accept students from the geographic area served by the campus. Students who live near Columbus are favorably admitted over students who do not live in the region, as long as admission requirements are met.

It was important to conduct the study in a prelicensure setting, as preparation for practice has indicated the need for sufficient clinical judgment skills upon graduation (AACN, 2020; ANA, 2015; NCSBN, 2015). In this setting, clinical judgment skills were assessed in students who have no prior experience making clinical decisions from a nurse's perspective. IUPUC is well-known to the researcher, with direct access to potential participants and faculty support when administering strategies to enhance clinical judgment skills. This was a benefit to the study because the researcher was familiar with the curriculum and the general characteristics of the student body.

Proposed Procedures

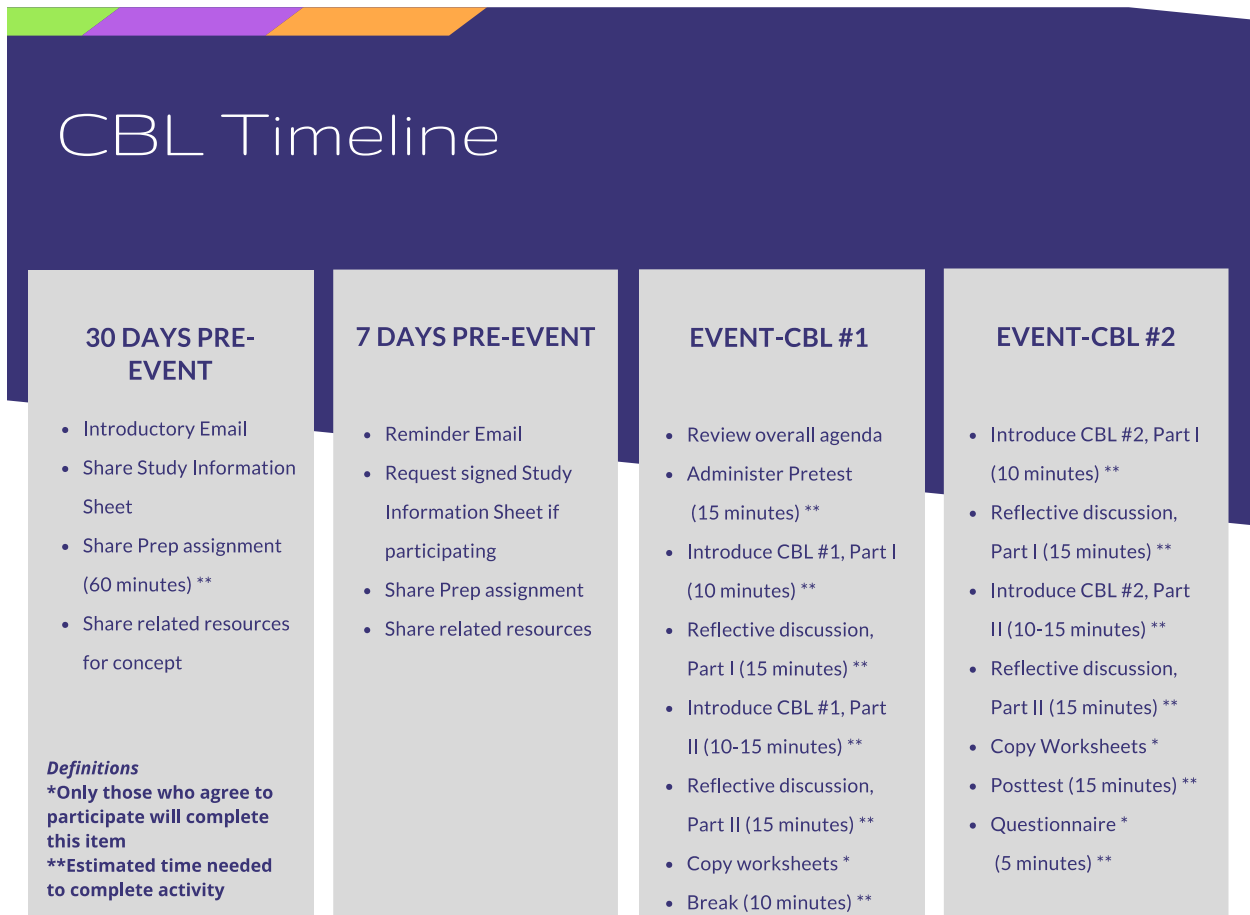
Participants were recruited through the learning management email system. As a former faculty member at this institution, the researcher has previously worked with faculty as well as participants that meet the qualifications. Participants were enrolled in a course titled Biophysical

Processes (H356) where the intervention was implemented, and data collected. Biophysical Processes is often described as the introductory Medical-Surgical course for this program and has prerequisites of both the Fundamentals and Physical Assessment courses. The course is placed in the third year of the nursing curriculum, where most students have junior year status (or higher) at the university. Students at this point in the program have been exposed to clinical settings and have had the foundational support of courses like Anatomy and Physiology, Chemistry, and Pharmacology. This course was selected because participants enrolled were exposed to the level of nursing knowledge necessary to benefit from the selected case material. A study information sheet that included informed consent to participate was offered via email approximately 30 days prior to the intervention to all students enrolled in the course.

A timeline (Figure 3) was created to provide a detailed description of how the intervention occurred. The timeline described the sequence of events within the intervention, immediately following Institutional Review Board (IRB) and dissertation proposal approval through the intervention and data collection process. The table provided information regarding each step of communication and activity around the intervention, as well as the amount of expected time participants would invest in each activity. This table was shared with the faculty of record and was reviewed with participants the day of the intervention as part of the overall agenda for the session. The faculty for the course had the opportunity to share the timeline with participants through the learning management system and had access to all case materials prior to the first day of the course. Sharing this information with the faculty prior to the intervention allowed for transparency and potentially encouraged engagement with the material. If any enrolled student chose not to participate, the researcher did not collect any data as indicated with an asterisk in the timeline below.

Figure 3

Timeline of CBL Intervention



Prior to the intervention, participants had a preparatory assignment (Appendix A) and diagnostics primer (Appendix B) designed to review relevant content to the selected cases. On the day of the intervention, the pretest (Appendix C) was administered before the first case. The pretest was created through the software company utilized by the nursing program. Within each case, participants were involved in two parts. Part I introduced the case and participants were asked to complete the associated worksheet (Appendices D and E) in small groups. After Part I was completed, the facilitator guided a discussion about Part I, intentionally encouraging reflection related to the development of clinical judgment skills. An example of the intentional

reflection process was to encourage participants to think about how they can recognize and analyze clues related to the case. The participants then moved through Part II of case, followed by another facilitator led session of intentional reflection. At the end of the reflection discussion, participants were asked to complete the final question on the worksheet, which asks them to reflect on the decisions made within the event. This process was repeated for the second case in the intervention. The worksheets from each participant were copied for later analysis by the researcher. An instructor's guide (Appendix F) was created to assist any facilitator choosing to implement this intervention. The guide provides a general overview of the cases as well as objectives for the intervention. Debriefing guidelines are formatted to address each objective and include questions the facilitator used to guide the discussions.

After participants completed both cases, a posttest was administered. The posttest replicated the pretest. At the conclusion of the posttest, participants were asked to complete the questionnaire (Appendix G). The instruments mentioned above are described in more detail in the following paragraphs.

Facilitation Process

The facilitation process was led by a general facilitation guide (Appendix F) developed specifically to meet both course objectives and address the development of clinical judgment skills. The facilitator applied the guide to both cases. Within the guide are questions specifically identified to the clinical judgment subcategories. These questions are discussed during the facilitator-led discussion during each case.

The facilitator for the intervention was the researcher. The researcher has both extensive experience in leading group discussions and was comfortable relating the material to specific subcategories of clinical judgment. The researcher was known to the participants and had

established a positive relationship with the students in previous instructional interventions. It was important for the facilitator to encourage reflection throughout the CBL intervention, and specifically when addressing the questions about reflection in the cases. Each question in the instructor's guide specifically related to a component of clinical judgment and the facilitator could intentionally relate and reinforce case data to clinical judgment skills.

Case Selection

The cases selected for the intervention were based on the general concept of metabolism, which is one of the key concepts for the H356 course. Within this concept, diagnoses related to an exemplar about diabetes often present significant challenges for nursing students to relate to clinical practice. The course learning objectives for the diabetes exemplar include the pathophysiology, etiology, clinical manifestations, interventions, and possible complications related to the disease. Two cases were selected from the National Center for Case Study Teaching in Science, a repository of cases related to the sciences (National Center for Case Study Teaching in Science [NCCSTS], n.d.). Within this site, many contributors add to the repository and a small annual fee is charged to access and use the cases. The cases selected within the repository for this intervention were contributed by Breanna Harris from Texas Tech University (NCCSTS, n.d.). Originally written from a science perspective, the cases (Appendices H and I) were adapted by the researcher to meet the learner objectives for the concept of diabetes within the H356 course.

Sample Population

Nursing students at IUPUC are preferentially admitted based on the region served by the institution. The accelerated track at IUPUC averages approximately 20-25 students per cohort. These students typically have a bachelor's degree in a health-related field (exercise science,

biology, or social work for example) and may have experience working in some area of healthcare (such as an emergency medical technician, patient care assistant or social worker). This additional educational and work experience provides a rich and diverse environment, which can facilitate interesting discussions.

The students in this region have a wide variety of knowledge, skills, and attitudes relevant for nursing program success and have significant awareness about the regional community and its population. These students often have a vested interest in being successful in the program as they will potentially serve in the communities where they live.

The characteristics of the sample include prelicensure nursing students who have the appropriate prerequisite knowledge to adequately understand and engage in the designed CBL strategy. Prerequisite knowledge would include exposure to anatomy and physiology, pharmacology, and nursing assessment and fundamentals courses. Participants will be in either the junior or senior year of the program and have had some exposure to clinical sites. This will ensure that the participants will have foundational nursing knowledge and some clinical experiences to relate to the cases. Having foundational nursing knowledge is important to make informed decisions in the clinical setting (NCSBN, 2015).

It would be expected that students at this level in the program are similar to the population at large (prelicensure nursing students across the United States), and therefore generalizations could be relevant to the broader prelicensure nursing student population. As this is a convenience sample, there may be some issues with generalization and external validity. For example, random sampling (instead of convenience sampling) is the accepted procedure to base generalizations to a larger population (King et al., 2011). The convenience and access of participants who meet all other qualifications (prelicensure nursing student, junior or senior

level, with faculty knowledge of curriculum) outweighs the lack of potential generalizability to provide a baseline of knowledge regarding case-based learning in this environment.

Data Sources

The data sources selected to answer the research questions for this study include both qualitative and quantitative data. Quantitative measures include clinical judgment rubric data, pretest posttest assessments, and questionnaire data. Qualitative data was collected through the questionnaire data with open-ended responses. Each data source was reviewed individually for intent and relevance. Themes that were considered include the four components of the LCJR (noticing, interpreting, responding, and reflecting behaviors) as well as any other emerging behaviors relevant to CBL or clinical judgment. The unit of analysis for this study was each individual participant as they experienced the CBL intervention and assessment process.

Data Collection Methods

The data was collected through the CBL worksheets, pretest posttest assessments, the questionnaire data, and the clinical judgment rubric data. The clinical judgment rubric data was transposed from the case worksheets for each participant. A clinical judgment rubric corresponded to the associated worksheet for each case and each participant.

CBL Worksheets

The CBL worksheets (Appendices D and E) were adapted to mirror the concepts of clinical judgment (noticing, interpreting, responding, and reflecting). Each question on the worksheet identified responses that can be placed into one of the categories above, which is reflected in the adapted Lasater Clinical Judgment Rubric (adapted LCJR). The participants completed a worksheet for both cases, and responses to the questions were discussed during the

CBL in the reflective discussion. At the end of the cases, the researcher collected the worksheets and copied them for further analysis in relation to the adapted LCJR.

Pretest Posttest Assessments

The pretest and posttest assessments (Appendix C) have been designed to evaluate clinical judgment related to the content of the CBL intervention. It is important to note that the pretest and posttest assessments are identical. While there are weaknesses to this design, the strengths of having the same set of questions to compare was considered beneficial (Fraenkel et al., 2012). These assessments have been created through a national software company that specializes in testing strategies to prepare nursing students for national licensure. Test items are designed to assess knowledge and higher order thinking skills and are foundationally based on Bloom's taxonomy (Oermann & Gaberson, 2014). At present, these types of questions are the best option available for the assessment of nursing knowledge and higher order thinking skills within the constraints of the current testing and entry to practice environment. The NCSBN is currently reevaluating the examination characteristics to better address the concerns of these item types as indicators of preparedness for novice practice (NCSBN, 2019).

One of the positive effects of a pretest posttest design within the learning intervention is the benefit of potential testing effects. Testing during or immediately following the learning intervention can provide significant retention of material and behaviors (Ebersbach et al., 2020). The pretest posttest design can assist learners in forming a foundational base of knowledge, skills, and attitudes.

A comparison of both individual and group scores through inferential statistics was analyzed (King et al., 2011). This data provided information relevant to current assessment

practices to better understand the question of what the impact is of experiences in CBL on clinical judgment competencies and overall knowledge of the concept of diabetes.

Each item on the pretest and posttest was analyzed for its ability to discriminate between students who performed well versus students who performed poorly, which is commonly described through an item-discrimination index (Popham, 2017). Six items from the ten-question pretest had a discrimination index greater than 0.40. According to Popham (2017), discrimination indices of greater than 0.40 indicate that the items do a very good job at discriminating between students who performed well and students who did not. One item had a discrimination index of 0.35, which indicates that it may be a good item but could benefit from additional review and the other three items had a discrimination index between 0.20-0.29. These three items are not good indicators of identifying good performers from poor performers and should be rewritten (Popham, 2017). Table 1 describes the test questions and their respective discrimination performance from the pretest results.

Table 1

Item Discrimination Analysis – Pretest

Question	Question Type	% Selected Correct Response	Discrimination Index
A nurse is assessing a client who is admitted for elective surgery and has a history of Addison's disease. Which of the following findings should the nurse expect?	Multiple Choice	45.5%	0.29
A nurse is caring for a child who has Addison's disease. Which of the following actions should the nurse take?	Multiple Choice	77.3%	0.43
A nurse is caring for a	Multiple Response	4.5%	0.26

Client who has Cushing's syndrome. The nurse should recognize that which of the following are manifestations of Cushing's syndrome? (Select all that apply.)

A nurse is caring for an adolescent client who has a long history of diabetes mellitus and is being admitted to the emergency department confused, flushed, and with an acetone odor on the breath. Diabetic ketoacidosis is suspected. The nurse should anticipate using which of the following types of insulin to treat this client?	Multiple Choice	18.2%	0.42
---	-----------------	-------	------

A nurse is providing teaching for a client who is newly diagnosed with type 2 diabetes mellitus and has a prescription for glipizide. Which of the following statements by the nurse best describes the action of glipizide?	Multiple Choice	59.1%	0.46
--	-----------------	-------	------

A nurse is providing teaching to a client who has a new diagnosis of type 2 diabetes mellitus. The nurse should recognize that the client understands the teaching when he identifies which of the following as manifestations of hypoglycemia? (Select all that apply.)	Multiple Response	31.8%	0.70
--	-------------------	-------	------

A nurse working for a home health agency is teaching a client who has diabetes	Multiple Choice	95.5%	0.25
--	-----------------	-------	------

mellitus about disease management. Which of the following glycosylated hemoglobin (HbA1c) values should the nurse include in the teaching as an indicator that the client is appropriately controlling his glucose levels?

A nurse in a prenatal clinic is teaching a client who is in her second trimester and has a new diagnosis of gestational diabetes. Which of the following statements by the client indicates a need for further teaching?	Multiple Choice	54.5%	0.35
--	-----------------	-------	------

A nurse is teaching a client who has diabetes mellitus and a new prescription for glimepiride. The nurse should teach the client to avoid which of the following drinks while taking this medication?	Multiple Choice	22.7%	0.58
---	-----------------	-------	------

A nurse is teaching about disease management for a client who has type 1 diabetes mellitus. Which statement made by the client indicates an understanding of the teaching?	Multiple Choice	86.4%	0.45
--	-----------------	-------	------

Assessment Technologies Institute (2021)

The posttest results (Table 2) were also analyzed for their ability to discriminate between poor performers and strong performers. The posttest was administered approximately three hours after the pretest and the CBL intervention was completed between the pretest and the posttest. The CBL intervention included discussions regarding the content and the application of nursing

actions that would benefit participants in addressing the questions of the posttest. Four questions have a discrimination index of not applicable (n/a) and two questions had indices of 0.01 and 0.16, where the majority of participants predominantly answered the questions correctly. Because of the timeframe of the intervention, these results could be expected, especially for questions that are considered knowledge questions. One question had a discrimination index of 0.35, which can be classified as a reasonably good item, and the other three had indices greater than 0.40 (considered very good items) (Popham, 2017).

Table 2

Item Discrimination Analysis – Posttest

Question	Question Type	% Selected Correct Response	Discrimination Index
A nurse is assessing a client who is admitted for elective surgery and has a history of Addison's disease. Which of the following findings should the nurse expect?	Multiple Choice	87.5%	0.58
A nurse is caring for a child who has Addison's disease. Which of the following actions should the nurse take?	Multiple Choice	91.7%	0.35
A nurse is caring for a Client who has Cushing's syndrome. The nurse should recognize that which of the following are manifestations of Cushing's syndrome? (Select all that apply.)	Multiple Response	75.0%	0.68
A nurse is caring for an adolescent client who has a long history of diabetes mellitus and is being admitted to the emergency	Multiple Choice	100%	n/a

department confused, flushed, and with an acetone odor on the breath. Diabetic ketoacidosis is suspected. The nurse should anticipate using which of the following types of insulin to treat this client?

A nurse is providing teaching for a client who is newly diagnosed with type 2 diabetes mellitus and has a prescription for glipizide. Which of the following statements by the nurse best describes the action of glipizide?	Multiple Choice	95.8%	0.01
--	-----------------	-------	------

A nurse is providing teaching to a client who has a new diagnosis of type 2 diabetes mellitus. The nurse should recognize that the client understands the teaching when he identifies which of the following as manifestations of hypoglycemia? (Select all that apply.)	Multiple Response	66.7%	0.53
---	-------------------	-------	------

A nurse working for a home health agency is teaching a client who has diabetes mellitus about disease management. Which of the following glycosylated hemoglobin (HbA1c) values should the nurse include in the teaching as an indicator that the client is appropriately controlling his glucose levels?	Multiple Choice	100%	n/a
---	-----------------	------	-----

A nurse in a prenatal clinic is teaching a client who is in her second trimester and has	Multiple Choice	87.5%	0.16
--	-----------------	-------	------

a new diagnosis of gestational diabetes. Which of the following statements by the client indicates a need for further teaching?

A nurse is teaching a client who has diabetes mellitus and a new prescription for glimepiride. The nurse should teach the client to avoid which of the following drinks while taking this medication?

Multiple Choice

100%

n/a

A nurse is teaching about disease management for a client who has type 1 diabetes mellitus. Which statement made by the client indicates an understanding of the teaching?

Multiple Choice

100%

n/a

Assessment Technologies Institute (2021)

Clinical Judgment Rubric

The clinical judgment rubric (adapted LCJR) data was used to assess clinical judgment as it evolves throughout the CBL interventions, evidenced through the responses provided on the worksheets. To apply this rubric within a CBL environment, adaptations of the LCJR needed to address the specific details of the intervention. The LCJR was adapted to reflect specific data relevant to each case and organized based on the four components of the rubric. For example, in the noticing section of the rubric, data from each case identified as relevant to assessing the client’s case was noted. Each section of the rubric was tailored to the specific case, with the notation that in some sections participants may identify relevant data not listed. Due to the unique nature of the nursing profession, there may be multiple interventions that are appropriate to an individual client. It is important to note that certain pieces of data are considered extremely

important within the boundaries of the case. These critical data points are noted on the LCJR by an asterisk. Participants must select these critical data points to earn a rating of accomplished or exemplary.

The adapted versions of the LCJR (Appendices J and K) were completed by the researcher for use during the intervention. The adapted LCJR results of the first case were compared to the results of the second case for each participant. The adapted LCJR was personalized for each case yet followed the overall concepts of clinical judgment. A numerical score was assigned to each clinical judgment concept, providing a numerical total for overall comparison. By assigning a numerical value to the rubric, growth was measured across interventions for individual participants. This numerical score was one indicator of a participant's clinical judgment skills as they develop over multiple CBL interventions throughout a program. The data was analyzed through the inferential method of t tests of effect size calculations (King et al., 2011).

Questionnaire

Questionnaire data was collected from the participants to answer the question of how nursing students characterized their experiences with the CBL intervention. A questionnaire (Appendix G) was designed with closed-ended questions because of the advantages of consistent responses, ease of scoring, and the familiarity of this approach with most participants (Fraenkel et al., 2012). A descriptive analysis of the data was performed to better understand the question of student experiences regarding the intervention (Fraenkel et al., 2012). The questionnaire also included open-ended questions that focus on allowing participants more independence in responses (Fraenkel et al., 2012). These were analyzed using thematic analysis (Merriam & Tisdell, 2016) to determine trends related to student experiences of the overall intervention

designed to address the development of clinical judgment skills. Thematic analysis was selected because it allows grouping of common themes within the data, which can assist in making sense of the data (Merriam & Tisdell, 2016).

Data Analysis

The data analysis process looked at the data collected from the pretest posttest assessments, the questionnaire, and the worksheets. The worksheet data was analyzed and correlated with the respective adapted LCJR. In the final step, data was compared across the assessments, questionnaire, and adapted LCJRs for consistencies and anomalies.

Scores from the pretest for each participant were compared to scores from the posttest and analyzed for any significant differences. Ideally, performance on the posttest would be higher than performance on the pretest for participants. To understand the statistical relationship between these two scores, analysis with a repeated measures design using a paired samples *t*-test was conducted (King et al., 2011). This comparison can identify any possible differences between the pretest and posttest assessments, which in turn may provide a description of potential strengths and weaknesses (in conjunction with the other data points) found with the CBL intervention.

The worksheet responses were correlated with the adapted LCJR. Each response for the questions on the worksheet was documented within an individualized LCJR for each participant and each case. After all data from the worksheet was transferred to the adapted LCJR, a score was calculated. For each participant, the score on the adapted LCJR for the first case was compared to the score that participant received on the second case. After the analysis of all worksheets was completed and scores awarded for every participant on both cases, comparisons were made through a repeated measures design using a paired samples *t*-test. The researcher

applied a rigorous and systematic approach to scoring the rubrics. One rater evaluated all worksheets in one setting and reviewed ratings for internal consistency. The worksheets were identified by numbers previously assigned to participants, protecting against any potential participant bias.

The closed-ended questionnaire responses were described as mean averages related to each question's scale. The open-ended questionnaire responses were analyzed using thematic analysis, looking for consistent themes related to student experiences during the CBL intervention. Both open- and closed-ended responses were analyzed for consistency and used to portray how participants felt about the intervention.

CHAPTER FOUR: RESULTS

The results reported in this section are categorized related to each research question. The first research question considered the impact of experiences in CBL on clinical judgment competencies and knowledge. The second research question explored how nursing students characterize their experiences in CBL with intentional reflection designed to impact clinical judgement skills.

Research Question One

The first research question was: What is the impact of experiences in CBL on clinical judgment competencies and knowledge? Collected data relevant to this question include the pretest/posttest data and the LCJR data.

Pretest/posttest

A paired samples *t*-test as well as item discrimination analyses were utilized to better understand the scores of the pretest and posttest. Student overall scores as means and standard deviations on the pretest and posttest were calculated. As the pretest and posttest had ten

questions and each question was worth one point, the mean scores were based on the number correct out of ten. The mean score of the pretest was 4.95 ($SD = 1.76$), and the mean score of the posttest was 9.0 ($SD = 0.93$). The results demonstrated a statistically significant difference between the pretest and posttest scores $t(21) = 10.79, p < 0.05, d = 2.30, 95\% \text{ CI } [1.49, 3.10]$. Effect size estimate, expressed as Cohen's d , was large (King et al., 2011). It is noteworthy that the power of this data is impacted by the small sample size and convenience sampling process (King et al., 2011).

An item analysis of the questions selected for the pretest/posttest was completed. The analysis found that 60% of the items had a discrimination index of greater than 0.40, which identifies these questions as good indicators of student performance related to their overall performance on the assessment. While every educator would appreciate a perfectly designed test with items that discriminate between those who perform well and those who do not, it is unrealistic to expect perfection in the real world, taking into consideration the environment, the participants, and any extraneous factors (Matlock-Hetzel, 1997).

LCJR data

The purpose of the adapted LCJR was to provide a consistent and objective measurement of clinical judgment skills. The LCJR scores were based on case responses on the part of each participant. An individual LCJR rubric score was assigned for each case per participant. Totals from overall worksheet scores as well as each subcategory (noticing, interpreting, responding, and reflecting) were then compared and analyzed. Table 3 provides the obtained values of the analyzed data for all participants.

Table 3

LCJR Mean (M), Standard Deviation (SD), t scores and Effect Size (d) Comparisons

LCJR Categories	<i>M</i>	<i>SD</i>	<i>t</i> (21)	<i>p</i>	<i>d</i>	95% CI
Overall						
LCJR #1	23.05	2.13				
LCJR #2	23.68	3.30				
Comparison			0.78	0.444	0.17	[-0.26, 0.59]
Subcategories						
Noticing						
Noticing #1	9.36	1.18				
Noticing #2	8.32	2.36				
Comparison			-1.82	0.084	-0.39	[-0.82, 0.05]
Interpreting						
Interpreting #1	4.45	0.89				
Interpreting #2	4.64	0.58				
Comparison			0.81	0.427	0.17	[-0.25, 0.59]
Responding						
Responding #1	6.27	1.52				
Responding #2	8.05	1.17				
Comparison			4.84	<0.001	1.03	[0.50, 1.55]
Reflecting						
Reflecting #1	2.95	0.67				
Reflecting #2	2.81	0.51				
Comparison			-1.37	0.186	-0.30	[-0.73, 0.14]

N=22

The overall comparison of scores between the first case and the second case did not demonstrate statistically significant change in student clinical judgment skills, $t(21) = 0.78$, $p = 0.444$, $d = 0.17$. When reviewing the subcategories from case to case, the only subcategory to demonstrate significant results was the subcategory titled *responding*, $t(21) = 4.84$, $p < 0.001$, $d = 1.03$. *Responding* included the clinical judgment concepts of a calm, confident approach, clear communication, well-planned interventions, flexibility in implementation, and being skillful.

Scores on two subcategories declined across cases. The decline on *reflecting*, $t(21) = -1.37$, $p = 0.186$, $d = -0.30$, was very small and could have easily occurred by chance. *Reflecting* included the concepts of evaluation, self-analysis, and commitment to improvement. The decline on *noticing* was larger, $t(21) = -1.82$, $p = 0.084$, $d = -0.39$, and was unlikely to have occurred by chance. *Noticing* included the clinical judgment concepts of focused observation, recognizing deviations from expected patterns and information seeking.

Research Question Two

The second research question was: How do nursing students characterize their experiences in CBL with intentional reflection designed to impact clinical judgement skills? A questionnaire was offered to each participant with questions designed to address this question. Additionally, participants were offered the opportunity to explore their experiences with CBL through a short interview with the researcher. No participants selected this option and therefore no interview data was collected.

The questionnaire was completed at the end of the session. A total of 22 participants were engaged in the activities, and 20 of these students provided feedback through the questionnaire. The questionnaire had seven Likert items and four open-ended items. The fourth open-ended item was an invitation to participate in an interview with the researcher. No responses were received for this question. The questions were assigned a value of five for the strongly agree response to a value of one for the strongly disagree response. Table 4 provides a summary of the responses provided by participants who completed the questionnaire. The number of participants who completed each question is noted in the fourth column of the table under the heading *N*.

Table 4

Post CBL Questionnaire Quantitative Results

Question	<i>M</i>	<i>SD</i>	<i>N</i>
1. The pre-assignment was helpful in Preparing you for the cases discussed in class.	4.70	0.46	20
2. The reading material was helpful in Preparing you for the cases discussed in class.	4.60	0.73	20
3. The in-class activities completed in small groups were useful in improving your clinical judgment (decision making/clinical reasoning) skills.	4.45	0.80	20
4. The facilitator led discussions after parts I and II of each case were helpful when considering the development of your clinical judgment (decision making/clinical reasoning) skills.	4.85	0.36	20
5. The in-class learning activities contributed to the development of your clinical judgment (decision making/clinical reasoning) skills.	4.40	0.97	20
6. The in-class activities contributed to your overall development of clinical judgment (decision making/clinical reasoning) skills.	4.40	0.80	20
9. Overall, I am very likely to recommend engaging with the material and in-class activities on diabetes to other nursing students.	4.53	0.60	19

Likert Items

The overall mean for all seven Likert questions was 4.56/5.0, which generally indicates positive ratings of the experience. The highest rated item was “The facilitator led discussions after parts I and II of each case were helpful when considering the development of your clinical judgment (decision making/clinical reasoning) skills” ($M = 4.85$, $SD = 0.36$). Interestingly, the second highest rated item was “The pre-assignment was helpful in preparing you for the cases

discussed in class” ($M = 4.70$, $SD = 0.46$). The two lowest scoring items were “The in-class learning activities contributed to the development of your clinical judgment (decision making/clinical reasoning) skills” ($M = 4.40$, $SD = 0.97$) and “The in-class activities contributed to your overall development of clinical judgment (decision making/clinical reasoning) skills” ($M = 4.40$, $SD = 0.80$).

Open-Ended Items

Of the three open-ended items where responses were given, the item “Please share what activities and experiences you liked most about the material and in-class activities on diabetes” received the most responses, with a total of 17. When analyzing these responses, the top three themes found to be liked the most by participants included the small group discussions and questions, the overall group discussion led by the facilitator, and how the group activities related to actual clinical settings. Other liked activities and experiences noted were the pre-session assignment, the change of atmosphere from traditional lecture, the interactive discussion, and the discussion of rationales. Specific comments related to this statement included “I liked the deliberation among the team” and “The breakout groups to go over cases were extremely helpful to see the clinical manifestations of the disease process rather than just a discussion/lecture over the disease process.” One participant stated, “I liked doing the group work and having multiple case studies to be able to discuss what we can do better to help our critical and clinical thinking.”

The second open-ended question with a total of seven responses was “Please share what activities and experiences could be improved to better enhance the development of your clinical judgment skills with the materials and in-class activities on diabetes.” The comments were unique and ranged from eliminating group activities, providing better pre-CBL resources, condensing cases to utilize time more efficiently, as well as offering structured discussions pre

and post the event to review the concept of diabetes and interpreting lab results. While no comments were consistently noted, specific feedback included participants who stated that “A brief overview of the lecture prior to starting the discussions to give everyone a refresher on the material” as well as “A structured discussion after to cover key points” would be helpful. It is valuable to note that only seven responses were received.

The third open-ended question asked participants to “Please provide any additional comments regarding this experience that you would like to share.” Six responses were provided, and the most common response noted here was that participants enjoyed learning with the facilitator. The only other feedback was that students really enjoyed the experience. Participants provided comments such as “I really enjoyed learning from you” and “I enjoyed learning from Professor Wilgenbusch. She is a great resource and asset for my learning.”

CHAPTER FIVE: DISCUSSION, IMPLICATIONS, LIMITATIONS, AND CONCLUSION

Discussion

The purpose of this study was to investigate the impact of CBL on clinical judgment competencies in nursing students as well as how participants perceive CBL as an instructional strategy. This section provides a summary and discussion of the study’s findings, the implications of these findings, as well as noted limitations. The study’s findings and resultant discussion are defined by research question.

Research Question One

The first question in this study was to better understand the impact of a CBL intervention on the development of clinical judgment skills in nursing students. The pretest/posttest results support improvement in general knowledge and clinical judgment related to the concept of

diabetes, which was the focus of the cases for the intervention. These results correlate to historical data regarding multiple choice/multiple response questions in the development of nursing knowledge and higher order thinking skills (NCSBN, 2011).

It is interesting to note that the NCSBN (2019) has spent significant resources analyzing the use of assessment items such as those utilized in the pretest/posttest to determine how well these questions assess clinical judgment preparedness in novice nurses. Research conducted by NCSBN found that new nurses are linked to significant errors in their first year of practice, and many of those errors may be related to clinical judgment skills (Muntean, 2012). While assessments designed in a similar fashion to the pretest/posttest can provide additional insight into the assessment of student progress, it is important to understand that multiple methods of assessment (as well as instructional strategies) can assist educators in acquiring insight into the clinical judgment skills of nursing students.

The overall results from the modified LCJR outcomes demonstrated overall improvement, but comparison results were not statistically significant. These results are not surprising in light of the fact that clinical judgment is a complex process (Tanner, 2009) and maturity in complex processes would not drastically improve within the span of three hours. It is noteworthy that most higher order thinking skills develop over a much longer period of time, where learners practice and can reflect on a variety of experiences and situations to develop skills like clinical judgment. These results support theories such as the Dreyfus Model of Skill Acquisition and Benner's Novice to Expert Theory, where new nurses develop stronger clinical judgment skills through multiple experiences and learning opportunities (Benner, 2001). It is important to recognize that consistency and reliability of the scoring process was managed

through a variety of strategies, which demonstrated that this method of assessment can apply in real-world environments.

It is noteworthy that the subcategory of *responding* did demonstrate significant improvement between cases. The subcategory of responding relates to how implementation of interventions occurs. In this subcategory, the participants were asked how they would communicate with the client as well as what interventions they would prioritize for the client. There could be many reasons as to why this score significantly improved. One reason could be related to the concept of diabetes and the way the cases were designed. The client in each case had either type I or type II diabetes. The interventions for both types of diabetes have strong similarities, potentially allowing the study participants to assimilate learning from the first case and apply it to the second case. Another reason for significant improvement in this subcategory could be that it included the process of communicating with the client. Therapeutic communication is a cornerstone of nursing processes and was relevant in each case. Finally, the data points in the responding subcategory could be of more interest to participants, as responding behaviors are often thought of as the “action” stage in the clinical judgment process and often have more concrete data points. The participants may have found the actions relatable to their learning interests in becoming a nurse.

The results also demonstrated decreased scores for the subcategories of *noticing* and *reflecting*, but these results were not statistically significant. A variety of possibilities could have contributed to these results. The participants in this study were enrolled in an accelerated nursing program. Through the time constraints of this program, students may not have had the necessary time and space to practice clinical judgment skills. When considering the *noticing* subcategory, the assessment data for both cases was relatively similar. Participants may have found little value

in re-writing the assessment data for the second case. In regards specifically to the *reflecting* subcategory, it is possible that participants do not appreciate the inherent value of reflection on the achievement of learning and developing clinical judgment skills. The reflection activity was also the last activity before a break, which often may lead participants to quickly complete the questions at the end of the intervention to access free time. The dedication of intentional time to reflect was offered, but the structure of this component was flexible and left to the participant's discretion.

The researcher found the modified LCJR data collection process to be one of the more valuable experiences in the study. Because of the difficulty of teaching and assessing higher order thinking skills like clinical judgment, the modified LCJR provided a quantifiable approach in assessing whether participants noted specific data that could then be related to one of the four components of the clinical judgment process. As an educator, it was gratifying to realize that possibilities exist to potentially measure clinical judgment development objectively. Knowing that this data would be more valuable if collected in multiple interventions over a longer period of time, it is reasonable to attempt to create modified LCJRs for multiple cases and implement a case-based learning strategy over the length of a nursing program. The intervention did not take any more time than allotted for teaching the same material and once prepared, could be re-used across semesters. CBL interventions allow the opportunity for improved proficiency in knowledge and clinical judgment skills, while being a less costly and time sensitive option compared to simulation. The intervention along with the rubric allow for consistent approaches and assessment strategies for nursing educators to model and discuss.

Research Question Two

The second question in this study referred to how nursing students characterize their experiences in CBL with intentional reflection designed to impact clinical judgement skills. The assessment tool used to collect data for this inquiry was the questionnaire. The questionnaire had two question types: Likert-style items and open-ended items.

The Likert-style responses about how students characterized their experiences were overwhelmingly positive. The averages of each question's mean scores ranged from 4.40-4.85 on a five-point scale. In general, participants seemed to value the material, the process, and the facilitation. It was interesting to note that the lowest three mean scores (4.40, 4.40 and 4.45) asked participants to assess the value of the activities specifically to the development of clinical judgment skills. It is possible that participants found it more difficult to recognize how the CBL process related to clinical judgment skill development. The three highest rated mean scores (4.85, 4.70, and 4.60) related to more concrete and visible resources, which include the preparatory materials and reading assignments as well as the interactions with the facilitator during the intervention. If this intervention were repeated, it may be valuable to more concretely identify how the cases, assignments, and questions linked to the components of clinical judgment.

The responses to the open-ended items were in general positive and informative. Many students commented on the positive aspects of group work and the sharing of ideas and reinforced the value of facilitator led discussions. In general, participants were affirmative about the experience. It may be worth considering the idea that these perceptions and attitudes may decrease over time, as the CBL interventions become more frequent. It would be appropriate to be somewhat cautious about these results regarding student experiences with CBL.

The participants also provided feedback on what could be improved within the instructional strategy. Some participants suggested that a structured review before and after the intervention might be helpful. Inquiry based learning strategies in general are designed to be somewhat ambiguous and demanding as learners explore new ways of thinking about cases, problems, or projects. It is important to use effective scaffolding techniques to assist learners with critical points throughout the intervention. Balancing appropriate scaffolding with both learner support and learner self-engagement can be challenging for both facilitators and participants. However, one of the key benefits of approaches like CBL is student self-awareness of collaborative knowledge acquisition and application to a result or problem. It would be valuable to clearly identify the process of an approach like CBL with participants in advance of the intervention. In this manner, participants would be aware of the difficulties they may encounter throughout the intervention and understand that these difficulties can enhance their growth and development.

It is also remarkable that some participants enjoyed working with the facilitator. It would be valuable to gain a better understanding of how facilitator knowledge, skills, and experiences impact student perception of CBL interventions. Future research could attempt to identify if certain facilitator skills are more effective than other approaches in student experiences with CBL.

Implications

The implications of this research have been divided into two sections. The two sections describe implications for practice as well as implications for research.

Implications for Practice

The implications of this study are related to the overall purpose of investigating the impact of a CBL instructional strategy on both the development of clinical judgment skills and the experiences of nursing students within the intervention. It was interesting to note that the results of this study were intuitively different from that of past research with CBL. In this study, knowledge gains were positive and overall clinical judgment gains were not statistically significant. In previous review of similar studies, gains in knowledge retention were not statistically significant (Thistlethwaite, 2012). These results may be different from previous studies because of an assortment of variables. The first variable would be the pretest/posttest design, where the posttest was administered within hours of the pretest. Due to the short timeframe, participant retention of the question content could have impacted results. It is also possible that with the pre-assignments, the pretest, and the facilitation of content during the intervention, knowledge retention strategies were supported for participants. It is also possible that the participant population have strong test taking skills. Nursing students in general are focused on test performance due to the ultimate need to pass the national licensure exam.

When thinking of the application of the LCJR results, it is reasonable to interpret this data as an expected finding. It is more reasonable to expect that clinical judgment skills in nursing students develop over the lengths of the curriculum instead of three hours. The nursing student participants were at a midpoint in the nursing program, and still had much to learn. It is important to invest in building clinical judgment skills, which are distinct from content knowledge. However, when compared to current practices such as lecture, simulation, and clinical experiences, CBL interventions offer a viable, cost-effective approach to developing clinical judgment abilities. In nursing education today, simulation and clinical experiences have

been required of nursing programs with the intent to assist students in developing needed skills for practice. Simulation is an effective option to address these skills, but at times is quite expensive to maintain. Clinical experiences are extremely valuable in developing all skills needed for practice, but are difficult to arrange, unpredictable when compared to current program and course objectives, and often do not meet the needs of each student in various nursing programs served by each facility. CBL lends itself as a more manageable intervention that is cost-effective and flexible enough in design to meet current program and course objectives.

When discussing the process of the intervention and the noted results of the reflection subcategory, it would be important to consider the act of reflection in more detail. It may be beneficial to consider including a defined debriefing session at the end of the intervention where participants are guided in the act of reflecting on the intervention. It may be valuable to create reflection norms, or guides, that assist in this process. By including an intentional reflective session, participants can be guided in self-reflection to enhance the development of clinical judgment.

It is also valuable to have learned that in general, participants enjoyed the CBL intervention. The data collected from the questionnaire indicates that many participants appreciated the experience and would welcome similar interventions to improve knowledge and skills. While this phenomenon may fade, it would be practical to implement these types of interventions across the curriculum knowing that participants enjoyed and felt the intervention was conducive to learning.

Implications for Research

While the LCJR data did not provide an overall statistically significant result, it is important, as a researcher, to learn that the LCJR (with modifications) can be utilized to assess

clinical judgment skills with specific case-based learning strategies. In the future, it would be valuable to implement CBL interventions with modified LCJRs across the curriculum of a nursing program, where improvement of clinical judgment skills in nursing students could be assessed over a longer period of time. Combining pretest/posttest data with LCJR data over time would provide educators with additional information to make more informed decisions about student progress in clinical judgment development and improvements in content knowledge.

By conducting CBL interventions on a larger scale over time with larger groups of participants, greater power in the significance of the results could be obtained. The LCJR assessment format is adaptable and can provide additional data on whether this is a potential approach to objectively measure clinical judgment skills in nursing students. Future considerations for the LCJR would also include the ability to weight subcategories. This would allow for more reliable comparisons where scores were based on a proficiency scale. It would also be interesting to consider further research that applies an adapted LCJR regimen to both control and study groups of participants. This could shed light on the effectiveness of CBL interventions as compared to other teaching/learning practices.

Ultimately, the value of future research in the development of clinical judgment skills in nursing students is directly related to the safety and health of the populations that nurses serve. The results of this study can support future research around CBL and the assessment of clinical judgment skills because of its cost-effective approach to both facilitating and assessing the development of clinical judgment. As previously stated, new nurse graduates have been linked to a significant number of medical errors, often related to skills like clinical judgment and clinical reasoning (Muntean, 2012). Any approaches that can directly or indirectly impact the development of clinical judgment skills in nursing students has the potential to decrease medical

errors for the populations served. Multiple approaches, including CBL interventions, that address the development of clinical judgment skills would be welcome by many nursing educators especially when noting that participants found CBL to be enjoyable and worthwhile. Future studies that compare the effectiveness of CBL in developing clinical judgment with other strategies (such as simulation) would be interesting.

Limitations

A few limitations are noted in this study. As noted previously, clinical judgment skills usually develop over time and not within the space of three hours. It would be recommended to conduct CBL interventions over the course of an undergraduate nursing program, where clinical judgment skills and reasoning could mature over years instead of hours. There is also a noted weakness of any repeated measures test, where posttest scores can be artificially higher when the questions are the same on both tests. When the pretest and posttest are administered on the same day, this can only be potentiated.

It is also important to note the size of sample. With less than thirty participants, it is difficult to determine statistical validity or power with the results of the assessment tools. The participants are also enrolled in an accelerated program, where students earn a bachelor's degree in less than eighteen months. The participants were enrolled in what would normally be considered a heavy workload that potentially limits the amount of available time to practice clinical judgment skills. For example, on the day of the intervention the participants had two other exams and scheduled courses to attend. Participant fatigue could have impacted assessment scores, participation, and retention.

Finally, while the modified LCJRs were more objective in nature and correlated with each case, the researcher noted that potential bias could exist when evaluating whether a

participant met the criteria of each subcategory. Furthermore, having only one rater may have created bias, as the ability to evaluate for consistency across raters would have increased the reliability of the scoring process. In the future, it would be valuable to create the modified LCJRs with a team of experts, who in turn could clearly identify every item in each subcategory and relate it to the case and course objectives.

Conclusion

In conclusion, this study provided additional data on the impact of experiences in CBL on clinical judgment competencies and knowledge as well as how nursing students characterize their experiences in CBL. It is important to recognize that CBL can be implemented within typical course schedules, covering the same content, with the ability to increase knowledge and clinical judgment skills. While the initial creation of the intervention and assessment tools may require some additional preparation, the value of CBL strategies lies with the ability of multiple applications with groups of learners over time. CBL is also a cost-effective alternative to instructional strategies such as simulation and direct clinical experiences, due to intense level of resources required for each of these options. Given the state of the profession of nursing and readiness of new graduates to enter practice, continued exploration of CBL interventions and assessment strategies can have a significant impact on the safety and preparedness of new nurses. The implications of this study support the use of modified LCJRs in CBL interventional strategies, along with pretest/posttest assessments, to better understand the development of clinical judgment skills in nursing students. In combination with the overall positive experiences of students with this strategy, it is reasonable to implement CBL interventions with intentional reflection to support the development of clinical judgment skills.

References

- Adamson, K. A., Gubrud, P., Sideras, S., & Lasater, K. (2012). Assessing the reliability, validity, and use of the Lasater Clinical Judgment Rubric: Three approaches. *Journal of Nursing Education, 51*(2), 66–73. <https://doi.org/10.3928/01484834-20111130-03>
- American Association of Colleges of Nursing. (2020, November 5). *The draft essentials document*. AACN Draft Essentials Document. Retrieved February 13, 2021, from <https://www.aacnnursing.org/Portals/42/Downloads/Essentials/Essentials-Draft-Document.pdf>
- American Nurses Association. (2010). *Nursing's social policy statement: The essence of the profession*. Nursesbooks.org.
- American Nurses Association. (2015). *Nursing: Scope and standards of practice* (3rd ed.). Nursesbooks.org.
- Andreassen, H. M., & Holmsen, T. L. (2018). Case-based learning in nursing education. *Nordisk Sygeplejeforskning, 8*(3), 219–229. <https://doi.org/10.18261/issn.1892-2686-2018-03-05>
- Ashcraft, A. S., Opton, L., Bridges, R. A., Caballero, S., Vessart, A., & Weaver, C. (2013). Simulation evaluation using a modified Lasater Clinical Judgment Rubric. *Nursing Education Perspectives, 34*(2), 122–126. <https://search-ebSCOhost-com.proxy.ulib.uits.iu.edu/login.aspx?direct=true&db=ccm&AN=104233845&site=ehost-live>
- Assessment Technologies Institute (2021). Group performance profile** CBL #1 pretest – 7021. <https://www.atitest.com/educator>

- Bailey, P. H., Mossey, S., Moroso, S., Cloutier, J. D., & Love, A. (2012). Implications of multiple-choice testing in nursing education. *Nurse Education Today*, 32, e40–e44. <https://doi.org/10.1016/j.nedt.2011.09.011>
- Benner, P. (2001). *From novice to expert: Excellence and power in clinical nursing practice* (Commemorative ed.). Prentice Hall Health.
- Benner, P., Tanner, C., & Chesla, C. (2009). *Expertise in nursing practice: Caring, clinical judgment, and ethics* (2nd ed.). Springer.
- Bussard, M. E. (2018). Evaluation of clinical judgment in prelicensure nursing students. *Nurse Educator*, 43(2), 106–108. <https://doi.org/10.1097/NNE.0000000000000432>
- Cattaneo, K. H. (2017). Telling active learning pedagogies apart: From theory to practice. *Journal of New Approaches in Educational Research*, 6(2), 144–152. <https://doi.org/10.7821/naer.2017.7.237>
- Cazzell, M., & Anderson, M. (2016). The impact of critical thinking on clinical judgment during simulation with senior nursing students. *Nursing Education Perspectives*, 37(2), 83–90. <https://doi.org/10.5480/15-1553>
- Dickison, P., Haerling, K. A., & Lasater, K. (2019). Integrating the National Council of State Boards of Nursing Clinical Judgment Model into nursing educational frameworks. *Journal of Nursing Education*, 58(2), 72–78. <https://doi.org/10.3928/01484834-20190122-03>
- Dreyfus, S. E. (2004). The five-stage model of adult skill acquisition. *Bulletin of Science, Technology and Society*, 24(3), 177–181. Retrieved February 21, 2021, from <https://doi.org/proxyiub.uits.iu.edu/10.1177/0270467604264992>

- Ebersbach, M., Feierabend, M., & Nazari, K.B.B. (2020). Comparing the effects of generating questions, testing, and restudying on students' long-term recall in university learning. *Applied Cognitive Psychology, 34*, 724-736. <https://doi.org/10.1002/acp.3639>
- Ertmer, P. A., & Glazewski, K. D. (2018). Problem-based learning: Essential design characteristics. In *Trends and issues in instructional design and technology* (4th ed., pp. 286–295). Pearson Education, Inc.
- Ertmer, P. A., & Koehler, A. A. (2018). Facilitation Strategies and Problem Space Coverage: Comparing Face-to-Face and Online Case-Based Discussions. *Educational Technology Research and Development, 66*(3), 639–670. <http://dx.doi.org.proxyiub.uits.iu.edu/10.1007/s11423-017-9563-9>
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). McGraw-Hill.
- Georg, C., Karlgren, K., Ulfvarson, J., Jirwe, M., & Welin, E. (2018). A rubric to assess students' clinical reasoning when encountering virtual patients. *Journal of Nursing Education, 57*(7), 408–418. <https://doi.org/10.3928/01484834-20180618-05>
- Gijbels, D., Dochy, F., Van den Bossche, P., & Segers, M. (2005). Effects of problem-based learning: A meta-analysis from the angle of assessment. *Review of Educational Research, 75*(1), 27–61. <http://www.jstor.org/stable/3516079>
- Grauer, G., Forrester, S. D., Shuman, C., & Sanderson, M. W. (2008). Comparison of student performance after lecture-based and case-based/problem-based teaching in a large group. *Journal of Veterinary Medical Education, 35*(2), 310–317. <https://jvme.utpjournals.press/doi/pdf/10.3138/jvme.35.2.310>

- Institute of Medicine. (2011). *The future of nursing: Leading change, advancing health*. The National Academies Press. <https://doi.org/10.17226/12956>
- Kantar, L. D. (2014). Assessment and instruction to promote higher order thinking in nursing students. *Nurse Education Today*, 789–794. <https://doi.org/10.1016/j.nedt/2013.08.013>
- Kantar, L. D., & SAILIAN, S. (2018). The effect of instruction on learning: Case-based versus lecture-based. *Teaching and Learning in Nursing*, 13, 207–211. <https://doi.org/10.1016/j.teln.2018.05.002>
- Kim, J., Park, J.-H., & Shin, S. (2016). Effectiveness of simulation-based nursing education depending on fidelity: A meta-analysis. *BMC Medical Education*, 16(152), 1–8. <https://doi.org/10.1186/s12909-016-0672-7>
- King, B. M., Rosopa, P. J., & Minium, E. W. (2011). *Statistical reasoning in the behavioral sciences* (6th ed.). John Wiley & Sons, Inc.
- Klenke-Borgmann, L., Cantrell, M. A., & Mariani, B. (2020). Nurse educators' guide to clinical judgment: A review of conceptualization, measurement, and development. *Nursing Education Perspectives*, 41(4), 215–221. <https://doi.org/10.1097/01.NEP.0000000000000669>
- Lasater, K. (2011). Clinical judgment: The last frontier for evaluation. *Nurse Education in Practice*, 11, 86–92. <https://doi.org/10.1016/j.nepr.2010.11.013>
- Lavoie, P., Pepin, J., & Cossette, S. (2017). Contribution of a reflective debriefing to nursing students' clinical judgment in patient deterioration simulations: A mixed-methods study. *Nurse Education Today*, 50, 51–56. <https://doi.org/10.1016/j.nedt.2016.12.002>

- Li, S., Ye, X., & Chen, W. (2019). Practice and effectiveness of “nursing case-based learning” course on nursing student's critical thinking ability: A comparative study. *Nurse Education in Practice*, 36, 91–96. <https://doi.org/10.1016/j.nepr.2019.03.007>
- Manetti, W. (2019). Sound clinical judgment in nursing: A concept analysis. *Nursing Forum*, 54, 102–110. <https://doi.org/10.1111/nuf.12303>
- Matlock-Hetzel, S. (1997). *Basic concepts in item and test analysis*(January, 1997) [Presented paper at Southwest Educational Research Association]. Clearinghouse on Assessment and Evaluation. <https://files.eric.ed.gov/fulltext/ED406441.pdf>
- McIntosh, C., Macario, A., Flanagan, B., & Gaba, D. M. (n.d.). *Simulation: What does it really cost?* [Poster Presentation]. 6th Annual International Meeting on Medical Simulation. https://journals.lww.com/simulationinhealthcare/Fulltext/2006/00120/Simulation_What_does_it_really_cost_.41.aspx
- Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass: A Wiley Brand.
- Miraglia, R., & Asselin, M. E. (2015). The Lasater Clinical Judgment Rubric as a framework to enhance clinical judgment in novice and experienced nurses. *Journal for Nurses in Professional Development*, 31(5), 284–291. <https://doi.org/10.1097/NND.0000000000000209>
- Morais, S. C., Nunes, J. G., Lasater, K., de Barros, A. L., & de Carvalho, E. C. (2018). Reliability and validity of the Lasater Clinical Judgment Rubric-Brazilian version. *Acta Paul Enferm.*, 31(3), 265–271. <https://doi.org/10.1590/1982-0194201800038>

Muntean, W. (2012). Nursing clinical decision-making: A literature review [Comprehensive White Paper]. *National Council of State Boards of Nursing*.

https://www.ncsbn.org/Nursing_Clinical_Decision_Making_A_Literature_Review.pdf

National Center for Case Study Teaching in Science. (n.d.). *About the collection*. Retrieved February 27, 2021, from <https://sciencecases.lib.buffalo.edu/collection/about.html>

National Council of State Boards of Nursing. (2007). *Guiding principles of nursing regulation*. NCSBN. Retrieved February 13, 2021, from

https://www.ncsbn.org/Guiding_Principles.pdf

National Council of State Boards of Nursing (2011). *Understanding the NCLEX examination through the core values of NCSBN*. https://www.ncsbn.org/NCLEX_Core_Values.pdf

National Council of State Boards of Nursing. (2014). *In focus: A publication of the National Council of State Boards of Nursing* (Pencils down, booklets closed: The evolution of the NCLEX: 20 years as a computer adaptive exam, Spring, 2014). NCSBN.

https://www.ncsbn.org/InFocus_Spring2014.pdf

National Council of State Boards of Nursing. (2015). *NCLEX-RN examination test plan for the National Council Licensure Examination for Registered Nurses*.

https://www.ncsbn.org/RN_Test_Plan_2016_Final.pdf

National Council of State Boards of Nursing. (2016). *NCSBN simulation guidelines for prelicensure nursing education programs*. NCSBN.

https://www.ncsbn.org/16_Simulation_Guidelines.pdf

National Council of State Boards of Nursing. (2019). *Clinical judgment measurement model* (Next generation NCLEX news, Winter 2019).

https://www.ncsbn.org/NGN_Winter19.pdf

- Oermann, M. H., & Gaberson, K. B. (2014). *Evaluation and testing in nursing education* (4th ed.). Springer Publishing Company.
- Popham, W. J. (2017). *Classroom assessment: What teachers need to know* (8th ed.). Pearson.
- Quinn, B. L., Smolinski, M., & Peters, A. B. (2018). Strategies to Improve NCLEX-RN Success: A Review. *Teaching & Learning in Nursing, 13*(1), 18–26. <https://doi-org.proxyiub.uits.iu.edu/10.1016/j.teln.2017.09.002>
- Reigeluth, C. M., & Carr-Chellman, A. A. (2009). *Instructional-design theories and models: Building a common knowledge base. Volume III*. Taylor & Francis.
- Rico, R., & Ertmer, P. A. (2015). Examining the Role of the Instructor in Problem-Centered Instruction. *TechTrends: Linking Research and Practice to Improve Learning, 59*(4), 96–103. <http://dx.doi.org.proxyiub.uits.iu.edu/10.1007/s11528-015-0876-4>
- Saad, L. (2020, December 22). *U.S. ethics ratings rise for medical workers and teachers*. Gallup. Retrieved February 13, 2021, from <https://news.gallup.com/poll/328136/ethics-ratings-rise-medical-workers-teachers.aspx>
- Spector, N., Blegen, M. A., Silvestre, J., Barnsteiner, J., Lynn, M. R., Ulrich, B., Fogg, L., & Alexander, M. (2015). Transition to practice study in hospital settings. *Journal of Nursing Regulation, 5*(4), 24–38. [https://doi.org/10.1016/s2155-8256\(15\)30031-4](https://doi.org/10.1016/s2155-8256(15)30031-4)
- Tanner, C. A. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *Journal of Nursing Education, 45*(6), 204–211. <https://doi.org/proxyiub.uits.iu.edu/10.3928/01484834-20060601-04>
- Thistlethwaite, J. E., Davies, D., Ekeocha, S., Kidd, J. M., MacDougall, C., Matthews, P., Purkis, J., & Clay, D. (2012). The effectiveness of case-based learning in health professional

- education. A BEME systematic review: BEME guide no. 23. *Medical Teacher*, 34(6), E421–e444. <https://doi.org/10.3109/0142159X.2012.680939>
- Victor, J. (2017). Improving clinical nursing judgment in prelicensure students. *Journal of Nursing Education*, 56(12), 733–736. <https://doi.org/10.3928/01484834-20171120-05>
- Victor-Chmil, J. (2013). Critical Thinking Versus Clinical Reasoning Versus Clinical Judgment: Differential Diagnosis. *Nurse Educator*, 38(1), 34–36. <https://doi.org/10.1097/NNE.0b013e318276dfbe>
- Victor-Chmil, J., Turk, M., Adamson, K., & Larew, C. (2015). Effects of an experiential learning simulation design on clinical nursing judgment development. *Nurse Educator*, 40(5), 228–232. <https://doi.org/10.1097/NNE.0000000000000159>
- Walker, A., Leary, H., Hmelo-Silver, C. E., & Ertmer, P. A. (2015). *Essential readings in problem-based learning: Exploring and extending the legacy of Howard S. Barrows*. Purdue University Press.
- Yew, E. H. J., & Yong, J. J. Y. (2014). Student Perceptions of Facilitators' Social Congruence, Use of Expertise and Cognitive Congruence in Problem-Based Learning. *Instructional Science: An International Journal of the Learning Sciences*, 42(5), 795–815. <http://dx.doi.org.proxyiub.uits.iu.edu/10.1007/s11251-013-9306-1>

Appendix A: Preparatory Assignment

PREPARATORY ASSIGNMENT

Use a reputable resource when answering the questions below. Include the name/web link of the resource. If the source is not listed, full points cannot be earned. Examples of reputable resources include: Mayo Clinic, Cleveland Clinic, NIH, CDC, American Diabetes Association, and primary literature (accessed via google scholar or PubMed). A few additional potentially useful websites are the following:

Pearson-Module 12 and Exemplars 12.A and 12.B

ATI Med Surg: Chapters 80-83, (adrenal and diabetes)

Centers for Disease Control and Prevention. 2015. Basics about diabetes <http://www.cdc.gov/diabetes/basics/diabetes.html>

Questions

1. What is Cushing's disease? What are the symptoms of this disorder?
2. What is Addison's disease? What are the symptoms of this disorder?
3. Using a table like the one below, discuss the importance of insulin for maintaining health/homeostasis and compare and contrast Type I and Type II diabetes (make sure to include causes, markers for diagnosis, and treatment).

4. <i>Importance/role of insulin:</i>		
a. <i>Type I only</i>	b. <i>Both I and II</i>	c. <i>Type II only</i>
5.	6.	7.

8. Describe how insulin (a) is produced, (b) is stored, (c) is released, (d) alters uptake of glucose, and (e) is broken down in the body.
9. What is a glucose tolerance test? Why/when is this test conducted? What are normal results for this test?
10. What is a dexamethasone suppression test? Why is it used clinically?

Appendix B: Diagnostics Primer

DIAGNOSTICS PRIMER

This sheet will be helpful for deciding which tests to order for your patients and for determining diagnoses.

- *Fasting Glucose/Blood Sugar Test:* This test measures the amount of glucose present in the bloodstream. The test is performed after at least eight hours of fasting and resulting glucose values should fall between 70–100 milligrams per deciliter (mg/dL). This test is conducted if patients have: an increase in urination frequency, blurred vision, confusion or trouble talking, change in behavior, fainting spells, or a seizure. It is also conducted to screen for diabetes. A glucose level of 126 mg/dl or higher is usually indicative of diabetes (> 200 mg/dl often means the patient has diabetes).
- *Oral Glucose Tolerance Test:* This lab test determines how effectively the body breaks down/takes up sugar. First, a baseline blood sample is drawn. Next, the patient drinks a sugary liquid (usually containing 75 g of glucose). Blood is drawn every 30–60 min for up to three hours. All blood samples are analyzed for glucose concentration. This test is performed to check for diabetes. Normal results: at baseline (fasting) 70–100 mg/dL, after 1 hr < 200 mg/dL, after 2 hrs < 140 mg/dL. A glucose level between 140 and 200 is often diagnosed as pre-diabetes; levels over 200 mg/dL are used to diagnose diabetes.
- *Hemoglobin A1c Test:* This test can provide an estimate of blood glucose levels over the last three months. When blood sugar is high, glucose attaches to the oxygen-carrying molecule in red blood cells created glycated hemoglobin (Hg A1c). A small blood sample is taken and analyzed for percentage of glycated hemoglobin. This test is used to screen for diabetes. Normal results for no diabetes are < 5.7%, values for pre-diabetes are 5.7–6.4%, and values for diabetes diagnosis are above 6.5%.
- *C-peptide Test:* C-peptide is cleaved from the parent insulin molecule before insulin is released. This peptide is created in a 1:1 ratio with insulin and is released into the bloodstream with insulin. The C-peptide test measures the amount of C-peptide in the blood. A small blood sample is taken, and C-peptide levels are determined. This test can determine if the body is producing insulin. Normal ranges for C-peptide are 0.5–2.0 nanograms per milliliter (ng/ml). People with Type II diabetes might have very high C-peptide levels if they are producing insulin but are resistant to its effects.
- *Urinary Glucose Evaluation:* Under normal circumstances, urine should not contain glucose. The nephron (functional unit of the kidney) removes glucose from the filtrate and brings it back to the blood stream. In individuals with very high blood glucose levels, the glucose transporters in the nephron get overwhelmed and glucose escapes into the urine. A urine sample can easily be tested for the presence of glucose. Glycosuria (glucose in the urine) is a hallmark of diabetes mellitus (it can also signal kidney disease/damage).
- *Urinary Ketone Evaluation:* Individuals with diabetes cannot process glucose correctly. Therefore, despite high levels of circulating glucose, their tissues cannot take in the glucose for fuel (either due to lack of insulin as in Type I or lack of sensitivity to insulin as in Type II). Due to this, the body “thinks” it is starving and begins to burn fat. A by-product of burning fat is the production of ketone bodies. When these ketone bodies build up, they are detectable in the

urine and the blood. If ketone levels get too high the individual can go into diabetic ketoacidosis; this is generally more common in Type I diabetics than in Type II diabetics. Ketoacidosis can be life-threatening. Urine screening for ketones is done if the blood sugar is over 240 mg/dL, if the person gets a severe illness, or if there is nausea and vomiting.

- *Blood Pressure:* The blood in the circulatory system is under pressure; a blood pressure reading determines the pressure produced during contraction of the heart (systolic pressure; the top number) and during relaxation of the heart (diastolic pressure; the bottom number). Blood pressure measures are taken as routine vital signs during visits to the physician. Normal values are 119/79 mmHg. Readings of 140/90 or higher qualify as hypertension (high blood pressure); 120–139/80–89 is considered pre-hypertension. High blood pressure is a risk factor for Type II diabetes.
- *Lipid Panel/Cholesterol Test:* Cholesterol is an important lipid that circulates in the bloodstream. Too much of this substance can be problematic and is related to heart disease. A cholesterol test measures the amount of high-density lipoprotein (the “good” cholesterol), low density lipoprotein (the “bad” cholesterol), and triglycerides present in the blood stream. This test is done after fasting for at least eight hours and a blood sample is collected for analysis. High cholesterol and triglycerides are a risk factor for Type II diabetes.
- *Morning Cortisol Test:* Cortisol is an important adrenal hormone. Cortisol levels are highest in the morning and decrease throughout the day. For this test, a blood sample is drawn and analyzed for cortisol concentration. This test is often done to test for Cushing’s and Addison’s disease. Cortisol has many physiological functions, so this test can be ordered for other reasons as well. Normal values are between 6–23 ug/dL when samples are collected in the morning.
- *Dexamethasone Challenge/Dexamethasone Suppression Test:* This test is used to determine if ACTH secretion from the anterior pituitary can be suppressed. This test is useful in determining HPA axis function and for determining if ACTH is being produced anywhere else in the body besides the anterior pituitary (e.g., a tumor). Dexamethasone is a synthetic glucocorticoid and when given acts on the hypothalamus and anterior pituitary (mainly acts here) to induce negative feedback; DEX suppresses the release of ACTH. Dexamethasone is administered to the patient and a follow up blood sample is collected for analysis of ACTH and/or cortisol. The low dose overnight method involves a dose of DEX at 11 PM and then a blood draw at 8 AM the next day. Morning values of cortisol should be < 1.8 ug/dL following the low-dose overnight method.
- *MRI Scan:* Magnetic resonance imaging. This procedure uses a large magnet and radio waves to look at internal body structures. MRIs can be used to look at ligaments, tissues, tumors, and various organs, including the brain and spinal cord. They can be helpful in multiple types of diagnoses and the images need to be read and interpreted by a healthcare professional.

All information for tests was retrieved from the National Institutes of Health, Medline.

Appendix C: Pretest Posttest Assessment

1. A nurse is assessing a client who is admitted for elective surgery and has a history of Addison's disease. Which of the following findings should the nurse expect?
 - A. Hyperpigmentation
 - B. Intention tremors
 - C. Hirsutism
 - D. Purple striations

2. A nurse is caring for a child who has Addison's disease. Which of the following actions should the nurse take?
 - A. Teach the parents about cortisol replacement therapy.
 - B. Place the child on a low-sodium diet.
 - C. Monitor the child for fluid volume excess.
 - D. Discuss the manifestations of hyperglycemia with the parents.

3. A nurse is caring for a client who has Cushing's syndrome. The nurse should recognize that which of the following are manifestations of Cushing's syndrome? (Select all that apply.)
 - A. Alopecia
 - B. Tremors
 - C. Moon face
 - D. Purple striations
 - E. Buffalo hump

4. A nurse is caring for an adolescent client who has a long history of diabetes mellitus and is being admitted to the emergency department confused, flushed, and with an acetone odor on

the breath. Diabetic ketoacidosis is suspected. The nurse should anticipate using which of the following types of insulin to treat this client?

- A. NPH insulin
- B. Insulin glargine
- C. Insulin detemir
- D. Regular insulin

5. A nurse is providing teaching for a client who is newly diagnosed with type 2 diabetes mellitus and has a prescription for glipizide. Which of the following statements by the nurse best describes the action of glipizide?

- A. "Glipizide absorbs the excess carbohydrates in your system."
- B. "Glipizide stimulates your pancreas to release insulin."
- C. "Glipizide replaces insulin that is not being produced by your pancreas."
- D. "Glipizide prevents your liver from destroying your insulin."

6. A nurse is providing teaching to a client who has a new diagnosis of type 2 diabetes mellitus. The nurse should recognize that the client understands the teaching when he identifies which of the following as manifestations of hypoglycemia? (Select all that apply.)

- A. Polyuria
- B. Blurred vision
- C. Polydipsia
- D. Tachycardia
- E. Moist, clammy skin

7. A nurse working for a home health agency is teaching a client who has diabetes mellitus about disease management. Which of the following glycosylated hemoglobin (HbA1c) values should the nurse include in the teaching as an indicator that the client is appropriately controlling his glucose levels?

- A. 6.3%
- B. 7.8%
- C. 8.5%
- D. 10%

8. A nurse in a prenatal clinic is teaching a client who is in her second trimester and has a new diagnosis of gestational diabetes. Which of the following statements by the client indicates a need for further teaching?

- A. "I should limit my carbohydrates to 50% of caloric intake."
- B. "I will reduce my exercise schedule to 3 days a week."
- C. "I will take my glyburide daily with breakfast."
- D. "I know I am at increased risk to develop type 2 diabetes."

9. A nurse is teaching a client who has diabetes mellitus and a new prescription for glimepiride. The nurse should teach the client to avoid which of the following drinks while taking this medication?

- A. Grapefruit juice
- B. Milk
- C. Alcohol
- D. Coffee

10. A nurse is teaching about disease management for a client who has type 1 diabetes mellitus. Which statement made by the client indicates an understanding of the teaching?

- A. "I am to take my blood sugar reading after meals."
- B. "Insulin allows me to eat ice cream at bedtime."
- C. "A weight reduction program will make me hypoglycemic."
- D. "I give the insulin injections in my abdominal area."

8. How would you communicate your plan to Jorge? Be specific. What potential obstacles might be present when communicating with Jorge?

9. Reflect on your work with Jorge. After the group discussion, answer the following questions.

 - A. What could you have done differently?

 - B. What did you feel that you did well?

 - C. How can you improve your analytic processes in the future?

Updated 2/21/2021

Appendix E – Case Worksheet-Janique Johnson

Participant Number: _____

A Sweet Life Worksheet – Janique Johnson

Please use this document to answer the questions noted within the case-based learning activity with Janique Johnson. Be as thorough as possible-please include any thoughts you have on how to best answer each question.

During the activity, you will be directed to answer specific questions. Please do not work ahead. Feel free to discuss your answers within your small group and be prepared to share your answers after completion of each part/section.

Part I

1. What symptoms is Janique experiencing?
2. Are any of her values on her chart outside normal ranges? If yes, which ones?
3. What additional information about Janique’s history would be useful in understanding her situation? Explain your answer.
4. What additional tests might assist in your understanding of your patient’s situation? Explain your rationale for your choice(s).

Updated 2/21/2021

Appendix F: Instructor's Guide

Instructor's Guide – Case Based Learning (CBL) Intervention-Cases 1 and 2

Guide for Case #1 (Jorge Alvarez) and Case #2 (Janique Johnson)

CASE OVERVIEW

This instructor's guide is designed for a 2-case CBL intervention in an in-person learning session in a nursing course designed to foster clinical judgment skills in nursing students. Jorge Alvarez and Janique Johnson are two of the clients assessed in a primary care provider's office for symptoms related to the concept of diabetes. Participants will need to review provided information to assist the provider in identifying potential problems as well as appropriate collaborative (medical and nursing) interventions for both clients. In preparation for this intervention, participants were asked to complete a preparatory assignment with suggested resources to assist them in this task.

For each case, the instructor will provide an outline of how participants will progress through the tasks. The instructor will ask participants to form small groups of 2-3, where they will review the information provided about the case and answer the questions that correspond to each part (Part I or II) of the case. The instructor will ask participants to begin with Part I, providing approximately 10 minutes for participants to complete the questions in Part I. After this task is completed, the instructor will lead a debriefing of each part addressing the objectives below. The debriefing is scheduled to last approximately 15 minutes, after which participants will be directed to Part II and repeat the process. The last question in Part II of each case is a reflective question, designed to be answered as the last component of the reflection discussion activities.

The questions for each objective can be applied to both cases, as the objectives for each case are the same. Answers may vary depending on each client's situation, but the guide is applicable to both clients.

CASE OBJECTIVES

After analyzing and discussing this case, undergraduate nursing students will be able to:

- Describe pathophysiology, etiology and risk factors of diabetes
- Consider collaborative interventions of importance to a client with diabetes
- Implement therapeutic communication skills to address any educational needs of the client
- Reflect on decision making strategies used to guide the client's care

DEBRIEFING GUIDELINES

Describe pathophysiology, etiology and risk factors of diabetes

Participants will be asked to complete the questions in Part I of the case in small groups. Part I of the case provides data regarding the client's history and initial laboratory results. The

questions specifically address symptoms related to the pathophysiology of diabetes, as well as possible etiologies related to each client's history, and potential risk factors.

When the small groups complete the tasks in Part I, ask them to return to the larger group for intentional reflection and discussion. In facilitating this discussion, the instructor will guide students in examining how their responses correlate to the objectives. The instructor can intentionally identify how the following questions relate to steps in the clinical judgment model, as noted in parentheses after each question.

Use the following questions to guide the discussion to correlate the questions in Part I to this objective:

- What symptoms did you notice that affect the client's current health and may be helpful in diagnosis? [Noticing]
- Are any of these symptoms more important than others? [Noticing]
- Are any of the lab values relevant to the client's problems? Why? [Noticing]
- Is there any additional data you would find helpful? Why? [Noticing]
- Are there any data points that can be identified as risk factors for specific disease processes? [Interpreting]

After the discussion for Part I is complete, ask participants to meet again in their small subgroups to complete Part II. Allow approximately 10-15 minutes to complete the questions in Part II, and then ask them to return to the larger group for another intentional reflection and discussion session. At this point, the instructor will guide participants in examining how their responses correlate to the objectives. Again, the instructor can intentionally identify how the following questions relate to the steps in the clinical judgment model, as noted in parentheses after each question.

Use the following questions to guide the discussion to correlate the discussion to this objective:

- Why do we need to know about the client's insulin production? [Interpreting]
- How would you explain the diagnosis to the client? [Interpreting, Responding]
- What medical diagnoses did you consider for the client? Why? [Interpreting]
- What nursing diagnoses would be important for the client? Why? [Interpreting]

Consider collaborative interventions of importance to a client with diabetes

During the Part II intentional reflection and discussion timeframe, the instructor will continue to encourage participants to link case material to each objective. When identifying how collaborative interventions would support Jorge's health needs, keep in mind that there are a wide range of interventions of benefit to Jorge. It will be important to focus on what may be most relevant for Jorge at this time.

Use the following questions to help participants identify interventions most relevant to Jorge right now:

- What collaborative interventions would help meet the client's immediate needs? Why? [Responding]
- What collaborative interventions would help meet the client's long-term needs? Why? [Responding]
- What intervention would be considered as most important? Why? [Responding]
- How would you prioritize interventions on a need versus want scale? [Interpreting, Responding]
- Are there any interventions for diabetes not relevant to the client at this time? Why? [Interpreting]
- What interventions can minimize long-term complications? [Interpreting, Responding]

Implement therapeutic communication skills to address any educational needs of the client

During the discussion for Part II, specifically focus on therapeutic communication skills in potential conversations with the client. It is important to encourage participants to think about how stressful new medical diagnoses can be for clients to manage. Therapeutic communication skills are a valuable set of skills using throughout nursing practice. Repetition and role playing may be considered here if time allows.

Use the following questions to assist participants in selecting therapeutic communication choices in potential conversations with Jorge:

- How would you approach the client? [Responding]
- What would you consider the priority educational topic for the client? Why? [Responding]
- If you could only share two pieces of education with the client today, what would they be? Why? [Responding]
- What communication tools would you think best for the client today? [Responding]
- How would you follow-up with the client? [Responding]
- Who might you consider adding to the client's treatment team? Why? [Responding]

Reflect on decision making strategies used to guide the client's care

To meet this objective, participants will complete the final question in Part II of the case as the last step of the reflection discussion. Allow participants to spend approximately 5 minutes to individually answer this question. Encourage students to reflect on their learning, and how they can apply the practices implemented in the case to other cases. No discussion is warranted, as individual growth may be personal and more reflective if confidential. The instructor can consider encouraging participants to share their thoughts if comfortable, but it is not necessary. The instructor can encourage students to review their reflection at a later point in time to identify areas of growth through the program.

Repeat this guide for the second case.

Case Based Learning Questionnaire

Q1 Thank you for participating in this student satisfaction questionnaire. The purpose of this questionnaire is to gain information about how you experienced case-based learning (CBL) instruction designed to improve clinical judgment skills.

When responding to these statements, please think of whether or not the specific activity added value to your understanding of the concept of diabetes and how that understanding will help you deliver care to someone with diabetes. Thank you for your participation.

The pre-assignment was helpful in preparing you for the cases discussed in class.

- Strongly disagree (1)
 - Somewhat disagree (2)
 - Neither agree nor disagree (3)
 - Somewhat agree (4)
 - Strongly agree (5)
-

Q2 The reading material was helpful in preparing you for the cases discussed in class.

- Strongly disagree (1)
 - Somewhat disagree (2)
 - Neither agree nor disagree (3)
 - Somewhat agree (4)
 - Strongly agree (5)
-

Q3 The in-class activities completed in small groups were useful in improving your clinical judgment (decision making/clinical reasoning) skills.

- Strongly disagree (1)
 - Somewhat disagree (2)
 - Neither agree nor disagree (3)
 - Somewhat agree (4)
 - Strongly agree (5)
-

Q4 The facilitator led discussions after parts I and II of each case were helpful when considering the development of your clinical judgment (decision making/clinical reasoning) skills.

- Strongly disagree (1)
 - Somewhat disagree (2)
 - Neither agree nor disagree (3)
 - Somewhat agree (4)
 - Strongly agree (5)
-

Q5 The case-based learning activities contributed to the development of your clinical judgment (decision making/clinical reasoning) skills.

- Strongly disagree (1)
 - Somewhat disagree (2)
 - Neither agree nor disagree (3)
 - Somewhat agree (4)
 - Strongly agree (5)
-

Q6 Case-based learning activities contributed to your overall development of clinical judgment (decision making/clinical reasoning) skills.

- Strongly disagree (1)
 - Somewhat disagree (2)
 - Neither agree nor disagree (3)
 - Somewhat agree (4)
 - Strongly agree (5)
-

Q7 Please share what activities and experiences you liked most about the CBL experience.

Q8 Please share what activities and experiences could be improved to better enhance the development of your clinical judgment skills within a CBL experience.

Q9 Overall, I am very likely to recommend using CBL strategies designed to improve clinical judgment skills to other nursing students.

- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q10 Please provide any additional comments regarding this experience that you would like to share.

Q11 If you would be interested in meeting with the researcher to discuss your experiences from today's session, please leave your name and contact information below. The meeting would take less than 15 minutes of your time and your feedback would be greatly appreciated!



Living the Sweet Life: An Internship in Endocrinology

by

Breanna N. Harris
Department of
Biological Sciences
Texas Tech University,
Lubbock, TX

It's 8:00 AM on Monday morning and you're getting ready to start your day at Dr. Gupta's practice. Dr. Gupta is an endocrinologist and has been in the field for 20 years. You've been working with Dr. Gupta as an intern for the past three weeks and so far you've seen patients with Addison's disease, neonatal diabetes, and Hashimoto's disease, plus a few others. You check the calendar and see that there are three patients scheduled for this morning:

- Jorge Alvarez
- Janique Johnson
- Mary Smith

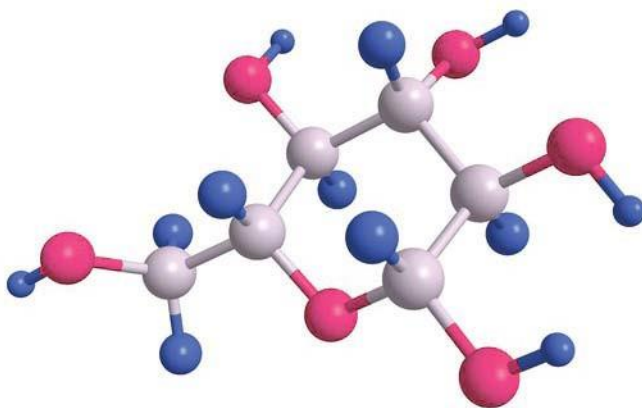


Figure 1. Molecule of glucose ($C_6H_{12}O_6$).

Case copyright held by the [National Center for Case Study Teaching in Science](#), University at Buffalo, State University of New York. Originally published April 26, 2016. Please see our [usage guidelines](#), which outline our policy concerning permissible reproduction of this work. Licensed images ©nys | Fotolia, id#107445396 (donut), © raimund14 | Fotolia, id#89226993 (glucose molecule).

Part I – Jorge Alvarez

Jorge is a 45-year-old Latino/Hispanic male. He works as an accountant and has three daughters. Jorge has been a smoker for 20 years but has been attempting to quit. His diet consists of about half home cooked foods and half fast-food items (he usually grabs a quick lunch from McDonald's, Arby's or Burger King when he's working), and is usually accompanied by sweet tea. He tries to exercise but his desk job keeps him pretty stationary during the day.

He has, however, been taking walks on the weekends with his daughters. Over the past few months, Jorge has been extremely thirsty, has had some tingling in his legs, has been urinating frequently, and has felt extremely tired. He also has a sore on his leg that just does not seem to heal. His primary care physician ran some quick labs and referred him to Dr. Gupta. Some blood work and patient info is in his chart and details are listed below.

<i>Test</i>	<i>Result</i>	<i>Normal Range</i>
BMI (weight: 210 lbs Height: 5'8")	31.9	18.5–24.9
Triglycerides (mg/dl)	225	< 150
High-density Lipoprotein (mg/dl)	42	≥ 40
Low-density Lipoprotein (mg/dl)	95	< 100
Blood Pressure (mm Hg)	155/95	90–120/60–80
Pulse	90	60–100
Hematocrit (%)	40	36–50
Hemoglobin (g/100 ml blood)	12.4	11–14
Glucose (mg/dl)	178	75–105
Sodium (mmol/L)	140	135–145
Potassium (mmol/L)	4.5	3.5–5.0

Questions. (To be completed on worksheet)

1. What symptoms is Jorge experiencing?
2. Are any of his values on his chart outside normal ranges? If yes, which ones?
3. What additional information about Jorge's history would be useful in understanding his situation? Explain your answer.
4. What additional tests might assist in your understanding of your patient's situation? Explain your rationale for your choice(s).

Part II – Jorge Alvarez

Carefully inspect the test results below and use the information together with what you learned from Part I to diagnose the patient and answer the following questions.

Alvarez, J. Lab Results – Dr. Gupta, M.D.

<i>Test</i>	<i>Result</i>	<i>Normal Range</i>
Random blood sugar (mg/dl)	200	< 140
Fasting blood sugar (mg/dl)	155	75–105
GTT glucose at 2hr	225	< 200
Fasting morning cortisol (ug/dl)	25	5–23
Hemoglobin A1c %	8	< 6.5
c-peptide (ng/ml)	2.5	0.5 to 2
Antibodies against pancreas	normal	varies
Urinary glucose (ug/dl)	30	0–15
Urinary ketones (mg/dl)	20	Very little to none
T3 (ng/dl)	50	80–180
T4 (ug/dl)	5	4.6–12

Questions (To be answered on Worksheet)

5. Based on the data, is Jorge producing adequate insulin? How do you know?

 6. Based on the data, what are your medical and nursing diagnoses for Jorge? What data support these diagnoses?

 7. What collaborative interventions would you recommend for this patient?

 8. How would you communicate your plan to Jorge?
- I.
9. Reflect on your work with Jorge. After the group discussion, answer the following questions.
 - What could you have done differently?
 - What did you feel that you did well?
 - How can you improve your analytic processes in the future?



Living the Sweet Life: An Internship in Endocrinology

by

Breanna N. Harris
Department of
Biological Sciences
Texas Tech University,
Lubbock, TX

It's 8:00 AM on Monday morning and you're getting ready to start your day at Dr. Gupta's practice. Dr. Gupta is an endocrinologist and has been in the field for 20 years. You've been working with Dr. Gupta as an intern for the past three weeks and so far you've seen patients with Addison's disease, neonatal diabetes, and Hashimoto's disease, plus a few others. You check the calendar and see that there are three patients scheduled for this morning:

- Jorge Alvarez
- **Janique Johnson**
- Mary Smith

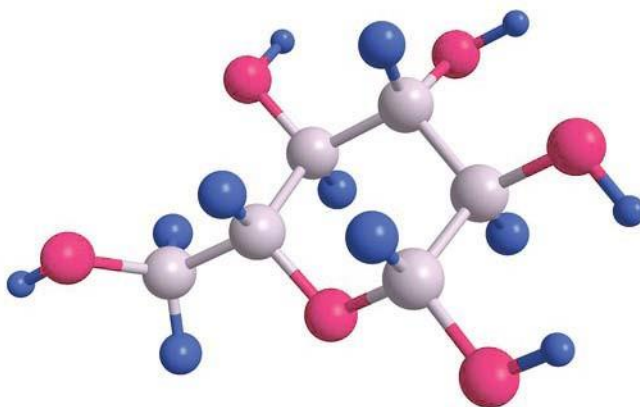


Figure 1. Molecule of glucose (C₆H₁₂O₆).

Case copyright held by the [National Center for Case Study Teaching in Science](#), University at Buffalo, State University of New York. Originally published April 26, 2016. Please see our [usage guidelines](#), which outline our policy concerning permissible reproduction of this work. Licensed images ©nys | Fotolia, id#107445396 (donut), © raimund14 | Fotolia, id#89226993 (glucose molecule).

Part I – Janique Johnson

Janique is a 12-year-old female. She is in the 7th grade and has been on the swim team for the past four years. She is a good student and is generally a happy child. Lately, however, Janique’s mother has been worried about her daughter. Janique has been very irritable the past few months and at first Mrs. Johnson just chalked that up to her daughter becoming a teenager. But, in addition to the mood changes, Mrs. Johnson has noted a few other changes in her daughter—Janique is often too tired to attend swimming practice and has complained of feeling too weak to swim and of having headaches. Despite her decreased physical activity, Janique has been eating almost non-stop but has lost about 5lbs; she is also drinking more than usual and has been vomiting frequently. Janique saw her primary care physician, and after running some tests, he sent Janique to Dr. Gupta for follow-up. Some blood work and patient information is in her chart and is listed below.

<i>Test</i>	<i>Result</i>	<i>Normal Range</i>
BMI (weight: 106 lbs Height: 5’4”)	18.2	18.5–24.9
Triglycerides (mg/dl)	130	< 150
High-density Lipoprotein (mg/dl)	66	≥ 40
Low-density Lipoprotein (mg/dl)	85	< 100
Blood Pressure (mm Hg)	110/70	90–120/60–80
Pulse	60	60–100
Hematocrit (%)	45	36–50
Hemoglobin (g/100 ml blood)	12.8	11–14
Glucose (mg/dl)	130	75–105
Sodium (mmol/L)	142	135–145
Potassium (mmol/L)	4.6	3.5–5.0

Questions (To be answered on Worksheet)

1. What symptoms is Janique experiencing?
2. Are any of her values on her chart outside normal ranges? If yes, which ones?
3. What additional information about Janique’s history would be useful in understanding her situation? Explain your answer.
4. What additional tests might assist in your understanding of your patient’s situation? Explain your rationale for your choice(s).

Part II – Janique Johnson

Carefully inspect the test results below and use the information together with what you learned from Part I to identify diagnoses and answer the following questions.

Johnson, J. Lab Results – Dr. Gupta, M.D.

<i>Test</i>	<i>Result</i>	<i>Normal Range</i>
Random blood sugar (mg/dl)	250	< 140
Fasting blood sugar (mg/dl)	165	75–105
GTT glucose at 2hr	242	< 200
Fasting morning cortisol (ug/dl)	24	5–23
Hemoglobin A1c %	10	< 6.5
c-peptide (ng/ml)	0.2	0.5 to 2
Antibodies against pancreas	high	varies
Urinary glucose (mg/dl)	25	0–15
Urinary ketones (mg/dl)	35	Very little to none
T3 (ng/dl)	175	80–180
T4 (ug/dl)	10	4.6–12

Questions (To be answered on Worksheet)

- Based on the data, what are your medical and nursing diagnoses for Janique? What data support these diagnoses?
- Dr. Gupta asks you to explain the diagnoses to the patient. Please write out how you would describe this to Janique.
- What collaborative interventions would you recommend for this patient?
- How would you communicate your plan to Janique?
- Reflect on your work with Janique. After the group discussion, answer the following questions.
 - What could you have done differently?
 - What did you feel that you did well?
 - How can you improve your analytic processes in the future?

**Lasater Clinical Judgment Rubric (LCJR)¹ adapted for Case Based Learning (CBL)
Living the Sweet Life: An Internship in Endocrinology-Jorge Alvarez²**

NOTICING	<u>Data Points</u>	<u>Description of Scoring Process</u>	Actual Score
	<i>There may be additional student input for each section</i>	<i>To earn score at accomplished or exemplary, students must select *data points for each row</i> Exemplary**: >75% of data points Accomplished**: 50-75% of data points Developing**: 25-49% of data points Beginning**: less than 25% of data points	
<u>Focused Observation</u> (Exemplary behaviors include observation that is appropriate; regularly observing and monitoring a wide variety of objective and subjective data to uncover any useful information)	Extreme thirst * Tingling in legs* Frequent urination* Extremely tired Nonhealing ulcer*	Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point	
<u>Recognizing Deviations from Expected Patterns</u> (Exemplary behaviors include recognizing subtle patterns and deviations from expected patterns in data and using these to guide assessment)	BMI* Triglyceride levels BP Glucose* Extreme thirst* LLE Tingling Frequent urination* Extremely tired Nonhealing ulcer	Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point	
<u>Information Seeking</u> (Exemplary behaviors include assertively seeking information to plan interventions; carefully collecting useful subjective data from observing the client and from interacting with the client and family)	Family history Client history (smoking, drinking, exercise) * Duration of symptoms * Other diagnoses* Medical care Support Most recent blood sugar Results of GTT Urinary glucose Ketone levels A1C level* Insulin levels* Anti-pancreas antibodies Thyroid panel	Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point	
INTERPRETING	<u>Data Points</u>	<u>Description of Scoring Process</u>	Actual Score

Updated 3/31/2021

	<i>There may be additional student input for each section</i>	<i>To earn score at accomplished or exemplary, students must select *data points for each row</i> Exemplary: >75% of data points Accomplished: 50-75% of data points Developing: 25-49% of data points Beginning: less than 25% of data points	
Prioritizing Data (Exemplary behaviors include focusing on the most relevant and important data useful for explaining the client's condition)	-Relates importance of abnormal values and symptoms -(Random BS, fasting BS, GTT, A1c, urinary glucose & ketones, T3) * -Identifies and relates symptoms as mentioned above to diagnosis -Use of priority setting frameworks to better understand how to make sense of data	Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point	
Making Sense of Data (Exemplary behaviors include that even when facing complex, conflicting, or confusing data, one can (1) note and make sense of patterns in the client's data, (2) compare these with known patterns*, and (3) develop plans for interventions that can be justified in terms of their likelihood of success)	Insulin production response DMII diagnosis * Can identify risk factors and symptoms of DMII* Potential nursing diagnoses: 1. Knowledge Deficit * 2. Skin Integrity, Impaired 3. Infection, Risk for 4. Tissue Perfusion, Peripheral, Ineffective 5. Fatigue 6. Nutrition, Imbalanced, Less than Body Requirements 7. Coping, Ineffective, Risk for * 8. Obesity 9. Risk for unstable blood glucose level*	Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point	
RESPONDING	Data Points <i>There may be additional student input for each section</i>	Description of Scoring Process <i>To earn score at accomplished or exemplary, students must select *data points for each row</i> Exemplary: >75% of data points Accomplished: 50-75% of data points Developing: 25-49% of data points Beginning: less than 25% of data points	Actual Score
Calm, Confident Manner (Exemplary behaviors include assumption of responsibility, delegating team assignments, assessing & reassuring client and family members)	1. Calm, approachable mannerisms* 2. Client perceives nurse is confident in knowledge base 3. Responds appropriately to client's words and behaviors (maintains therapeutic environment)	Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point	
Clear Communication (Exemplary behaviors include communicating effectively; explaining interventions, calming/reassuring clients and	1. Utilizes/discussed therapeutic communication skills (eye contact, body positioning) * 2. Short phrases/sentences* 3. Pauses and asks for teach back	Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point	

Updated 3/31/2021

families; directing and involving team members, explaining and giving directions; checks for understanding)	4. Provides multiple modes (written, oral, video, demonstration) of communication		
Well-Planned Intervention/Flexibility (Exemplary behaviors include interventions that are tailored for the individual client; monitoring client progress closely and adjusting treatment as indicated by client response)	<ol style="list-style-type: none"> 1. Notices how overwhelmed Jorge may be* 2. Multiple communication approaches* 3. Think priority education versus nice to know* 4. Think multiple sessions 5. Consider expert-diabetic educator 6. Consider potential resistance, especially when long-term complications may not seem real 7. Think about family as resources-who should be included in the discussions <p>*See answer key for specific interventions</p>	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
Being Skillful (Exemplary behaviors include showing mastery of necessary nursing skills)	<ol style="list-style-type: none"> 1. Communicates effectively* 2. Prioritizes interventions* 3. Prioritizes educational needs 4. Aware of client’s ability to engage 	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
REFLECTING	Data Points	Description of Scoring Process Exemplary: >75% of data points Accomplished: 50-75% of data points Developing: 25-49% of data points Beginning: less than 25% of data points	Actual Score
Evaluation/Self-Analysis (Exemplary behaviors include independently evaluating/analyzing personal clinical performance, noting decision points, elaborating alternatives and accurately evaluating choices against alternatives)	<p>Demonstrates identification of missing elements from previous questions and identifies plan that could have addressed those elements.</p> <p>Identifies elements of case that student recognized as important and reinforces the elements that can be applied to multiple situations.</p>	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
Commitment to Improvement (Exemplary behaviors include demonstrating commitment to ongoing improvement: reflecting on and critically evaluating nursing experiences; accurately identifying strengths/weaknesses and developing specific plans to eliminate weaknesses)	Identifies steps in the reflective processes that improve clinical judgment (noticing, interpreting, responding and reflecting)	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
Total Score		Add all numbers in final column	____/44

Updated 3/31/2021

1: The LCJR was developed by Kathie Lasater, Ed.D. (2007). Permission was granted to the researcher to adapt the rubric in the context of case-based learning interventions (Lasater, personal communication, November 1, 2020).

2: Living the Sweet Life: An Internship in Endocrinology is a case made available because of the researcher's membership in the National Center for Case Study Teaching in Science (NCCSTS) and is applied within its approved uses. Please see <https://sciencecases.lib.buffalo.edu/> for additional information.

*Known patterns can be defined as knowledge garnered from the nursing knowledge base, research, personal experience, and intuition

**The generalized definitions of these terms are based on the Lasater Clinical Judgment Rubric¹ and summarized below:

	Exemplary	Accomplished	Developing	Beginning
Noticing	Focused observation, recognizes subtle patterns, assertively seeks relevant information	Regularly observes, recognizes obvious patterns, seeks subjective information	Attempts to observe but is overwhelmed by data, identifies obvious patterns but misses some key data, makes limited effort to gather additional information	Confused by situation and data, focuses on individual pieces of data and misses patterns, and does not effectively seek additional information
Interpreting	Focuses on relevant data, makes sense of information and compares with known patterns to develop interventions within complex environments	Focuses on relevant data but may be distracted by less pertinent data, and in less complex situations can compare with known patterns to develop interventions. May seek guidance of expert	Attempts to prioritize data but also attends to irrelevant data. In simple environments, can compare data with known patterns and develop interventions. Seeks advice repeatedly, even in simple situations	Has difficulty focusing on relevant data and struggles to make sense of data to develop interventions. Requires assistance in diagnosing and developing interventions
Responding	Assumes responsibility, communicates effectively, calmly and involves team appropriately, interventions are tailored for client, monitors and adjusts interventions as needed, mastery of necessary nursing skills	Generally displays leadership and confidence in most situations, communicates well but may not involve team appropriately, monitors interventions but unable to adjust if needed, proficiency of most nursing skills needed	Tentative leader, reassuring in simple situations, has some communication skills but struggles with relationship building, develops obvious interventions but unable to make adjustments if needed, ineffective at most nursing skills	Can function only in simple and routine situations, difficulty communicating, explanations confusing, focuses only on one intervention and unable to adjust, unable to perform nursing skills
Reflecting	Independently evaluates personal performance, accurately evaluating choices against alternatives, demonstrates commitment to continuous improvement, reflects on and evaluates experiences, accurately identifying strengths and weaknesses	Evaluates personal performance with minimal prompting, identifies key choices and looks at alternatives, demonstrates a desire to improve, reflects on experiences but not thorough or systematic	Briefly verbalizes most obvious performance components, has difficulty identifying alternatives, demonstrates awareness of improvement needs and makes some effort to improve performance but relies on obvious solutions	Evaluations are brief, short and not used to improve performance, appears uninterested in improvement, rarely reflects, uncritical of self, unable to see flaws

Lasater Clinical Judgment Rubric (LCJR)¹ adapted for Case Based Learning (CBL)
Living the Sweet Life: An Internship in Endocrinology-Janique Johnson

NOTICING	<u>Data Points</u> <i>There may be additional student input for each section</i>	<u>Description of Scoring Process</u> <i>To earn score at accomplished or exemplary, students must select *data points for each row</i> Exemplary**: >75% of data points Accomplished**: 50-75% of data points Developing**: 25-49% of data points Beginning**: less than 25% of data points	Actual Score
<p>Focused Observation (Exemplary behaviors include observation that is appropriate; regularly observing and monitoring a wide variety of objective and subjective data to uncover any useful information)</p>	Irritability Mood swings Fatigue* Weakness Headaches Continuous eating with weight loss* Unusual thirst* Frequent vomiting	Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point	
<p>Recognizing Deviations from Expected Patterns (Exemplary behaviors include recognizing subtle patterns and deviations from expected patterns in data and using these to guide assessment)</p>	BMI* Glucose* Fatigue Weakness Continuous eating with weight loss* Unusual thirst* Frequent vomiting	Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point	
<p>Information Seeking (Exemplary behaviors include assertively seeking information to plan interventions; carefully collecting useful subjective data from observing the client and from interacting with the client and family)</p>	Family history Client history (smoking, drinking, exercise) * Duration of symptoms * Other symptoms or diagnoses Medical care (visits, medications) Current treatment interventions Support Most recent blood sugar Results of GTT Urinary glucose Ketone levels A1C level* Insulin levels* Anti-pancreas antibodies	Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point	
INTERPRETING	<u>Data Points</u> <i>There may be additional student input for each section</i>	<u>Description of Scoring Process</u> <i>To earn score at accomplished or exemplary, students must select *data points for each row</i>	Actual Score

Updated 3/31/2021

		<p>Exemplary: >75% of data points Accomplished: 50-75% of data points Developing: 25-49% of data points Beginning: less than 25% of data points</p>	
<p>Prioritizing Data (Exemplary behaviors include focusing on the most relevant and important data useful for explaining the client's condition)</p>	<p>-Identifies and relates importance of abnormal values and symptoms -(Random BS, fasting BS, GTT, A1c, urinary glucose & ketones, T3) * -Identifies and relates symptoms as mentioned above to diagnosis identification -Use of priority setting frameworks to better understand how to make sense of data</p>	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
<p>Making Sense of Data (Exemplary behaviors include that even when facing complex, conflicting, or confusing data, one can (1) note and make sense of patterns in the client's data, (2) compare these with known patterns*, and (3) develop plans for interventions that can be justified in terms of their likelihood of success)</p>	<p>Insulin production response DMI diagnosis * Identify risk factors and symptoms of DMI* Potential nursing diagnoses: 1. Knowledge Deficit * 2. Infection, Risk for 3. Fatigue 4. Nutrition, Imbalanced, Less than Body Requirements* 5. Coping, Ineffective, Risk for * 6. Injury, Risk for 7. Compromised family coping, Risk for 8. Risk for unstable blood glucose level*</p>	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
RESPONDING	<p>Data Points</p> <p><i>There may be additional student input for each section</i></p>	<p>Description of Scoring Process</p> <p><i>To earn score at accomplished or exemplary, students must select *data points for each row</i></p> <p>Exemplary: >75% of data points Accomplished: 50-75% of data points Developing: 25-49% of data points Beginning: less than 25% of data points</p>	Actual Score
<p>Calm, Confident Manner (Exemplary behaviors include assumption of responsibility, delegating team assignments, assessing & reassuring client and family members)</p>	<p>1. Calm, approachable mannerisms* 2. Client perceives nurse is confident in knowledge base 3. Responds appropriately to client's words and behaviors (maintains therapeutic environment)</p>	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
<p>Clear Communication (Exemplary behaviors include communicating effectively; explaining interventions, calming/reassuring clients and families; directing and involving team members, explaining and</p>	<p>1. Utilizes/discussed therapeutic communication skills (eye contact, body positioning) * 2. Short phrases/sentences* 3. Pauses and asks for teach back 4. Provides multiple modes (written, oral, video, demonstration) of communication</p>	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	

Updated 3/31/2021

giving directions; checks for understanding)			
Well-Planned Intervention/Flexibility (Exemplary behaviors include interventions that are tailored for the individual client; monitoring client progress closely and adjusting treatment as indicated by client response)	<ol style="list-style-type: none"> 1. Notices how overwhelmed Janique may be* 2. Multiple communication approaches* 3. Think priority education versus nice to know* 4. Think multiple sessions 5. Consider expert-diabetic educator 6. Consider potential resistance, especially when long-term complications may not seem real 7. Think about family as resources-who should be included in the discussions <p>*See answer key for specific interventions</p>	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
Being Skillful (Exemplary behaviors include showing mastery of necessary nursing skills)	<ol style="list-style-type: none"> 1. Communicates effectively* 2. Prioritizes interventions* 3. Prioritizes educational needs 4. Aware of client’s ability to engage 	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
REFLECTING	Data Points	Description of Scoring Process Exemplary: >75% of data points Accomplished: 50-75% of data points Developing: 25-49% of data points Beginning: less than 25% of data points	Actual Score
Evaluation/Self-Analysis (Exemplary behaviors include independently evaluating/analyzing personal clinical performance, noting decision points, elaborating alternatives and accurately evaluating choices against alternatives)	<p>Demonstrates identification of missing elements from previous questions and identifies plan that could have addressed those elements.</p> <p>Identifies elements of case that student recognized as important and reinforces the elements that can be applied to multiple situations.</p>	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
Commitment to Improvement (Exemplary behaviors include demonstrating commitment to ongoing improvement: reflecting on and critically evaluating nursing experiences; accurately identifying strengths/weaknesses and developing specific plans to eliminate weaknesses)	Identifies steps in the reflective processes that improve clinical judgment (noticing, interpreting, responding and reflecting)	<p>Exemplary – 4 points Accomplished – 3 points Developing – 2 points Beginning – 1 point</p>	
Total Score		Add all numbers in final column	<u> </u> /44

Updated 3/31/2021

1: The LCJR was developed by Kathie Lasater, Ed.D. (2007). Permission was granted to the researcher to adapt the rubric in the context of case-based learning interventions (Lasater, personal communication, November 1, 2020).

2: Living the Sweet Life: An Internship in Endocrinology is a case made available because of the researcher's membership in the National Center for Case Study Teaching in Science (NCCSTS) and is applied within its approved uses. Please see <https://sciencecases.lib.buffalo.edu/> for additional information.

*Known patterns can be defined as knowledge garnered from the nursing knowledge base, research, personal experience, and intuition

**The generalized definitions of these terms are based on the Lasater Clinical Judgment Rubric¹ and summarized below:

	Exemplary	Accomplished	Developing	Beginning
Noticing	Focused observation, recognizes subtle patterns, assertively seeks relevant information	Regularly observes, recognizes obvious patterns, seeks subjective information	Attempts to observe but is overwhelmed by data, identifies obvious patterns but misses some key data, makes limited effort to gather additional information	Confused by situation and data, focuses on individual pieces of data and misses patterns, and does not effectively seek additional information
Interpreting	Focuses on relevant data, makes sense of information and compares with known patterns to develop interventions within complex environments	Focuses on relevant data but may be distracted by less pertinent data, and in less complex situations can compare with known patterns to develop interventions. May seek guidance of expert	Attempts to prioritize data but also attends to irrelevant data. In simple environments, can compare data with known patterns and develop interventions. Seeks advice repeatedly, even in simple situations	Has difficulty focusing on relevant data and struggles to make sense of data to develop interventions. Requires assistance in diagnosing and developing interventions
Responding	Assumes responsibility, communicates effectively, calmly and involves team appropriately, interventions are tailored for client, monitors and adjusts interventions as needed, mastery of necessary nursing skills	Generally displays leadership and confidence in most situations, communicates well but may not involve team appropriately, monitors interventions but unable to adjust if needed, proficiency of most nursing skills needed	Tentative leader, reassuring in simple situations, has some communication skills but struggles with relationship building, develops obvious interventions but unable to make adjustments if needed, ineffective at most nursing skills	Can function only in simple and routine situations, difficulty communicating, explanations confusing, focuses only on one intervention and unable to adjust, unable to perform nursing skills
Reflecting	Independently evaluates personal performance, accurately evaluating choices against alternatives, demonstrates commitment to continuous improvement, reflects on and evaluates experiences, accurately identifying strengths and weaknesses	Evaluates personal performance with minimal prompting, identifies key choices and looks at alternatives, demonstrates a desire to improve, reflects on experiences but not thorough or systematic	Briefly verbalizes most obvious performance components, has difficulty identifying alternatives, demonstrates awareness of improvement needs and makes some effort to improve performance but relies on obvious solutions	Evaluations are brief, short and not used to improve performance, appears uninterested in improvement, rarely reflects, uncritical of self, unable to see flaws

Updated 3/31/2021

Bev Wilgenbusch, MSN, RN, CNE

EDUCATION

EdD, Instructional Systems Technology. Indiana University, Bloomington, IN,
United States. (November 2021).

MS, Nursing Education. IUPUI, Indianapolis, IN, United States. (2016).

BS, Nursing. Northern Kentucky University, Highland Heights, KY, United States.
(2013).

Diploma, Nursing. The Christ Hospital School of Nursing, Cincinnati, OH, United
States. (2005).

BA, Psychology. Indiana University, Bloomington, IN, United States. (1989).

APPOINTMENTS

ACADEMIC

Instructor, Mount St. Joseph University Cincinnati, OH (August 16, 2021-Present).

Clinical Assistant Professor, Indiana University Purdue University Indianapolis,
IUPUC NURSING. (January 1, 2018-January 8, 2021).

Visiting Lecturer, Indiana University Purdue University Indianapolis, IUPUC
NURSING. (August 1, 2016-December 31, 2017).

NON-ACADEMIC

Professional

Nurse Educator, NCLEX Services, Ascend Learning, Leawood, KS, United States
(April, 2021-Present).

Integration Specialist Nurse Educator (ISNE), Ascend Learning, Leawood, KS, United
States (January 11, 2021-March 2, 2021).

Registered Nurse/Float Pool, Mercy Health-West, Cincinnati, United States. (April 2020-January 2021).

Registered Nurse/Unit Based Educator, Mercy Health-Fairfield, United States. (June 2012-December 2019).

Registered Nurse, The Christ Hospital-Cincinnati, United States (August 2008-June 2012).

Registered Nurse, Mercy Western Hills-Cincinnati, United States (August 2007-August 2008).

Registered Nurse, University Hospital-Cincinnati, United States (August 2005-August 2007).

Consultant, Ascend Learning, United States. (January 20, 2018-February 1, 2018).

Previous history available upon request.

LICENSURE, CERTIFICATION, SPECIALTY BOARD STATUS

"Registered Nurse", Indiana State Board of Nursing, State. (2013-October 2023).

"Registered Nurse", Ohio State Board of Nursing, State. (August 2005-October 2023).

PROFESSIONAL ORGANIZATION MEMBERSHIPS

National League for Nursing, NLN, National, United States. (March 2020-March 2021).

Indiana League for Nursing, ILN, State. (June 2018-March 2021).

Graduate and Professional Student Government Association, GPSGA, Bloomington, IN, United States. (August 2017-Present).

Southeastern Indiana Organization of Nurse Leaders, SEIONL, Regional, United States. (May 3, 2017-Present).

Indiana Organization of Nurse Executives, IONE, State, United States. (May 2017-Present).

Sigma Theta Tau International, STTI, International, United States. (2016-Present).

PROFESSIONAL HONORS AND AWARDS

Received, University Graduate School and OVPIA Scholarship, IU University Graduate School, United States, International. (February 2020).

Received, Scholarship for Doctoral Education, Indiana Organization of Nurse Executives, State. (October 17, 2018).

PROFESSIONAL DEVELOPMENT

Teaching, Certification, "Certified Nurse Educator", National League for Nursing, (August 28, 2020).

Teaching, Workshop/tutorial attendance, "CNE Review-Indiana League for Nursing" (August 3, 2020).

Teaching, Certification, "Apple Teacher", Apple, Inc. (June 15, 2019 - Present).

Teaching, Certification, "Mental Health First Aid Adult Instructor", Mental Health First Aid, United States. (May 22, 2019 - Present).

Teaching, Workshop/tutorial attendance, "Early Career Teaching Academy", IUPUI, Indianapolis, IN, United States. (February 2, 2018 - Present).

Teaching, Workshop/tutorial attendance, "IUSON Annual Fall Faculty and Staff Workshop", IUSON at Columbus, Columbus, IN, United States. (August 2016 - Present).

Other, Certification, "Advanced Cardiac Life Support", American Heart Association. (2005 - Present).

Other, Certification, "Basic Life Support", American Heart Association. (2003 - Present)

Teaching, Conference attendance, "ATI Summit", ATI, Savannah, GA, United States. (March 30, 2019 - April 3, 2019).

Teaching, Conference attendance, "IST Conference", Indiana University IST Department, Bloomington, IN, United States. (March 1, 2019).

Service, Conference attendance, "IONE Conference", Indiana Organization of Nurse Executives, French Lick, IN, United States. (October 17, 2018 - October 19, 2018).

Teaching, Certification, "Mental Health First Aid Course". (June 22, 2018 - June 29, 2018).

Service, Conference attendance, "IRHA Conference", Indiana Rural Health Association, French Lick, IN. (June 25, 2018 - June 27, 2018).

Teaching, Simulation Workshop-VR, "VR and AR Simulation Workshop", IUPUC, Columbus, IN. (March 21, 2018).

Teaching, Conference attendance, "IST (Instructional Systems Technology) Conference", IU, Bloomington, IN, United States. (March 2, 2018).

Service, Skill Certification Course, "Ultrasound Training", Pregnancy Care Center, Lawrenceburg. (January 15, 2018 - January 18, 2018).

Teaching, Conference attendance, "IONE Fall Conference 2017", IONE, French Lick, IN, United States. (October 18, 2017).

Teaching, Conference attendance, "RHIC Simulation Symposium", RHIC

Simulation Center, Terre Haute, IN, United States. (September 8, 2017).

Teaching, Workshop/tutorial attendance, "Labor and Delivery Simulation", IUPUC,

Columbus, IN, United States. (January 10, 2017).

TEACHING

TEACHING ASSIGNMENTS

Course Subject and Class Number	Course Name	Delivery Method	Term and Year	Enrollment Total
NUR-800	THEORETICAL AND PHILOSOPHICAL PERSPECTIVES FOR EBP		Fall 2021	
NUR-710	EXPLORING LEADERSHIP IN NURSING		Fall 2021	
NUR-205	HEALTH ASSESSMENT LAB		Fall 2021	
NUR-521	PHARMACOLOGY LAB		Fall 2021	
NURS-H 356	BIOPHYSICAL PROCESSES		Fall 2020	43
NURS-H 356	BIOPHYSICAL PROCESSES		Fall 2020	8
NURS-H 360	INTERACTIVE PROCESSES		Fall 2020	8
NURS-B 444	NURSING INTENSIVE		Summer 2020	16
NURS-B 444	NURSING INTENSIVE		Summer 2020	8
NURS-B 444	NURSING INTENSIVE		Spring 2020	31
NURS-S 488	SYNTHESIS		Spring 2020	31
NURS-H 356	BIOPHYSICAL PROCESSES		Fall 2019	28
NURS-H 356	BIOPHYSICAL PROCESSES		Fall 2019	10
NURS-H 356	BIOPHYSICAL PROCESSES		Fall 2019	10
NURS-H 356	BIOPHYSICAL PROCESSES		Fall 2019	29
	Cumulative Student Evaluation Scores: 2017-2019: 4.8125		2019	
NURS-B 444	NURSING INTENSIVE		Summer 2019	9
NURS-H 371	ADAPTIVE PROCESSES		Spring	52

			2019	
NURS-S 483	CLIN NURS PRACTICE CAPSTONE		Spring 2019	10
NURS-B 444	NURSING INTENSIVE		Spring 2019	8
NURS-S 488	SYNTHESIS		Spring 2019	31
NURS-H 360	INTERACTIVE PROCESSES		Fall 2018	50
NURS-H 360	INTERACTIVE PROCESSES		Fall 2018	9
NURS-H 360	INTERACTIVE PROCESSES		Fall 2018	6
NURS-B 444	NURSING INTENSIVE		Summer 2018	5
NURS-S 483	CLIN NURS PRACTICE CAPSTONE		Spring 2018	8
NURS-B 304	HEALTH POLICY		Spring 2018	32
NURS-B 444	NURSING INTENSIVE		Spring 2018	7
NURS-H 360	INTERACTIVE PROCESSES		Fall 2017	52
NURS-H 360	INTERACTIVE PROCESSES		Fall 2017	10
NURS-H 360	INTERACTIVE PROCESSES		Fall 2017	9
NURS-H 360	INTERACTIVE PROCESSES		Fall 2017	7
NURS-H 476	COMPLEX PROCESSES		Summer 2017	7
NURS-B 260	FUNDAMENTALS OF NURSING		Summer 2017	16
NURS-S 475	COMMUNITY HEALTH: RNBSN		Spring 2017	12
NURS-B 334	FAMILIES AND POPULATIONS		Spring 2017	7
NURS-B 245	HEALTH ASSESSMENT: PRACTICUM		Spring 2017	10
NURS-B 304	HEALTH POLICY		Spring 2017	9

TEACHING ADMINISTRATION AND CURRICULUM DEVELOPMENT

Integration of ATI in curriculum, Activity Lead, "ATI Complete Partner program".

(April 2018 – January 2021).

Course Lead, NURS-S 488, NURS-B 304, NURS-H 360 (January 2019 – January 2021).

RESEARCH/CREATIVE ACTIVITY

INVITED PRESENTATIONS - RESEARCH

State

Wilgenbusch, B. (Presenter), Research/Creative Activity, Poster Presentation, Competitive/Refereed, "The impact of implementing Mental Health First Aid with prelicensure nursing students in rural Indiana", Virtual Conference, Indiana Nursing Summit, Indiana Center for Nursing (November 2020). This replaced the cancelled event in April 2020.

Wilgenbusch, B. (Presenter), Research/Creative Activity, Lecture/Talk, Competitive/Refereed, "The impact of implementing Mental Health First Aid with prelicensure nursing students in rural Indiana", Conference, Indiana AHEC Network Statewide Conference, Indiana AHEC. This was unfortunately cancelled due to the corona virus pandemic, Greenwood, IN, United States, Academic, State. (April 2020).

Wilgenbusch, B., Love, S. L., Watson, L., Research/Creative Activity, Lecture/Talk, Competitive/Refereed, "Integration of Virtual Reality", Workshop, UK 15th Annual Faculty Development Workshop, University of Kentucky, Lexington, KY, United States, Academic, State. (May 10, 2019).

National

Wilgenbusch, B. (Co-Presenter), Homer, L. B. (Co-Presenter), Watson, L. (Co-Presenter), Ingle, J. M. (Co-Presenter), Research/Creative Activity, Poster,

Competitive/Refereed, "A Comprehensive Integration of ATI Best Practices to Improve NCLEX Pass Rates", Conference, ATI Summit, Assessment Technologies Institute, National Conference-this was unfortunately cancelled due to the corona virus pandemic, Seattle, WA, United States, Academic, National. (April 2020).

Wilgenbusch, B., Research/Creative Activity, Poster, Competitive/Refereed, "Creating a Digital Tool to Enhance and Assess Clinical Reasoning Skills in Nursing Students", Conference, American Association of Colleges of Nursing Baccalaureate Education Conference, American Association of Colleges of Nursing, Orlando, FL, United States, Academic, National. (November 21, 2019).

Wilgenbusch, B., Love, S. L., Watson, L., Research/Creative Activity, Poster, "Integration of Virtual Reality (VR) simulation: An evaluation of clinical instructional methods", Conference, ATI Summit, ATI, Savannah, GA, Academic, National. (April 1, 2019).

SERVICE

UNIVERSITY SERVICE

DEPARTMENT

Synergy Curriculum Committee, Chair. Approximately 40 Spent Per Year,
Appointed (August 2018 – January 2021).

APG Committee, Committee Member. Approximately 16 Spent Per Year,
Appointed. (August 2019 – January 2021).

IUSON at IUPUC, Faculty Advisor/Mentor, United States. Approximately 80 Spent Per Year, Appointed. (January 30, 2019 – January 2021). Mentor faculty in new role.

Faculty Advancement Committee, Committee Member. Approximately 10 Spent Per Year. (August 2018 – January 2021). Committee focused on assisting faculty to advance in promotion and tenure tracks

CAMPUS

Faculty Senate Executive Committee, Committee Member. Approximately 10 Hours Spent Per Year, Appointed. (June 1, 2018 - May 31, 2019). Member of Executive Committee as Constitution and Bylaws Chair

PROFESSIONAL SERVICE

LOCAL

Faculty Staff Assembly, Attendee, Meeting, United States. Approximately 6 Hours Spent Per Year. (August 2016 – January 2021). Vice Chancellor and Dean addresses IUPUC faculty and staff

REGIONAL

Regional Medical Institutional Review Board, Member, United States. Approximately 6 Hours Spent Per Year, Appointed. (January 2017 – January 2021).

Member of RMIRB, reviewing proposals to ensure safety for all participants

Attendee, Meeting. Approximately 4 Spent Per Year. (April 12, 2019).

Assisted with IPE event involving multiple schools and EI-AHEC

COMPLETED SERVICE GRANTS/FELLOWSHIPS

Wilgenbusch, B., Grant, Service, "All Saints Youth Ministry Grant", Center for
Congregations, Competitive, Not-for-Profit, United States, \$30,000.00, Awarded.
(March 2016 - July 2017).

PUBLICATIONS

RESEARCH/CREATIVE

ACTIVITY REFEREED

Journal Articles

Agee, M., Hansel, C., Wilgenbusch B. (2020). The Creation of a Technology
Integration Checklist: Design and Implications. Submitted to *Educational Media
International* on October 5, 2020.

Wilgenbusch, B., Schwindt, R. G., McNelis, A., Agley, J. D., Lay, K., Hudmon, K.
(2018). Training future clinicians: An interprofessional approach to treating
tobacco use and dependence. *Journal of Interprofessional Care*.

Full text of this item: [bawilgen/intellcont/Training future clinicians An
interprofessional approach to treating tobacco use and dependence-1.pdf](http://bawilgen/intellcont/Training%20future%20clinicians%20An%20interprofessional%20approach%20to%20treating%20tobacco%20use%20and%20dependence-1.pdf)

NON-REFEREED

Digital applications/software

Wilgenbusch, Bev. Digital applications/software, Research/Creative Activity,
National, invited, "Creating a Digital Tool to Enhance and Assess Clinical
Reasoning Skills in Nursing Students". (June 24, 2019 - June 27, 2019).

Invited to the Apple campus in Austin, TX by Apple and American
Association of Colleges of Nursing (AACN) to attend the Digital Bootcamp,

where creative ideas were meshed with digital applications to enhance student learning.