Enhancing Nursing Skills to Care for Patients with Chronic Obstructive Pulmonary Disease

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Doctor of Nursing Practice Scholarly Project

Abstract

Best practices in the care of patients experiencing a deteriorating condition include identifying changes in patient condition and initiating prompt and effective interventions. Nurses frequently fail to recognize deteriorating conditions and serious exacerbation of symptoms and thus are limited in providing appropriate supportive care to patients with COPD. Innovative strategies, such as the implementation of clinical simulations, are reported to be effective in reinforcing essential clinical decision-making skills to assist nurses in developing the knowledge and skills to better recognize and intervene in the care of deteriorating conditions in patients with COPD.

The purpose of this Doctor of Nursing Practice quality improvement project was to develop, implement and evaluate the use of two simulation experiences to assist registered nurses to recognize and intervene in deteriorating conditions in chronically ill adult patients with COPD. Simulation scenarios included the patient with exacerbation of COPD and the patient with a spontaneous pneumothorax as a result of COPD complications.

A convenience sample of seven licensed registered nurses from diverse clinical backgrounds participating in a nursing orientation program at an urban, general adult medicine and surgical hospital in Baltimore, Maryland engaged in the project. The NLN/ Jeffries Simulation Theory and the INASCL Standards of Best Practices in Simulation provided the framework for the project. Utilizing the three phases of the simulation experience, the seven registered nurses were immersed in the two simulated clinical situations.

Baseline knowledge of the care of the patient with COPD and spontaneous pneumothorax was assessed by administering a 10 item, paper-pencil pre-test aligned to the simulation objectives. The simulation experiences were evaluated using the Creighton Competency

Evaluation Instrument (C-CEI) and a 10 item posttest. The clinical nurse educator and the DNP project director used the C-CEI tool to separately evaluate participant performance in each simulation experience. The project director with clinical nurse educator validation, set the competency score for the C-CEI at 75%. The scores on the C-CEI were collected as an aggregate of the nurses delivering care to the simulated patient. All groups of nurses scored above 75%. A T-test (n=7, p =.000) for dependent groups was used to evaluate whether students' performance on the COPD and pneumothorax pre-test improved on the post-test. There was a statistically significant increase in the COPD and pneumothorax mean scores from the pre-test to the post-test.

The completed DNP project supports the use of clinical simulation to train and remediate practicing nurses. The participating nurses were able to immerse themselves in a realistic clinical situation and care for the simulated patients in a safe environment as though the patients were real. The participating nurses could identify significant changes in patient condition and were competent in intervening and caring for the deteriorating conditions of a COPD patient. Evidence from this DNP quality improvement project supports the need for continued clinical work and program evaluation on the development, and implementation of hospital based clinical simulation programs for nurses.

Enhancing Skills of Nurses to Care For Patients With Chronic Obstructive Pulmonary Disease

Chronic obstructive lung disease (COPD) is a debilitating syndrome of respiratory related diseases that affect the airways. COPD is listed as the third leading cause of death in the United States, and affects 5.3% of the population in Maryland (Center for Disease Control (CDC), 2012). The incidence of COPD is higher in urban-poor communities at a reported rate of 11. 2% in America (Raju, 2015). COPD is a frequent cause of hospitalization in our aged population, accounting for an approximately 65% of discharges in patients 65 years and older in 2010 (CDC, 2012).

Patients with COPD do not receive the same quality of nursing care as patients with other chronic disorders (Griffith, Murrells, Dawoud, & Jones, 2010). Factors that negatively impact the ability of nurses to adequately intervene in deteriorating conditions of chronically ill patients include failure to perform appropriate observations, failure to record pertinent observations, failure to recognize early manifestations of deterioration, and failure to communicate deteriorating conditions to the provider (Beaumont, Luettel & Thomson, 2008). Nurses caring for patients with chronic conditions need support in recognizing deteriorating patient conditions and serious exacerbation of symptoms (Friese & Aiken, 2008).

Professional development activities traditionally include lecture in classroom and modules online for imparting information. Clinical professional development programs that include hands-on learning opportunities that reflect actual patient care experiences have been found to increase nurse satisfaction with the learning process and improve retention (Patterson, Bayley, Burnell & Rhodes, 2010). Innovative strategies for relating knowledge to practice, such as the implementation of clinical simulations, have been reported to be effective in reinforcing essential clinical decision making skills to assist nurses in developing the knowledge and skills to

better recognize and initiate prompt interventions in deteriorating conditions in patients (Bultas, Hassler, Ercole & Rea, 2014). Improved clinical decision making skills in nurses should positively affect patient outcomes.

The use of hospital based simulation experiences is an evolving teaching strategy to improve the quality of healthcare delivered to patients. Simulation exercises have been found to be an effective strategy to enhance patient safety and strengthen patient safety outcomes (Schmidt, Goldhaber-Fiebert, Ho & McDonald, 2013). Simulation allows healthcare providers to engage in patient care situations, and allows participants to practice technical and procedural actions without posing risks to vulnerable populations. Simulated experiences allow participant learners to engage in clinical situations in a safe and supportive environment (Ackermann, Kenny & Walker, 2007). Simulated clinical experiences may help to address the need for innovation in hospital nursing professional development programs as well as facilitate experiential learning (Belden, 2011; Decker, Sportman, Puetz & Billings, 2008; Liaw, Koh, Dawood, Kowitlawakul, Zhou & Lau, 2013; Roche, Schoen, & Kruzel, 2013). Simulated clinical events are structured to depict realistic patient care situations. Central to the development of the clinical experiences is the use of human patient simulators (HPS) or standardize patient actors that serve as the patients in the clinically focused scenarios. These structured clinical events allow the participant-learner to gain expertise in clinical situations. These experiences also allow the learner to develop knowledge, skills and attitudes relevant to clinical practice in a realistic situation without fear of harming actual patients (International Nursing Association for Clinical Simulation [INACSL], 2013; Pilcher, Goodall, Jensen, Huwe, Jewell, Reynolds & Karlson, 2012).

The purpose of this Doctor of Nursing Practice quality improvement project was to develop, implement and evaluate the use of two simulation experiences to assist registered nurses to recognize and initiate prompt and effective interventions in deteriorating conditions in chronically ill adult patients with COPD. It is anticipated that the development and implementation of simulation experiences to foster learning will provide consistent and structured patient care opportunities for registered nurses. The implementation of simulation experiences focusing on patient conditions frequently seen in the urban hospital setting will provide nurses with the experience to critically think through situations of deteriorating patient conditions in a less threatening and safe environment.

Theoretical Framework

The NLN/ Jeffries Simulation Theory underpins the activities of the quality improvement project (Jeffries, 2012). The NLN/ Jeffries Simulation Theory grew out of the development of the science of clinical simulation. No formal theoretical framework specifically designed to explain the phenomenon of clinical simulation existed prior to the development of the NLN/ Jeffries Simulation Theory (Rizzolo, Durham, Ravert & Jeffries, 2012). This middle-range theory articulates the administrative, teaching and clinical aspects of simulation experiences (Durham, Cato & Lasater, 2014).

The NLN/ Jeffries Simulation Theory identifies three phases of the simulated clinical experience: pre-briefing activities, the implementation of the clinical simulation and a debriefing discussion period (Jeffries, 2012; Jeffries, Rodger & Adamson, 2015). Together, these three phases foster clinical reasoning and decision making in the learners. The use of a predesigned, peer reviewed script will guide the clinical situation and will be used to provide background clinical information to leaners in the pre-briefing phase of the simulation. During the

implementation of the clinical simulation effort must be taken to make the simulation arena appear as close to the actual patient care environment as possible. Equipment and patient care supplies are needed to enhance the realism and authenticity of the simulated clinical situation. Appropriate moulage and props should be used to enhance the realism of the clinical experience. The use of a quality post simulation debriefing technique will be used to engage the learner in a dynamic and robust interaction at the end of the clinical situation. Through this post-simulation discussion learners discover their strengths and identify opportunities for improved performance in the prescribed clinical situation. These three phases of the theory were used to select, implement and evaluate simulated learning activities in the proposed educational program.

Review of the Literature

The review of the literature will focus on the management of patients with COPD, the needed training of nurses to adequately care for these patients, and the use of clinical simulation to facilitate that training. The literature review will begin with a discussion of the recommended treatment for patients with exacerbated COPD. It will proceed with evidence related to programs for training nurses on providing adequate nursing support for COPD patients. Finally, the review will conclude with current evidence on the use of simulation scenarios in nursing practice as a strategy to improve ability of licensed, bedside nurses to care for COPD patients.

A review of the literature revealed current evidence based treatment protocols for patients with COPD is directed at physician and nurse practitioners. This includes the administration of corticosteroids, bronchodilators, antibiotics and oxygen with noninvasive positive pressure ventilation, as appropriate treatment for patients in COPD exacerbation (Global Initiative for Obstructive Lung Disease [GOLD], 2015; National Guidelines Clearinghouse [NGC], 2014). Nurses caring for COPD patients in inpatient, direct care settings do not have the authority to

initiate these protocols in practice. However, they must be able to recognize the critical condition of patients with exacerbated COPD and make prompt interventions using these treatment protocols as a guide to their practice. Scullion (2008) addressed the role of bedside nurses in the prompt treatment of exacerbations in COPD. Scullion (2008) developed a teaching program to assist British nurses to understand the importance of prompt intervention in the treatment of patients with COPD. The educational program is based on a COPD quality care standard developed by the National Collaborating Centre for Chronic Conditions and the National Service Framework for COPD. The teaching program consist of four discussion topics related to the nursing care of the patient with COPD; prompting nurses to: a) consider the patient's presenting symptoms, b) consider the understanding healthcare professionals and the public concerning the treatment of COPD, c) consider the education and emotional needs of the patient experiencing an acute exacerbation and, d) identify collaborative resources to aide in the care of the COPD patient. Evaluation information about the program was not included. However, the program employs the use of the effective educational strategies to promote discussion and reflection from the participants.

Cope, Fowler and Pogson (2015) also identified that a teaching program directed at enhancing the knowledge of nurses caring for COPD patients would positively impact patient outcomes. Cope et al. (2015) implemented a nurse led COPD support program aimed at reducing length of stay in patients in an England based hospital. Nurses engaged in a teaching program designed to increase their knowledge and skill in caring for patients with COPD. COPD patients cared for by nurses participating in the study reported receiving an improved quality of care. Cope et al. (2015) compared the length of stay of patients in 2013 to patients in 2014 (n=464). The researcher identified the average length of stay for COPD patients in a

hospital in England was reduced by 2.53 days for patients cared for by nurses that participated in the educational program.

Professional development programs directed at nurses caring for patient with COPD will strengthen nurse-patient and family relationships and can provide information directed at enhancing COPD patient and family satisfaction with the care they receive. Gardiner et al. (2009) in a literature review of 15 articles determined that open communication with COPD patients and their families, directed at alleviating fear and providing emotional support was reported by patients as relevant to their satisfaction with the care received. However, it was identified that the nursing staff did not routinely give this type of emotional support. Based on this review, there is a need for the development and implementation of professional development programs and interactive learning strategies to increase the knowledge and skill of nurses to provide emotional support to patients with COPD.

Structured learning opportunities for nurses caring for patients with COPD and pneumothorax can improve their recognition of a deteriorating respiratory condition. Exacerbation of these conditions can be a rapidly deteriorating and complicated situation for patients. The ability of nurses to appropriately monitor patients, identify changes in patient conditions, and initiate prompt interventions are critical to the survival of patients experiencing a deteriorating conditions (Chua, Mackey, Ng & Liaw, 2013; Miller 2015). However, nurses may not recognize the significance of minimal changes in the patients' conditions, causing a delay in appropriate interventions. The development and implementation of the use of simulation in a clinical education program has been reported to improve the recognition of deteriorating patients (Waldie, Tee & Day, 2016).

The Institute of Medicine (IOM) report, To Err is Human: Building a Safer Health Care System (2000) supports the use of clinical simulation to improve patient safety (Kohn, Corrigan, & Donaldson, 2000). Simulated clinical experiences can provide learners with opportunities to experience clinical situations and provide interventions within a safe, supervised setting without posing a risk to a patient (Durham & Alden, 2008). High quality, simulated exercises with mandatory periodic updates is a recommended protocol to train and remediate nurses in implementing practice standards and to improve recognition of deteriorating conditions in patients (Waldie, Tee & Day, 2016). For example, Cooper et al. (2011) used a simulated clinical experience focusing on the care needs of a deteriorating patient (n=35). The participant achieved minimal situational awareness scores of 50%, after engaging in the simulated experience. Performance scores and situational awareness scores improved with repeated exposure to the scenario. The result of the study is limited by its small sample size. However, the result is consistent with similar studies related to situational awareness and simulation.

A synthesis of the literature reveals that structured learning programs for nurses, such as simulation experiences, can improve safety in the care given to patients (Cope, Fowler & Pogson, 2015; Kohn, Corrigan, & Donaldson, 2000). These educational programs should be designed to support the acquisition of knowledge in the care of patients with specific health conditions and should include activities that assist the nurse in developing skills to meet the physical and emotional needs of patients (Gardiner, et al, 2009). Simulated clinical experiences are effective to approve the ability of the nurse to recognize of deteriorating conditions in patients and support the initiation of prompt interventions that are critical to the survival of patients experiencing deteriorating conditions, such as those with COPD (Chua, Mackey, Ng & Liaw, 2013; Miller 2015). The structured, simulated clinical experiences should be periodically

updated to maximize the benefits of remediation in supporting the recognition of deteriorating patients (Waldie, Tee & Day, 2016). Current evidence based treatment protocols for patients with COPD supports the implementation of repetitive training of physician providers and nurses using simulated clinical simulation scenarios to improve skills in prompt and appropriate intervention of the deteriorating patient with COPD (Global Initiative for Obstructive Lung Disease [GOLD], 2015; National Guidelines Clearinghouse [NGC], 2014). The continued development of evidence-based programs involving structured clinical experiences, such as simulation, is needed to assist professional registered nurses to care for patients with deteriorating conditions such as those with COPD. The evaluation of the research included in this literature review appears in the evidence-rating chart, (see Appendix A1).

Methods

Design, Setting and Sample

The setting of the DNP quality improvement project was an urban, adult medicine and surgical general hospital in Baltimore, Maryland. The hospital census for September 2016-May, 2017 identified 140 patients were admitted with COPD. These admissions culminated in 716 total days of inpatient care, with an average length of stay of 5.1 days (Census report, Bon Secours Health System Baltimore, May 2017).

A convenience sample of seven licensed registered nurses participating in a general nursing orientation program at the hospital participated in the project.

Procedures

Introduction and Training

The project leader met with the clinical nurse educator responsible for facilitating the nursing orientation program and the Director of Nursing of the hospital to explain the objectives of the project. The project leader shared copies of the introductory script, the COPD and pneumothorax pre-test and posttest, the demographic data collection survey, the simulation scenarios and the Creighton C-CEI tool with the clinical nurse educator and Director of Nursing (see Appendix C-K).

The project leader and the clinical nurse educator met two weeks prior to the implementation of the project to complete training for the Creighton C-CEI tool and to prepare the simulation laboratory and the high fidelity manikin for the simulation exercises. The content of the training program was based on the International Nursing Association for Clinical Simulation and Learning [INACSL] (2013) standards of best practices for simulation, and included a review of all assessment tools to be used in the simulations. The training required the project leader and the nurse educator to complete the online instructional program to use the Creighton Competency Evaluation Instrument (C-CEI) (https://nursing.creighton.edu/academics/competency-evaluation-instrument/training). The project leader reviewed the use and scoring of the C-CEI tool with the clinical nurse educator to clarify questions for the educator. The project leader reviewed the simulation scenarios; guided the clinical nurse educator in preparing the simulator and the equipment used in the scenarios; reviewed the process to guide participants through the three phases of the simulation experience; and assisted the educator in performing a test of each of the simulations. The pre-testing of the simulations helped the educator and the project leader to coordinate the activities of each

simulation and increased the comfort level of both in implementing the scenarios during the orientation. The project leader functioned as a simulation mentor and supported the clinical nurse educator in facilitating and administering the simulation experiences. Training of the nurse educator supported the sustainability of the project.

Together, the project leaders and the clinical nurse educator agreed on which behaviors on the C-CEI tool were applicable to the simulation scenarios to be implemented. The project leader and the clinical nurse educator agreed that items six- documents clearly, concisely and accurately; and seventeen-delegates appropriately, did not apply to the anticipated actions of the simulation participants. The project leader and the clinical nurse educator agreed that these behaviors will be excluded from the evaluation process. The developers of the C-CEI tool state that omissions will not impact the validity of the tool (https://nursing.creighton.edu/academics/competency-evaluation-instrument/training).

Implementation

The simulation scenarios were implemented from February 2017 to May 2017, during the second and third weeks of the orientation sessions. During this time in the orientation period, the newly hired nurses were paired with a preceptor and were engaging in patient care on the nursing units. Delivering simulation experiences as the newly hired nurses engage in actual patient care supported the direct patient care experiences of the nurse orientees.

The clinical nurse educator scheduled nurses at specific times during their new hire orientation to participate in the simulation activities. There were times when the simulation experiences had to be re-scheduled from the dates identified due to changing activities during the orientation period. Some of the nurse participants required shortened orientation periods due to their level of patient care experience. Their participation in the simulated experiences needed to

be scheduled earlier because their orientation period was shortened. Other participants were working the night shift and special scheduling was needed to have them participate in the daytime simulation activities.

The nurse participants assembled at the simulation center, and were greeted by both the clinical nurse educator and the project leader. During the pre-briefing segment of the simulation experience, each participant was given a dated packet that included a demographic survey, the pre and post knowledge assessment of content related to the simulation, an overview of the simulated client and the Creighton Competency Evaluation Instrument. Prior to the implementation of the simulations, the project leader prepared slips of paper with ten numbers and letters to be randomly selected by the participants. The numbers and letters were used to code the tests of the participants. Participants were asked to select a slip of paper from a box and to write the letter or number on their pre and posttest. Once a slip of paper was selected, it was not returned to the box to ensure that no participants received the same code. Pre and posttest forms were coded to distinguish pre and post test data.

A statement was read prior to the beginning of each simulation session explaining the objectives of the simulation experiences and that participation in the simulation would not affect employment (Appendix C).

Simulation Scenarios

The simulation scenarios used in the project were peer reviewed, developed by Laerdal® and were designed to be used with the 3G SimMan simulator. Each scenario included specific objectives and included programing and implementation guidelines to be used by simulation facilitators. The seven nurses participating in the simulation project formed simulation teams of 1 to 4 nurses participating in each scenario. Simulation teams consisted of active observers and

care giving participants. Participants in simulation teams of three or more nurses were randomly selected to assume the role of active observers or care giving participants.

The first simulation exercises were delivered in February, 2017. Four nurses participated in the simulation exercises. Two nurses in the team of four participants were randomly selected to be direct care givers in the scenario. The remaining two nurses were active observers during the simulations. The direct caregivers worked as a team to identify signs of the deteriorating patient with COPD and to deliver care to the simulated patient. The nurse observers were guided by the simulation objectives. The same nurses participated in the simulation scenario focusing on the care of the patient developing a pneumothorax. The four nurses exchanged roles during the second simulation; those nurses that functioned as direct care givers in the previous scenario now assumed the role of observers and those nurses that were active observers functioned in the role of direct care givers.

The second implementation of the simulation project was conducted in March, 2017 and consisted of one newly hired nurse. This nurse functioned as the sole direct care giver during both of the scenarios. The third implementation of the simulation project was conducted in May, 2017 and consisted of two newly hired nurses. Both nurses stated behavioral health as their most recent area of clinical nursing experience. These nurses were willing to participate in the medically focused simulation scenarios, but preferred to work together as a team. The project director and the clinical education agreed with the nurses. Therefore, no nurse observers participated in their simulation experiences.

Application of the NLN/ Jeffries Model

Using the NLN/Jeffries model, three phases of the simulation experiences were conducted; pre-briefing, simulation engagement and debriefing. During the pre-briefing phase,

the nurse educator, with the assistance of the project director read a script describing the simulation environment and read the objectives of the simulation experience (see Appendix C). The script included statements referring to the psychological safety and non-competitive environment of the simulation arena (INACSL, 2013). The script included information on the roles of the direct caregivers and the observers. The nurse educator with the support of the project leader; administered a 10 item pre-test to identify baseline knowledge of the care of the patient depicted in the simulation scenario (see Appendices D and E). The educator, with the assistance of the project leader read a script containing background history and current admission information on "Henry Williams", the simulated patient with COPD (see Appendix F). The nurse educator and the project leader reviewed the use of the C-CEI tool with the nurse orientees and explained that the assessment information collected with the tool will be shared with the participants during the debriefing portion of the simulation exercise.

During the second phase of the simulation, the participants engaged in caring for the Henry Williams, the simulated patient. The participants functioning as direct caregivers were given an orientation to the simulation environment prior to the intervention. The high fidelity human patient simulator was labeled with lung sounds, heart sounds, an indicated blood pressure and pulse rate. In the first scenario, a patient with chronic COPD is admitted to a nursing unit in minor distress. As the scenario progresses, there are changes in the vital signs, oxygen saturation rates and patient breathing pattern that indicates the patient is deteriorating and developing respiratory distress (see Appendix F and G).

In the second scenario, the previous patient with COPD is re-admitted to the unit 5 days after discharge and has a spontaneous pneumothorax (see Appendix H). The patient presents with chest pain, shortness of breath, increased respiratory rate and no breath sounds on the

effective side of the chest. The nurse educator, with the support of the project director presented the background history of the patient to the nurse orientees (see Appendix G). The simulator was assembled to reflect the changing vital signs of a patient with a spontaneous pneumothorax (see Appendix I). Participants were expected to recognize the signs and symptoms of a spontaneous pneumothorax and initiate the appropriate interventions. The clinical educator with the assistance of the project leader used the C-CEI to evaluate the care given by the direct caregivers. The direct caregivers were evaluated as an aggregate.

All participants took part in the third phase of the simulation experience and contributed to the guided debriefing exercises post the simulation experiences to explore nursing actions and critical thinking that occurred within the simulation experiences. The 10 item post-test was administered post the simulations and the debriefing exercise to assess the improvement in knowledge of the care of the patient with COPD or a spontaneous pneumothorax. The nurse educator and the project leader shared the information collected using the C-CEI tool with the participants during debriefing.

Data Collection

Pre-simulation, baseline knowledge of the care of the patient with COPD and spontaneous pneumothorax was assessed by administering a 10 item, paper-pencil pre-test. The items on the test were aligned to the simulation objectives. Validity was established by review of an expert in the area of chronic diseases. The expert was given the objectives and questions and asked if the test items were congruous with the objectives and if the questions were relevant and clearly written. Questions receiving a positive response from the expert were included on

the test. The same tool was administered as a post-test during the debriefing segment of the simulation exercise. Responses were anonymous.

Participant demographic data was collected to describe the sample of participants. The demographic data was collected via a paper-pencil questionnaire that was separate from the pre-test. Information collected included age, years of registered nursing experience, primary nursing area of expertise-med/surg, ICU, ED, PACU, ER, educational level and shift hired to work (see Appendix J). No identifying information was collected on the forms and participants submitted completed forms in a drop box to support anonymity and protect the human rights of the participants.

Simulation outcomes were evaluated using the C-CEI (see Appendix K). The C-CEI tool was developed by educators at Creighton University College of Nursing in Omaha, NE to assess student competency in clinical performance using simulation (Todd, Manz, Hawkins, Parsons & Hercinger, 2008). The C-CEI assesses 23 general nursing behaviors, divided into four categories-assessment, communication, clinical judgement and safety. The C-CEI has reported content validity scores ranged from 3.78 to 3.89. The tool has a reported Cronbach's alpha score >.90 when used to score three different levels of simulation performance during the National Council of State Board of Nursing National Simulation Study and in studies conducted to evaluate the tool’s internal consistency (Adamson, Kardong-Edgren, 2012; Hayden, Keegan, Kardong-Edgren, Smiley, 2014). Permission to use C-CEI was granted by completing an online tutorial sponsored by Creighton University. Although the C-CEI tool allows the evaluator to list the name of individuals participating in the simulated clinical experience, no names were recorded during the clinical experiences related to this project.

The C-CEI has a two point grading rubric that assigns a score of zero when a desired nursing action is not performed; a score of one when the desired nursing action is performed. The passing score for the C-CEI is calculated by adding the total number of behaviors achieving a score of 1 and multiplying that number by 0.75 (Creighton Simulation Evaluation, n.d.). Scores for the C-CEI can range from zero to 23. The developers of the C-CEI recommend that users of the tool adapt the possible observed behaviors to meet their clinical situation. It is recognized that not all behaviors included on the C-CEI tool may be applicable to all clinical situations. The project director and the clinical education reviewed the C-CEI tool and agreed to eliminate items six and 17 when evaluating the care giving behaviors of the nurses participating in the scenarios. The scenarios involving "Henry Williams" did not require the nurses to delegate care to ancillary staff and did not require the nurses to document care delivered to the simulated patient. Therefore, these two behaviors were not considered during the evaluation of the simulations. The participants must achieve a total score of at least 75 % (15.75) to be considered proficient. The scores were collected as an aggregate of the nurses delivering care to the simulated patient. Each item used on the C-CEI tool was divided into 100 and assigned a weight of 4.45%. The total number of behaviors receiving a one were multiplied by 4.45 to convert the outcome scores to conventional test scores based on a perfect score of 100%.

Protection of Human Subjects

This DNP project was designed to meet the patient care needs and system of the institution and is thus intended neither for generalizable knowledge nor to be applied to another health care setting. The DNP project proposal was submitted to the University of Maryland (UMB) Institutional Review Board (IRB) and to the Nurse Executive/ Nursing Research Council

and the Student Advisor Committee of the hospital and gained approval from each committee for a Non-Human Subject Research (NHSR) determination. Participants in the DNP project experienced minimal physical or psychological discomfort through engagement in the simulation scenarios; the risk was similar to physical and psychological risk experienced caring for actual patients with COPD and pneumothorax. The project leader and the nurse educator stated that performance outcomes during the simulations did not affect employment. The demographic survey and knowledge pre and post-tests contained no identifiers.

Project Timeline

The project leader submitted the project proposal to the project committee members; the hospital agency IRB and related committees in November 2016 (see Table 1). The project leader proceeded to implement the project according to the timeline.

Data Analysis

The data collected represents the group of seven participants and was analyzed using Statistical Package for Social Sciences (SPSS) version 24. The participant sample includes one male representing 14.3% of the sample; and six female participants (85.3%). Participant ages range from 26 to 51+ years, with 42.9% of the participants between 32-35 years of age. Approximately 86% of the participants have 1-5 years of nursing experience. Two participants (28.6%) are graduates of ADN programs; and five participants (71.4%) possess BSN degrees. Six participants (85.3%) state they participated in simulation experiences while in nursing school. One participant (14.3%) responded that they engaged in simulation experiences with other employment. Table 2 represents the descriptive data of the participants.

Baseline knowledge of the care of the patient with COPD and spontaneous pneumothorax was assessed by administering a 10 item, paper-pencil pre-test aligned to the simulation objectives prior to engaging in the simulation. The participants completed a post-test after the debriefing segment of the simulation. The nurse educator and the project leader evaluated the responses on the pre- and post-test. Items on the 10 question tests were valued at 10 points each. Proficient knowledge was determined with the achievement of a score of at least 80 %. Table 3 represents the pre- and post-test scores of the participants.

Summarized Findings

The simulation experiences were evaluated using the Creighton Competency Evaluation Instrument (C-CEI) and a 10-item posttest. The clinical nurse educator and the DNP project director used the C-CEI tool to evaluate participant performance in each simulation experience. The project director and the clinical nurse educator set the competency score for the C-CEI at 75%. The scores on the C-CEI were collected as an aggregate of the nurses delivering care to the simulated patient. C-CEI scores for the COPD and pneumothorax scenarios ranged from 84.74 to 89.20.

A T-test for dependent groups was used to evaluate whether students' performance on the COPD and pneumothorax post-test differed significantly from the pre-test scores as a result of the simulation. The alpha level was set at 0.05. There was a statistically significant increase in the COPD mean scores from the pre-test (M= 80.0, SD= 12.9) to COPD post-test scores (M = 84. 28, SD= 12.72). The mean increase in COPD knowledge scores was 4.28 with a 95% confidence interval ranging from 68.06 to 91.93 on the COPD pre-test and 72.51 to 96.05 on the COPD post-test.

The level of significance was .000. There was a statistically significant increase in the pneumothorax mean scores from the pre- test (M= 77.14, SD= 17.99) pneumothorax post-test scores (M= 92.85, SD = 7.55). The mean increase in the pneumothorax knowledge scores was 15.33.

Discussion

This evidence-based, DNP quality improvement project supports findings in the literature that suggest simulation can improve nursing knowledge in the care and recognition of deteriorating patients. COPD and pneumothorax post-test mean scores improved after participants engaged in the simulated patient care experiences and debriefing activities. There was a statistically significant change in the mean scores of the knowledge level pre-and post- test for each simulation scenario. The project director and the clinical nurse educator compared their observations of the simulation activities after each simulation event. They agreed that each group achieved a passing score on the C-CEI.

The prior exposure to simulated clinical experiences potentially supported the comfort level of the participants. All participants had prior experience with simulation. No one asked questions regarding performance expectations during the pre-briefing portion of the simulation. Participants seem relaxed when administering care to the simulated patient. Those that functioned as active observers during the simulation seemed to understand their role. They took notes and were actively engaged in the debriefing discussions.

All of the participants actively engaged in the debriefing discussions after each simulation experience. The participants discussed nursing observations, actions and outcomes during each of the simulated encounters. The participants used clinical reasoning skills to identify clinical cues in deteriorating patients with COPD and for patients with a pneumothorax.

The participants were able to discuss appropriate nursing actions to improve the condition of these type of patients. They were able to identify assessments and interventions that were missed during the actual engagement in patient care. The nurses agreed that they could have performed a more thorough respiratory assessment and should have notified the provider sooner of the patient in distress. They were able to agree that the actions needed to be included when delivering care to these types of patients.

Several factors affected the implementation of this project. The individual work schedules and orientation needs of each participant made it difficult to arrange for the nurses to participate in the project. Scheduling participants during first week of orientation presented fewer obstacles that arranging participation during the second week of orientation. Orientation activities for newly hired nurses were offered during the day shift for the first week of orientation. After the first week, nurses work with a preceptor on their assigned nursing unit. Nurses with more than 1-2 years of previous nursing experience are scheduled to complete the remaining portion of their orientation on the shift they were hired for. One of the participants in this project was hired to work from 7:00 pm to 7:00 am, and two of the participants were hired to work on the weekends. The project director and the clinical nurse educator worked diligently with the nurse managers to secure the availability of the participants. Conducting simulation experiences during the first week of orientation and during the annual competency validations may be a more effective strategy to secure the participation of nurses.

There was a limited number of nurses hired during the time the project was implemented. Peak hiring times for new graduate nurses occurs 4-6 months after graduation, between September and October (American Association of Colleges of Nursing, 2013). According to Monster.com, companies may implement hiring initiatives near the end of year and at the end of

the summer (Rossheim, 2017). Only seven nurses were oriented during the time the project was implemented. Four of the participants were in the first cohort of nurses that took part of the simulation experiences in February.

Due to renovations in the nursing education area, the simulations were conducted in converted conference rooms instead of the nursing education lab. This limited the availability of equipment that is usually in the patient care areas. This affected the level of realism during scenario implementation possibly affected outcomes of one of the criteria on the C-CEI. Participants were evaluated if they performed hand hygiene before approaching the patient. This behavior was included on the C-CEI evaluation tool. No sink was available in the conference room, however bottled hand sanitizer was available. Several participants did not perform hand hygiene, and thus did not receive points for completing this task in the C-CEI. It cannot be determined if the participants omitted the action because they were negligent or because they over looked the sanitizer, or did not react because they did not see a sink. The INASCL Standards of Best Practices in Simulation (2016) encourages the creation of a simulation environment that resembles an actual clinical setting. This will maximize the ability of the participant to react to situations that occur in the simulation in a realistic manner.

Sufficient time is needed to set the simulation environment and prepare the manikin for use. Each simulation experience required approximately 45 minutes of preparation time. Due to the renovations, a designated simulation room could not be maintained. The manikin was stored on another floor. The supplies were kept in a closet within the nursing education area and needed to be restocked after each simulation experience. After each simulation, the room used for the simulation needed to be converted back to a conference room. Intravenous pumps and oxygen tanks needed to be returned to nursing units. Twenty minutes or more was needed to clean up

the simulation room. The INACSL standards (2016) support the design and use of a designated clinical laboratory to use for simulation. Implementing strategies to reduce the mentioned limitations may enhance the simulation experience.

Conclusion

This Doctor of Nursing Practice quality improvement project focused on the development and implementation of two simulation experiences to assist registered nurses to recognize and initiate prompt and effective interventions in deteriorating conditions in chronically ill adult patients with COPD and pnuemothorax. The participating nurses were better able to recognize manifestations of a deteriorating patient with COPD after engaging in the simulation experiences. The completed DNP project supports the use of clinical simulation to train and remediate practicing nurses. The participating nurses were able to immerse themselves in a realistic clinical situation and care for the simulated patients in a safe environment as though the patients were real. Participant clinical behaviors included using communication skills, and engaging in clinical decision-making. The participants were able work in care teams to deliver appropriate nursing care to the simulated patients. Anecdotal responses by the participating nurses included request to have more opportunities to engage in simulated experiences.

The mean scores on the COPD and pneumothorax knowledge test improved after the nurses participated in the simulation experiences. Evidence supports that this knowledge and these skills will transfer into the actual clinical setting.

The literature supports the need to implement strategies to improve the early recognition of deteriorating patients. Simulation is supported as an effective strategy to reinforce safety and improve the quality of care given to patients. The pre-test provided information on the baseline

nursing knowledge for each of the simulation scenarios. The post-test evaluated the improvement of knowledge after the simulation experiences. The simulation experience provided and opportunity for the participants to engage in care of a deteriorating patient in a safe environment. The evaluation each simulation experiencing using the C-CEI tool provided feedback on participate engagement during the three phases of the simulation experience. Clinical nurse educators can be mentored by DNP prepared nurse leaders experienced in simulation design, implementation and evaluation to implement quality-simulated experiences that can enhance patient safety. Much of the literature is directed at the use of simulation in academic settings. Further exploration is needed in the use of clinical simulation with licensed nurses. Evidence from the DNP project supports continued clinical work and program evaluation is needed on the development, and implementation of hospital based clinical simulation programs for nurses.

Nursing practice supports the use of innovative technologies to improve the care delivery to patients. Evidence supports the use of simulation to improve patient outcomes. However, the development and implementation of an effective hospital based simulation program is a complex project to undertake. The project will require a significant commitment from hospital and nursing administrators. The commitment to develop a clinical simulation program will be costly. The establishment of a fully functioning hospital simulation center will require significant space renovation. High fidelity manikins, computer, monitoring and recording equipment must be purchased. Educational staff will require extensive training in simulation scenario design, technical support, implementation, debriefing, and scenario and program evaluation. McIntosh, Marcario, Flannagan and Gaba (2006) estimated the start-up cost to purchase equipment, train staff and to develop an existing space to support simulation as $876,485. The development and

continued support of a simulation center must be a part of the hospital organization, nursing and ancillary department strategic plans to be a successful and fully supported innovation.

The DNP nurse leader has the skill and knowledge to help guide the development of such a project. The DNP leader is educated and has experience in implementing and evaluating care delivery models and strategies to improve the quality of care delivered to patients. The DNP prepared nurse is able to conduct a comprehensive, systematic evaluation of systems and the literature to build strategies and to identify the best evidence to support the design, implementation and evaluation of therapeutic interventions and clinical programs. The DNP leader has the skill to educate and guide administrators and leadership teams through the complex transitions in practice. The DNP leader has the scholarly knowledge and skill to solve problems in a complex environment.

The DNP leader is skilled to affect practice policies and procedures. The DNP leader understands that practice innovations must be evidenced-based, sustainable and measurable. The DNP leader is proficient in quality improvement strategies that reflect the cost effectiveness of care and that implore the use of principles of economics to develop and implement effective and realistic care delivery innovations.

A DNP prepared simulation expert can guide, mentor, and support clinical nurse educators and other nurses to achieve skill and knowledge in simulation education to foster excellence in nursing practice.

This clinical simulation based, nursing quality improvement project conducted at a Baltimore area hospital was successfully developed and implemented by a DNP nurse leader. Further development of a sustainable clinical simulation program is recommended. The innovation project should expand beyond nursing and take a multidisplinary, interprofessional

approach to simulation based education. The innovative team must be supported by the organizational executive leaders and should include nurse managers, the clinical nurse educator, staff nurses, constituents from ancillary departments and should be lead by a doctoral prepared nurse.

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Appendix A

Evidence Rating Table

Author & Date	Purpose	Study design	Findings	Limitations	Evidence Level	Evidence Quality
Bultas, M., Hassler, M., Ercole,P., Rea, G.(2014).	To determine if high fidelity simulation would improve the pediatric staff nurses' ability to intervene in deteriorating patient conditions.	Experimental; Pre-test/ post test with control group. (*n*=33), randomized selection into control group. Used modified PEARS tool to measure participant level of knowledge of the deteriorating pediatric patient.	Knowledge retention and skills performance improved in experimental group.	PEARS tool was modified and not validated; small sample size; did not use a tool to validate performance during simulation; small sample size.	Level I-experimental, with randomized control group	B-Good: reasonably consistent results; well defined methods
Cooper, S., McConnell, T., Cant, R., Porter, J., Missen, K., Kinsman, L., Endacott, R., Scholes, J. (2011).	To examine use of simulation in rural nurses' ability to assess and manage patient deterioration.	Exploratory, quantitative, non-randomized control group, pre-test post test measure of situational awareness, case study	Low situational awareness scores of participants before simulation treatment; simulation related to COPD; use reliable and valid tool to assess	Small sample size; non-randomization of participants; No indication that case study was reliable and valid.	Level II-Quasi-experimental	B-Good: reasonably consistent results; well defined methods

		comparative to simulation n=35	situational awareness.			
Cope, Fowler, Pogson, (2015)	Discussion on development a COPD clinical nurse specialist role in an emergency department	Non-experimental, observational study, collected data for approximately one year. N=464	Identified average patient length of stay decreased by 2.4 days with interventions of COPD clinical nurse specialist.	Research conducted in one hospital in England; no control of other variables that may influence LOS	Level III- non experimental; good sample size.	B-Good: reasonable results, literature review includes scientific evidence
Currie, G., Alluri, R., Christie, G., Legge, J. (2007)	Presentation of information, guidelines for the care of a patient with pneumothorax.	Expert opinion	Presentation of guidelines for the care of a patient with pneumothorax		Level V- evidence based on expert opinion form the literature; used research findings to develop position.	B-Good: results are reasonable and consistent with the literature.
Dellinger, R. P., Levy, M. M., Rhodes, A., Annane, D., Gerlach, H., Opal, S. M., Moreno, R. (2013).	Discussion of failure to rescue in neonatal unit. Concluded that ability of nurses to appropriately monitor patients, identify changes in patient conditions, and	Expert opinion	Consensus meeting of 68 international experts to evaluate quality of evidence using Grading of Recommendations Assessment, Development and Evaluation (GRADE) system;		Level IV- opinions of nationally recognized experts	Good- reasonably consistent results.

	initiate prompt interventions are critical to the survival of patients experiencing a deteriorating conditions.		evidence graded from (A) to very low (D), strength of evidence rated as strong (1) or weak (2) Group consensus on best practices in care of patients deteriorating from sepsis. Failure to rescue can result from unintentional awareness			
Disler, Jones (2010)	Literature review identifying nurse role in care of the COPD patient	Expert opinion	68 studies examined; one RCT; 39 studies clinical; 24 reviews, 2 editorials, 2 books; literature review examined needs of the end stage COPD patient	None- used OVID, Medline, CINAHL databases, search terms consistent with literature	Level V- Conclusion are opinion based	B-Good: reasonable consistent findings in the literature; literature review includes scientific evidence
Gardiner, C., Gott., M., Payne, S.,	Literature review of care needs of the	Expert opinion	Fifteen articles included in review;	Limitations-low; used Steinhauser variables to	Level IV- evidence based on expert	B-Good: results are reasonable and consistent

Small, N., Barnes, S., Halpin, D., Ruse, C., Seamark, S. (2009).	advanced COPD patient from perspective of the patient and the healthcare provider		considered the quality of the evidence provided in the articles; COPD patients need emotional support from nurses and others on the health care team. Health professionals need to be trained on special needs of the COPD patient.	identify important end-of-life issues facing the COPD patient.	opinion form the literature; used research findings to develop position	with the literature.
Global Initiative for Chronic Obstructive Lung Disease (GOLD). (2015	International guidelines on the treatment of COPD	Expert opinion	Clear guidelines on the treatment of COPD for physicians and nurse practitioners	None	Level II- conclusions based on a variety of studies.	A-High: used panel of experts to review studies to develop standards of care; recommendation based on substantial studies.
Griffith, P., Murrells, T., Dawoud, D., Jones, S. (2010).	Examining the relationship between staffing and care of the patient with COPD, diabetes and asthma.	Observational study, cross sectional analysis	Admissions for COPD were lower when the staffing levels were high; COPD practice had 13.4 staff members assigned to care for these patients compared to 4.5 caring for	Study limited to England, non-experimental design,	Level III- non experimental	Good-well defined methods, reasonable results

			diabetes, 7.55 for asthma patients.			
National Advisory Group on the Safety of Patients in England (2013)	Paper to discuss the methods to improve the quality of health care and patient safety in England.	Expert opinion	Summarizes factors that influence safe patient care; identifies education and training of healthcare workers as an important strategy in reducing error.		Level V	B-Good: reasonable conclusions, expertise is credible
Rawal, G., Yadav, D., Garg, N., Wan, U. (2015).	Examining incidence of the development pneumothorax as a complication of COPD.	Expert opinion	Discussion of incidence, and other risk factors influencing the develop of a pneumothorax as a complication of COPD	Investigational findings based on opinion.	Level V-opinion based on discussion; quality improvement project.	B-Good: findings are reasonable and comparable to experts
Scullion, J. (2008).	Promote use of national care guidelines in England to care for patients with COPD	Expert opinion	Teaching program extended to nursing staff, teaching program consisted of three discussion questions designed to stimulate clinical reasoning,	No (*n*) listed.	Level V-opinion of content expert	Low quality-concepts not tested
Waldie, Tee,	Reducing	Expert opinion	Presents		Level V-	B-Good:

Day, (2016)	incidence of Failure to rescue.	information to be included in protocols for treating deteriorating patient with COPD in England; Hospitals and government must work together to produce protocols for care, strengthen patients. Introduction of a framework for caring for the COPD patient.	Opinion of expert,	information consistent with literature

Note. Evidence rated using the JHNEBP Evidence Rating Scale

Table 1

DNP Scholarly Project Time Line

Tasks	Date
• Submit DNP scholarly project proposal to committee members.	November, 2016
• Present DNP scholarly project proposal to committee members.	December, 2016
• Submit DNP scholarly project proposal to hospital Institutional Review Boards for Non-Human Subject Research (NHSR).	November, 2016
• Submit DNP scholarly project proposal to UMB Institutional Review Boards for Non-Human Subject Research (NHSR).	December, 2016
• Project implementation	February-May 2017
• Analyze, synthesize and evaluate collected DNP scholarly project data.	June, 2017
• Submit draft of scholarly project to adviser for review.	July, 2017
• Revise scholarly project draft as needed.	August- October, 2017
• Present final DNP scholarly project to committee.	November, 2017

Table 2

Characteristics of the participants (N=7)

	n	%
Sex	7	
Male	1	14.3
Female	6	85.7
Age	7	
26-30 years	1	14.3
31-35 years	3	42.9
36-40 years	1	14.3
41-45 years	1	14.3
51+ years	1	14.3
Education	7	
Associate Degree prepared (ADN/AA)	2	28.6
Baccalaureate prepared (BSN)	5	71.4
Nursing Experience	7	
1-5 years	6	85.7
5-10 years	1	14.3
Expertise	7	
Med/ Surg	3	42.9
Emergency Department (ED/ER)	2	28.6
Other	2	28.6
Experience with Simulation	7	
Sim in nursing school	6	85.7
Sim with other employment	1	14.3

Table 3

Pre- and Post-test scores (N=7)

	n	Range	Mean
COPD Pre	7	68.06-91.93	80.00
COPD Post	7	72.51-96.05	84.28
Pneum Pre	7	60.50-93.78	77.14
Pneum Post	7	85.86-99.84	92.85

Appendix B
Nurse Educator Training

One Day Training- To be conducted two weeks prior to simulation implementation.

Nurse Educator is required to complete online C-CEI training prior to participating in this training session.

Objectives: After the instructor training, the nurse educator will be able to-

1. Discuss the purpose of simulation in the clinical setting.
2. Describe the roles of participants in the simulation experience (facilitator, direct care givers and observers).
3. Describe the three phases of the simulation experience.
4. Discuss information shared with the learning during the pre-briefing segment of a simulation scenario.
5. Demonstrate preparation of the simulation environment included equipment, moulage, and costumes to promote realism.
6. Utilize open statements to facilitate critical thinking and discussion during the debriefing segment of the simulation scenario.
7. Describe the data collection tools used in the project.
8. Demonstrate use of the Creighton Competency Evaluation Instrument.
9. Complete two test of each simulation scenario.

Time	Training Content
9:00 a.m. -9: 15 a.m.	Explain the purpose of the simulation training. Project leader will review objectives of the training. Share a copy and briefly review the INACSL Standards of Best Practice: Simulation (2013).
9:15 a.m. – 9:30 a.m.	What is simulation? Nurse educator will discuss their understanding of the nursing simulation. Project leader will clarify misconceptions.
9:30 a.m. – 9: 45	Describe the roles of participants in the simulation experience (facilitator, direct care givers and observers). Facilitator: “individual providing guidance, support and structure during the simulation experience” (INACSL, 2013) Direct Care Givers: Participants that will function in the role of the registered nurse and will provide care to the simulated patient.

Time	Training Content
	Observers: Participants that are non-direct care givers. They actively observe the simulation, thinking along with the direct care givers. Observations are guided by the objectives of the simulation.
9:45 a.m.– 10: 45 a.m.	Discussion of three phases of the simulation experience.
	Pre-briefing, the simulation scenario, debriefing
	Training segment will include role play, review of script to be read in pre-briefing segment of the simulation.
	Review of best practices for facilitating the simulation experience- provide orientation of the simulation environment for the participants; allow the simulation to progress without interruption; use the simulation objectives and the C-CEI tool to guide observations of the participants' interventions.
	Review best practices in facilitating de-briefing- reviewing the purpose of debriefing; reiterating the safe, non-judgmental environment of the simulation arena, using the simulation objectives to guide the discussion, use open ended statements to encourage critical thinking, reflective reasoning and discussion; allowing time to participants to discuss their points of view; engage both direct care givers and observers in the discussion; review outcomes of C-CEI tool; summarize ideas and conclusions presented during de-briefing.
10: 45 a.m. – 11:00 a.m.	Break
11:00 a.m.- 11:30 a.m.	Review of the scenarios
	Review objectives, narrative and transitions for each scenario.
11:30 a.m. – 12: 00 noon	Review data collecting tools used in the project.
	Demographic data survey, 10 item pre/post-test for COPD; 10 item pre/post-test for spontaneous pneumothorax, C-CEI tool.
	Review answer key of pre/post-test; review elements of the C-CEI tool.
12:00 noon -1:00 p.m.	Lunch

Time	Training Content
1:00 p.m.- 1:30 p.m.	Review equipment, moulage, costume needs for the simulations. Identify what items are available in the simulation laboratory, what items need to be ordered/ secured for the simulations.
1:30 p.m.- 1:45 p.m.	Break
1:45 p.m. – 3:30 p.m.	Practice run of the scenarios. Including practice with all three phases of the simulation experience.
3:30 p.m.- 4:00 p.m.	Practice use of the C-CEI tool Guide nurse educator in review of a video of a simulation scenario, use the C-CEI tool to evaluate the performance of participants in the video; discuss outcomes with project leader; describe information to be shared with participants.
4:00 p.m.- 4:30 p.m.	Questions and answers. Discussion of next steps in implementing the project.

Appendix C

Pre-Briefing Script

Good morning/afternoon to everyone. Welcome to the simulation laboratory of _____. Today, you will be participating in a simulated patient care experience. Simulation provides an opportunity for nurses and other healthcare professionals to practice clinical skills, engage in critical thinking and use inter-professional communication skills in an environment that is not harmful to patients. The simulation experiences are conducted to mimic a realistic clinical situation. All circumstances around the simulation should be treated as real patient care events. Efforts have been made to make the simulation as realistic as possible.

We realize that this type of patient care setting can be uncomfortable and even intimidating. However, the opportunities for learning are tremendous! This is a safe environment to develop and refine patient care skills. Participants will experience minimal physical or psychological discomfort through engagement in the simulation scenarios; the risk is similar to physical and psychological risk experienced caring for actual patients.

The simulation will take approximately 45 minutes to complete. Each of you will be assigned a role to participate in the simulation. Some of you will be actual care givers, and some of you may be assigned the role of an observer. I will be observing your nursing actions and will evaluate your interventions. I will share my observations during the discussion following the simulation. Everyone will have the opportunity to discuss the experience together in a group. We will review the strengths and opportunities for improvement in the nursing care provided. All comments are welcomed, however there are ground rules that must be followed:

- Nurses must conduct themselves in the simulation setting exactly as if they are in a clinical setting.

- Nurses are expected to treat each other, the educator, and the simulator respectfully at all times.
- Nurses are expected to maintain the confidentiality and privacy of the scenarios and the participants. "What goes on in Sim, stays in Sim."

_____

Note: Adapted from Creighton University
College of Nursing
Guidelines for Simulation Experiences

Appendix D
COPD Pre/ Post Test

Code No. _____

DO NOT PUT YOUR NAME ON THIS TEST.

Care of the Patient with COPD

DIRECTIONS: Read the following statement and circle your responses.

1. Which of the following assessment data can indicated a deteriorating condition in the patient with COPD ***(Select all that apply)*.**
   a. Decreased respiratory rate
   b. Elevated blood pressure
   c. Decreased urine output
   d. Increase restlessness
   e. Productive cough
   f. Presence of a fever

2. A client with acute exacerbation of COPD is showing inspiratory and expiratory wheezes and a decreased expiratory volume should be treated with which of the following classes of medication right away?
   a. Beta-adrenergic blockers
   b. Bronchodilators
   c. Inhaled steroids
   d. Oral steroids

3. A nurse plans care for a client with chronic obstructive pulmonary disease, knowing that the client is most likely to experience what type of acid-base imbalance?
   a. Respiratory acidosis
   b. Respiratory alkalosis
   c. Metabolic acidosis
   d. Metabolic alkalosis

4. A client with emphysema should receive only 1 to 3 L/minute of oxygen, if needed, or he may lose his hypoxic drive. Which of the following statements is correct about hypoxic drive?
   a. The client doesn't notice he needs to breathe.
   b. The client breathes only when his oxygen levels climb above a certain point.
   c. The client breathes only when his oxygen levels dip below a certain point.
   d. The client breathes only when his carbon dioxide level dips below a certain point.

5. Teaching for a client with chronic obstructive pulmonary disease (COPD) should include which of the following topics?
    a. How to teach his wife listen to his lungs with a stethoscope.
    b. How to increase his oxygen therapy.
    c. How to treat respiratory infections without going to the physician.
    d. How to recognize the signs of an impending respiratory infection.

6. A nurse is caring for a client hospitalized with acute exacerbation of COPD. Which of the following would the nurse expect to note on assessment of this client?
    a. Increased oxygen saturation with exercise
    b. Hypocapnia
    c. A hyper inflated chest on x-ray film
    d. A widened diaphragm noted on chest x-ray film

7. An oxygenated delivery system is prescribed for a client with COPD to deliver a precise oxygen concentration. Which of the following types of oxygen delivery systems would the nurse anticipate to be prescribed?
    a. Venturi mask
    b. Aerosol mask
    c. Face tent
    d. Tracheostomy collar

8. Proper positioning of the patient in respiratory distress includes:
    a. Maintaining the head of the bed in a flat, recumbent position.
    b. Placing the patient in a dorsal recumbent position.
    c. Elevating the head of the bed to high fowler's position
    d. Elevating the legs on two pillows.

9. Continuous oxygen therapy is indicated for the COPD patient during which condition?
    a. When the patient's oxygen saturation is 88% or lower.
    b. When the patient has frequent bronchospasms and non-productive cough.
    c. When the patient develops hemoptysis.
    d. When the patient develops bilateral rales.

10. Which of the following are priority interventions for the patient in respiratory distress due to exacerbated COPD? ***(Select all that apply)***.
    a. Identify potential causes of the respiratory distress.
    b. Notifying the provider on call.
    c. Evaluation of ABG's
    d. Administration of steroid inhalers.
    e. Prepare for possible intubation
    f. Apply oxygen via nasal cannula

Code No. _____

Appendix E
Pneumothorax Pre/Post Test

DO NOT PUT YOUR NAME ON THIS TEST.

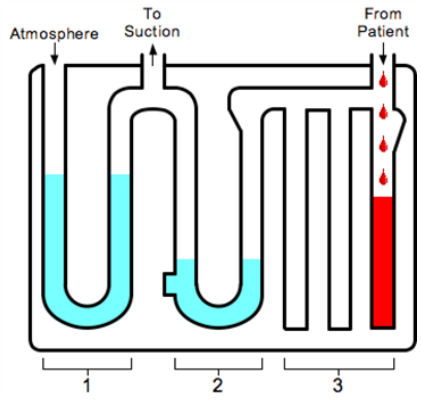
Care of the Patient with a Spontaneous Pneumothorax

DIRECTIONS: Read the following statement and circle your responses.

1. A client is diagnosed with a spontaneous pneumothorax necessitating the insertion of a chest tube. What is the best explanation for the nurse to provide this client?
    a. "The tube will drain fluid from your chest."
    b. "The tube will remove excess air surrounding your lung."
    c. "The tube controls the amount of air that enters your chest."
    d. The tube will seal the hole in your lung."

2. The nurse is caring for a patient with a diagnosis of COPD who is experiencing a sudden onset of dyspnea and pleuritic pain. Which of these assessment findings are expected if the patient is experiencing a pneumothorax? (***Select all that apply***).
    a. Dysphagia
    b. Inspiratory wheezes
    c. Decreased diaphragmatic excursion
    d. Tachycardia
    e. Paradoxical chest movement

3. A patient arrives to the emergency department after developing a spontaneous pneumothorax. A chest tube is inserted and connected to a three-chamber drainage system. Identify the section of the chest tube drainage system that prevents air from re-entering once it has left the pleural space.



    a. Section 1
    b. Section 2
    c. Section 3

4. On auscultation, which finding suggests a right pneumothorax?
    a. Bilateral inspiratory and expiratory crackles
    b. Absence of breaths sound in the right thorax
    c. Inspiratory wheezes in the right thorax
    d. Bilateral pleural friction rub

5. A hospitalized client long term COPD is dyspneic and has been diagnosed with left spontaneous pneumothorax. Which of the following observed by the nurse indicates that the pneumothorax is rapidly worsening?
    a. Hypertension
    b. Pain with respiration
    c. tracheal deviation to the left
    d. tracheal deviation to the right

6. The presence of a pneumothorax verified by which of the following diagnostic test?
    a. Thoracentesis
    b. Chest Xray
    c. 2 D echo
    d. Pulmonary function test

7. Proper positioning of the patient with a chest tube includes:
    a. Placing the patient flat in bed, slightly turned toward the chest tube.
    b. Placing the at least two pillows behind the patient's head.
    c. Elevating the head of the bed to high fowler's position
    d. Elevating the legs on two pillows.

8. The nurse is monitoring a patient after chest tube insertion. The nurse notes fluctuation of the fluid level in the water seal chamber. Based on the assessment, which of the following actions would be most appropriate?
    a. Immediately inform the provider.
    b. Encourage the patient to deep breath.
    c. Continue to monitor the patient, this is an expected finding.
    d. Reinforce the dressing at the insertion site.

9. Which of the following is an appropriate task to delegate to the nursing assistant helping to care for a patient with a pneumothorax?
    a. Documenting on a flow sheet the presence of bubbles in the chest tube system.
    b. Verifying the settings of the suction monometer.
    c. Reinforcing the chest tube connections
    d. Monitoring the patient's respiratory rate.

10. Which of the following should be gathered in preparation of the insertion of a chest tube? (***Select all that apply***).
    a. 0.9% NSS IV bag and tubing.
    b. Sterile needle, syringe and 1% lidocaine
    c. Suction set-up
    d. Close system drainage equipment
    e. Wound culture applicators
    f. Informed consent form

Appendix F
Case Study Narrative: "Henry Williams"

Scenario #1: COPD

Henry Williams is a 67 year old African-American male with a long history of COPD a result of multiple co-morbidities including smoking and working in a paper factory. Mr. Williams has several hospital admission per year for pneumonia and severe shortness of breath related to his COPD. Mr. Williams lives with his wife Ernestine in a small house in the city. He experiences marked SOB climbing the stairs to his bed room in home, resulting in him frequently sleeping on the sofa in the living room. Mr. Williams came to the ER three hours ago, C/O of shortness of breath, chest tightness and a non- productive cough.

Assessment Data:

T: 99.2 F

P: 112 beats/min

R: 28/ min

O2 % 86 %

Bilateral, fine wheezes and rales throughout lung fields. Pt. is alert, oriented X 3, follows simple commands. Exhibits increased SOB with activity.

Provider orders:

Bed rest with bed side commode.

Vital signs q 4 hours

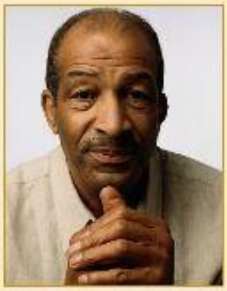
O2 via nasal cannula 2 L/min

Med lock

Appendix G
COPD Scenario Variations in Patient Condition

Outline of Scenario of Patient with Exacerbation COPD

PATIENT DATA:



Name: Henry Williams
Age: 67 years
Race: African American
Religion: Baptist
Allergies: No known
Immunizations: Up to date
Location: Medical Unit

Past Medical History: Patient has a 50-year history of smoking 2 packs a day and has continued to smoke despite health care providers' recommendations to quit. During the last year he has had two COPD exacerbations.

History of Present Illness: Patient has complained of increasing fatigue and shortness of breath with activity and inability to sleep well at night. He has also had increased sputum production and cough.

Social History: Married for 42 years, has three grown children. Retired businessman.

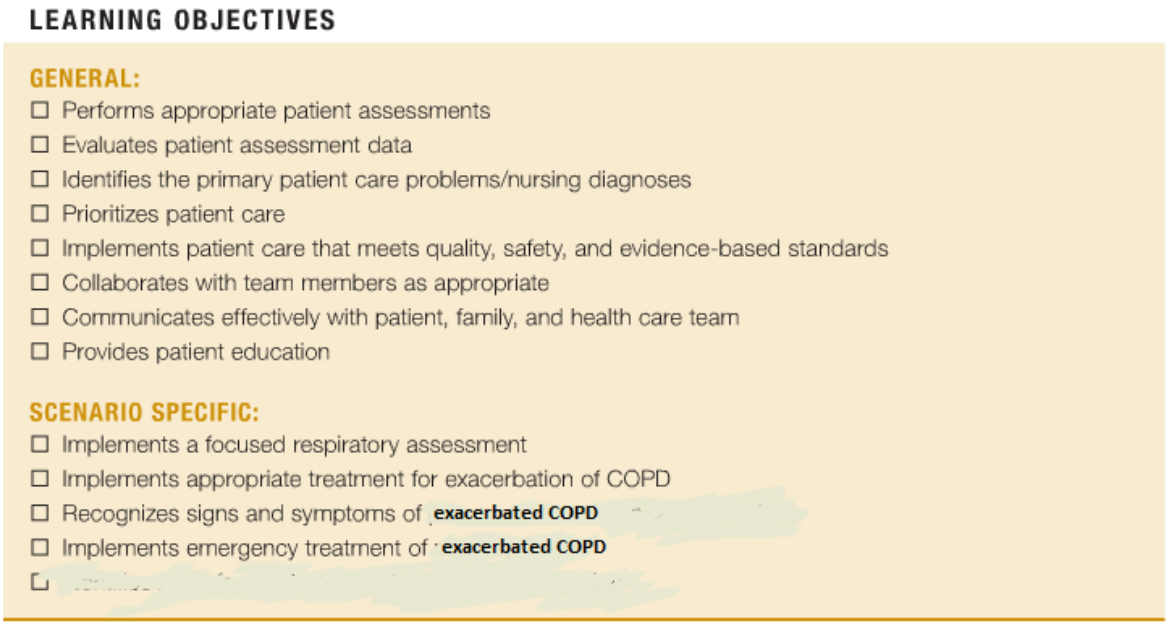
Surgeries/Procedures & Dates: None

The scenario is part of the *Henry Williams Unfolding Case*. The scenario can be used as a standalone scenario or as part 1 of the case. Henry Williams is a 67-year-old retired rail system engineer with COPD.

This scenario takes place a few hours after Henry was admitted through the emergency room with an acute exacerbation of COPD. His O2 saturation has been at 88 percent. He is alert, oriented, and appears depressed. The admission has not been completed due to the patient's shortness of breath. His neighbor brought him.

The learners will have cues to report labs and arterial blood gas results to the provider.
As support for the instructor, the scenario contains guided refection questions for use during debriefing. The questions have been developed to address both The ACES Essential Nursing Actions and QSEN competencies.

The scenario simulation is mapped to the QSEN competencies. These are divided into activities related to the QSEN knowledge, skills and attitudes (KSAs).



LEARNING OBJECTIVES

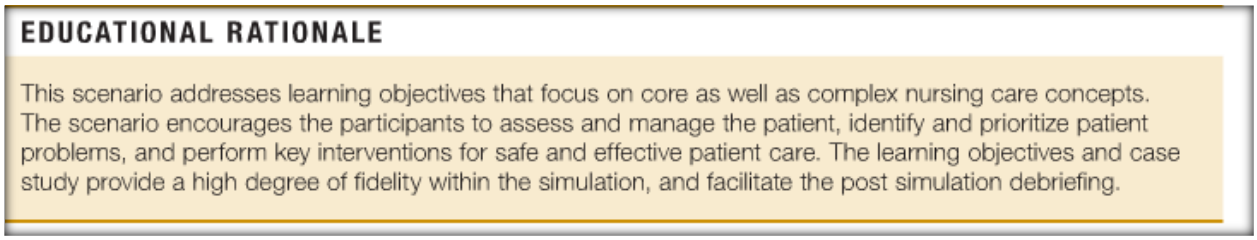
GENERAL:

- ☐ Performs appropriate patient assessments
- ☐ Evaluates patient assessment data
- ☐ Identifies the primary patient care problems/nursing diagnoses
- ☐ Prioritizes patient care
- ☐ Implements patient care that meets quality, safety, and evidence-based standards
- ☐ Collaborates with team members as appropriate
- ☐ Communicates effectively with patient, family, and health care team
- ☐ Provides patient education

SCENARIO SPECIFIC:

- ☐ Implements a focused respiratory assessment
- ☐ Implements appropriate treatment for exacerbation of COPD
- ☐ Recognizes signs and symptoms of exacerbated COPD
- ☐ Implements emergency treatment of exacerbated COPD
- ☐

This scenario is programmed to encourage learners to assess and manage the patient, identify and prioritize patient problems, and perform key interventions for safe and effective patient care.



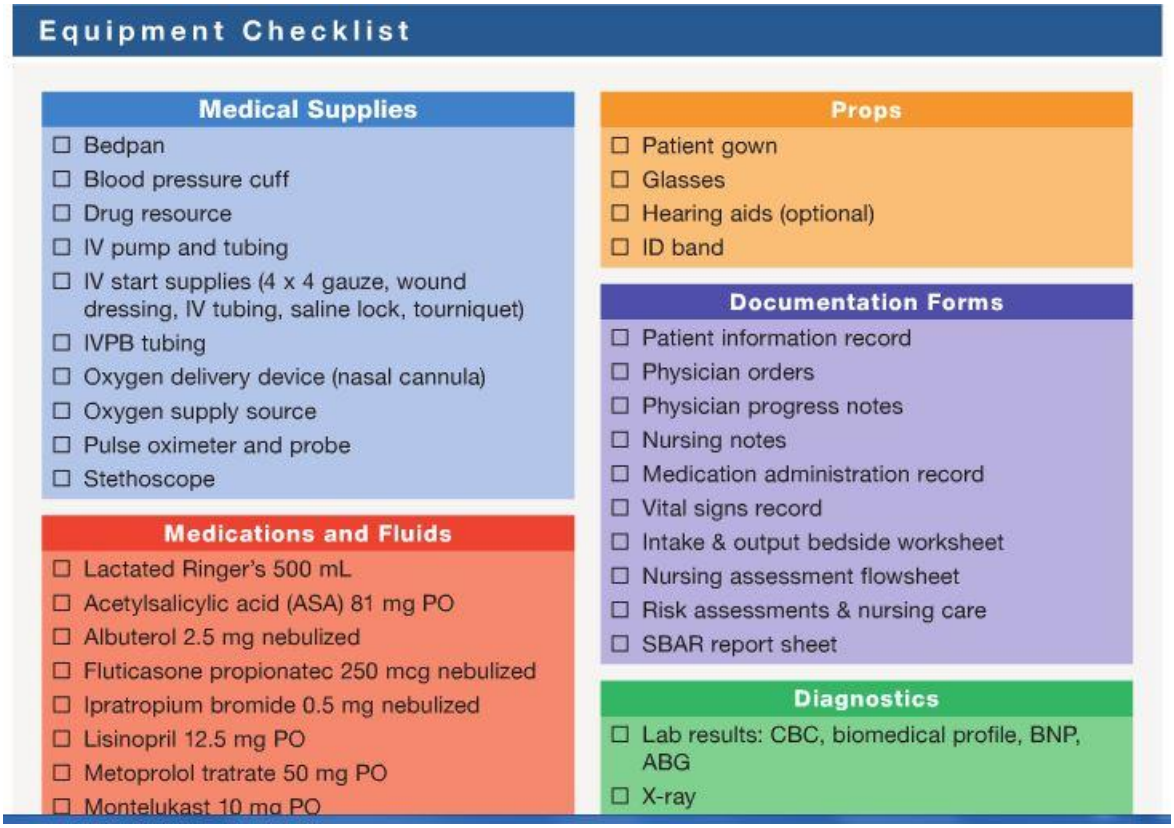
EDUCATIONAL RATIONALE

This scenario addresses learning objectives that focus on core as well as complex nursing care concepts. The scenario encourages the participants to assess and manage the patient, identify and prioritize patient problems, and perform key interventions for safe and effective patient care. The learning objectives and case study provide a high degree of fidelity within the simulation, and facilitate the post simulation debriefing.

The Laerdal simulation package includes:

• A list of the nursing diagnoses that students should be able to identify in the scenario.
• Pre-simulation requirements and recommended resources for the learner to review.
• A role information sheet for the student playing the role of the support person, if desired by the instructor/ facilitator.
• An enhanced debriefing guide with guided reflection questions mapped to the Quality and Safety Education for Nurses (QSEN) competencies.
• A patient chart with appropriate documentation and order forms to help enhance realism.

• Latest drugs and interventions to meet newest standards of care for respiratory distress due to a spontaneous pneumothorax.
• Most current best practice references and resources.



Estimated pre-briefing time: **10 minutes**

Estimated scenario time: **20 minutes**

Estimated time for debriefing: **30 minutes**

Scenario Dialogue and Simulator Transitions

Time	**Monitor/ Simulator**	**Patient Dialogue**	**Expected Learner Intervention**	**Cues/ Prompts**
0-5 minutes	**Initial State:** HR: 112/min BP: 138/90 mmHg RR: 28/ min $Sp0_2$: 86% Lung sounds: Wheezes	"I am really short of breath and so tired." Am I due for a breathing treatment (gasping). They said I would get something soon…."	Wash hands Introduce self to patient Review labs ND X-ray results Obtain vs Obtain $Sp0_2$ Apply O_2 Perform focus respiratory assessment Assess pain	If student does not recognize that oxygen is not improving Sp02, then henry should say, *"I'm still having a hard time breathing. Can't you do something?*"
	Treading to HR: 110/min BP: 134/88 mmHg Sp02: 80% over 15 minutes	Pain level 1		
5-15 minutes	**When albuterol administered:** HR: 116/min RR 22/min BP: 130/80 mmHg Sp02: 93% Lung sounds: clear over 5 minutes	***If learner do not administer albuterol, Henry should say, "***Where are my pills and my inhaler."	Administer albuterol nebulized treatment per orders, perform an overall assessment, Prepare to administer medications, Call assessment results to provider using SBAR format.	If learner does not perform overall assessment, henry should say, "*I guess it's time for you to give me the 'once over', go ahead a pick and prod over me like you usually do."*
15-20	**Trending to stable**	"I'm starting	Reviews/ read	

minutes	**state:** HR: 108/min RR: 20/min BP: 130/80 Sp02: 96% Lungs: Clear	to feel better. Those attacks can come up on you really quickly. I guess I'm going to be like this for the rest of my life".	back orders from provider; re-assess patient lungs, Sp02; documents on chart, attends to emotional needs of patient.	

Note: Adapted from Laerdal ® Medical-Surgical Simulation scenario, Unfolding Case of Henry Williams

Appendix 8
Case Study Narrative: "Henry Williams"

Scenario #2: Pneumothorax

This is the continuing case of Mr. Henry Williams, a 67 year old African-American male with a long history of COPD a result of multiple co-morbidities including smoking and working in a paper factory. Mr. Williams was recently discharges from the hospital after an acute exacerbation of COPD. He returns to the hospital today with an episode of sudden chest pain and shortness of breath. Mr. Williams states his breathing is labored, and he feels that he can't catch his breath. He states "My chest hurts and I feel weak. I'm not sure what is going on with me."

Assessment Data:

T: 98.2 F

P: 88 beats/min

R: 24/ min

BP: 132/80 mm Hg

O2 % 94 %

Bilateral rales throughout lung fields, with decreased breath sounds on the right side. Pt. is alert, oriented X 3, follows simple commands. Exhibits increased SOB at rest.

Provider orders:

Bed rest with bed side commode.

Vital signs q 4 hours

O2 via nasal cannula 2 L/min

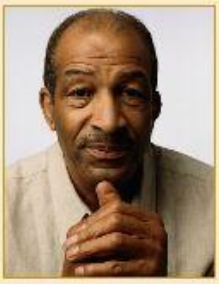
Med lock

Chest Xray now, call provider with the results.

Appendix I
Pneumothorax Scenario Variations in Patient Condition

Outline of Scenario of Patient with Spontaneous pneumothorax

PATIENT DATA:



Name: Henry Williams
Age: 67 years
Race: African American
Religion: Baptist
Allergies: No known
Immunizations: Up to date
Location: Medical Unit

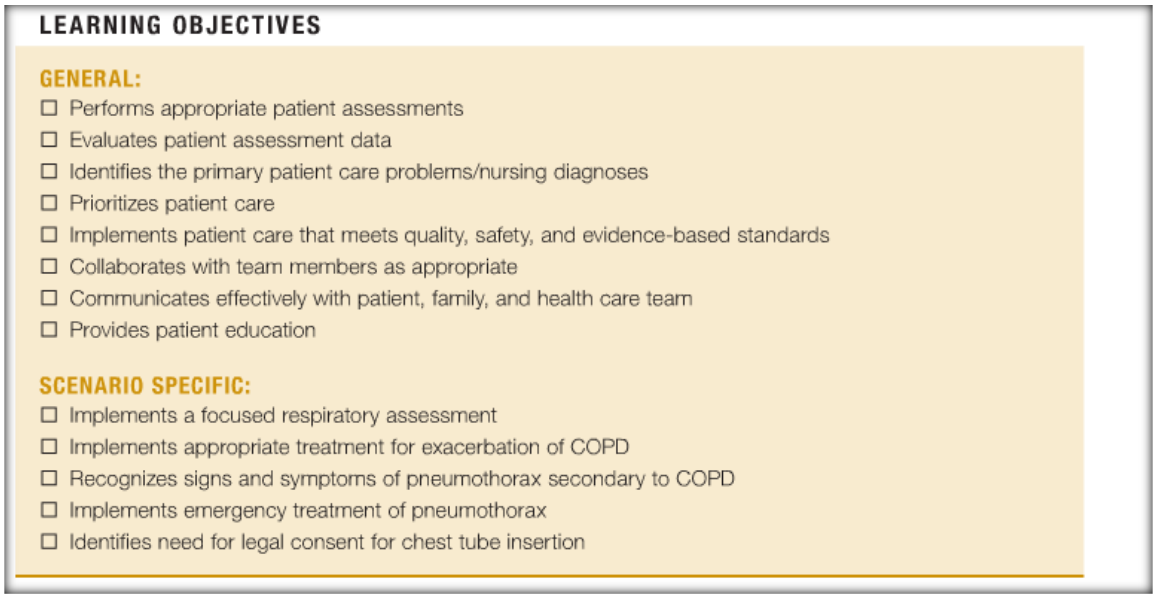
Past Medical History: Patient has a 50-year history of smoking 2 packs a day and has continued to smoke despite health care providers' recommendations to quit. During the last year he has had two COPD exacerbations.

History of Present Illness: Patient has complained of increasing fatigue and shortness of breath with activity and inability to sleep well at night. He has also had increased sputum production and cough.

Social History: Married for 42 years, has three grown children. Retired businessman.

Surgeries/Procedures & Dates: None

This case presents the continuing story of "*Henry Williams"* who is admitted to the Medical Unit for a reoccurring COPD exacerbation. He has been stable for several hours following bronchodilators but suddenly experiences profound respiratory distress due to a spontaneous pneumothorax. The learners will be expected to recognize this potential complication, notify the provider, and provide appropriate interventions, including pain medication administration, preparing and assisting with chest tube insertion, and providing support for patient and family.



LEARNING OBJECTIVES

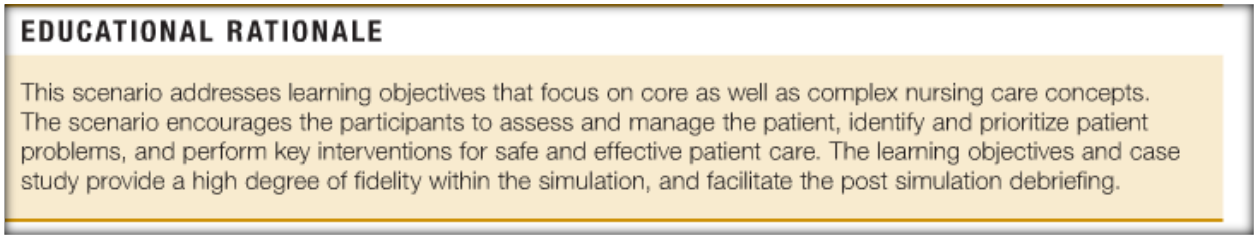
GENERAL:

- ☐ Performs appropriate patient assessments
- ☐ Evaluates patient assessment data
- ☐ Identifies the primary patient care problems/nursing diagnoses
- ☐ Prioritizes patient care
- ☐ Implements patient care that meets quality, safety, and evidence-based standards
- ☐ Collaborates with team members as appropriate
- ☐ Communicates effectively with patient, family, and health care team
- ☐ Provides patient education

SCENARIO SPECIFIC:

- ☐ Implements a focused respiratory assessment
- ☐ Implements appropriate treatment for exacerbation of COPD
- ☐ Recognizes signs and symptoms of pneumothorax secondary to COPD
- ☐ Implements emergency treatment of pneumothorax
- ☐ Identifies need for legal consent for chest tube insertion

This scenario is programmed to encourage learners to assess and manage the patient, identify and prioritize patient problems, and perform key interventions for safe and effective patient care.



EDUCATIONAL RATIONALE

This scenario addresses learning objectives that focus on core as well as complex nursing care concepts. The scenario encourages the participants to assess and manage the patient, identify and prioritize patient problems, and perform key interventions for safe and effective patient care. The learning objectives and case study provide a high degree of fidelity within the simulation, and facilitate the post simulation debriefing.

The Laerdal simulation package includes:

• A list of the nursing diagnoses that students should be able to identify in the scenario.
• Pre-simulation requirements and recommended resources for the learner to review.
• A role information sheet for the student playing the role of the support person, if desired by the instructor/ facilitator.
• An enhanced debriefing guide with guided reflection questions mapped to the Quality and Safety Education for Nurses (QSEN) competencies.
• A patient chart with appropriate documentation and order forms to help enhance realism.
• Latest drugs and interventions to meet newest standards of care for respiratory

distress due to a spontaneous pneumothorax.
• Most current best practice references and resources.

EQUIPMENT CHECKLIST

MEDICAL SUPPLIES
- ☐ Blood pressure cuff
- ☐ Chest tube (24 French)
- ☐ Chest drainage system
- ☐ ECG electrode cables
- ☐ General medication administration supplies
- ☐ IV pump
- ☐ Manual resuscitation device/bag-mask device
- ☐ Oxygen delivery devices (nasal cannula and/or mask)
- ☐ Oxygen supply source
- ☐ SpO_2 probe
- ☐ Stethoscope
- ☐ Suction device and suction catheter
- ☐ Thermometer
- ☐ Thoracostomy tray
- ☐ Universal precautions equipment

PROPS
- ☐ Patient chart
- ☐ Patient gown
- ☐ Patient ID band

MEDICATIONS AND FLUIDS
- ☐ D5 ½ normal saline with 20 mEq KCl at 100 mL/hour
- ☐ Morphine sulfate 2 mg IV push

Estimated pre-briefing time: 10 minutes

Estimated scenario time: 20 minutes

Estimated time for debriefing: 40 minutes

Scenario Dialogue and Simulator Transitions

MONITOR/SIMULATOR	PATIENT DIALOGUE	EXPECTED STUDENT INTERVENTIONS	CUE/PROMPT
***0 TO 5 MINUTES**			
Initial state: RR: 24/min HR: 88/min BP: 132/80 mmHg SpO_2: 94% Temp: 37.7°C (99.9°F) **Auscultation sounds:** Lung sounds with course crackles bilaterally	Coughing "I think I'm breathing a little easier; it's just this cough." Coughing again	Wash hands Introduce self Identify patient with two identifiers Obtain blood pressure, pulse, respiratory rate, temperature, SpO_2 Position/comfort the patient Auscultate lung sounds Evaluate lab results	*If learners fail to introduce themselves:* Patient may ask what happened to the nurse who was working earlier in the day.
***5 TO 10 MINUTES**			
Pneumothorax trend: RR → 30/min HR → 120/min BP → 140/80 mmHg SpO_2 → 76% Over 3 minutes **Auscultation sounds:** No lung sounds on left side	"I'm having pain in my chest."	Identify low SpO_2 Increase oxygen to 4 L Auscultate lung sounds Recognize left pneumothorax Call for help	*If learners don't recognize sudden worsening respiratory difficulty:* Pt. will say: "I'm getting worse again; you need to do something."

Note: Adapted from Laerdal© Medical-Surgical simulation scenario for SimMan 3G

Appendix J

Demographic Survey

Directions: *Please mark your response to the following demographic criteria*.

Gender: ☐ Male ☐ Female

Age: ☐ 18- 25 yrs. ☐ 26-30 yrs. ☐ 31-35 yrs.

☐ 36-40 yrs. ☐ 41-45 yrs. ☐ 46-50 yrs. ☐ 51 + yrs.

Years of experience as a nurse: ☐ 1-5 yrs. ☐ 5-10 yrs. ☐ 11-15 yrs.

☐ 16- 20 yrs. ☐ 21+ yrs.

Primary nursing area of expertise: ☐ Med/Surg ☐ ICU ☐ ED/ ER

☐ PACU ☐ Other _____

Educational preparation: ☐ ADN/ AA ☐ BSN ☐ MS ☐ Doctoral

Experience with simulation: ☐ No simulation experience/ first time participant.

☐ Simulation experience in nursing school.

☐ Simulation experience with other employment.

Appendix K

Creighton UNIVERSITY

Creighton Competency Evaluation Instrument (C-CEI)

Scenario:	0 = Does not demonstrate competency 1 = Demonstrates competency		Date:
ASSESSMENT	(Circle Appropriate Score for all Applicable Criteria)		**GROUP COMMENTS***
Obtains Pertinent Subjective Data	0	1	
Obtains Pertinent Objective Data	0	1	
Performs Follow-Up Assessments as Needed	0	1	
Assesses in a Systematic & Orderly Manner Using the Correct Technique	0	1	
COMMUNICATION			
Communicates Effectively w/Providers (delegation, medical terms, SBAR, WRBO)	0	1	
Communicates Effectively with Patient and S. O. (verbal, nonverbal, teaching)	0	1	
Writes Documentation Clearly, Concisely, & Accurately	0	1	
Responds to Abnormal Findings Appropriately	0	1	
Promotes Realism/Professionalism	0	1	
CRITICAL THINKING			
Interprets Vital Signs (T, P, R, BP, Pain)	0	1	
Interprets Lab Results	0	1	
Interprets Subjective/Objective Data (recognizes relevant from irrelevant data)	0	1	
Formulates Measurable Priority Outcomes	0	1	
Performs Outcome-Driven Interventions	0	1	
Provides Specific Rationale for Interventions	0	1	
Evaluates Interventions and Outcomes	0	1	
Reflects on Simulation Experience	0	1	
TECHNICAL SKILLS			
Uses Patient Identifiers	0	1	
Utilizes Standard Precautions Including Hand Washing	0	1	
Administers Medications Safely	0	1	
Manages Equipment, Tubes, & Drains Therapeutically	0	1	
Performs Procedures Correctly	0	1	

Student Participants

_____

_____

_____

_____

Faculty Evaluator:

Total Score →

Passing Score →

If not applicable, no score is given.

Passing score = 0.75 x number of items used.

*Individual comments on clinical evaluation form

Revised 11/09