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# Inpatient Diabetes Management Readiness: For the Nurse, When Does it Begin?

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Inpatient Diabetes Management Readiness: For the Nurse, When Does it Begin?

by

Lisa Haynes

A thesis submitted to the faculty of  
Gardner-Webb University Hunt School of Nursing  
In partial fulfillment of the requirements for the  
Master of Science in Nursing Degree

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Submitted by:

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## Abstract

It is the bedside nurse that spends the most time and effort managing symptoms of the diabetic patient during the course of a hospitalization. With the goal of optimal blood sugar levels of each patient to promote healing and wellbeing, this task can be quiet daunting. It is imperative for the acute care nurse to acquire a competency level of diabetes management that exhibits evidence-based practice, regardless of length of work experience, in order for patients to receive excellent care. This research studied the level of comfort, familiarity, and knowledge of new nurse graduates while answering the question, “When does inpatient diabetes management readiness begin?” Despite their years of experience, studies report that nurses are managing the care of patients without an adequate level of knowledge related to the clinical decisions necessary in caring for diabetic patients. This, along with the plethora of tasks including blood sugar monitoring several times a day, being aware of caloric intake, overseeing mealtimes and snacks, administering insulin and/or glycemic throughout the day, as well as keeping the physician updated on patients diabetic trends and recommendations, proves to be a great challenge. All of these tasks mentioned help to make up the long list of activities an acute care nurse is responsible for managing, often for several patients, during any given shift.

A qualitative study was conducted to evaluate the knowledge level of new graduate nurses, employed one year or less, along with their feelings of comfort and familiarity of managing the care of patients with diabetes at the bedside. New nurse graduate participants (n = 75) were obtained through a Nurse Residency Program of a Magnet designated hospital located in the Southeast, United States. Data was collected

using the Diabetes Management Knowledge Assessment Tool (DMKAT), along with a demographic survey, each administered separately to ensure participants privacy. On average, nurses in this study rated their comfort level of managing diabetes at 7.05 mean and their familiarity level at 5.79 mean. However, from the participant's test scores of the DMAKT, the overall mean rating for knowledge level of diabetes management was .5844. This result indicated poor actual knowledge of how to appropriately manage diabetic patients at the bedside. Developers of the DMAKT deemed the adequate knowledge should be a score of at least 80 percent. The 58% pass rate in this study indicated there is a significant lack of knowledge exhibited among new nurse graduates' competency level with bedside management of diabetic patients. Educational institutions and healthcare facilities should be aware of this knowledge gap among new nursing graduates, and take swift strategic action to bring this separation of knowledge level and practice together to ensure competency in the care of a disease that affects 29.1 million Americans today (Center for Disease Control and Prevention (CDC), 2014).

*Keywords:* comfort, familiarity, knowledge level, diabetes management, new graduate nurse

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## **CHAPTER I**

### **Introduction**

It is the bedside nurse who spends the most time and attention in efforts to manage diabetic symptoms of the acute care patient in the hospital setting. Once a physician has ordered a diabetic treatment plan, it is the nurse who implements and executes the plan at the bedside for optimal patient outcomes. Over the course of a diabetic patient's hospitalization, the nurse providing care spends a significant amount of time and effort to ensure blood glucose levels are managed for best patient outcomes through assessing, obtaining blood sugar results several times a day, documenting caloric intake, and administering timely glycemetic medications either by mouth, subcutaneously or intravenously.

Inadequate knowledge of up-to-date treatment methods that promote best clinical decisions in diabetes management can directly affect the quality and safety of diabetic patients. Hospital length-of-stay and readmission rates are said to increase if diabetic symptoms are not managed well at the bedside (American Diabetes Association [ADA], 2013). The purpose of this study is to research the new graduate nurse's comfort, familiarity, and knowledge of inpatient diabetes management principles. From the results of this study, hospital administrators, university curriculum committees, and diabetes education departments across the country can have a better awareness of when and how to effectively prepare new graduate nurses for competency in this essential skills set that affects so many hospitalized patients today.

### **Significance of Study**

Diabetes mellitus is a complicated disease process affecting 29.1 million people in the United States (CDC, 2014). Diabetes management is a life-altering concept for both newly diagnosed and chronic diabetics. Studies show that diabetes is a lead-contributing factor to blindness, kidney failure, amputations, heart disease, and it also increases the risk of cancer and dementia (Fradkin, 2012). Despite their age, individuals diagnosed with the disease are in need of education and management skills in regards to diet, healthy lifestyle choices, and medication usage to maintain healthy blood sugar levels. It is estimated that 30-50% of adult patients hospitalized have diabetes as a primary diagnosis and/or experience hyperglycemia during their stay, which further complicates comorbidities and recovery times (Draznin, Gilden, Golden, & Inzucchi, 2013).

Although diabetic educators and clinical nurse specialists are considered experts in aiding diabetics in educational needs, it is the bedside nurse that spends the most concentrated time in diabetic care and education of the patient (Drass, Muie-Nash, Boykin, Turek, & Baker 1989). With medical direction and defined protocols set by a physician, nurses make clinical management decisions about the treatment of diabetes, provide self-management education, and coordinate interdisciplinary services to meet the patient's needs while hospitalized. Because of this important role the bedside nurse plays throughout a patient's entire hospitalization, up-to-date evidence-based knowledge of diabetes management practice is paramount for all nurses, regardless of their length of work experience. The results of this study will be significant to nursing research because there has been no prior research conducted to assess the comfort, familiarity, and knowledge level of the new graduate nurse in regards to diabetes management of the

hospitalized patient. Questions to address: Are new graduates prepared for the often-daunting task diabetes management entails? Is more training needed after graduation (and how much) to safeguard the level of competency needed to make good clinical decisions at the bedside of the diabetic patient?

### **Problem Statement**

Over the past decade or more, evidence continues to suggest that controlled blood sugar levels for hyperglycemia ( $> 180$  mg/dL) and hypoglycemia ( $< 70$  mg/dL) are beneficial for better patient outcomes (Draznin et al., 2013). Draznin reported varying degrees of both knowledge and agreement on treatment plans when assessing a consensus of evidence-based practice within the medical profession of both hyper- and hypoglycemia treatment, further complicating diabetes care. Several studies advocate insufficient diabetes management knowledge among healthcare providers as an obstacle for proper diabetic patient care (Gerrard, Griffin & Fitzpatrick, 2010; Modic et al., 2009). This study will help determine where potential gaps may be in the care of hospitalized diabetic patients. According to the ADA (2013) regarding recent diabetes management knowledge changes, inadequate knowledge implementation can affect the quality and safety of hospitalized patients, often times causing increased length of stay and readmission rates. This study will help determine the comfort, familiarity, and knowledge level of new graduate nurses in regard to diabetes management, and seek to determine if more focused training is needed after graduation. Questions that can begin to be answered from the results of this study: Do university curriculums need to be changed to better equip the graduate with diabetes management skills at the time of graduation? Should hospital Nurse Residency Programs, currently being used across the

country to further advance the knowledge level of the new graduates, focus more attention on how nurses can better manage diabetes at the bedside?

### **Purpose**

The nurse is the designated healthcare provider who interacts on a continuous basis with acute care patients throughout a hospitalization. Therefore, it is imperative that his/her diabetes management skill set be at the competency level of evidence-based practice for optimal outcomes of patients with diabetes. The purpose of this study is to examine comfort, familiarity, and knowledge level of diabetes management of new graduate nurses to add to the research of diabetes management readiness among bedside nurses.

### **Research Question**

The intent of this study is to answer the following question:  
What are the comfort, familiarity, and knowledge level of diabetes management of a new graduate nurse?

### **Theoretical Framework**

More than 20 years ago Patricia Benner pinned the words, “Increased acuity levels of patients, decreased length of hospitalization, and the proliferation of health care technology and specialization have increased the need for highly experienced nurses” (p. 420). In an endeavor to theorize the learning process *From Novice to Expert* in nursing practice, Patricia Benner used the ascending levels of proficiency by Dreyfus and Dreyfus as bases for her model of skill acquisition as it relates to the clinical nurse (Benner, 1982). The premise of this model relies on Dreyfus’s notion of clinical and ethical skill acquisition, and formation of an expert, being directly connected to

experiential learning that is essential for progressing from the novice stage of learning in any field to becoming an expert (Benner, Tanner, & Chelsa, 2009). Benner's theory of *From Novice to Expert* will serve as the theoretical framework for this study.

Benner's work *From Novice to Expert* generalized five stages of career development being novice, advanced beginner, competent, proficient, and expert (English, 1993). According to Benner, acquiring expertise status in clinical skills requires working through these stages, and cumulative career development is thought to depend on the richness of the nurse's clinical experience. Length of practice is considered positively correlated to the progression of the stages (English, 1993).

Novices are considered beginners in nursing practice without any experience in the situations they are expected to perform tasks (Benner, 1982). To introduce the beginner into clinical practice situations, Benner terms objective attributes as the features of a task to be performed. An example of this would be the measurable parameters of a patient's condition such as weight, vital signs, and intake and output. The novice is aware of the basic rules of obtaining these measurable parameters, but unable to make any judgments about the situation in light of these values.

The advanced beginner is considered as being exposed to certain situations enough times, either through experience or by training, they are able to perform on a marginal acceptable level. In this stage, measurable attributes are replaced with "recurrent meaningful situational components called aspects" (Benner, 1982). Aspects are considered global characteristics that can only be known through prior situational experience. The advanced beginner is somewhat comfortable in their surroundings, however, lacks the knowledge to prioritize aspects that we now call clinical reasoning. A

competent nurse is needed to follow along with the advanced beginner so that important patient care aspects are not missed.

The competent nurse, one who has been practicing two to three years, learns to look at the tasks at hand in a given clinical situation and makes appropriate care plans. These plans are made and implemented by the attributes and aspects that seem most urgent to the nurse. Benner (1982) describes the competent nurse as one who looks to a plan to bring perspective, and is based on the “considerable conscious, abstract, analytic contemplation of the problem” (p. 403). Through planning the patient’s care, efficiency and organization of care are achieved. The competency stage is characterized by the feeling of mastery, and the ability to handle oneself and manage events that may unfold in a clinical setting.

Once the competent nurse has mastered the concept of planning the patient’s care, he/she can then begin to focus on long-term goals as care is provided. This stage of skill acquisition begins the proficiency level in nursing care where tasks are performed with an awareness of the long-term goals or overall picture of best outcomes for the patient rather than performing only fragmented parts or aspects of care. Holistic care is characterized by the proficient nurse and improves his/her decision-making skills (Benner, 1982).

The last level of skill acquisition to be achieved is the expert level. Expertise in nursing is difficult to define. Benner considers expertise in nursing as being achieved through the nurse being involved, engaged and by exhibiting a caring attitude in her practice of nursing (Benner & Wrubel, 1989). In this stage, because of the expert’s rich knowledge base gained by experience, rules and guidelines do not solely govern decisions; rather it becomes the nurse’s discernment of circumstances. The expert nurse

sees the picture completely, and solutions to problems are quickly made based on intuition from passed experiences.

The framework of *From Novice to Expert* can be used for any specialized area or for teaching disease management in nursing practice. Being aware of the gathering of didactic knowledge, building of experiences, and learning to weave the two together over the course of time, serves the nurse at every stage of the skills acquisition process.

### **Definition of Terms**

In relation to this study, several terms will be defined for clarity. Modic et al. (2014) defines comfort in regards to diabetes management as a sense of confidence in performing a skill or using knowledge. In the same study, familiarity referred to knowledge or mastery of a skill. For this research, knowledge level is defined as the measured amount of information known about a topic as resulted from the assessment tool results. A new graduate nurse is considered to be a novice who has practiced one year or less. Diabetes management refers to an active awareness and participation in managing the symptoms of diabetes as they present in the hospitalized patient.

### **Summary**

In summary, better understanding the comfort, familiarity, and knowledge level of diabetes management of new graduate nurses can greatly affect the way resourcing bodies within the healthcare system can improve diabetic care outcomes of the hospitalized patient. It is essential that nurses move quickly through the novice to expert stages of diabetes management to ensure patients are receiving quality care every day of hospitalization. In turn, this practice readiness will improve competency levels for



nurses, ultimately enhancing the positive affect of the hospitalized patient's care experience.

## **CHAPTER II**

### **Literature Review**

Due to the limited amount of literature available about new graduate nurses, this literature review includes scholarly articles that have been published within the last ten years, as well as other topics related to the proposed research. Several studies have been conducted to examine various aspects of the nurse's knowledge level in regards to diabetes management at the bedside. However to this researcher's knowledge, there has been no research to examine new graduates comfort, familiarity, or knowledge level of diabetes management. Newer studies have researched different ways in which to educate nurses on diabetes management, reporting that online education, as opposed to didactic sessions of learning, offered flexibility in accessing evidence-based practices. However, no mandatory training for diabetic education was found in the literature (Young, 2011). The purpose of this chapter is to present a thorough review of current literature, focusing on diabetes management skills as they relate to new graduate nurses and their readiness to practice these skills at the bedside.

### **Review of the Literature**

According to the American Diabetes Association in 2013, the estimated total cost of diagnosed diabetes was calculated to be \$245 billion. This was a considerable increase from \$174 billion reported in 2007. The percentage of patients admitted to hospitals with Type 2 Diabetes Mellitus is higher than patients without diabetes (American Association of Clinical Endocrinologists [AACE], 2011). A knowledge deficit among healthcare providers is cited in several articles as an obstacle for proper diabetic patient care among hospital staff (ADA, 2013; Gerrard et al., 2010; Modic et al., 2009).

## **Knowledge Deficit**

In her research, Francisco (2013) said, “The bedside RN is the first-line educator for the patient: and it is his/her ability to impart that knowledge to the patient/family that provides the basis for further education and determines whether the patient will be able to safely survive outside the hospital” (p. 139). Francisco performed an integrative review evaluating the instruments currently available to measure nurse’s knowledge of diabetes. Although not a conclusive list, some of the assessment tools reviewed were the Diabetes Knowledge Test (DKT), Diabetes Self-Report Tool (DSRT), Diabetes Basic Knowledge Test (DBKT), Diabetes Knowledge Questionnaire (DKQ), and the Diabetes Survival Skills Knowledge Test (DKSST). Marginal reliability and validity measures were reported for the assessment tools in this review. A call for new instruments integrating up-to-date evidence-based diabetic care practices to test nurse’s knowledge was recommended.

Modic et al. (2014) conducted a similar descriptive study examining nurses’ comfort, familiarity, and knowledge of diabetes management principles in the hospital setting. This study concentrated on participants completing the self-developed Diabetes Management Knowledge Assessment Tool (DMKAT) after attending a four-hour diabetes educational program designed by two inpatient certified diabetes educators. The 20 multiple-choice questionnaire measured nurses’ knowledge of hyperglycemia, insulin therapeutics, hypoglycemia prevention and management, and diabetes survival skill teaching. Researchers focused on possible knowledge problems persisting after completion of the diabetes educational program. Other aims of this study included the correlation of nurse’s age and level of diabetes management knowledge, differences in

knowledge level and length of education or years of experience, and the possibility of an increase in knowledge after participants attended the provided diabetic course.

Conducted at a 1,200 bed healthcare center in the Midwest, this study included a large convenient sample of 2,250 nurses. Participants were administered the DMAKT prior to the four-hour diabetic course and after completing the course. According to participant demographics, 24.4% reported having less than one year's experience. The data resulted a negative correlation between age of the nurse and level of diabetes management knowledge, with scores decreasing as age increased. There was no correlation in diabetes knowledge level and the nurse's level of education. Researchers did find a relationship between comfort and familiarity. As predicted, there was a significant difference in pre- and post-test scores of those attending the diabetic educational program, with higher scores resulting after the program completion. The level of comprehension of diabetes management was lower than expected with regard to nurses' years of experience, and the research showed that level of education had no effect on knowledge level. Modic et al. (2014) concluded that novice and experienced nurses are not current in diabetes management practices.

Modic et al. (2009) conducted a cross-sectional correlational study to examine the diabetes knowledge of cardiac nurses. This study took place in a large tertiary care center in northeast Ohio. A total of 90 registered nurses participated in the survey by voluntarily completing the Diabetes Survival Skills Knowledge Test (DKSST). This 20-item true/false questionnaire assessment tool consisted of five content areas: diet, oral-glucose-lowering agents, blood glucose monitoring, symptom management, and insulin administration. Researchers found the mean score in the survey results was 10.4,

meaning the mastery of assessed content areas of diabetes skills was at 50% among participants. There was a positive association (higher scores) between the years of practice and test scores, years of working at the facility and test scores, and years working on the current unit and test scores. From the demographics of participants, the average years worked as a nurse in this study was 5.6 years; therefore, new graduates were not included in this study. Among the nurses who completed the DKSST, knowledge and comfort levels related to diabetes survival skills principles was very low, with the strongest correlate of test scores being length of time as a nurse.

Berman et al. (2014) conducted a descriptive study to determine competency gaps among new graduate nurses who, despite efforts to do so, had not obtained employment within 18 months of graduation. This study was performed in the San Francisco Bay Area in 2010-2011 in an effort to retain participants in the nursing profession and increase their ability to be employed by expanding their skill sets and competencies. A total of 345 new graduate nurses enrolled to participate in the study and placed in programs located in four different sites across the geographical area. Groups were made up of 14 to 53 nurses, with educational programs lasting between 12 to 16 weeks, and consisted of weekly classes that included classroom, online, simulation, or skills laboratory instruction provided by designated clinical faculty members. Program participants were asked to complete a modified version of the Casey-Fink Graduate Nurse Experience Survey at the beginning of the program and once it was completed. Similarly, preceptors for each group used the 36-item New Graduate RN Transition Program Competency Assessment to gauge nurse competency levels. This assessment focused on the six Quality and Safety Education for Nurses (QSEN) competencies.

During the assessment process, participants experienced simulation laboratory testing of several selected skills; among them was subcutaneous insulin administration. Preceptors documented competency gaps in nurses not performing appropriate hand hygiene before preparing or administering insulin, not mixing NPH insulin appropriately before drawing it up, and not appropriately validating order, dosage, and amount in syringe with a second nurse. Researchers purposed that over the next decade the competency of new nurse graduates at entry to practice will be evermore crucial for patient safety and to ensure high-quality nursing care. It is imperative that institutions rise to the challenge of better preparing students for competency in practice upon graduation (Berman, 2014).

Yacoub et al. (2014) conducted a cross-sectional descriptive study to determine the knowledge level of registered nurses regarding diabetes. The Diabetes Self-Report Tool (DSRT) and the Modified Diabetes Basic Knowledge Test (MDBKT) were administered to participants involved in this study to assess nurse's perceived and actual knowledge of diabetes. The DSRT is a 22-item questionnaire developed by Drass et al. (1989) and assesses knowledge of diabetic ketoacidosis, stress effects on diabetes control, long-term complications, exercise, and diet. The MDBKT is a revision of the Diabetes Basic Knowledge Test and consists of 45 questions that evaluate the nurse's basic knowledge of diabetes. A convenient sample of 277 registered nurses from seven hospitals in Jordan completed the questionnaires. Registered nurses who had worked between one and five years and employed on medical units were included in the study. Therefore, new graduates were not a part of this research study. Researchers reported that the majority of the nurses who participated in the study showed a knowledge deficit in the following areas: initial treatment of hypoglycemia, insulin storage and preparation,

meal planning, and duration of action with hypoglycemic agents. Years of experience had no significant association with actual diabetes knowledge levels as reported in other studies on this topic.

Yacoub et al. (2014) followed up their study from 2014 with a quasi-experimental, one-group, pre-test/post-test design to evaluate the effectiveness of a one-day lecture style educational intervention at three hospitals in Jordan. A total of 129 nurses participated in this study. Both the Diabetes Self-Report Tool (DSRT) and the Modified Diabetes Basic Knowledge Test (MDBKT) were administered to participants, pre and post involvement of the one-day diabetes educational program. Pre-test pass rates for the DSRT and the MDBKT were 52.7%. Post-test scores were significantly higher at 78.3%. Researchers concluded that a one-time targeted educational program can increase nurse's knowledge levels about diabetes management and can positively alter nurse's perceived and actual knowledge in relation to caring for patients with diabetes.

Smith-Miller and Thompson (2013) conducted a mixed-methods design study aimed to explore how well new graduate nurses were able to perform recommended diabetes self-management behaviors, whether the nurse's participation in an experiential program would change the participant's self-efficacy related to diabetes self-management, and then observed the participant's documented experience of "Living with Diabetes." This study was conducted in response to voiced frustrations from new graduate nurses, after caring for diabetic patients who had repeated hospitalizations and displayed complications from the disease. Nurses implied these patients were noncompliant and questioned why they did not adhere to suggested guidelines to promote

healthier lifestyles and outcomes. Researchers reasoned that nurses were unaware of the many psychosocial factors that affect diabetes self-management. It was also felt that these nurses had no idea of how their personal and professional values affected their attitudes about the diabetes patients. The study design fit into the nurse residency program for recently graduated nurses at a large academic medical center in the Southeastern United States. Participants completed the Confidence in Diabetes Self-Care Scale (CIDS) prior to and after completing the “Living with Diabetes” program offered during the nurse residency classes. The CIDS Type 1 is a 21-item, 5-point Likert-type scale that measures confidence in individuals’ ability to perform diabetes self-care (Bandura, 1997; van der Ven et al., 2003). The “Living with Diabetes” program was developed by the research team and consisted of a one-hour surviving diabetes education class, daily logbook and journal entries, and a one-hour focus group session at the end of the weeklong program. A certified diabetic educator taught the program. Participants were asked to follow an intensive Type 1 diabetes self-management plan over a one-week period to emulate the experience of having diabetes. A seven-day supply of blood glucose self-monitoring supplies was provided to each participant. Daily logs were kept for caloric intake and blood sugar reading documentation. A few of the sample prompts for daily journal entries included “Challenges and Successes” and “My feelings about having diabetes today.” Focus group sessions were conducted after the weeklong experience and digitally recorded for more data collection. Questions for the group to further explore their feelings of the experience centered around how the experience affected understanding of the disease, thoughts and feelings of what is required to successfully self-manage diabetes, and how they anticipate the involvement in the



program would influence their future interactions with diabetic patients. Despite high expectations of the graduate nurse when the study began, emotions were very different when the study ended. Participants reported difficulty in adhering to the set regimen of diet, exercise, monitoring blood sugar levels, and medication administration. Nurses had the most difficulty following the guidelines for physical activity. There was no significant change in the nurse's level of self-efficacy related to diabetes self-management. Nurses reported to have developed empathy for patients with diabetes after experiencing the challenges they face daily. Many of the nurse's reflections revealed an achievement of expanded awareness and broadened perspective of managing the disease.

### **Readiness to Practice**

Under the direction of the Nursing Executive Center, Berkow, Virkstis, Stewart, and Conway (2009) conducted a national cross-sectional descriptive study to determine nurse leaders' level of satisfaction of new nurse graduates proficiency on 36 nursing competencies. These competencies were deemed essential to patient safety and effective nursing practice by the research team who incorporated over 100 industry experts input, including hospital leaders, nursing associations, and nursing school administrators. The aim of the study focused on new graduate nurse performance as reported by 5,700 participating nurse leaders. These leaders completed the New Graduate Nurse Performance Survey. According to the results, only 25% of nurse leaders are fully satisfied with new graduate performance. Only two of the 36 competencies received performance expectations approval from more than 50% of nursing unit leaders. These competencies were "utilization of information technologies" and "rapport with patients and families." Researchers also found new graduates' greatest improvement needs were

clinical skills such as taking initiative, tracking multiple responsibilities, and delegation. Rather than a call for nursing curricula to change focus and meet preparation-practice gaps, it was recommended for local hospitals to work with nursing schools to improve upon the low-ranking competencies resulting from this study during student clinical rotations. Currently, hospitals assume the role of bridging the practice gap post-hire and shouldering the developmental costs.

Tschannen, Aebersold, Sauter, and Funnell (2013) conducted a pilot study that was a second phase of a larger program sponsored by Blue Cross Blue Shield of Michigan. This program was developed to create a model for provider-delivered care management among ambulatory care nurses from family medicine clinics. The second phase was conducted in order to allow nurses to practice empowerment-based skills in relation to a specific disease process. This study used Type 2 diabetes mellitus as the disease to educate nurses and evaluate the nurse's perception of meeting educational session objectives using the Evaluation of the Diabetes Curriculum survey. To educate the participants, a four-hour informational session incorporated three scholastic strategies based on the problem-based learning framework to enhance the clinical expertise. These strategies included nurses asking an expert in diabetes management questions, diabetic educators conducting small group discussions of actual case studies, and simulation using role-play or through virtual environment program. Participants included 21 ambulatory care nurses. A demographic survey was not used in the study; therefore, data regarding level of education or years of experience was not a part of this study. In the simulation portion of the educational session, three themes were used. Nurses were provided with the following scenarios of a diabetic patient: noncompliance, medication management

and psychosocial management. The instructive program used a multifaceted strategy aimed to improve nurse's perceptions of competency in empowerment-based skills required for diabetes self-management education. Using adult learning theory as a framework, problem-based learning and simulation were used to achieve this goal. To further appraise the programs content, a second survey was conducted to evaluate the simulation methods used to educate the nurses. Five questions using a five-point Likert scale ranging from strongly disagree to strongly agree was used to gauge the overall simulation experience. The reported results of the educational experience were positive. The Evaluation of the Diabetes Curriculum survey resulted in 81% of the nurses reporting they perceived that they could describe the pathophysiology of diabetes, 90% could describe its treatment, 86% could apply two strategies learned in the educational session, and 81% could describe how to use two patient educational materials that were presented in the program. Overall, the program was deemed a successful teaching endeavor that included knowledge acquisition and deliberate practice of new skills.

### **Literature Related to Theoretical Framework**

Competency in practice for nurses is the ultimate goal in managing any disease process for the hospitalized patient. Despite years of practice, nurses are expected to provide up to date evidence-based care in order to ensure the highest level of care at the bedside. Benner's model of skill acquisition based on ascending levels of proficiency will be used as a framework for this study.

A literature review was conducted to find studies that used Benner's model of skills acquisition as a framework. Databases used for this search included Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, PubMed, and

Google Scholar. Theory of *From Novice to Expert* will serve as the theoretical framework for this study.

Longo, Roussel, Pennington, and Hoying (2014) conducted a descriptive study using Benner's (1984) *From Novice to Expert* theory as a framework to determine if the nurse's perceptions of their level of practice were the same as their nurse manager's perception. The study took place on a 20-bed pediatric unit in a 561-bed hospital in the Midwest. A total of 67 nurses participated in the study. Clinical managers were asked to identify their direct reports' level of practice according to the Benner's *From Novice to Expert* model (1984). Nurses were asked to self-identify their perceived level of practice using Benner's operational definitions of the five stages of skills acquisition. Novice, advanced beginner, competent, proficient, and expert levels were rated by both nurses and their clinical managers. The results of the data collection were purposed as an opportunity for the clinical manager to better understand the level of competency of the participating nurses, and be able to use the Situational Leadership Model management philosophy more effectively. By using this model, clinical managers then adjust management styles based on the nurses' competency level, thus promoting a healthier work environment and better retention of nurses. According to Blanchard (2000), effective leadership begins with matching the appropriate leadership style to the nurse's developmental level. Examples of leadership styles include directing, coaching, supporting, or delegating. By knowing the nurses' competency level, the clinical manager can best match the appropriate situational skill to help develop the nurse to his/her highest level of performance on a goal or task. Situational leadership opens up communication about performance and development, assists staff in increasing

competency, and educates employees in regards to how to provide their own direction and support. Competency levels are an operational foundation for linking nursing care and positive patient outcomes. Benner's *From Novice to Expert* theory provides a structure for hospital administrative offices and educational departments to support nurses along the learning continuum.

### **Strengths and Limitations of Literature**

The nurses' role of diabetes management in the acute care setting started to be a topic of interest during the 1980s, focusing on the actual and perceived knowledge of diabetes (Scheiderich, Freilbaum, & Peterson, 1983). Many studies followed to probe this topic over the course of twenty-plus years. These studies laid the groundwork for future research to be conducted, along with the formation of several assessment tools needed for further evaluations. The study by Francisco brought together a long list of current instruments used to assess diabetes knowledge into one integrated review. This strengthened the literature by emphasizing the progression of the topic over an extended period of time. The review of the current literature showed the effectiveness of continuing education courses for nurses on topics like diabetes management, as well as the need for Nurse Residency programs, specifically designed for recent nursing graduates, to enhance practice readiness. The recent study by Berman et al. (2014) included new nursing graduates who had not yet found employment, bringing attention to the knowledge gap created during this lapse of time in a clinical setting, which encompassed diabetes management skills. Knowledge deficits in diabetes management continue to be part of the results of several studies confirming the need to evaluate the level of comfort, familiarity, and knowledge level of the new graduate. In her large study,

Modic revealed both novice and experienced nurses are reported to lack knowledge in regards to current diabetes management practices (Modic et al., 2014). From the review of the literature, no studies have mentioned new graduate knowledge level of diabetes management.

### **Summary**

Over the last five years, there has been a significant increase in diabetes mellitus cases in America. In 2012, the cost of treating this chronic disease was set at \$245 billion per year. Given this magnitude, there is a great need for healthcare providers to be functioning at the industries' evidence-based practice level at all times in order to ensure patients are receiving safe and optimal care. In addition, healthcare workers have a responsibility to educate patients, providing detailed instructions with regards to the disease process and treatment, to ensure proper management at home (ADA, 2013).

The literature review of studies related to this topic emphasized these needs using many different avenues of research. Knowledge deficits and readiness to practice were the theme of several of the studies, implying the need to further research the actual knowledge level of new graduate nurses.

## **CHAPTER III**

### **Methodology**

A descriptive study with the purpose of identifying the comfort, familiarity, and knowledge level of diabetes management of new graduate nurses was conducted. From the results of this study, nursing academia, diabetic educators, and hospital administrators can possibly determine knowledge gaps in recent graduates' diabetes management skill sets in order to bring them to a competency level that meets the needs of diabetic patients in the acute care setting at the onset of their nursing career. The results of this study will add to the literature of diabetes management knowledge of bedside nurses.

### **Research Design**

This study used a descriptive research design to investigate the comfort, familiarity, and knowledge level of diabetes management skills of new graduate nurses who have practiced one year or less. At a rural 461-bed, Magnet designated hospital in the Southeastern region of the United States, approximately 75 nurses enrolled in a Nurse Residency Program were surveyed using a demographic questionnaire and the DMAKT.

### **Setting**

As stated, this study was conducted at a rural 461-bed Magnet recognized, acute care hospital, located in the Southeast United States. The hospital provides services within a Level II trauma emergency department, three critical care units including coronary, intensive, and neuro-intensive care, along with eight other specified medical units. The community served by this facility has higher incidence rates of diabetes than the state and even the nation, reporting diabetes as the seventh cause of death in the community (DHEC, 2012). Because of this fact, the facility is working to improve these

rates by providing extensive training in diabetes management to staff nurses who are considered the frontline for educating individuals with diabetes, regardless of inpatient or outpatient status. This strong diabetic educational department consists of three certified diabetic educators and two dietitians, available to both staff members and patients, with the intent to promote better patient outcomes. The results of this study will generate significant data that will be used to strengthen the educational endeavors of the diabetic educational department and the nurse residency program at the facility.

### **Sample**

Convenience sampling was used to recruit participants for this study. The researcher proposed the study during the Nurse Residency program among recently hired, new graduate nurses working in three critical care units, eight medical units, and the emergency room department, with the hopes of securing at least 75 new graduate nurses willing to fill out the survey. Inclusion criteria was that participants must be a licensed registered nurse with one year or less experience currently employed by the hospital, who were working either full time or part time and actively involved in bedside patient care. All shifts were included in the sample.

### **Protection of Human Subjects**

The Institutional Review Boards at the university and at the healthcare facility reviewed this research proposal for approval. The research study proposed minimal risk to participants, as it is a voluntary, anonymous survey. There were no risks or benefits for the participants, and the individual's decision to engage or decline to engage in the study did not affect their current or future relationship with the facility. Those that opted



to contribute to the study were given an informed consent to sign showing their willingness to volunteer participation.

### **Instruments**

The Diabetes Management Knowledge Assessment Tool (DMKAT) was developed by Mary Beth Modic at the Nursing Institute of the Cleveland Clinic in Cleveland, Ohio, and has been used to examine bedside nurses' knowledge level of inpatient diabetes management principles. The American Association of Clinical Endocrinologists (AACE) and the American Diabetes Association (ADA) guidelines and standards of care were used in the formation of the assessment tool (AACE Diabetes Mellitus Clinical Practice Guidelines Task Force, 2011; ADA, 2013).

The DMKAT is divided into five sections including demographics, self-assessment, self-assessment of comfort, self-assessment of familiarity, and diabetes knowledge. The demographics section contains questions to help describe the sample. The self-assessment section contains two questions related to the nurse's teaching skill and knowledge about diabetes management. Responses are indicated on a 10-point Likert scale with answers ranging from poor to exceptional. The self-assessment of comfort includes eight questions related to the nurse's comfort with diabetes management. Responses are indicated on a 10-point Likert scale with answers ranging from very uncomfortable to very comfortable. Scores could range from 0 to 80, with higher scores indicating a higher level of comfort. The self-assessment of familiarity includes six questions related the nurse's knowledge of diabetic hospital policies and resources. Responses are indicated on a 10-point Likert scale with answers ranging from very unfamiliar to very familiar. Scores could range from 0 to 60, with higher scores

indicating a higher level of knowledge regarding policies and resources. The diabetes knowledge section includes 20 multiple-choice questions that measure nurses' knowledge in content areas such as hyper/hypoglycemia prevention and management, insulin therapeutics, and diabetes survival skills teaching of the patient. Each of these questions weighed one point, allowing for scores 0 to 20, with higher scores indicating more diabetes knowledge. The content validity DMKAT was assessed and reported as .95 using a modified two-stage Delphi technique (Modic et al., 2014).

### **Data Collection**

New graduate nurses employed one year or less and working in critical care units and eight other medical units including the Emergency Room of the hospital were introduced to the research study during a mandatory Nurse Residency Program meeting in July 2016. Hard copies of the informed consent, demographic survey, DMAKT and the debriefing statement of the study were handed out by the researcher individually and collected individually at the beginning of the meeting. Total length of data collection time was approximately thirty minutes. (See Appendices A through E).

### **Data Analysis**

Data analysis of the results was compiled into a spreadsheet by the researcher using Excel, and then integrated into the Statistical Package for the Social Sciences (SPSS) version 19.0 software for data calculations.

## CHAPTER IV

### Results

The goal of this study was to investigate new graduate nurses' comfort, familiarity, and knowledge level of diabetes management at the bedside. A descriptive analysis, including means and standard deviations of continuous variables, frequencies and percentages of categorical variables were calculated to describe the sample. No correlations studies were conducted for this research purpose. The data collected was aggregated, coded, and entered into SPSS Version 19.0 for data analysis and statistical description, using Levene's test and a standard one-sample t-test to evaluate the results.

### Sample Characteristics

The sample for this research study consisted of 75 new graduate nurses enrolled in a Nurse Residency Program during their first year of employment. The demographics are in Table 1.

Table 1

*Frequencies and Percentages for Categorical Demographic Variables*

	<i>n</i>	<i>%</i>
Gender		
Female	66	88
Male	9	12
Education		
ADN	36	48
BSN	39	52
Age Range		
22-30	54	72
31-40	16	21
40-48	5	7

## Major Findings

This study allowed participants to conduct a self-assessment of their comfort, familiarity, and knowledge of diabetes management at the bedside. The lowest comfort level rate was given to usage of insulin pumps ( $m = 4.5$ ,  $sd = 2.5$ ) and the highest comfort level was given to administration of subcutaneous insulin ( $m = 8.8$ ,  $sd = 1.5$ ). The participants rated most familiarity with hypoglycemia prevention ( $m = 7.2$ ,  $sd = 1.7$ ) and the least familiarity with insulin pump policy ( $m = 4.1$ ,  $sd = 2.4$ ). Group participants that expressed feeling competent of diabetes management skills rated at 7.2 ( $sd = 1.4$ ). Tables 2, 3, and 4 depict the mean and standard deviation of the new nursing graduate's self-assessment of all the comfort, familiarity, and knowledge level questions regarding diabetes management during the first year of employment.

Table 2

*Self-Assessment Comfort Level of Diabetes Management*

Comfort with:	<i>m</i>	<i>sd</i>
Administering subcutaneous insulin	8.8	1.5
Teaching patient insulin administration	8	1.6
Administering IV insulin	5.1	3.4
Insulin pumps	4.5	2.5
Managing hyperglycemia	7.7	1.7
Managing hypoglycemia	7.6	1.6
Teaching patients how to manage blood sugars	7.3	1.7
Teaching patients about glucose monitoring	7.4	1.8

Table 3

*Self-Assessment of Familiarity of Diabetes Management*

Familiarity with:	<i>m</i>	<i>sd</i>
Hypoglycemia prevention	7.2	1.7
IV insulin administration	6.1	2.9
ICU IV policy	4.3	3.6
Insulin pump policy	4.1	2.4
Available resources	6.2	2.1

Table 4

*Self-Assessment of Competency of Diabetes Management*

	<i>m</i>	<i>sd</i>
Feels competent	7.2	1.4
Teaching skills	6.4	1.5
Knowledge of diabetes management	6.5	1.5

The DMAKT, a 20-question test, allowed participants to present their actual knowledge of the topic. The acceptable mean item score (for group) and whole test score (individual and group) of 80% or higher determined an acceptable knowledge of diabetes management skills at the bedside using the DMAKT (Modic et al., 2014). Table 5 displays the frequency and percentages for the DMAKT. The mean item score for this group of participants was 58%. Table 5 shows the group results per question.

Table 5

*Percentages Correct and Incorrect for DMAKT*

	% Correct	% Incorrect
Q1 Infection more difficult to treat .....	20	80
Q2 Neutrophil impairment begins to take.....	54	46
Q3 Glargine (Lantus) is.....	92	8
Q4 Diabetes Survival Skill Education.....	81	19
Q5 Treatment for hypoglycemia should.....	75	25
Q6 When converting from a continuous IV.....	75	25
Q7 Basal insulin accounts for .....	29	71
Q8 Patients with an illness such as flu.....	97	3
Q9 A novice nurse on a medical unit.....	61	39
Q10 The individual with diabetes at home.....	73	10
Q11 The BEST nursing intervention to.....	53	47
Q12 Sharp medical waste (syringes, lancets).....	80	20
Q13 The most appropriate treatment for mild.....	83	17
Q14 Continuous IV insulin administration is.....	31	69
Q15 All of the following insulin orders.....	16	84
Q16 You should instruct your patient with.....	16	84
Q17 After treatment and the patient's.....	72	28
Q18 All of the following contribute to.....	26	74
Q19 Patients should be instructed to notify.....	16	84
Q20 Your patient takes insulin glargine (Lantus).....	39	61

## **CHAPTER V**

### **Discussion**

Throughout a hospitalization, the nurse is the designated healthcare provider who interacts on a continuous basis with acute care patients in need of diabetes management. Therefore, it is imperative that his/her diabetes management skill set is at the competency level of evidence-based practice for optimal outcomes of those patients with an admitting diagnosis of diabetes or those listed with it as a secondary diagnosis. The purpose of this study was to examine comfort, familiarity, and knowledge level of diabetes management of new graduate nurses to add to the research of diabetes management readiness among bedside nurses.

### **Implication of Findings**

The findings of this study suggested there was a reasonable knowledge gap pertaining to diabetes management for nurses recently graduated from nursing schools, having entered the work force, and are currently caring for patients with diabetes in the hospital setting. As previously mentioned, the ADA (2013) reported inadequate knowledge implementations can affect the quality and safety of hospitalized patients, often times causing increased length of stay and readmission rates. The results of this study suggested new graduate nurses have moderately high levels of feeling comfortable and familiar with the care they give at the bedside of a diabetic patient. However, utilizing the DMAKT, the findings in this sample group showed the actual knowledge level of competent diabetes management was below the recommended score of 80 percent. A 58% pass rate was scored for the group. The implications of these findings suggested new graduate nurses need more preparation in order to make the necessary

clinical decisions affecting diabetic patients in the hospital setting. Modifications in lesson plans are needed to ensure that the content being taught in the classroom is considered up-to-date, evidence-based practice. The depth and the breadth of diabetes, particularly how the disease affects and/or complicates so many other aspects of the patient's health, needs to be emphasized. In teaching the skills to facilitate the management of diabetes along with optimal blood sugar levels for each patient, students should be competent in transferring adequate knowledge of the disease to practical clinical reasoning skills to ensure excellent care.

Some may imply these findings are a direct reflection of the ever-changing treatment guides for diabetes or the lack of consensus for streamlined treatment plans among diabetes experts. Despite these issues, hospitalized diabetic patients still need to be managed at a competency level that is considered evidence-based practice. In this day and age of technological advances and depth of knowledge, we should not expect any less than optimal performance when it comes to diabetic care plans. Still, this data adds to previous research to show that knowledge deficit in this skill set is present even after the new graduate nurse has successfully achieved Nursing Board Certification. Strategic improvements in equipping new graduate nurses for competent diabetes management skill sets are needed. Nurse Residency programs can further mitigate this knowledge gap through awareness of the information provided by this study, and thus tailor educational endeavors to aid the new graduate nurse in learning to apply evidence-based practices with clinical reasoning at the bedside. If the education provided for these nurses is up-to-date and reinforced to establish practical application, the necessary foundation for competent, proficient, and expert care of the patient can be achieved.



### **Application to Theoretical/Conceptual Framework**

As previously discussed, Benner's theory of *From Novice to Expert* served as the theoretical framework for this study. Benner's work *From Novice to Expert* generalized five stages of career development being novice, advanced beginner, competent, proficient and expert (English, 1993). According to Benner, acquiring the status of expertise in clinical skills requires working through these stages, and thought to depend on the richness of the nurse's clinical experience. The novice nurse is considered a beginner in nursing practice without any experience in the situations they are expected to perform tasks (Benner, 1982). The novice is aware of the basic rules of obtaining measurable parameters of the patient, but they are unable to make any judgments about the situation in light of these values. The advanced beginner is somewhat comfortable in their surroundings; however, lacks the knowledge to prioritize aspects, what we now call clinical reasoning. A competent nurse is needed to follow along with the advanced beginner so that important patient care aspects are not missed. The competent nurse, one who has been practicing two-three years, learns to look at the tasks at hand and begin to make plans for care given a clinical situation. The competency stage is characterized by the feeling of mastery and the ability to handle oneself and manage events that may unfold in a clinical setting. The stage of skill acquisition at the proficiency level in nursing care begins when tasks are performed with an awareness of the long-term goals, while immediate care is being provided. Benner considers expertise in nursing as being achieved through the nurse being involved, engaged and by exhibiting a caring attitude in her practice of nursing (Benner, 1984). The expert nurse sees the picture completely and solutions to problems are quickly made based on intuition from passed experiences.

Applying this theory of skill acquisition to diabetes management, the new graduate nurse, nurse managers, and hospital administrators are able to recognize how knowledge levels begin and build over the course of time through focused learning opportunities and experience. Competency levels for managing any disease process of the hospitalized patient can be monitored using the *From Novice to Expert* theoretical framework. Utilizing this framework should begin in nursing school, be carried out through Nurse Residency programs, and continue through ongoing mentoring programs and professional guidance efforts for the duration of one's nursing career.

### **Limitations**

The fact that the sample group came from a Magnet hospital is considered a positive aspect of this study; however, it was limited by geographical location being conducted in a small, rural southeast region of the United States. All participants had graduated within the last year from several local community colleges and universities. The demographic portion of the study could have specified school of study for each participant, which would have possibly provided further information regarding strengths and weaknesses of each educational program represented. It would have been more advantageous to survey and obtain data from a larger sample group from several hospitals, rather than limited to only one, which could be more representative of a larger population of nurses with varying clinical experiences.

### **Implications for Nursing**

More focused education in diabetes management is needed among nursing school curricula so that new graduates are better equipped at the start of their career in providing care for patients at the bedside. Nurse Residency programs are generally conducted

during the first year of employment for new graduates. Facilitators should ensure the topic of diabetes management is scheduled at the beginning of the course rather than at the end of the yearlong program. This is necessary because length of orientation for new graduate nurses varies among institutions. In some instances, these nurses will be providing care to patients within several weeks' time with a level of autonomy that necessitates clinical reasoning skills with implications that are far reaching for the diabetic patient.

### **Recommendations**

With regards to diabetes management, improved curricula among nursing schools are needed to address the knowledge gap of new graduate nurses entering the work force to ensure readiness to practice. A simple way for this to be accomplished is having a member of academia, responsible for teaching this information, to reach out to certified diabetic educators for the latest in evidence-based practices for managing diabetes in the hospitalized patient, thus ensuring that proper foundations of learning are established for this important disease process. Nurse Residency programs are generally conducted for new graduates during the first year of employment. Facilitators of these programs should make certain the topic of diabetes management is scheduled at the beginning of the course, rather than the end, in response to the increased numbers of hospitalized diabetic patients, and the ramifications that the lack of competent care can imply. Finally, the researcher recommends increased focus among academia and hospital administrators to address the lack of new graduate nurses' readiness to practice in regards to diabetes management at the bedside by improving current educational endeavors among nursing students and new graduate nurses. It is essential that at the university or school of

nursing level, meeting the challenges of implementation methods with regards to evidence-based practice for diabetes management is an integral part of the curricula. This can be cultivated by nursing professors collaborating with Certified Diabetic Educators in the field, who are up-to-date with the newest treatment plans for diabetes, rather than solely relying on past, personal knowledge or informational textbooks. These CDEs are the experts in the nursing profession pertaining to diabetes management and education, and are best equipped to lay the foundation of best practice knowledge, treatment, and clinical reasoning skills with regards to the diabetic patient. This pertinent knowledge and experience, shared with students via written or oral form, can better prepare the student to reach the competency level needed for this disease process that ultimately affects the patient in so many ways. In addition to providing ideal patient care for best possible outcomes, this advanced training in diabetes management can enhance time efficiency in providing daily care, a challenge which hospital, bedside nurses consistently face.

### **Conclusion**

An estimated 86 million Americans over the age of 20 have prediabetes and 1.4 million individuals are diagnosed with diabetes each year (ADA, 2013). It is the bedside nurse who spends the most time and attention in efforts to manage diabetic symptoms of the acute care patient. The importance of new graduate nurses' readiness to manage the care of patients with diabetes can be time consuming and detailed. Complications of the disease and poor management of blood sugar levels affect many other factors for the hospitalized patient. This study helped to determine if new graduate nurses are ready to meet the challenges of diabetes management by assessing their comfort, familiarity, and

knowledge level. The findings of the sample group showed that new graduate nurses feel both comfortable and familiar with diabetes management skills at the bedside. However, their knowledge level is below the acceptable range according to the assessment tool used in this study. Since this sample group was made up of new graduate nurses having practiced nursing at the bedside less than one year, an awareness of this knowledge gap during the first year of practice needs to be made, and efforts to bridge the gap must be executed. Improving the student's knowledge base regarding management of diabetes for the hospitalized patient, whether in the classroom before graduation or during a nurse residency program, is essential so that both nurses and patients can expect that best practice in clinical knowledge is being applied, thus enabling the nurse to make educated clinical decisions for excellent care of the patient with diabetes.

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## APPENDIX A

### **Informed Consent Form**

You are being asked to participate in a research study conducted by Lisa Haynes, a Master of Science in Nursing student at Gardner-Webb University (GWU).

**PURPOSE:** The purpose of this study is to determine the comfort, familiarity and knowledge level of new graduate nurses in regards to diabetes management at the bedside.

**PROCEDURE:** You are being asked to complete a demographic form and the Diabetes Management Knowledge Assessment Tool (DMKAT) survey. Once you have completed this survey, you will have no further obligations to the study. The researcher will provide instructions on how to complete the survey. Your participation should take approximately 20 minutes.

**VOLUNTARY PARTICIPATION:** Participation in this study is voluntary. Your decision to participate or not to participate will in no way affect your involvement in the Nurse Residency Program or your employment with AnMed Health. You have the right to refuse to answer any question(s) for any reason without penalty.

**CONFIDENTIALITY:** The researcher is asking you to complete this survey anonymously. Please do not disclose any identifying information on the survey. All research data will be stored in the researcher's home in a locked file cabinet. All electronic data will be stored on the researcher's personal computer which is password protected. After completion of the study, all surveys will be given to the Hunt School of Nursing for storage. Surveys will be kept for three years in a secured location.

**RISKS & BENEFITS:** The Institutional Review Board at GWU has determined that participation in this study poses minimal risk to participants. There are no direct benefits associated with participation in this study; however, it is hoped that your participation will help advance the educational efforts for new graduate nurses regarding diabetes management. After completing the survey, if you have additional questions or concerns regarding your hospital's current diabetes management guidelines, you may contact Jane Maudlin at 512-1000.

If you have questions, want more information or have suggestions, please contact Lisa Haynes, who may be reached at 864-437-0300 or at llong4@gardner-webb.edu.

If you have any concerns about your rights, how you are being treated, or complaints regarding this study, benefits, or risks associated with being in this study please contact the Institutional Review Board for the Hunt School of Nursing at 704-406-4724.

**CONSENT TO PARTICPATE:**

By signing this consent form you are agreeing that you read, or it has been read to you, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered to your satisfaction.

Signature \_\_\_\_\_ Date \_\_\_\_\_

## APPENDIX B

**Request for Using the DMAKT via email**

**From:** Lisa Haynes [llong4@gardner-webb.edu]  
**Sent:** Monday, January 11, 2016 10:54 AM  
**To:** Modic, Mary Beth  
**Cc:** Cindy Miller  
**Subject:** Request for using the DMKAT

Hello,

My name is Lisa Haynes. I am a graduate student at Gardner-Webb University Hunt School of Nursing in Boiling Springs, NC. The thesis I am currently working on will compare the knowledge level of diabetic management of acute care patients in the hospital setting for new graduate nurses practicing one year or less and nurses who have practiced three or more years. This research will be conducted at a 400 bed acute care hospital that has recently instituted the *Step In Line With 179* program that promotes physicians and nurses to maintain patient's blood sugars under 179 while hospitalized.

I read your article [Diabetes Management Unawareness: What Do Bedside Nurses Know?](#) and found it very informative. Seeing the reliability scores, I would like to use the Diabetes Management Knowledge Assessment Tool in the research I am conducting.

I would like a copy of the DMKAT and permission to use the assessment tool in the above mentioned study.

I look forward to hearing from you.

Respectfully,

Lisa Haynes, BSN

---

## RE: Request for using the DMKAT

Modic, Mary Beth <MODICM@ccf.org>

Tue 1/12/2016 11:14 PM

To: Lisa Haynes <llong4@gardner-webb.edu>;

Cc: Tracy Arnold <tarnold@Gardner-Webb.edu>;

 2 attachments (137 KB)

Glucose Excursions-Pre-Assessment- DMKAT\_.doc; Glucose Excursions-Pre-Assessment- DMKAT\_ANSWERS.doc;

Hello Lisa,

Thank you for the completed form. I have attached the preassessment along with the answer key. You have my permission to alter the demographic section and to modify the comfort and familiarity section to meet your needs. Some organization may not have a Regular Nursing Floor (RNF) Policy for IV Insulin for example.

You also have my permission to replace the rapid acting insulin with another rapid acting insulin if Apidra (Glulisine) is not on your formulary without requesting further approval.

I wish you success with your study.

Sincerely,  
Mary Beth Modic

## APPENDIX C

## Optimizing Glucose Control in the Hospitalized Patient with Diabetes: Preventing Glucose Excursions

### I. Demographics

Directions: Please take a few minutes to respond to the following: answer the following questions by placing an X in the box that best describes you, or filling in the blank for each question posed.

Age: \_\_\_\_\_ Gender:  Female  Male Education:  ADN  BSN

Specialty:  Behavioral Health  Cardiac Stepdown  Critical Care  ED  
 Medicine  Neuro  Oncology  Ortho  
 PACU  Surgical  Pediatrics  
 Other\_\_\_\_\_

Status:  Part Time  Full Time  Weekender  PRN

Ethnicity:  Caucasian  African American  Asian American  
 Hispanic/Latino American  Pacific Islander  
 Other\_\_\_\_\_

Years of Nursing Experience:\_\_\_\_\_

Attendance at inservices/continuing education in which diabetes was the focus:

- None
- Within the last 6 months
- More than 6 months but less than 1 year ago
- More than 1 year ago but less than 2 years ago
- More than 2 years ago

Number of patients with diabetes you care for on a weekly basis:

- None
- 1-2
- 2-5

6-10

> 10

Generally speaking, how competent do you feel in caring for a patient with diabetes?

**0 = NOT COMPETENT to 10 = VERY COMPETENT.** Circle the number that BEST describes you.

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

The greatest obstacle to managing blood glucose in the hospital: Check all that apply

- |  |   |
|--|---|
| <input type="checkbox"/> Personal knowledge deficit  | <input type="checkbox"/> Hand-off communication   |
| <input type="checkbox"/> Unclear glucose targets     | <input type="checkbox"/> Unfamiliar with hospital policies  |
| <input type="checkbox"/> Ineffective insulin regimen | <input type="checkbox"/> Lack of coordination between BGM (Blood Glucose Monitoring) Insulin Administration and Meal Delivery |
| <input type="checkbox"/> Other:                      |   |

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## II. Self-Assessment:

Directions:

The following 2 statements assess your overall teaching skills and knowledge about diabetes management in the hospital:

Choose a number for each question.

1. Rate your overall teaching skill (instructing patients about managing symptoms, taking medications correctly, when to notify their physician, blood glucose monitoring, etc.) – 0 = Poor to 10 = Exceptional

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

2. Rate your overall knowledge of diabetes management (knowledge and side effects of glucose lowering agents, action and duration of different insulins, managing of high and low blood sugars, lifestyle modifications, etc.)

0 = None to 10 = Expert

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

### III. Self-Assessment of Comfort

Directions:

The following 8 statements assess your comfort with diabetes management in the hospital. Please rate yourself on a scale from 1-10 with **0 = VERY UNCOMFORTABLE to 10 = VERY COMFORTABLE**. Circle the number that BEST describes you.

(Comfort is defined as a feeling of ease in performing the following skills).

1. General level of comfort in administering subcutaneous insulin  
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  
2. General level of comfort in teaching patients about insulin administration  
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  
3. General level of comfort in administering IV insulin infusions  
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  
4. General level of comfort in caring for patients with insulin pumps  
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  
5. General level of comfort in managing hyperglycemia (hyperglycemia is defined as a blood sugar >150 mg/dl)  
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  
6. General level of comfort in managing hypoglycemia (hypoglycemia is defined as a blood sugar <70mg/dL by the American Diabetes Association, ADA)  
0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10



7. General level of comfort in teaching patients how to prevent and manage low blood sugars at home (low blood sugar is defined <70 mg/dL by the ADA)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

8. General level of comfort in teaching patients about blood glucose monitoring (correct use of the meter, frequency and timing of glucose checks, and disposing of lancets and strips)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

#### IV. Self-Assessment of Familiarity

The next series of statements assess your familiarity with **hospital** policies and resources regarding diabetes management. Please rate yourself on a scale from 1-10 with 0=VERY UNFAMILIAR to 10=VERY FAMILIAR. Circle the number that BEST describes you. Familiarity is defined as a thorough knowledge and understanding of the following policies.

9. General level of familiarity with diabetes management policy

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

10. General level of familiarity with hypoglycemia prevention and management policy

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

11. General level of familiarity with Insulin, Intravenous administration on non-ICU unit's policy

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

12. General level of familiarity with ICU intravenous administration policy

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

13. General level of familiarity with Insulin Pump policy (Patient's own medical device)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

14. General level of familiarity with available resources for teaching patients about SURVIVAL SKILLS (Symptom Management, Medication and Insulin administration and Blood Glucose Monitoring)

0.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

## APPENDIX D

## Diabetes Knowledge (DMAKT)

**V. Diabetes Knowledge (DMAKT)**

1. Infections may be more difficult to treat during hyperglycemia because:
  - a. macrophages lose their chemotactic action
  - b. hypercoagulation occurs
  - c. insulin secretion increases
  - d. lipolysis slows healing
  
2. Neutrophil impairment begins to take place at what glucose level:
  - a. 300 mg/dL
  - b. 240 mg/dL
  - c. 180 mg/dL
  - d. 150 mg/dL
  
3. Glargine (Lantus®) is:
  - a. prandial insulin
  - b. basal insulin
  - c. correctional insulin
  - d. mixed insulin
  
4. Diabetes Survival Skill Education (education necessary for patient to be safe at home) includes:
  - a. eating healthy; being physically active; coping effectively
  - b. taking medication; monitoring blood glucose; managing symptoms
  - c. counting carbohydrates; reducing risks, injecting insulin

- d. knowing resources, eliminating sweets from diet, exercising 30 minutes a day
5. Treatment for hypoglycemia should be initiated at a blood glucose:
- a. Less than 40 mg/dL
  - b. Less than 50 mg/dL
  - c. Less than 60 mg/dL
  - d. Less than 70 mg/dL
6. When converting from a continuous IV insulin infusion to subcutaneous insulin, start subcutaneous basal insulin approximately:
- a. 2 hours before stopping the infusion
  - b. at the same time as stopping the infusion
  - c. 1 hour after stopping the infusion
  - d. no need for basal insulin
7. Basal insulin accounts for \_\_\_\_\_ % of daily insulin requirements:
- a. 25
  - b. 30
  - c. 50
  - d. 75
8. Patients with an illness such as flu or fever should be instructed to:
- a. stop insulin because of decreased caloric intake
  - b. limit food and drink due to nausea and vomiting
  - c. monitor blood glucose every 2-4 hours
  - d. begin antiemetics

9. A novice nurse on a medical unit asks you to explain hypoglycemia unawareness. You respond:
- “This is a term used to explain patient’s lack of knowledge in treating hypoglycemia”
  - “It describes the phenomenon of adrenergic surge that occurs in hypoglycemia.”
  - “This occurs when someone injecting insulin loses consciousness due to a low blood sugar.”
  - It is “A condition in which a person with diabetes does not experience the usual early warning signs of hypoglycemia.”
10. The individual with diabetes at home who requires glucagon administration is:
- 14 year old mildly confused and diaphoretic
  - 27 year old nonresponsive and shaky
  - 35 year old disoriented and complaining of hunger
  - 4 year old crying and pale
11. The BEST nursing intervention to prevent hyperglycemia in hospitalized patients with diabetes is:
- administer basal and supplemental insulin even when patient is NPO
  - administer prandial/bolus insulin for tube feedings
  - initiate supplemental insulin when glucose >250 mg/dL
  - initiate an IV Insulin infusion when glucose exceeds 200mg/dL
12. Sharp medical waste (syringes, lancets) from the home should be disposed:
- into home waste/trash
  - into a hard-sided container with a screw-on lid

- c. into an empty aluminum can
  - d. into a plastic pop bottle
13. The most appropriate treatment for mild hypoglycemia in a conscious and unsedated patient is:
- a. 12 oz can regular soda
  - b. 4 oz juice
  - c. 8 oz juice with 2 packets of sugar
  - d. 3 packages of graham crackers
14. Continuous IV insulin administration is the preferred method of treating DKA or HHS because an IV insulin infusion:
- a. brings down the glucose more quickly than the subcutaneous route
  - b. sustains normal glucose once target glucose is achieved
  - c. facilitates insulin stacking
  - d. is more effective in regulating velocity of glucose change
15. All of the following insulin orders require clarification EXCEPT:
- a. Lantus<sup>®</sup> 10 units at 0700, Levemir<sup>®</sup> 7 units at 0700 and 1730
  - b. NovoLOG<sup>®</sup> 5 units before meals, NovoLIN R 28 units at 0700 and 2200
  - c. NovoLOG<sup>®</sup> 6 units and NPH 15 units at 0700 and 1730
  - d. NovoLOG<sup>®</sup> 8 units before meals, Correctional Scale #2 with NovoLIN R
16. You should instruct your patient with newly diagnosed Type 2 diabetes, using oral glucose lowering agents, to do self-blood glucose monitoring (SBGM):

- a. before breakfast, and before and 2 hours after the largest meal of the day
  - b. before bedtime only
  - c. three times per week at different times
  - d. before breakfast only
17. After treatment and the patient's recheck, a blood glucose rose from 45 mg/dL-65 mg/dL. The next course of action is to:
- a. call the physician and hang an IV of D5 W
  - b. wait another 15 minutes and recheck
  - c. give another 15 gms of carbohydrates
  - d. administer an amp of D<sub>50</sub>
18. All of the following contribute to development of hyperglycemia in the hospitalized patient EXCEPT:
- a. vasopressors
  - b. holding insulin for normal glucose
  - c. tube feedings
  - d. nutrition interruption
19. Patients should be instructed to notify their physician with:
- a. one unexplained glucose of < 70 mg/dL
  - b. two fasting glucoses >126 mg/dL
  - c. blood glucose >150 mg/dL for one week
  - d. two consecutive glucoses of 180 mg/dL

20. Your patient takes insulin glargine (Lantus®) at bedtime and insulin glulisine (NovoLOG®) insulin with meals.

	<b>Breakfast</b>	<b>Lunch</b>	<b>Dinner</b>	<b>HS</b>
	Before mg/dL	Before mg/dL	Before mg/dL	Mg/dL
Tuesday	86	58	97	78
Wednesday	126	62	89	74
Thursday	111	66	92	80
Friday	420		172	

As you review the blood glucose levels, you know that the insulin dose that needs to be adjusted is:

- a. bedtime Lantus®
- b. morning NovoLOG®
- c. lunchtime NovoLOG®
- d. dinner NovoLOG®



## APPENDIX E

### **Debriefing Statement**

Thank you for your participation in this research on new graduate nurses. The goal of the questionnaire was to assess the comfort, familiarity and knowledge level of diabetes management for new nursing graduates. Currently, no research has been conducted to assess the competency level of new graduates in the care of the diabetic patient. Your participation is important in helping researchers understand the competency level of practice for new nurses in the hospital setting in hopes to gain further insight into such a significant topic in healthcare today.

Final results will be available from the investigator, Lisa Haynes by August 15, 2016. You may contact me at [llong4@gardner-webb.edu](mailto:llong4@gardner-webb.edu) to receive an email copy of the final report. Your participation will be absolutely anonymous. Only your answers from the demographic questionnaire and survey will be used in the study with no identifiable markers to you whatsoever, even if the report is published.

If you have any additional questions regarding this research, please feel free to contact me at [llong4@gardner-webb.edu](mailto:llong4@gardner-webb.edu).