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Nursing Simulation Project Improving Patient Safety: Development of a High-Fidelity Simulation Scenario to Develop Critical Judgment and Drug Calculation Skills in Medication Administration

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Improving Patient Safety: Development of a High-Fidelity Simulation Scenario to Develop Critical Judgment and Drug Calculation Skills in Medication Administration

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Chapter One

Improving Patient Safety

Background and significance

Medication errors are the most common and consistent errors occurring in the hospital setting (Luk, Milly, Ko, & Ung, 2008). The Institute of Medicine report, *To Err is Human: Building a Safer Health System,* estimated that at least 44,000 – 98,000 medical errors occur each year in the hospital setting which result in patient death (Kohn et al., 2000). "Medication errors account for one out of 131 outpatient deaths and one out of 854 inpatient deaths" (Kohn et al., p. 27). "The economic cost of medication errors is approximately $5,000 per error or an annual impact of $2.8 million for an average 700-bed teaching hospital, and patient length of stay is prolonged by approximately two days" (Dennison, 2007, p. 177). The cost is even higher if the occurrence results in litigation.

The Institute for Health Care Improvement (2008) implemented a campaign called *Five Million Lives* with the goal of protecting patients from five million harmful medical events. The hope was that this initiative would save many lives between December 2006 and December 2008. Medication administration and protection from errors was a major component of this campaign. Joint Commission has developed ten National Patient Safety Goals. For many years two out of ten of these safety goals have dealt with medication safety and administration (Joint Commission, 2009).

Medication errors have been extensively studied because they are one of the most common errors, increase the cost of health care, and can potentially cause the greatest harm (Kohn et al., 2000). Medication administration is a major role in nursing, representing one of the highest risk areas. Nurses who make an error that causes patient harm frequently suffer severe

emotional distress. They remember the event for years and can retain feelings of guilt (Dennison, 2007). Patients are the first victims; however, nurses are affected by the same error, causing them to be the second victims (Schelbred & Nord, 2007).

Nurses are only part of a system failure, but since they are at the frontlines administering the medications, they have the distinct ability to prevent the medication error. The Institute for Safe Medication Practices (ISMP) states that student nurses can be involved in medication errors even though they are closely supervised by clinical instructors (2007). That is why it is imperative that nurse educators design a curriculum that places an intense focus on medication administration and the prevention of errors.

High-fidelity simulation is the newest technology that nursing schools are incorporating into their curriculum. Simulation uses computer based mannequins that are interactive, provide realistic assessment findings, and can be programmed to show changes in the patient's clinical condition. This allows students to replicate situations in nursing practice in a safe, non-threatening environment that does not involve a real patient. Simulation experiences reinforce the development of skills in assessment, psychomotor activity, critical thinking, problem solving, decision making, and collaboration with others (Rothgeb, 2008, p. 489).

Since the late 1990s, the National League for Nursing has strongly encouraged that nurse educators incorporate high-fidelity simulation into their nursing curriculum. High-fidelity simulation can serve several purposes. It can be used to assess and evaluate nursing students' skill level or it can be used as a teaching strategy which provides nursing students' opportunities for additional clinical experience that helps link theory to practice in a controlled environment (Cantrell, 2008).

Currently, there is little research on how simulation can be utilized to evaluate critical

thinking skills in nursing students for medication administration. According to Harding and Petrick (2008), medication errors are still a significant issue for nursing students. Student errors can range from misinterpreting doctors' orders to failing to follow-up on client response to medication. Research is needed to determine effectiveness of simulation since most current simulation research is evaluating the assessment process only (Jeffries & Rogers, 2007).

Problem statement and statement of purpose

There are a significant number of medication errors that occur in the hospital setting that may cause poor patient outcomes and increase cost to the healthcare system. Nurse educators need to develop and implement new teaching strategies to promote critical thinking skills for students especially in high risk areas of nursing such as medication administration.

The purpose of this project is to develop a medication based simulation scenario for nursing students in a pre-licensure nursing program that can assist them in developing effective critical thinking skills and dosage calculations in all stages of medication administration. The use of high-fidelity simulation could increase the knowledge and competencies of future nurses in the area of medication administration. This project will contribute to the education of nursing students by utilizing a contemporary solution to an on-going concern of medication errors in nursing students.

Summary of introduction

Student nurses, as well as new graduate nurses, are faced with many challenges in the clinical and workplace setting. Administering medications is one of the top high risk tasks that nurses perform on a routine basis. It is imperative that nurse educators focus on assisting nursing students with the development of critical thinking skills. Medication errors are a concern in the healthcare system, and the use of a non-traditional teaching approach such as high-fidelity

simulation has the potential to be an effective way to develop critical thinking skills in nursing students and make medication administration safer.

Chapter Two

Literature Review

Introduction

The acuity of patients in the hospital setting is increasing, and new nurses are expected to transition quickly into an independent nursing role. Because administration of medications is considered one of the highest risk aspects of the nursing profession, nursing schools must utilize a variety of teaching strategies to prepare new nursing graduates for this task. High-fidelity simulation is one strategy that can be utilized to assist in meeting these high expectations of graduates and increase the likelihood of improved patient outcomes and a decrease in errors.

The nursing education literature is currently filled with a variety of information on the use of simulation. The trend in literature relates to the implementation and success of simulation. There are very few quantitative studies on the topic. When reviewing the literature, the following aspects were considered: patient safety and medication administration, history of simulation, current practices in nursing simulation, current nursing research available, frameworks and models used in simulation, and the debriefing process of simulation.

Patient safety and medication administration

The delivery of medications is a complex task. Errors can occur anywhere during the process; from the ordering of the medication all the way to administration. It has been identified that most errors occur during the ordering and administration phases (Harding & Petrick, 2008). When medication errors are made, they are usually underreported due to healthcare facilities placing blame on individuals. Nurses are held responsible for the majority of medication errors even though it is now known to be more of a system problem. Nurses are taught to implement the “five rights,” but the normal procedures for checking these rights are easily neglected

because of interruptions. Nurses and nursing students need to be held accountable when errors occur. Poor understanding of medications, failure to calculate dosages correctly, and insufficient training can play a role in errors. Nurses need to be involved in helping identify system failure issues and in providing possible solutions. The culture of the hospital setting needs to change to be less punitive, and nursing schools need to provide adequate education (Dennison, 2007; Harding & Petrick, 2008; Stetina, Groves, & Pafford, 2005; Tang, Sheu, Yu, Wei, & Chen, 2007).

History of simulation

The history of simulation can be traced back to the field of aviation in the late 1930's. Pilots were able to use simulation to experience how to manage dangerous situations in a controlled and safe environment. Pilots' competencies were maintained and improved with this teaching strategy. Schools of medicine and dentistry also utilized simulation for training. During these teaching sessions, medication and other errors were identified and residents were able to improve their skills. Anesthesia has used high-fidelity simulation to train in medication administration, to clarify procedures, and to deal with complications (Bradley, 2006; Hyland & Hawkins, 2009). Midwifery students utilize simulation to improve their confidence levels when they are learning how to provide patient care and enhance their skill acquisition (Dow, 2008; Hyland & Hawkins, 2009). The history of simulation shows that it can have a positive effect on students in many disciplines by assisting them in improving their decision making processes.

High-fidelity simulation in nursing education

There are many advantages to using simulation in nursing. There is no threat to a real patient, errors can be discussed and corrected immediately, active learning can occur, specific clinical situations can be replicated, consistent case studies can be presented to all students, and

theory is linked to practice (Decker, Sportsman, Puetz, & Billings, 2008; Medley & Horne, 2005; Pauly-O'Neill, 2009).

Sometimes nursing students find it difficult to relate to a plastic mannequin patient. As the students become more familiar with simulation experiences, they learn to anticipate patient complications which decrease students' anxiety (Lasater, 2007). Nurse educators can focus on particular aspects of patient care and provide the learning opportunity in a self-paced environment. Simulation experiences provide standardization for all learners to be exposed to certain diagnoses. Students can develop critical thinking skills and make mistakes without negative consequences, and simulation provides a comprehensive evaluation of the development of students' clinical judgment (Dillard et al., 2009; Ravert, 2008).

Nurse educators must utilize the most current evidence and teaching strategies when designing and implementing simulations into their nursing curriculum. Also, they must base the simulations on a valid and reliable nursing simulation framework so that simulations can be tested and replicated. By using evidence-based teaching, nurse educators will be able to design and develop strong and effective simulation learning opportunities for their students (Halstead, 2009; Jeffries, 2005).

Research in nursing simulation

The influence of simulator fidelity and student gender on teaching effectiveness was researched by Grady et al. (2008) in an experimental study. Grady, et al. found that teaching by high-fidelity simulation led to significantly higher performance than did teaching by low-fidelity, utilizing non-interactive models, ($F\{1,37\} = 2.83$, $p<0.05$), the attitudes of the students were also found to be more positive after training with a high-fidelity situation ($F\{1,37\} = 3.22$, $p <0.05$), simulation provided realistic feedback based on the students' actions ($t(37) = 2.43$ $p<0.05$), and

that the simulator responded in a way that helped them learn about the different procedures ($t(37) = 3.43$ $p<0.01$).

Brannan, White, and Bezanson (2008) compared the effectiveness of two different instructional teaching methods using specific nursing content that dealt with myocardial infarction. Students who received the simulation teaching attained significantly higher posttest scores than the students who just received the traditional lecture teaching approach ($T=2.0$, $df = 79$, $p = 0.05$).

Lasater (2007) explored students' experiences with high-fidelity simulation and found that simulation brought together the theory component of nursing and integrated it with skills and critical thinking. It also provided instant feedback on the students' interventions, which enhanced the level of education. Requiring students to participate encouraged the development of critical thinking. Students requested more debriefing or discussions after the simulation scenarios were complete. They also requested that the instructor focus on the students' strengths during these sessions. Jeffries et al. (2004) also explored the use of high-fidelity simulation and discovered that the most important features were providing the students with feedback, educational practice of collaboration, and the development of self-confidence.

Pauly-O'Neill (2009) observed nursing students in their pediatric rotation while administering medications pre and post simulation intervention. It was identified through the observation of 20 pre-licensure master's degree nursing students that students were inadequate in going beyond the five rights of medication such as medication dilution, safe intravenous rate, and other critical judgment components. After the intervention of simulation, results showed that all students increased their ability to provide safe patient care regarding medication administration.

Ackermann (2009) conducted a quasi-experimental study looking at the acquisition and

retention of knowledge as applied to cardiopulmonary resuscitation using the traditional method versus simulated scenarios. The students who received the high-fidelity simulation cardiopulmonary arrest scenario showed statistically significant improvement in their CPR skills and knowledge (p=.000). These same students also showed significant improvement in their retention of the information three-months later (p=.002). See appendix A for further details.

Frameworks and models used in simulation

As high-fidelity simulation becomes more popular and is included in more nursing curriculums, frameworks and structure need to be added to the simulation scenario building process. This will also allow a structured process for research to occur. Jeffries (2006) describes the Nursing Education Simulation Framework that was developed by the combined efforts of the National League for Nursing and Laerdal Corporation, Inc. This framework is composed of five major components which are teacher factors, student factors, educational practices, design characteristics and simulation, and outcomes. In simulation, the teacher plays a role of facilitator so the students must be self-motivated and held responsible for their actions. Best educational nursing practices need to be incorporated into the high fidelity simulation to allow for active participation. Simulation design must include specific objectives, incorporate realism, range from simple to complex, and include a debriefing component. Outcomes include measurement of students' knowledge, skill performance, satisfaction, critical thinking, and self-confidence (Jeffries, 2004).

The Nursing Education Simulation Framework is part of a four step process for constructing a simulation. This four step process involves developing the blueprint, procuring the bill of materials, assembling the structure, and finishing the project. The four educational principles important in simulation design and implementation involve active learning,

collaboration, diverse ways of learning, and high expectations (Jeffries, 2006).

The Situated Cognition Framework is also being utilized in developing simulation scenarios to provide guidance for design and evaluation. The key concepts of this framework are people, ingredients, and activities. In situated cognition, learning and thinking usually make sense only when there are certain situations, communities of practice are where people act and construct meaning, acquiring knowledge depends on the tools that are used, and social processes cause situations to make sense. Using this framework allows nursing students to apply the knowledge learned to a real life client activity and provides for direct and structured learning (Paige & Daley, 2009).

Debriefing

Debriefing is defined as the process whereby faculty and students reexamine the clinical encounter, fosters the development of clinical reasoning and judgment skills through reflective learning processes (Drufuerst, 2009, p. 109). It is important for nursing educators to develop best practices in debriefing since this process is considered by most simulation experts as the most critical component of the simulation experience and the area where most learning occurs (Drufuerst, 2009; Kuiper, Heinrich, Matthias, Graham, & Bell-Kotwall, 2008; Nehring & Lashley, 2010). It is felt that knowing how to conduct a debriefing session is just as important as knowing how to build and conduct a simulation scenario (Drufuerst, 2009). It is very important that nursing faculty facilitate the debriefing sessions so that any misunderstandings, thoughts or frustrations can be addressed. The sessions also identify and develop therapeutic communication skills and critical thinking. It is important to review objectives so that events can be linked to real clinical practice.

Best practices of debriefing are identified as providing a safe, non-threatening

environment, conducting the debriefing immediately following the simulation scenario, timing of the debriefing should be at least as long as the actual simulation, facilitating should be done by the nursing faculty involved in the simulation, and all students involved in the simulation scenario should be debriefed together (Nehring & Lashley, 2010). Videotaping the sessions is becoming more popular in regards to debriefing. Videotaping can help evaluate competencies and assist in decreasing nursing student stress (Cantrell, 2008).

Cantrell (2008) identified that debriefing needed to occur immediately after completion of the simulation scenario to increase learning. Nursing faculties' attitudes were critical to the success of a simulation debriefing. Nurse educators who provided some cuing to the students, had a sense of humor, and provided a mentoring and coaching approach supported the nursing students learning. Another critical component was that nursing students had adequate lecture preparation and pre-work prior to the simulation scenario and debriefing.

Another aspect of debriefing involved using a model to guide the debriefing process. Kuiper et al. (2008) identified the Outcome Present State-Test Model of Clinical Reasoning (OPT) as a model that provides structure, enhances reflection, and enhances the clinical reasoning process. Kuiper et al.found that the 44 nursing students involved did have promotion of higher-order cognition utilizing the OPT model for debriefing.

Tanner's Clinical Judgment Model has also been used to facilitate and structure the debriefing process. This model organizes four different dimensions in relationship to clinical judgment; noticing, interpreting, responding, and reflecting. This model helps nurse educators give guidance to students to help them identify any breakdowns, areas that need improvements, and consider what learning experiences they need to focus on. Lasater developed an evidence-based rubric from this model that consists of 11 indicators (Dillard et al, 2009).

Two additional models that have been referred to in the literature are the 4-Step Debriefing Model by Chiodo and Flaim and the Gibbs Reflective Cycle. Chiodo and Flaim's model focuses on the experience of the simulation, student inferences, case analysis, and comparison to practice (Thompson & Bonnel, 2008). The Gibbs Reflective Cycle is a six step process that focuses on emotion during the simulation experience (Gibbs, 1988).

Conclusion

Medication errors are a valid concern in the healthcare setting. New nurses must be provided with the best education possible to reduce these errors and thus improve patient outcomes. Other disciplines have utilized high-fidelity simulation in a variety of experiences with success. Utilizing simulation in a nursing education environment provides a very unique and creative teaching opportunity. Simulation experiences provide nursing students with a safe, non-threatening environment for learning. Every possible teaching strategy needs to be included in the curriculum in order for nursing students to develop knowledge and critical thinking skills to decrease medication errors and build confidence in their nursing practice. The maintenance of structured, high-fidelity simulations provides the highest quality simulation. Several frameworks and models are being utilized to ensure that high-fidelity simulations include teaching best practices.

Theoretical framework

This nursing project will utilize the constructivist theory which was pioneered by philosopher and developmental psychologist Jean Piaget. According to this theory, learning is an active process of constructing meaning and transforming understanding. It involves the idea that the instructor creates a learning environment where hands-on exploration and discovery is used to help the student make a connection between new knowledge and prior knowledge

(Leonard, 2002). Constructivists believe that students improve their critical thinking and problem solving skills when they construct new knowledge that has been based on prior experiences, resources, and construction of meaning. This occurs when they are able to interact with and interpret their environments (Chikotas, 2008, p. 361).

Constructivism fits in a non-traditional teaching approach such as high-fidelity simulation. This framework allows for enhanced self-direction in learning and empowers students with problem solving, reflecting, and evaluation skills. This type of education would enable

nursing graduates to go into their place of work with the skills and tools needed to integrate confidently and safely into their profession (Peters, 2000). In addition, this project will utilize the Nursing Education Simulation Framework (see appendix B) to build the medication administration simulation scenario, and the Tanner's Clinical Judgment Model (see appendix C). An evidence-based rubric will be used to develop the structured debriefing session questions.

Chapter Three

Comparative Evaluation

Assessing the fit

Simulation education became a part of the nursing curriculum two and a half years ago. Prior to this time, the high-fidelity simulators were utilized in teaching assessment components only. Over the past two and a half years the use of simulation has transitioned from an off-campus experience utilizing the staff and equipment of another nursing school to having become a critical component of all the medical/surgical clinical courses (Fundamentals, Adult One, Adult Two, and Adult Three). All simulation education is now conducted on campus in the designated simulation classroom.

The simulation classroom has been adapted over the past few years to include as many features as possible to resemble a "real-life" hospital setting. A medication and crash cart have been added. A nurses' station has been assembled which includes departmental phone numbers, chart rack with all simulated patient records included, IV supplies, syringes, and referencing material. Student roles are assigned based on the scenarios and simulation checklists are handed out in order to get everyone involved in each scenario.

Nursing students attend simulation once during each of their classes in Fundamentals, Adult One, Adult Two, and Adult Three. Six students are present during each simulation session. Three patient scenarios are completed during the four hour session with debriefing occurring after each scenario. The students are paired up and each assumes the role of primary nurse during one of the scenarios. During the other two scenarios, they have the role of charge nurse, fellow co-worker, family member or other as assigned by the simulation teacher. Prior to coming to simulation, the students are each responsible for completing pre-work which is posted

at the beginning of the course on web-based learning. Students are required to review and complete information on the patient's pathophysiology, medications to be given, pre and post-op education, patient teaching components, and apply the Neuman Systems Model to their patient.

Both volumes of the National League for Nursing Simulation Scenarios have been purchased and have been adapted to meet the needs of the nursing students in each nursing semester. A graduate teaching assistant wrote one scenario that has been incorporated into the Adult Two simulation. Currently, debriefing occurs after the conclusion of each scenario; however, there is no consistent model or tool being utilized to provide consistency in the debriefing process. Due to limited space, debriefing occurs in the same room as the simulations.

Feasibility

This nursing school currently has a new nursing building under construction. Much time, effort, and resources have been put into planning a state-of-the-art simulation lab for the nursing students. This new simulation lab will also have the capability to videotape each scenario, allowing for better reflective feedback and enhancing the debriefing process.

The current nursing faculty is ready for additional simulation to be included in the nursing curriculum. An on campus simulation faculty development educational session was conducted last spring and several current simulation instructors recently attended the 2nd Annual Tennessee Simulation Conference Education and Practice sponsored by Belmont University in Nashville, Tennessee. The course teachers have made it a priority for students to understand the importance of simulation and to be prepared for the educational session.

This nursing school currently has two SimMan simulators, one pediatric VitalSim, and one baby VitalSim. Over the past few months, it has been identified that additional supplies are needed to enhance the realism of the simulation. Students have requested that during each

simulation scenario they be allowed to spike IV fluids, program or reprogram IV rates, have vials with flip-tops, hang new IV piggybacks, and give IV push medications.

Scheduling students into the simulation lab can be potentially problematic due to classroom teaching times. The medication administration scenario that has been developed would need to be implemented during the Fundamentals nursing course. This would allow students to complete the scenario prior to hospital clinicals where they would be performing medication calculations and administration of the medications. Implementing this scenario would require a change in the timing of the simulation teaching. It would need to be conducted over the course of two days with the addition of another simulation instructor. Students would need to be separated into groups of six and would need to attend one two hour session.

Current practice and substantiating evidence

This school of nursing's simulation practice is congruent with most simulation literature. This school has identified the following benefits of simulation: the students connect theory to practice, enjoy the process of active learning, appreciate the safe, non-threatening environment in which to learn and the mentorship of the simulation instructors, and value the debriefing session as the most critical component of the simulation experience.

Several items that this school of nursing would need to consider for implementation are the need to validate scenarios that have been developed by nursing faculty, and the development of an evaluation tool which would provide consistency from semester to semester. It will also be important for the adoption of a debriefing model or framework, the conduction of more qualitative and quantitative research, and to utilize a proven framework in the development of future scenarios.

It will also be important to develop a simulation evaluation tool which would include the

following elements, if the students felt the objectives were met or not met, the instructor provided appropriate constructive feedback, and if the instructor provided an appropriate learning environment. This one tool would be utilized with every simulation session to provide consistent feedback for the simulation program. It would also be important to adopt a model to formalize the debriefing process. The literature states that the debriefing sessions are where the real learning occurs, so this process needs to be further developed (Cantrell, 2008; Dreifuerst, 2009; Kuiper, et al. 2008; Medley & Horne, 2005; Rothgeb, 2008; Thompson & Bonnel, 2008). It will be important for this nursing school to utilize a proven framework when developing or adapting additional scenarios.

Chapter Four

Translation and Application

The Fundamentals Medication Calculation and Critical Thinking Scenario will be taught in the first semester of nursing in the Fundamentals class prior to the students administering any medications in the hospital setting. The Fundamentals Medication Calculation and Critical Thinking scenario will be conducted over the course of two days and will be counted as clinical time. The students will sign up in groups of six. Two simulation instructors will conduct six sessions each in order to accommodate the class size. The students will receive the medication and calculation lecture component prior to the simulation experience. The students will be given a case study to review prior to the simulation. The case study will provide the students with basic information and history on the patient, healthcare provider orders, and report from the night shift nurse. They will also be asked to complete a medication worksheet on six medications that will be administered to this patient and to explain briefly the basic pathophysiology and etiology of pneumonia, diabetes, and congestive heart failure (see Appendix D).

Pamela Jeffries (2004) Nurse Education Simulation Framework was used to develop the medication simulation scenario (see Appendix E). The focus of this scenario is on medication calculation and actual administration of the drugs. The primary goal is to improve accuracy, critical thinking skills, and confidence during medication dosage and calculations. At the end of the scenario, the students will be able to explain what the physician's orders are really asking them to do, identify key data required to solve the dosage calculations, formulate a plan to solve dosage calculation problems accurately and consistently, solve the dosage calculation problems, and judge whether dosage calculation solutions are logical or illogical and apply it to the patient's specific situation, and actually administer and document the medications. Debriefing

will occur at the end of the session with the following questions:

1. what happened with this case study,
2. what were thoughts and feelings during the dosage calculations,
3. what was good and bad about the experience,
4. what made sense,
5. what else could have been done,
6. and how to apply the information learned to the actual clinical setting.

The first step of the Nurse Education Simulation Framework is to develop the blueprint or outline of the components of the scenario such as patient, age, diagnosis, and other additional compounding problems. The patient will be an 85 year old male who is admitted with pneumonia and also has diabetes and congestive heart failure. He will have six morning medications that need to be given by the students. Each student will play a leadership role and become the expert on one of his medications. They will discuss within their group how they arrived at their dosage calculation and what nursing implications apply. Each student will also play the role of observer to the lead student and will actively give input during the discussion of each medication. Each student will then have the opportunity to prepare, administer, document their medication, and evaluate each other (see Appendix F).

The second step of the process is procuring the bill of materials. The high-fidelity SimMan mannequin will be utilized for this experience. Additional equipment such as vials of medication, syringes, medication cups, IV fluids, IV pump, patient name band, etc. will be needed (see Appendix D for further details). To make the simulation more realistic, a patient chart will be developed which will include a Physician Order Sheet, Medication Administration Record (MAR), and Diabetic Flowsheet (see Appendix G). The students will administer the

medications in the order outlined on the patient's MAR.

The third step is assembling the structure. The teacher's role will be as a facilitator and will provide cues in a hands-on learner centered environment. Faculty members who will be assisting will receive training on expectations of the students' learning, expected outcomes, and debriefing focus. The students will each play a leadership role and become the expert on one medication for this patient. They will instruct their fellow classmates on how they derived their medication calculation and what nursing implications they are responsible for. They will actually demonstrate giving the medication to the mannequin. They will also have the role of observer as they learn from their classmates and observe medication administration.

Best education practices will be embedded into the structure. Engaged students who are actively involved in their learning will provide reinforcement, feedback, and support to the learning process. This simulation structure promotes collaboration in problem-solving with their peers and what actually happens in the real world clinical setting. Simulation accommodates the many diverse learning styles and provides them with the confidence in recreating the experience in real life (Medley & Horne, 2005; Rothgeb, 2008). Students are encouraged to set high goals and expectations for themselves while the teacher will be available for clarification and support during the process of medication calculation and administration. A list of medication simulation teaching elements is listed in Appendix H.

The fourth step of the process of building a simulation experience is evaluation of the process which then leads to revisions and refinements. The evaluation process will be discussed in greater detail in the next chapter. However, a pilot study of this project was conducted during the spring of 2009 which led to minimal revisions in the case study scenario. It was identified that the students would need to complete their pathophysiology and medication pre-work prior to

coming to the simulation since the pre-work required too much time and took away from the actual simulation experience. Students requested that they not be rushed in the actual process of medication administration.

Chapter Five

Evaluation

Expected outcomes and evaluation

Nurse educators are expected to use a variety of creative teaching strategies to enhance the learning of the student. The overall goal of a pre-licensure program is to produce a nurse who is competent and confident in caring for complex patients while also producing optimal, quality patient outcomes. The expected outcome of this high-fidelity medication scenario is to give the nursing students additional medication calculation skills, medication safety knowledge, and increased confidence in calculating and administering medications.

There are three specific outcomes that will be measured and evaluated using this simulation scenario. The first outcome that will be measured is that the nursing students will obtain higher scores on their semester drug calculation tests prior to clinicals. At this nursing school, each semester the nursing students are required to pass a ProCalc Medication Test® prior to administering any medication. Students frequently express anxiety and concern about this test because of lack of knowledge or experience. Several of them require remediation in order to pass the test. Analysis of test scores and frequency of remediation can be compared to previous semesters prior to the implementation of the medication simulation scenario. Each lead teacher who administers this ProCalc test will complete the analysis of the test scores.

The second outcome that will be measured is the number of students who are correctly answering medication questions on the different nursing exams throughout the pre-licensure program. This nursing school uses the test program SmarTest which provides detailed test analysis on all exams given. The teachers for each class can do comparative analysis to determine if there have been any improvements on the test questions that specifically addressed

medication administration or dosage calculation. Each lead teacher for the nursing courses will complete this analysis.

The third outcome that will be measured is that confidence level of the students remains high as it relates to medication administration in the clinical setting. Students need to feel that they have received an adequate knowledge base in the classroom setting to be safe and competent as they administer medications to patients. It is important that the students also feel that they have received adequate hands-on teaching. The students need to see actual vials of medications, read the labels of these vials, calculate dosages after seeing the vials or physicians' orders, program IV pumps, connect tubing to secondary bags, and document on a simulated patient record.

This third outcome will be measured by using the Simulation Evaluation Form (see Appendix I) used at this university. This form will be given to the students during the class period after the completion of the simulation. The Clinical Coordinator is responsible for the tabulation of this form and reports the results to the Associate Program Coordinator. The results are disseminated to the nursing faculty via the Master Plan End of Year Results. This Simulation Evaluation Form has been reviewed by four expert faculty prior to implementation. Question number six has been adapted for this simulation. The wording was changed from "increased confidence in assessment skills" to "increase confidence in medication administration and calculation skills."

Feasibility of implementation

The future of nursing education is evolving due to the increase in sophisticated technology. Nurse educators see that simulation is the way of the future due to this technology, lack of clinical site availability, and nursing faculty shortage. Different levels of simulation can

be incorporated such as low, medium, and high-fidelity. Low fidelity is usually models that allow students to practice a skill, and medium-fidelity provides a little more realism such as breath and heart sounds. High-fidelity simulation provides the student with a very interactive real environment which shows physiological responses. The cost does increase with the level of fidelity (Rothgeb, 2008).

Due to these costs, nursing schools may feel that they may not be able to implement this medication scenario using the high-fidelity approach. There are other options that can be explored. Most nursing schools have mannequin models that could be set up in the skills lab to mimic this medication scenario. This would be using a low-fidelity approach. Several nursing schools may have the VitalSims which provide a few computerized features using medium fidelity. Live actors are another way to provide the same style of high-fidelity approach used in this project. The live actor is provided a script of how the scenario will progress and what he or she needs to verbalize during the process. The live actor could be set up to mimic the mannequin set up in this simulation. Students would still be able to program the IV pump, administer the IV push through a simulated set-up, and use subcutaneous injection pads. A challenge with using live actors is that you have to determine if they will be volunteers or if they will be paid for their time. The actors will need to be educated on how to respond and act during the simulation process.

With simulation teaching becoming more popular and more research needed in this area, nursing schools may decide to investigate what grant money may be available for purchase of equipment or assistance of research. Currently the National League of Nursing Simulation Innovation Resource Center program is providing grant monies for simulation research. Other options that could be explored are NLN Research Initiatives, Laerdal Foundation, and the

International Nursing Association for Clinical Simulation and Learning.

Many aspects may need to be considered when implementing simulation scenarios. Schools of nursing need to educate and develop designated faculty to become the experts in simulation. All nursing faculty need to be kept abreast of the latest research and developments in the area of simulation, it would also be helpful to have a designated faculty member to manage the schedule of simulation. Each school of nursing will need to determine how many faculty will need to participate in this medication scenario and how many days of teaching will be needed. This school of nursing had two designated faculty who taught 72 students over the course of two days.

Chapter Six

Summary

The plan of this school of nursing is to continue to incorporate this medication scenario during the Fundamentals of Nursing course. It will be taught prior to the nursing students administering any medications to actual patients in the clinical setting. This will allow the students to acquire the knowledge and develop the necessary skills in a controlled environment. It is hopeful that implementing this scenario, which allows students to practice calculating and administering medications, will increase patient safety and reduce medication errors in the future. Students will also gain confidence in drug calculations and administering a variety of medications.

Process issues that occurred which may affect the effectiveness of this project is to make sure the simulation is appropriately placed in the course. During the Fundamentals course, medication administration and drug dosage calculations are covered over four lecture periods. Due to simulation scheduling and changes in the course schedule, the nursing students only received one out of the four lectures prior to the simulation experience. Next semester the schedule will be coordinated so that all lectures will be completed prior to simulation. The other process issue that occurred was the medication vials began to leak after being used for two medication simulations. For next semester, multiple vials will be obtained for each of the medications so that all the students can have equipment that is functioning appropriately. It would be helpful to conduct an additional medication simulation during the Fundamentals course or to have clinical instructors follow-up on dosage calculations. This would allow reinforcement of the material.

Physical space can be an issue with the implementation of this medication simulation.

Depending on the class size and if the nursing school has a designated simulation area, additional classrooms or offices may need to be utilized in order to get all the nursing students through the simulation experience.

Traditional nursing students today have been brought up in a world that involves a variety of sophisticated technologies. With this evolution of technology, the education of nursing students needs to adapt to these new technologies. Nursing faculty must implement teaching strategies that engage students and incorporate as much technology as possible. Simulation provides students with a hands-on approach that does not involve real patients. Students are able to gain confidence in their skills prior to clinical experiences and also continue to develop their nursing skills throughout their education experience.

Simulation has the potential to be included in many aspects of nursing education not just the pre-licensure programs. With nursing schools making large investments in the simulation technology, it is important to incorporate into the curriculum as much as possible. Simulation can be utilized in baccalaureate classes such as community health, assessment, or leadership and management classes. It can also be incorporated into graduate classes such as advanced assessment, pharmacology, and other courses that involve the development of hands-on skills to be developed.

The development of this medication simulation has contributed to the body of knowledge for nursing education. Developing simulations is a time intensive process and nurse educators need to support each other and share their knowledge. Future plans are to copyright this scenario and make it available for other schools of nursing to utilize. It will be presented at the 9th Annual International Nursing Simulation Learning Resource Center Conference in Las Vegas in June of 2010 and the Tennessee Simulation Conference in Nashville in November of 2010.

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Appendix A

RESEARCH MATRIX: METHODOLOGICAL FACTORS

Title, Year, Author, & Source	**Purpose** + Hypotheses or Study Questions	**Measurements/Operational Definitions** (with Rel/Val, prn) Independent variables	Dep/Intervention variables	**Sampling:** Method & size per subgroup	**Design:** Level of evidence & Other
Study #1: Learning Nursing Procedures The Influence of Simulator Fidelity and Student Gender on Teaching Effectiveness. (2008). Grady, J.L., Kehrer, R.G., Trusty, C.E., Entin, E.E., & Brunye, T.T. Journal of Nursing Education (47)9.	Purpose was to examine the influence of mannequin fidelity levels on the learning of two common nursing procedures: nasogastric tube insertion and indwelling urinary catheter insertion. First hypothesis: training supported by a reactive simulator that provides a better analog to the real world will produce a better training milieu and result in higher performance than training supported by the legacy static simulation. Second hypothesis: Men will be more comfortable with and more receptive to training on a high-fidelity mannequin, leading to higher performance.	Mannequin fidelity manipulated over two levels: low and high.	Student performance on nasogastric tube and urinary catheter insertion testing.	52 first year nursing students were invited to participate, 13 students failed to sign consent forms or complete the training session. 39 students completed study. 27 women, 12 men. Two experimental groups were created. Group 1 received high-fidelity simulation on the NG tube insertion and low-fidelity simulation on inserting a urinary catheter. Group 2 had low-fidelity simulation on the NG insertion and high-fidelity on insertion of urinary catheter. It was stated that students were randomly assigned to each group. Group 1 was tested on day one and group 2 was tested on day two.	Experimental
Study #2: Simulator Effects on cognitive Skills and Confidence Levels. (2008). Brannan, J.D., white, A. & Bezanson, J.L. Journal of Nursing Education 47(11).	Purpose was to compare the effectiveness of two instructional methods in teaching specific nursing education content (acute myocardial infarction, junior level) and how it affects nursing students' cognitive skills and confidence. Hypothesis: Baccalaureate nursing students who received instruction with the Human Patient simulation method regarding clinical treatment of patients with acute myocardial infarction	Instructional method (classroom lecture versus use of the human patient simulator method	Levels of cognitive skill and confidence in treating a patient with acute myocardial infarction	The eligibility criterion was enrollment in adult health nursing course as a BS nursing student either in the fall or spring semester. A total of 107 BS nursing students were enrolled. Group 1 (Fall) had 53 students and they received the traditional lecture. Group 2 (Spring) had 54 students and they received the human patient simulator method. Not randomly assigned.	Prospective, quasi-experimental, pretest and post-test comparison group design Both student groups completed pretesting Acute Myocardial Infarction Questionnarie Cognitive Skills Tests A and B, Confidence Level tool, and Demographic Date Form. The Cognitive skill test and confidence level tool were administered as posttests.

Title, Year, Author, & Source	**Purpose** + Hypotheses or Study Questions	**Measurements/Operational Definitions** (with Rel/Val, prn) Independent variables	Dep/Intervention variables	**Sampling:** Method & size per subgroup	**Design:** Level of evidence & Other
	would demonstrate greater levels of cognitive skills and Second hypothesis: confidence in their ability to provide nursing care to those patients.				Cognitive skills test piloted by 16 nursing students
Study #3 High-Fidelity simulation and the Development of clinical Judgmen: Students' Experiences. (2007). Lasater, K. Journal of Nursing Education, 46(6).	The purpose of this study is to examine the experience dimension, the high-fidelity simulation experiences of some of the first student participants and the effect of the experiences on the students' development of clinical judgment.			48 junior level students who were enrolled in the Nursing Care of the Acutely Ill Adult course. Only 39 of the 48 students were observed. All 39 observed students were invited to participate in the focus group. Only 15 students volunteered. They were all nontraditional students. 8 nontraditional female students formed another group. There was a representative from each of the original simulation groups.	Qualitative – researcher observations
Study #4 Testing a Simulation Framework Using a Simulation in Insulin Management. (2004). Jeffries, P.R., Dobbs, C. & Sweitzer, V. Retrieved March 15, 2009, from the Indiana University Purdue University Indianapolis Web site: http://planning.iupui, edu/392.html	The purpose of this study is to describe a teaching-learning strategy using simulation designed to increase the knowledge, problem-solving skills, and self-confidence when caring for a diabetic, insulin-managed patient and the students' satisfaction with this instructional method. Research questions: -What simulation design features were important to include in the insulin management simulation design? -What are the important educational practices embedded in the insulin			Convenience sample. 60 baccalaureate junior nursing students enrolled in the spring semester. Currently taking classes Alteration in Health I and Alterations in Health I practicum. Simulation was a regular course activity	Exploratory study. Simulation Design Scale – Cronbach alpha was 0.92. Educational Practices in Simulation Scale – Cronbach alpha was 0.96. Evaluation scale – Cronbach alpha 0.94 Self-confidence in learning – Cronbach alpha 0.85. Cognitive gains – pre and post tests

Title, Year, Author, & Source	**Purpose** + Hypotheses or Study Questions	**Measurements/Operational Definitions** (with Rel/Val, prn) Independent variables	Dep/Intervention variables	**Sampling:** Method & size per subgroup	**Design:** Level of evidence & Other
	management simulation? -What are the learning outcomes of knowledge, satisfaction, self-confidence, and judgment performance of the students when incorporating a simulation in the teaching-learning process?				
Study #5 The Importance of Debriefing in Clinical Simulations. (2008). Cantrell, M.A. Clinical Simulation in Nursing, 4(2).	The purpose of this study was to evaluate the benefit of a structured debriefing session after the students completed three pediatric clinical scenarios.			11 senior level students currently enrolled in the pediatric nursing course. Oral debriefing after scenario and review of videotaping 2 weeks following participation.	Qualitative – researcher observations
Study #6 Debriefing with the OPT Model of Clinical Reasoning during High Fidelity Patient Simulation. (2008). Kuiper, R.A., Heinrich, C., Matthias, A., Graham, M.J., & Bell-Kotwall, L. International Journal of Nursing Education Scholarship, 5(1).	The purpose of this study was to explore the impact of patient simulation technology on situated cognition of undergraduate nursing students. Hypothesis: It is hypothesized that debriefing with a clinical reasoning model can structure cognition, encourage reflection, and enhance judgments for clinical expertise. Goals: 1. Determine the clinical reasoning activities surrounding patient simulation and how they compare with authentic clinical experiences. 2. Determine if the OPT model could be			44 undergraduate senior level nursing students who had no previous experiences with simulation who completed OPT worksheets 2-3 hours after their assigned session for simulation.	Descriptive Design (Kendall's coefficient: W = .703, X2 (24) = .573, p = .000 Inter-rater reliability of 87% between two clinical instructors for a random selection of 16 OPT work sheets

Title, Year, Author, & Source	**Purpose** + Hypotheses or Study Questions	**Measurements/Operational Definitions** (with Rel/Val, prn) Independent variables	Dep/Intervention variables	**Sampling:** Method & size per subgroup	**Design:** Level of evidence & Other
	used as a method of debriefing following patient simulation.				
Study #7 Beyond the Five Rights: Improving Patient Safety in Pediatric Medication Administration Through Simulation. (2009). Pauly-O'Neill, S. Clinical Simulation in Nursing, 5(5).	The purpose of this study was to identify if intense training with simulation could improve student nurses' ability to accurately administer medications to complex pediatric patients.			Single observer, 20 prelicensure master's degree entry nursing students pre intervention. 30 student observations post intervention. Observation of student nurses in the simulation lab prior to training on medication administration and then observation post training. 59 second-semester junior level BSN students completed a pediatric medication administration exam.	Observational Used a Pediatric Medication Administation Skills Validation tool. (No indication of reliable and validity of tool).
Study #8 Investigation of Learning Outcomes for the Acquisition and Retention of CPR Knowledge and Skills Learned with the Use of High-Fidelity Simulation. (2009). Ackermann, A.D. Clinical simulation in Nursing, 5(6).	The purpose of this study was to compare the effects of two teaching methods on the initial acquiring of CPR knowledge and the retention of the information 3 months later. Research Questions: 1. Are there any differences in the acquisition of CPR knowledge and skills for junior-level nursing students receiving the two different teaching methods? 2. Are there any differences in the retention of CPR knowledge and skills for junior-level nursing students	Standard AHA CPR for Adults	High-Fidelity Simulation Experience	Acquisition phase sample size = 65. Retention phase sample size = 49. Junior-level baccalaureate nursing students from a small liberal arts college in the northeast. Pre test for previous CPR knowledge was given to both groups. CPR review for both groups. Posttest for acquisition of CPR knowledge/skills for both groups.	Quasi-Experimental Design Pre/post evaluation for CPR knowledge was performed using a 14-item multiple choice test extrapolated from the AHA exam. Cronbach alpha was .799 Measurement of CPR skills was determined by the AHA BLS for Healthcare Provider Course Final Evaluation Skills Sheet for Adult CPR. Crpnbach alpha was .74.

Title, Year, Author, & Source	**Purpose** + Hypotheses or Study Questions	**Measurements/Operational Definitions** (with Rel/Val, prn) Independent variables	Dep/Intervention variables	**Sampling:** Method & size per subgroup	**Design:** Level of evidence & Other
	receiving the two different teaching methods? 3. Are there differences in acquisition and retention of CPR knowledge and skill between the accelerate and traditional junior-level nursing students? 4. What is the relationship between the demographics of previous experiences and participation in CPR and the acquisition and retention of CPR knowledge and skills?			Second posttest 3 months later for both groups.	

Instructions for BAYSTATE MEDICAL CENTER INTEGRATED REVIEW TABLE, PART II OF II UTILIZATION FACTORS
(refer to Stetler model re: applicability of findings to practice, N.O., 1994, for details on meaning of various aspects of this utilization table)

Findings (per critiquers' review, with key qualifiers)	**Fit:** Setting & sample/subject description and related implications	**Unknown Factors** Potentially Relevant to Practice Problem	Implications for Feasibility: **Risk (benefit/harm)**	Implications for Feasiblity: **Resources/cost/readiness**
Study #1: ●Training with the high-fidelity mannequins led to significantly higher performance than did training with low-fidelity mannequins, F{1,37} = 2.83, p<0.05. This finding supports the hypothesis that high-fidelity mannequins enhance the effectiveness of training. It provides a better training environment. ●Students' attitudes were more positive after training with the high-fidelity simulators compared to the low-level simulators. F{1,37} = 3.22, p <0.05. Four items were found to contribute to this: -More realistic environment, t(37) = 1.57, p <0.10. -Provided realistic feedback to the student actions, t(37) = 2.43 p < 0.05. -Responded in a way that helped them learn the procedures, t(37) = 3.51, p < 0.01. -Almost as good as a live patient t(37) = 1.37, p <0.10. ●There was no overall performance differences between genders. Performed equally well on both nasogastric tube and urinary catheter procedures. Interaction between simulator fidelity and gender was only slightly significant F{1,37} = 1.83, p <0.10. ●A simple effects analysis showed that male students achieved higher performance scores than the female students only on the high-fidelity simulators, t(37) = 1.69, p < 0.05. ●Male students had a more positive attitude toward high-fidelity simulation F{1,37} = 5.01, p <0.05. ●Simple effects analysis showed that male students held a more positive attitude toward the high-fidelity simulation, t(11) = 1.90, p < 0.05.	This research information is very fitting for SAU School of Nursing. Sample size is close to what the school of nursing allows in their program. SAU has a high percentage of male nursing students which this research addressed. The procedures taught with the low-fidelity and high-fidelity simulators are procedures taught during SAU's skills lab – urinary catheter insertion and nasogastric tube insertion.	What level of simulation training did each of the nine instructors have? Was there a standard script involved so each of the instructors taught the same way?	Cause anxiety is some students, students not perform skills well if not trained using the high-fidelity simulators, students may not learn well if instructors not trained in simulation.	SAU currently has three simulation teachers with one BS level student assisting. Very limited teacher resources are available for any unexpectant absences. Simulation mannequins are extremely costly. Currently two adult mannequins were donated, and a recent purchase of a child and infant simulation mannequins was done this past summer. Pre-developed scenarios were also purchased this past summer. The climate of the school is definitely ready for this change. Many man hours have been used to research the impact of this learning style on curriculum. A simulation classroom with a control room is currently under construction. Visions of utilizing videotaping of the scenarios are being considered.
Study #2 Cognitive skill test showed a Spearman-Brown reliability coefficient of 0.74. Confidence Level tool reported a reliability coefficient of 0.89. Hypothesis #1 was supported. Students who received the simulation teaching achieved significantly higher posttest	The researchers used experienced adult health nurse educators. The setting of this study involved two different schools. Their simulation experience			The approach of 5 different stations (4 stations of case study review with clinical decision making questions to provide student direction and one station of

Findings (per critiquers' review, with key qualifiers)	**Fit:** Setting & sample/subject description and related implications	**Unknown Factors** Potentially Relevant to Practice Problem	Implications for Feasibility: **Risk (benefit/harm)**	Implications for Feasiblity: **Resources/cost/readiness**
scores on the cognitive test than the students who received traditional lecture. T=2.0, df = 79, p = 0.05. Intervention group also had significantly higher pretest scores t=-2.5, df = 96, p = 0.01. Hypothesis #2 was not supported. Confidence levels in the simulation group were not significantly higher than students receiving the lecture approach. T=-1.74, df = 81. P=0.09. Both groups confidence levels significantly improved regardless of teaching method.	involved 5 stations and students were rotated during a 2-hour period. Only 4 male students were involved in study. Their simulation approach is different from SAU's approach. SAU has a high percentage of male students.			simulation) involves many faculty. Development and implementation of simulation teaching involves a significant amount of resources and time. SAU does not have the availability of multiple faculty to help with simulation at this time.
Study #3 Thirteen primary themes were identified and then they were condensed into 5 major codes. They are: the strengths and limitations of high-fidelity simulation, the paradoxical nature of simulation, an intense desire for more direct feedback about their performances, the value of students' connection with others, some general recommendations for better facilitation and learning. *Strengths:* integrator of learning, brought theory and psychomotor skills together and required critical thinking, saw instant feedback of their interventions, forced them to anticipate complications which increased their critical thinking skills. *Limitations:* always had a female voice, no nonverbal communication, certain kinds of assessments can't be accomplished and the simulator can't be cut or show signs of swelling, etc. *Nature of simulation:* could mess up and the simulator wouldn't die, sometimes students felt stupid. *More direct feedback:* students wanted more direct feedback from instructor, build on strengths, identify the severity of the patient outcomes, wanted videotaped feedback. *Connection with others:* students learned from each other, interjected stories from fellow students or instructor, faculty comments about scenario, and others' ideas during debriefing, watching from another room was boring, stay in the same small groups, didn't like being the primary nurse and having to make decisions. *Recommendations:* improved reflection through the debriefing process, more structured observation, improve the learning obtained from reflective observation	This school of nursing used simulation in place of one clinical day per week. SAU only replaces one clinical day per quarter. SAU has a very diverse nursing student population. This study sample was very small and limited to nontraditional students.		Too much time taken away from regular studies due to discussing simulation scenarios.	One simulation scenario described involved the HPS receiving an antibiotic and then developing anaphylactic shock. This scenario could be incorporated into SAU program. Students stated that this scenario caused them to be aware of medication administration issues. New simulation program will include the possibility of videotaped feedback.

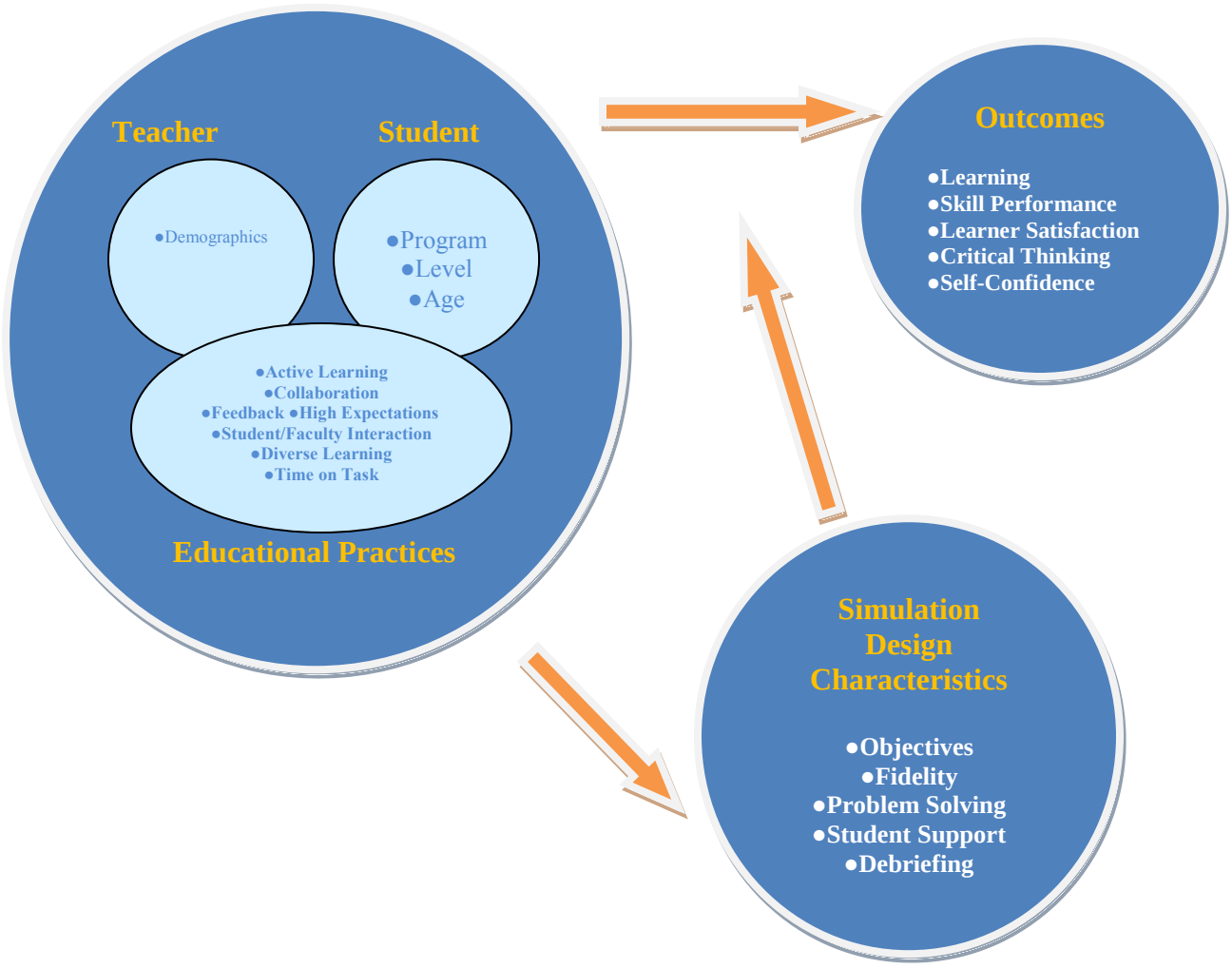
Findings (per critiquers' review, with key qualifiers)	**Fit:** Setting & sample/subject description and related implications	**Unknown Factors** Potentially Relevant to Practice Problem	Implications for Feasibility: **Risk (benefit/harm)**	Implications for Feasiblity: **Resources/cost/readiness**
Study #4 -The simulation design features that were most important to include in the insulin management simulation was having feedback. This helps the students understand the real-time experiences and identify what they did correct and what they did incorrectly and the rationales behind it. Next important was the high-fidelity simulation design. -The most important educational practices that need to be embedded in the simulation experience was the need for active learning and collaboration. -Learning outcomes of knowledge, satisfaction, self-confidence and judgment showed no difference between the pre and post tests. -Overall self-confidence in caring for an insulin dependent patient in the clinical setting was 4.3 on a 1-5 scale, the students perceived that they were making systematic appropriate judgments was 3.7, and the satisfaction with the instructional method was 4.2	This study is a good fit for SAU as the school is focusing on developing more simulation scenarios that deal with medication administration and critical thinking skills.		Lost some hospital clinical time since simulation was performed in the laboratory setting.	This is an easy scenario that could be incorporated into the Adult I clinical setting. It would involve educating four clinical instructors on the process of simulation. Additional quick scenarios could be developed for preconference material.
Study #5 -Results concluded that there were three critical components that influenced the students learning. They needed to be adequately prepared, appropriate demeanor of the faculty, and having debriefing at the conclusion of the scenario. -The students felt they were most prepared for the scenario that involved sickle cell anemia because they had discussed this content in class. They also appreciated having questions to answer prior to simulation. -Nursing faculty who provided cues to the students during the actual scenario, initiated humor, and had a supportive/mentor demeanor supported the students' learning. -Students felt very strong regarding having debriefing immediately after the scenario. The students didn't feel strongly either way regarding oral or videotaping. They felt the timing was the most important factor. Students suggested that after debriefing, the faculty could demonstrate how the scenario should have occurred. -Debriefing is a teaching strategy.	Important to be aware that nursing students' overall satisfaction are related to nursing faculty's demeanor and debriefing at the conclusion of a scenario.	-Simulation education of nursing faculty. -Length of debriefing session compared to actual simulation. -Model of debriefing used. -Actual questions used in debriefing.	-Anytime videotaping is used, students may experience an increase in anxiety.	-The three major components that were identified have already been incorporated. -Need to evaluate the purpose and need for videotaping.
Study #6 The 44 OPT model scores for the simulation experiences	-Simulation experiences should be conducted in correlation	-Length of time it took to complete a OPT	Nursing students stress in completing yet	Need to incorporate a standard model for

Findings (per critiquers' review, with key qualifiers)	**Fit:** Setting & sample/subject description and related implications	**Unknown Factors** Potentially Relevant to Practice Problem	Implications for Feasibility: **Risk (benefit/harm)**	Implications for Feasiblity: **Resources/cost/readiness**
averaged 48 points out of 76 points. These scores were then compared with the clinical reasoning scores of the same 44 students during authentic clinical experiences with critically ill medical-surgical patients. The 44 OPT model rating scale scores averaged 47 points out of a possible 76 points. A comparison of the two groups revealed no significant differences between the mean scores (t = -1.321, p = .194). A paired sample t-test comparing the scores for each section of the model by student revealed no significant difference between authentic clinical experiences and high fidelity patient simulation (t=-.680, p=.504). Overall, the scores were higher for simulation OPT worksheets on listing interventions, recording laboratory data, making judgments regarding tests, and connecting present-outcome states and NANDA diagnoses. Narrative comments: 1. The experience made us actually think for ourselves without relying on an instructor or preceptor to step in. 2. The experience challenged my clinical decision-making skills but it was difficult to write an OPT model about a mannequin. 3. The experience makes you think on the spot which I need practice with because it enhances critical thinking skills. 4. It was the first time I had to think fast to assess an unstable patient and prevent them from declining. 5. I think this was a fairly decent learning experience; however, we could get some of this practice in clinical. 6. We were able to practice doing all the things we would have to do in real situations without practicing on a living patient. It was identified that students shouldn't have actual clinical experiences completely replaced by simulation, but simulation does provide for critical thinking opportunities. It was also concluded that using the OPT worksheets helped provide and foster the debriefing process.	with didactic components. -Simulation is aligned with the Constructivism Theory. -Simulation can be used for remediation. -Simulation allows for errors in a safe environment. -Possibility of using simulation for student evaluations.	worksheet. -What other components of debriefing were utilized.	another worksheet.	debriefing throughout the curriculum.
Study #7	-Pediatrics is considered a	-Description of the	-Student anxiety in	-The implementation of a

Findings (per critiquers' review, with key qualifiers)	**Fit:** Setting & sample/subject description and related implications	**Unknown Factors** Potentially Relevant to Practice Problem	Implications for Feasibility: **Risk (benefit/harm)**	Implications for Feasiblity: **Resources/cost/readiness**
Pre-intervention showed 4 out of 18 (22%) correct medication administrations. -Right med 30% -Right patient 95% -Right time 90% -Right route 85% -Right dose 88% -Identifies self 76% -Assesses allergies 0% -Explains procedure 47% -Correct administration 22% Post intervention showed 29 out of 30 (97%) correct medication administrations. -Right dose 83% -Assesses allergies 90% -Correct administration 96%	complex nursing environment. -Errors do occur in the practice setting. -Need to focus on high risk drugs such as: morphine, insulin, vancomycin, potassium chloride, gentamicin, ceftrioxone, and heparin.	scenario. -Length of scenario. -Question if debriefing occurred. -What model of debriefing was used.	simulation. -Potential loss of classroom or clinical time to implement scenario.	medication administration scenario in the pediatric rotation has great potential. -Currently only assessment of the pediatric patient is being taught with the simulator. -Potentially have very limited nursing faculty that have pediatric and simulation experience.
Study #7 -The results for the pretest for CPR knowledge showed no significant difference in the mean score (p = .902). Scores between the traditional and accelerated groups showed (p=.900). Students who had performed CPR to a live patient showed higher scores (p=.012). -The CPR knowledge scores for the control group during acquisition phase showed a significant improvement (p=.000). -CPR knowledge scores for the experimental group during acquisition showed a significant improvement as well (p=.001). -Acquisition scores for CPR skills in the experimental showed significance (p=.000). -Three month retention of CPR knowledge were significantly higher for the experimental group (p=.002).	-Hands-on learning and active participation, and reflection enhance the learning process. -Simulation environment provides for safe learning. -Debriefing should be included with simulation experiences. -Students can be exposed to a wide variety of simulated experiences.	-Model and questions included in the debriefing session.	-All nursing students need to be exposed to a critical situation as the need for CPR since they can encounter this at any time during their nursing education.	-Limited resources as it related to CPR education. -Simulation could increase cost. -Faculty are ready to implement simulation in more areas of the nursing curriculum.

Appendix B

The Nursing Education Simulation Framework



(Jeffries & Rogers, 2007)

Appendix C

Tanner's Clinical Judgment Model/Lasater's Evidence-Based Rubric

Effective Noticing	Focused Assessment Recognized deviations from expected patterns Information Seeking
Effective Interpreting	Making Sense of the data Prioritizing
Effective Responding	Calm, confident manner Clear communication Well-planned intervention/flexibility Being skillful
Effective Reflecting	Evaluation/self-analysis Commitment to improvement

(Dillard et al, 2009)

Appendix D

SOUTHERN ADVENTIST UNIVERSITY
SCHOOL OF NURSING
NRSG 107 – FUNDAMENTALS II
MEDICATION SCENARIO

Location: Medical Unit

History/Information:
The patient is an 85 year old male admitted to the Medical Unit at Simlab Memorial with a recent diagnosis of pneumonia. Yesterday he went to his healthcare provider with complaints of fatigue, pleuritic pain, productive cough and some shortness of breath. An initial work-up revealed an elevated WBC, and his chest x-ray showed bilateral lower lobe infiltrates. He is a retired social worker, and his wife passed away three months ago. His past medical history includes diabetes, congestive heart failure, and a right total knee surgery 5 years ago.

Report at 6:45am:
You have just received report from the 7p-7a nurse. **Vital signs:** BP: 140/92, HR 92, RR 18, Temp. 100.3, and O2 saturation 94%. It is reported that the patient has slept well. Has required pain medication once during the shift. He is tolerating respiratory treatments well and has been placed on strict fall risk precautions. **Blood glucose** level at 9p last evening was 224 and this morning it was 195**. Labs:** WBC: 15.4 and K+: 3.9. **Allergies:** NKA **Weight:** 158 lbs

Healthcare Provider's Orders:
Admit to Medical Unit
Diagnosis: Pneumonia
Vital Signs every 4 hours
O2 at 2L per nasal cannula
Intake and output every shift
Foley catheter if unable to void
Bathroom privileges with assistance
Incentive spirometer (ICS) 10 times per hour, every hour while awake
Normal Saline at 30 ml/hour
Blood glucose monitoring before meals and at bedtime

MEDICATIONS: Trade Name (Generic Name)
Rocephin (Ceftriaxone) 1 Gram in 250cc IVPB every day (infuse over 90 minutes)
Heparin (Heparin) 50 units/kg subcutaneous BID
Novolog (Insulin Aspart) per sliding scale

Level 2	BS Normal Dose	Dose Reduction for HS/Skipped Meals
111-150	2 units	0 units
151-200	4 units	2 units
201-250	8 units	4 units
251-300	10 units	5 units
301-350	12 units	6 units
351-400	16 units	8 units

Solumedrol (methylprednisolone sodium succinate) 80 mg IV push BID
Lasix (Furosemide) 40 mg IV push every day
K-G Elixir (Potassium gluconate) 40 mEq po every day

Questions to complete:

1. Briefly describe the pathophysiology and etiology of pneumonia.

2. Briefly describe the pathophysiology and etiology of diabetes.

3. Briefly describe the pathophysiology and etiology of congestive heart failure.

4. Complete medication information.

Medication Form

Generic/Trade Name Dose, Route, Schedule	**Drug Action** - **A brief description of how the drug works**	**Why is your patient on this medication?**	**Nursing Implications** - **How do you give it? and in what time frame?** **What equipment will you need (include size of syringes)?**	**Is the medication appropriate to be given:**		
				Patient Diagnosis?	**Patient Lab Work?**	**Patient Vital Signs?**
Example **Lopressor (metaprolol) 50 mg PO BID**	Blocks beta1 receptors to help bring down high blood pressures and heart rates	Because his blood pressure is 140/82 and his HR is 92. His heart doesn't work very effectively, therefore, we have to make sure it doesn't get too tired out.	Check the V/S, if apical pulse is < 50 or B/P is low then I will hold it and call MD. Daily wt and I & O. Bring it in with a meal.	Yes. He has CHF	Yes.	Yes. B/P is 140/82 and HR is 92.
Rocephin (Ceftriaxone) 1 Gram IVPB in 250 NS every day (infuse over 90 minutes)						
Heparin 50 units/kg subq. BID						
Novolog (Insulin Aspart) Sliding Scale						
Solumedrol (Methylprednisolone sodium succinate) 80 mg IV push BID						
K-G Elixir (Potassium gluconate) 40 mEq po every day						
Lasix (Furosemide) 40 mg IV push every day						

Appendix E

Nurse Education Simulation Framework

Template for Simulation Development

Stage 1: Develop the Blueprint			
Course Name:	NRSG 107: Fundamentals II		
Client Name:	Larry Hawkins	**Client Acuity:**	Stable
Manikin:	Medium-High Fidelity	**Content:**	Medication Administration/Calculation
Skills:	Dosage calculations and the process of medication administration		
Type:	High-fidelity case study in the simulation lab	**Time:**	2 hour session
Evaluation:	Medication Test (ProCalc) Simulation Evaluation Form (see Appendix I)		
Authors:	Joelle Wolf, RN, BSN, MSN(c) Jaclynn Huse, PhD(c), MSN, CNE		
Date Created:	4/15/2009		

Goal:	Improve accuracy and critical thinking skills during medication dosage calculations
Objectives:	At the end of this scenario the student will be able to: 1. Explain what the physician's orders are really asking them to do. 2. Identify key data required to solve the dosage calculation. 3. Formulate a plan to solve dosage calculation problems accurately and consistently. 4. Solve the dosage calculation problem. 5. Judge whether dosage calculation solutions are logical or illogical and apply it to the patients specific situation.
Participant Preparation:	Each student will be required to bring Davis's Drug Guide and Medical-Surgical Nursing: Critical Thinking for Collaborative care by Ignatavicius and Workman. There will be pre-work for medication information and pathophysiology/etiology on pneumonia, diabetes, and congestive heart failure.

Client History:	The patient is an 85 year old male that lives in a local nursing home. Yesterday, he was seen by his healthcare provider with complaints of fatigue, pleuritic pain, productive cough and some shortness of breath. The healthcare provider transferred him to the Medical Unit at Simlab Memorial to be admitted with a diagnosis of pneumonia.									
Medical History:	Diabetes Congestive Heart Failure Total R Knee Replacement (5 years ago) Widowed and retired social worker									
Allergies:	NKA			**Height:**	5'9		**Weight:**	158 lbs		
Meds:	Rocephin (Ceftriaxone) 1 Gram in 250 NS mL IVPB every day (infuse over 90 minutes) Heparin (Heparin) 50 units/kg subcutaneous BID Novolog (Insulin Aspart) per Sliding Scale Solumedrol (methylprednisolone sodium succinate) 80 mg IV push BID Lasix (Furosemide) 40 mg IV push every day K-G Elixir (Potassium gluconate) 40 mEq po every day									
VS:	**B/P**	140/82	**HR**	92	**RR**	18	**T**	100.3 F	**SpO2**	94%
Labs:	WBC: 15.4 K+: 3.9 BG (9 pm): 224 BG (7 am): 195 Chest X-Ray – Bilateral lobe infiltrates									
Orders:	Admit to Medical Unit Diagnosis: Pneumonia Vital Signs every 4 hours O2 at 2L per nasal cannula Intake and output every shift Foley catheter if unable to void Bathroom privileges with assistance Incentive spirometer (ICS) 10 times per hour, every hour while awake Normal Saline at 30 ml/hour Blood glucose monitoring before meals and at bedtime									
Report to Start Scenario:	It is 6:45 am and the 7p-7a nurse reports that the patient has slept well through the night although he required pain medication once during the shift. He is tolerating respiratory treatments well and has been placed on strict fall risk precautions. Blood glucose level at 9p last evening was 224 and this morning it was 195.									

Stage 2: Procuring the Bill of Materials			
Simulation Scenario Equipment			
EQUIPMENT IN ROOM:			
Gender	Male	**Dress:**	Hospital Gown
IV	Peripheral R arm	**Oxygen Device:**	2L/NC
IV pump	X 1	**IV fluid**	NS at 30 mL/hr
IV piggyback tubing	X1	**IV fluid for PB**	250 NS
Syringes	1 mL, 3 mL, & 10 mL Insulin syringe	**IV flush**	NS
Medication Cup	Graduated medication cup		

MEDICATIONS AVAILABLE:			
Rocephin	500 mg vials of powdered Rocephin	**Solumedrol**	125 mg vial
Heparin	5,000 unit vial	**Lasix**	100 mg vial
Novolog Insulin	Vial	**K-G Elixir**	20 mEq/15 mL (need 2 total)

GENERAL EQUIPMENT:
Patient Chart Name band Stretcher bed Alcohol wipes

DOCUMENTATION AND ORDER FORMS
Physician's Order Sheet Medication Administration Record Diabetic – Flow sheet **(See Appendix F for all of these forms)**

Stage 3: Assembling the Structure	
Teacher Role:	The teacher acts as a facilitator and provides cues in a learner-centered environment. Faculty members responsible for implementing the classroom and clinical lab simulation have met with lead investigator and had the majority of the input into the development of this scenario. Future meeting will be scheduled prior to implementation to problem-solve and ensure that teachers are comfortable with this format.
Student Role:	All students will have the role of the nurse in calculating the

	medications. Each student will play a leadership role and becomes the expert on one medication and will discuss with the small group of students how they arrived at their solution and what the references have to say about dosing and administration. Each student will also play the role of observer to the lead student and listen and actively give input during the discussion of each medication. Students in clinical lab will each prepare one of the medications they have calculated and give it to the manikin.
Embedding Best Educational Practices:	1. Engage students in active learning while providing cues, reinforcement, feedback, and support in the learning process. - Students will actively participate in small group discussions - Teacher will be available for clarification and support 2. Promote collaboration in problem-solving with peers and mimicking what actually happens in the real world working environment. - Small group work will be encouraged 3. Accommodate diverse styles of learning to a rapidly changing diverse student body. - Utilizing simulation and collaboration 4. Empower students to set high goals and high expectations to become confident nurses - This simulation gives them the opportunity to learn to be successful in dosage calculations prior to beginning clinical rotations which require medication administration.
Debriefing Priorities:	1. Identify theory to practice gaps. 2. Investigate the emotional experience of the student. 3. Reinforce learning objectives.
Debriefing Questions:	Utilizing Tanner's Clinical Judgment Model: 1. Describe what happened with this case study today? 2. What were you thinking and feeling while you were doing the dosage calculations? 3. How accurate were your calculations? 4. What information helped you during this simulation? 5. How did you prioritize? 6. How was your communication? 7. What was good and bad about the experience? 8. What sense can you make of this situation? 9. What else could you have done?

	10. If the issues you experienced arose again, what would you do?
Stage 4: Finishing the Project	
Evaluate the Learning Process	Scores from Medication Test – ProCalc Scores from Unit Tests specifically medication questions Evaluation information from Simulation Evaluation
Revisions & Refinement	This scenario has been refined and revised after implementing it with a group of Fundamental II students during the spring of 2009 and fall of 2009. Medication and pathophysiology information will be conducted prior to the simulation experience, so that during the simulation focus can be placed on medication calculation and administration.

Appendix F

Dosage Calculation Worksheet

Complete the following dosage calculations for these medication orders **on your own** by using the medications and equipment such as syringes, etc. available to you in the laboratory to answer these questions.

1. **Rocephin (Ceftriaxone) 1 gram in 250 mL NS IVPB over 90 minutes.**
    a. How fast will you set the rate on the IV pump?
    b. In your opinion, does this sound like a reasonable rate?
    c. What supplies are needed?

2. **Heparin (Heparin) 50 units/kg subcutaneous BID.**
    a. How much does your patient weigh in pounds?
    b. How much does your patient weigh in kilograms?
    c. How many units of Heparin are you going to give?
    d. How many mls will you draw up from the vial for this dose?
    e. What syringe would you choose to draw it up and administer it?
    f. In your opinion, does this sound like a reasonable amount to inject?

3. **Novolog (Insulin Aspart) per Sliding Scale.**
    a. Based on the sliding scale, how many units of insulin are you going to give?
    b. In your opinion, does this sound like a reasonable amount to inject?

c. What syringe would you choose to draw it up and administer it?

4. **Solumedrol (Methylprednisolone sodium succinate) 80 mg IV push BID**.

   a. How many mL will you draw out of the vial for this dose?

   b. In your opinion, does this sound like a reasonable amount to push IV?

   c. Dilution amount?

   d. Rate of administration of IV push?

5. **K-G Elixir (Potassium gluconate) 40 mEq po every day.**

   a. How many mL will this patient need to get the prescribed dose?

   b. In your opinion, does this sound like a reasonable amount to give the patient?

   c. Does the elixir need to be diluted? If yes, how?

6. **Lasix (Furosemide) 40 mg IV push every day**.

   a. How many mL will you draw up into the syringe?

   b. In your opinion, does this sound like a reasonable amount to give IV push?

   c. Dilution amount?

   d. Rate of administration of IV push?

Medication/Drug Evaluation

Within your small groups, each student takes on the leadership role and:

1. Discuss your assigned drug including the information from the page above.
2. Describe how you solved the dosage calculation
3. Allow other members of the group to describe how they solved the problem.

Generic/Trade Name **Dose, Route, Schedule**	**Did the calculated dose fall within the normal range of dosages?**	**Describe the different methods your classmates used to solve the problem.**	**Did you all obtain the same solution?** **……** **…** **If not, did you or someone else help you catch it when you were discussing the process?**	**Did your peer** **a. Calculate** **b. Prepare** **c. Administer** **the medication correctly?**
Rocephin (Ceftriaxone) 1 Gram IVPB in 250 NS every day (infuse over 90 minutes)				a. b. c.
Heparin 50 units/kg subq. BID				a. b. c.
Novolog (Insulin Aspart) Sliding Scale				a. b. c.
Solumedrol (Methylprednisolone sodium succinate) 80 mg IV push BID				a. b. c.
K-G Elixir (Potassium gluconate) 40 Eq po every day				a. b. c.
Lasix (Furosemide) 40 mg IV push every day				a. b. c.

Appendix G

SOUTHERN ADVENTIST UNIVERSITY
power for mind & soul
School of Nursing

Larry Hawkins
#000000004

Simlab Memorial Hospital
Physician Orders

Admit to Medical Unit
Diagnosis: Pneumonia
Vital Signs every 4 hours
O2 at 2L per nasal cannula
Intake and output every shift
Foley catheter if unable to void
Bathroom privileges with assistance
Incentive spirometer (ICS) 10 times per hour, every hour while awake
Normal Saline at 30 ml/hour
Blood glucose monitoring before meals and at bedtime
Rocephin (Ceftriaxone) 1 Gram in 250cc IVPB every day (infuse over 90 minutes)
Heparin (Heparin) 50 units/kg subcutaneous BID
Novolog (Insulin Aspart) per sliding scale

Level 2	BS Normal Dose	Dose Reduction for HS/Skipped Meals
	111-150 2 units	0 units
	151-200 4 units	2 units
	201-250 8 units	4 units
	251-300 10 units	5 units
	301-350 12 units	6 units
	351-400 16 units	8 units

Solumedrol (methylprednisolone sodium succinate) 80 mg IV push BID
Lasix (Furosemide) 40 mg IV push every day
K-G Elixir (Potassium gluconate) 40 mEq po every day
Morphine (Morphine Sulfate) 1-2 mg IV every 4 hours PRN pain

_____

Dr. J. Wolf

SOUTHERN ADVENTIST UNIVERSITY
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School of Nursing

Larry Hawkins
#000000004

MEDICATION ADMINISTRATION RECORD			
Initials	SCHEDULED MEDS DOSE	0701-1900	1901-0700
	Rocephin (Ceftriaxone) 1 Gram in 250cc NS Infuse over 90 minutes	1000	
	Heparin (Heparin) 50 units/kg subcutaneous BID	0900	2100
	Novolog (Insulin Aspart) subcutaneous per sliding scale AC & HS Level 2 BS Normal Dose / Dose Reduction for HS/Skipped Meals 111-150 2 units / 0 units 151-200 4 units / 2 units 201-250 8 units / 4 units 251-300 10 units / 5 units 301-350 12 units / 6 units 351-400 16 units / 8 units	0730 1130 1630	2100
	Solumedrol (methylprednisolone sodium succinate) 80 mg IV push BID	0900	2100
	K-G Elixir 40 mEq po every day	0900	
	Lasix (Furosemide) 40 mg IV push every day	0900	
	PRIMARY IV'S and DRIPS	0701-1900	1901-0700
	Normal Saline at 30ml/hour		
	PRN MEDS DOSE		
	Morphine (Morphine Sulfate) 1-2 mg IV every 4 hours PRN pain		

FULL SIGNATURE	INIT	FULL SIGNATURE	INIT	FULL SIGNATURE	INIT

SOUTHERN ADVENTIST UNIVERSITY
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DIABETES
FLOW SHEET

Patient: Larry Hawkins
#000000004

- Obtain lab glucose to verify glucose < 50 or > 380. Subsequent glucose values > 380, verify every shift.
- Blood Glucose Targets: < 110 Preprandial < 180 Postprandial or random
- **For all blood sugars < 60 and for blood sugars 60-80 with symptoms, initiate *Hypoglycemia Protocol* from Physician Standing Orders.**

Insulin Key

R = Regular (Humulin, Novulin**)**
NPH = NPH (Humulin, Novulin)
H = Humalog
Nov = Novolog
La = Lantus
70/30 = Humulin/Novulin 70/30
75/25 = Humalog Mix 75/25
70/30 Nov = Novolog Mix 70/30
All others, do not abbreviate; give full name of insulin type

Site Key

1 = Rt Armback
2 = Lt Armback
3 = Rt Thigh
4 = Lt Thigh
5 = Rt Abdomen
6 = Lt Abdomen

Date	Time	Blood Glucose			IV Insulin			Sub Q Insulin					Comments
		Meter	*Lab*	*Init.*	*Drip Rate units/hr*	*Bolus IVP*	*Init.*	*Time*	*Insulin Type*	*Units*	*Site*	*Init.*	
3/8/10	2100	224		JD				2110	Nov	4	1	JD	

SIGN & TITLE	*INIT*	*SIGN & TITLE*	*INIT*	*SIGN & TITLE*	*INIT*
Jane Doe, RN	JD				

Appendix H

Medication Simulation Teaching Elements

- Review the report "To Err: Is Human
- Discuss the implication of medication safety and how it relates to nursing practice
- Review pathophysiology of pneumonia, CHF, and diabetes
- Link the patient's condition to MD orders, patient's lab results, and medication orders
- Show an incentive spirometer and how to use it
- Learn how to identify key information in the drug book
- Learn how to complete a drug information sheet (similar to their client worksheet info)
- Learn how to use an IV Drug book
- Review the importance of knowing dilution, rate of administration, and compatibility with IV medications.
- Learn the Polya's process of planning how to do drug calculations
- Actually calculated medication drug problems (6) and reviewed rounding rules
- Read medication labels
- Identify three different syringes and their usage.
- Discuss six medications and their usage, correct dose, reason why our patient is receiving them, and did their calculations make sense
- Draw up medications from vials
- Discuss safety goals especially identification of the patient prior to med administration
- Discuss double check medications
- Perform subcutaneous injections
- Review areas on the body for subcutaneous injections
- Review angles that subcutaneous injections are given
- Identify critical judgments used in deciding what angle to use when giving SC injections
- Learn the process of how to perform an IVP
- Discuss the needleless IV tubing system
- Actually perform IVPs on the patient
- Learn the process of hanging an IVPB
- Actually hang an IVPB
- Discuss primary IV solutions and secondary solutions
- Learn what a MAR was how to document on it
- Actually document on a MAR
- Learn what a Diabetic Flowsheet is and how to document on it
- Actually document on the Diabetic Flowsheet
- Identify legal issues with medication documentation
- Discuss insulin and how to use a sliding scale to cover blood glucose levels
- Identify infection control practices related to medication administration
- Answer any other questions the students might have had

Appendix I

SOUTHERN ADVENTIST UNIVERSITY
SCHOOL OF NURSING

Student Evaluation of Simulation Lab

Teacher Name _____ Class Level_____

Directions: *Rate your simulation experience on each item, giving the highest scores for an effective experience and lowest score for an ineffective experience. Circle the number after each statement that most nearly expresses your view. Please do not sign your name.*

		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	The simulation objectives and outcomes were clearly explained.	4	3	2	1
2.	The simulation scenarios represented realistic situations in healthcare.	4	3	2	1
3.	Learning in the simulation setting was non-threatening.	4	3	2	1
4.	The simulation experience promoted critical thinking skills.	4	3	2	1
5.	The instructor provided cues and guidance when needed in the simulation experience.	4	3	2	1
6.	The simulation experience allowed me to gain self confidence in my medication administration and calculation skills.	4	3	2	1
7.	The simulation experience gave me a better understanding of the nursing role in the healthcare setting.	4	3	2	1
8.	The instructor exhibits current nursing knowledge and skills.	4	3	2	1
9.	The instructor provided clear and meaningful answers to student questions.	4	3	2	1
10.	During the debriefing, the instructor provided constructive feedback.	4	3	2	1

What was the MOST helpful aspect of SimLab or Sim Instructor?

What improvements could be made in SimLab?