IMPACT OF SIMULATION EXPERIENCE ON STUDENT PERFORMANCE DURING RESCUE HIGH FIDELITY PATIENT SIMULATION

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ABSTRACT

Purpose: When patients' lives are at stake, the most skilled provider should respond to improve the likelihood of rescue. During rescue situations, students become observers; thus, many nurses do not experience key roles in patient rescue until well into their first year of practice. Although nursing education has typically included hands-on resuscitation skills (CPR), only recently have high fidelity mannequins become available to facilitate patient rescue training. High fidelity patient simulation provides the opportunity to become skilled in patient rescue without threatening patient safety.

Patient simulation is a unique learning experience because it requires participants to suspend disbelief, immerse themselves in the scenario, and obtain data from a mannequin. It follows that some participants need experience in the setting to perform well, but the correlation between time spent in simulation and performance remains unknown. The purpose of this study is to investigate the correlation between previous simulation experience (hours and events) and student performance during simulation.

Theoretical Model: This study was conducted within the conceptual framework of Bandura's Social Cognitive Theory, which explores the relationship between self-efficacy and behavioral change. Four constructs influence self-efficacy: performance accomplishments, vicarious experiences, verbal persuasion, and emotional arousal. Each is relevant to how students experience simulation, and suggests that more simulation may improve performance by enhancing self-efficacy.

Design: This is a descriptive correlational study.

Setting: The University of Kansas School of Nursing, College of the Ozarks, and Grand Valley State University.

Participants: A convenience sample of 27 students in Baccalaureate nursing programs.

Methods: This descriptive correlational study was part of an interventional study to learn how debriefing practices impact performance. Convenience samples were recruited from four nursing schools (N=27). Student performance was measured using the Heart Failure Simulation Competency Evaluation Tool (HFSCET). The Pearson product-moment correlation coefficients were used to correlate faculty-reported simulation experience and performance.

Results: Results indicated a moderate but statistically insignificant correlation between previous simulation hours and total score on the HFSCET ($r = .353$, $p < .077$), and a moderate but statistically insignificant correlation between previous simulation events and total HFSCET score ($r = .300$, $p < .136$).

Conclusions: There was a moderate positive correlation between previous simulation experience and student performance during simulation. Therefore, simulation researchers should control for experience as a confounding variable.

INTRODUCTION

Nurses are in a unique position to recognize the deteriorating patient and intervene appropriately. However, new graduate nurses are often inadequately prepared to take action in rescue scenarios due to limited experience, potentiating a failure to rescue. According to the Agency for Healthcare Research and Quality (AHRQ), failure to rescue includes prevention of clinically important deterioration, such as "death or permanent disability from a complication of an underlying illness (e.g., cardiac arrest in a patient with acute myocardial infarction) or a complication of medical care (e.g., hemorrhage after thrombolysis for acute myocardial infarction)" (2015, p. 1). The concept of failure to rescue was designated as a Patient Safety Indicator (PSI) by the AHRQ in 2006. PSIs, such as failure to rescue, are likely preventable in part by changing aspects of the health care system to reduce the likelihood of their occurrence (AHRQ, 2006). In the hospital setting, failure to rescue often occurs because early signs of deterioration aren't recognized and acted upon by healthcare professionals, particularly novice nurses with limited experience in recognizing and responding to patient deterioration (Clarke & Aiken, 2003). Baccalaureate nursing programs have the potential to play a part in reducing rates of failure to rescue by implementing patient simulations that expose nursing students to rescue scenarios.

Baccalaureate nursing programs have recently begun to incorporate high-fidelity mannequins into their curriculum to allow students to experience a rescue scenario and learn to respond appropriately without putting real, deteriorating patients at further risk for harm. Simulation has been incorporated into nursing programs to supplement traditional approaches such as didactic learning and clinical experiences. These nursing

programs provide students the opportunity to experience high fidelity patient rescue scenarios through simulation in order to build confidence and competency in recognizing a deteriorating patient and taking appropriate action. To gain from the experience, students must become immersed in the scene, moving past the knowledge that the scenario is not real. This mental adjustment requires some experience with simulation, and may influence how a student learns from the experience.

It follows that some participants need experience in the simulation setting to perform well, but the correlation between time spent in simulation and performance remains unknown. The purpose of this study is to investigate the correlation between previous simulation experience (hours and events) and student performance during simulation.

LITERATURE REVIEW

Failure to rescue has been associated with hospital characteristics rather than patient characteristics, and improved rescue rates have been associated with changing aspects of the hospital environment (Clarke & Aiken, 2003; Silber, Williams, Krakauer, & Schwartz, 1992). The literature also suggested that the use of high-fidelity simulation mannequins can be an effective tool in instructing undergraduate nursing students to recognize and correctly respond to the deteriorating patient (Aronson, Glynn, & Squires, 2012). In addition, self-efficacy as defined by psychologist Albert Bandura (2002) plays a role in the student's ability to be successful during simulation.

Failure to Rescue

The concept of failure to rescue "is based on the premise that although deaths in hospitals are sometimes unavoidable, many can be prevented" (Clarke & Aiken, 2003, p. 43). Research indicated that rates of failure to rescue in hospitals were unique from rates of complications and death in that failure to rescue was associated primarily with hospital characteristics rather than patient characteristics. Furthermore, a hospital's failure to rescue rate was a better indicator of the quality of care a hospital provided than the rate of complications or deaths alone (Silber et al., 1992). Frequent surveillance and careful assessment of patients was a key component of preventing failure to rescue, making novice nurses particularly vulnerable to failing to detect a complication or deteriorating condition, as they are still in the process of honing their nursing and assessment skills (Clarke & Aiken, 2003). After recognizing a complication, a nurse must be poised to take appropriate action, which may include activating hospital resources and staff, taking control of the situation, and administering life saving interventions. Timely and effective interventions also included anticipation of potential complications and events, and preparing for those events by collecting necessary supplies. Novice nurses who are still developing their skills may be less likely to anticipate and prepare for potential complications, and may not have the wherewithal to take timely and appropriate action (Clarke & Aiken, 2003).

High-Fidelity Simulation

According to Aronson et al., "research on simulation in nursing education is in its infancy stage" (2012, p. e290). Recently, high-fidelity simulation mannequins have become more common in nursing schools in an effort to increase patient safety and quality of care

(Aronson et al., 2012). More research is needed to determine whether a correlation exists between the use of high-fidelity simulation in nursing education and decreased rates of failure to rescue in novice nurses. Research demonstrated that nursing students performed poorly on clinical assessments of simulated patients who were clinically deteriorating (Aronson, Glenn, & Squires, 2013). It is possible that the student's response to a patient's deteriorating condition may be improved through the use of high-fidelity simulation; however, more research is needed to define the effectiveness of high-fidelity simulation as an educational tool for nursing students.

The Role of Self-Efficacy in Simulation

Social Cognitive Theory, a psychological theory proposed by psychologist Albert Bandura, postulated that human behavior is "extensively motivated and regulated by the ongoing exercise of self-influence" (Bandura, 1991, p. 248). This theory has been used to correlate self-efficacy and behavior change, and includes four constructs: performance accomplishments, vicarious experiences, verbal persuasion, and emotional arousal (Bandura, 1977). Each of these constructs is relevant to high-fidelity simulation. Performance accomplishments include the student's actions during simulation, and emotional arousal occurs in response to the high-fidelity environment of the scenario. This emotional arousal promotes student success when the student experiences a moderate level of anxiety. Too little or too much anxiety restricts the student's ability to learn (Bandura, 1977), in this case from the simulation experience. Vicarious experiences occur when a student observes others acting in a simulation. Verbal persuasion relates to the debriefing that occurs after simulation. Self-efficacy is considered the pivotal aspect of

Social Cognitive Theory because "it affects action not only directly, but through its impact on other classes of determinants as well" (Bandura, 1999, p. 28). Self-efficacy thus impacts the student's ability to be successful in simulation.

METHODS

DESIGN

This study used a descriptive correlational design. Pearson product-moment correlation coefficient (Pearson's r) was used to examine the correlations between student experience in simulation and performance scores.

INSTRUMENTS

The Heart Failure Simulation Competency Evaluation Tool (HFSCET) (Appendix A) was used to measure student performance during simulation. The HFSCET has been revised and tested with more than 400 students in two undergraduate nursing programs and has acceptable levels of inter-rater reliability (r = .89-.98) and user friendliness (Aronson et al., 2012). The HFSCET includes the following six categories: Initial Patient Safety Activities, Assessments, Communication, Interventions, Core Measure Education about Heart Failure, and Documentation. There are 91 individual behaviors on the checklist; students receive a point for each behavior they successfully complete during the simulation.

Each participant completed a Demographic Data sheet (Appendix B). For the purpose of this data sheet, students were told the number of simulation hours they had participated in during the nursing program, eliminating the potential for inaccurate student estimations of the quantity of previous simulation experiences.

SAMPLE

The sample (N=27) was one of convenience- recruited from Baccalaureate nursing programs from three universities in the Midwestern region of the United States. Two of the three schools were academic medical centers. A fourth nursing program was originally part of this study, but conducted the simulations too late to be included in this study.

PROCEDURES

Human Subjects approval for this study was granted prior to recruiting participants. Participants were recruited from four Baccalaureate nursing programs in the United States and Canada, although only results from the three U.S. sites were available at the time the data were analyzed. Participants were randomly assigned to either the control group or the intervention group. This study was part of an interventional study to learn how debriefing practices impact performance, and this delineation of control and intervention groups was a component of that interventional study. After signing a consent form, each participant completed a Demographic Data Sheet and watched a 40-minute instructional video of an expert nurse completing the heart failure simulation. The participant was then oriented to the simulation room and provided with informational papers pertinent to the simulation, as outlined in Appendix C. Participants in the control group were given 40 minutes to complete the simulation, after which the simulation coordinator led them through a standard debriefing session. Participants in the intervention group were stopped after 20 minutes of the simulation and led through a deliberate practice debriefing session, then allowed to start from the beginning and complete the simulation for another 20 minutes. They were then debriefed again using the deliberate practice debriefing model. Each participant's performance was scored using the HFSCET. Participants were provided with a small gift card and certificate of completion for their participation in the study.

RESULTS

All participants in this study were fourth year Baccalaureate nursing students (N= 27). Of these students, 85.2% participants were female (N= 23) and 14.8% were male (N= 4). In regards to language and ethnicity, 88.9% of participants were Caucasian (N= 24), 7.4% were Hispanic (N= 2), and 3.7% were African American (N= 1). All participants spoke English as their primary language. Of this sample, 63% had been employed in healthcare (N= 17), and 29.6% had never been employed in healthcare (N= 8). The mean number of simulation events was 11.24 (SD= 7.449), and the mean number of simulation hours was 32.59 (SD= 36.184). The mean total score on the Heart Failure Simulation Competency Evaluation Tool (HFSCET) was 48.16 (SD= 10.792). Simulation hours and total score were moderately correlated (r = .353). Simulation events and total score were also moderately correlated (r = .300), but neither of the correlations were statistically significant.

LIMITATIONS AND RECOMMENDATIONS

Although conducting research in multiple sites adds to the generalizability of the findings, it can be challenging for multiple researchers to communicate and adhere to strict simulation and data collection protocol. Collaborating across borders and time zones presented a barrier to effective and timely communication. Additionally, at one site the simulations were not run by the researcher, but rather by the lab staff, resulting in variations in data collection techniques. Two sites had difficulty attracting and retaining participants. Another site completed their simulations months after the rest of the sites; thus, data from this site was not available for this analysis.

The length of the simulation also created challenges in data collection. The 40-minute heart failure simulation was selected primarily because previous researchers had validated the simulation and a corresponding evaluation tool, the HSFCET (Aronson et al., 2012). In retrospect, the intervention group may have been disadvantaged since they were stopped at 20 minutes, debriefed, and then were asked to start over. Although students were more efficient during the second 20-minute encounter, the simulation was so lengthy that most participants struggled to complete all of the content in the scenario, particularly related to administering medication and educating the patient on heart failure.

There was a moderate positive correlation between previous simulation experience and student performance during simulation. This correlation suggested that simulation researchers should control for experience as a confounding variable when measuring performance. Further research is needed to determine whether a causational relationship exists between previous simulation experience and student performance.

Recommendations for future research include refining the simulation to be more concise. This might be easily accomplished by keeping the focus of the simulation on failure to rescue, rather than including the heart failure education piece. This would allow adequate time for most participants to complete the entire scenario within the allotted time, and attracting a larger sample size. Additionally, it is possible that the moderate correlation between simulation hours and total score would reach statistical significance with a larger sample size. More research powered by an adequate sample size is needed to firmly establish the link between the dose of high-fidelity simulation (in terms of both time and events) and student performance.

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APPENDIX A

Heart Failure Simulation Competency Evaluation Tool © (Aronson, Glynn, Squires, 2010)

Student Group # _____

Initial Patient Safety Activities- check if observed

1.	Performs hand hygiene with alcohol based hand rub before entering room (both participants must perform hand hygiene to receive credit)
2.	Checks patient identification using two patient identifiers before providing care (must use two identifiers to receive credit)
3.	Each participant identifies self before providing care (both participants must use own name to receive credit)

_____Total

Assessments

1.	Assesses neurological status (must include assessment of orientation to person, place and time to receive credit)
2.	Assesses fall risk (must include assessment of previous history of falls, use of assistive devices, mobility impairments to receive credit)
3.	Assesses and verbalizes lung sounds (must place stethoscope on chest and identify crackles to receive credit)
4.	Assesses and verbalizes bowel sounds (must place stethoscope on abdomen and identify active bowel sounds to receive credit)
5.	Assess and verbalizes cardiac sounds (must place stethoscope on chest and identify the presence of S3 to receive credit)
6.	Assesses and verbalizes leg edema (must identify bilateral peripheral leg edema to receive credit)
7.	Assesses and verbalizes lower leg circulation (must identify the presence of bilateral pedal pulses to receive credit)
8.	Assesess and verbalizes EKG rhythm (must look at monitor and identify atrial fibrillation to receive credit)
9.	Assesses and verbalizes intravenous site (must identify date of insertion, integrity of dressing, and lack of swelling, edema and pain to receive credit)
10.	Assesses and verbalizes intravenous fluid (must identify type of fluid {.09%} and compare with order, pump rate {50 ml/hr}, and tubing date to receive credit)
11.	Assesses and verbalizes skin integrity (must assess anterior and posterior pressure points and verbalize the finding of intact skin)
12.	Assesses and verbalizes foley catheter integrity (must assess for kinks and integrity of tubing, presence of catheter tube holder, and condition of insertion site to receive credit)
13.	Assesses and verbalizes urine output (must look at catheter bag and verbalize urine output of about 100 mL to receive credit)
14.	Assesses pain level (must ask about level of pain using analog scale of 1-10 to receive credit)
15.	Assesess and verbalizes oxygen level (must look at and identify flow meter position of 2 liters to receive credit)

16.	Takes and verbalizes accurate initial reading of blood pressure (must be within 4 mmHg of systolic and diastolic reading = 110/70
17.	Takes and verbalizes accurate initial reading of pulse rate (must be within 2 points to receive credit- may use monitor value or take manually= 90/ minute)
18.	Takes and verbalizes accurate initial reading of respiratory rate (must be within 2 points to receive credit = 20/ minute)
19.	Looks at monitor and verbalizes accurate initial reading of pulse oximetry (must look at monitor and verbalize reading= 94%)
20.	Looks at monitor and verbalizes accurate initial reading of temperature (must look at monitor and verbalize reading = 99 degrees)
21.	Takes and verbalizes accurate reading of blood pressure after patient deteriorates (must be within 4 mmHg of systolic and diastolic reading = 90/60 to receive credit)
22.	Takes and verbalizes accurate reading of pulse rate after patient deteriorates (must be within 2 points to receive credit- may use monitor reading or take manually= 120/ minute to receive credit)
23.	Takes and verbalizes accurate reading of respiratory rate after patient deteriorates (must be within 2 points to receive credit = 30/ minute)
24.	Looks at monitor and verbalizes accurate reading of pulse oximetry after patient deteriorates (must look at monitor and verbalize reading= 89% to receive credit)
25.	Takes vital signs together at the same time (must take both sets together to receive credit)

_____ Total

Communication

1.	Responds verbally to patient's complaints of shortness of breath and provides reassurance
2.	Calls physician to report using SBAR format Situation Calls physician and identifies self by name (must include name and designation of title = RN, nurse or student nurse to receive credit)
3.	Identifies the patient being called about- must state Raymond Garrison to receive credit)
4.	Provides brief history of patient (must include date of admission and admission diagnosis of heart failure to receive credit)
5.	Reports change in blood pressure
6.	Reports change in pulse oximetry
7.	Reports change in pulse rate
8.	Reports change in respiratory rate
9.	Reports bilateral peripheral edema
10.	Reports presence of atrial fibrillation
11.	Reports presence of crackles (lung sounds)
12.	Reports complaint of shortness of breath
13.	Reports urine output (100 mL)

14.	**Assessment** **Assesses situation and verbalizes conclusion to physician**
15.	**Recommendation** **Verbalizes need for assistance and makes appropriate recommendations for care**
16.	**Writes down verbal orders**
17.	**Reads back and verifies orders (must read back orders accurately to receive credit)**

_____**Total**

Interventions

1.	**Elevates head of bed (must elevate at least 45 degrees to receive credit)**
2.	**Verbalizes need to check weight during shift**
3.	**Increases oxygen from 2 liters to 4 liters**
4.	**Washes hands before preparing medications**
5.	**Checks allergy record before preparing medications (NKA)**
6.	**Obtains correct medications from pixis (Cardizem and Lasix)**
7.	**Checks medication name, dose, route on vial against MAR or verbal order (Lasix 40 mg IV push now) three times (must check three times to receive credit)**
8.	**Checks medication name, dose and route on vial against MAR or verbal order (Cardizem 20 mg IV push now) three times (must check three times to receive credit)**
9.	**Reviews reference for correct administration of both medications**
10.	**Draws up correct dose of Lasix (must draw up 4 mL to receive credit- medication is not diluted)**
11.	**Draws up correct dose of Cardizem (must draw up 4 mL to receive credit- medication is not diluted)**
12.	**Labels Lasix syringe correctly (must label syringe with patient name, medication name and dose to receive credit)**
13.	**Labels Cardizem syringe correctly (must label syringe with patient name, medication name and dose to receive credit)**
14.	**Maintains aspectic technique while preparing Lasix (must wipe vial top before needle is inserted must not contaminate needle to receive credit)**
15.	**Maintains aspectic technique while preparing Cardizem (must wipe vial top before needle is inserted must not contaminate needle to receive credit)**
16.	**Checks patient identification using two patient identifiers before administering medications (must use two identifiers to receive credit)**
17.	**Wipes port of IV catheter with alcohol before needle insertion (must wipe port each time catheter is accessed to receive credit)**
18.	**Stops pump and kinks tubing before administering meds (must do both)**
18.	**Flushes site with 1 mL of normal saline before and after administering Lasix (must do both to receive credit)**
19.	**Flushes site with 1 mL of normal saline before and after administering Cardizem (must do both to receive credit)**
20.	**Administers Lasix over two minutes**
21.	**Administers Cardizem over two minutes**

22.	Disposes of needles and syringes in appropriate needle box
23.	Washes hands after medication administration
24.	Recognizes and verbalizes the improvement in patient condition after medications administered
25.	Communicates improvement to patient

_____Total

Core Measure Education about Heart Failure

1.	Provides brief explanation to patient about how Lasix works
2.	Provides brief explanation to patient about how Cardizem works
3.	Assesses patient understanding about heart failure
4.	Provides information about heart failure
5.	Assess patient adherence to low sodium diet
6.	Provides information about importance of low sodium diet
7.	Assesses patient's activity level
8.	Provides information about the importance of regular activity
9.	Assesses patient's medication adherence patterns
10.	Provides information about the importance of medication adherence and ways to increase adherence
11.	Assess patient's daily weight check adherence
12.	Provides information about appropriate way to check and record weight
13.	Assesses adherence to follow-up appointments
14.	Provides information about importance of regular follow-up with HCP
15.	Assesses patient's knowledge of signs and symptoms to report to HCP
16.	Provides information related to signs and symptoms to report to HCP (must include discussion of leg edema, weight increase of 2-3 lbs over 2-3 days, increased SOB and orthopnea to receive credit)

_____Total

Documentation

1.	Documents Lasix on medication administration record (must include date, time and initials in correct place to receive credit)
2.	Documents Cardizem on medication administration record (must include date, time and initials in correct place to receive credit)
3.	Documents vital signs (must document initial vital signs and vital signs taken after patient deteriorates, must include BP, P, RR and pulse ox)
4.	Documents assessments (must record results of documentation assessments completed to receive credit)
5.	Writes descriptive narrative note related to patient situation

_____Total

APPENDIX B

Demographic Data

Participant Number _____

Level of student: _____4th year undergraduate student

_____ Other (Please describe) _____

Gender (circle) M F

Race (circle) African American Caucasian

East Indian Asian

American Indian Hispanic

Other _____

Estimate the number of simulation hours you participated in during your nursing program:

_____.

Estimate the number of times you experienced simulation: _____.

Have you ever been exposed to deliberate practice during a simulation or debriefing?

Have you ever been employed in healthcare (paid positions)?

No _____

Yes _____

If yes, describe the setting (i.e. hospital, long term care) _____

What was your title? _____

How long? _____

English first language

Yes _____

No, what is first language learned _____

APPENDIX C

The Heart Failure Response to Rescue Simulation © Aronson, Glynn and Squires, 2010

You are a nurse on a cardiac telemetry unit of a 130 bed community hospital. You receive report from the Emergency Department about a patient who has just arrived on your unit – North 3 room 22. The nursing assistant has put the patient into bed and placed him on telemetry monitoring.

Emergency Room Report
Mr. Garrison is a 75-year old Caucasian male with a history of hypertension, coronary artery disease, and hyperlipidemia. He suffered an acute Myocardial Infarction (MI) four years ago and was treated with Coronary Artery Bypass Graft (CABG) surgery. He was later diagnosed with systolic left-sided heart failure. His ejection fraction is 35%. He is classified as Stage II (New York Hospital Association) heart failure. Mr. Garrison is 5 ft, 10 inches tall and weighs 195 pounds. He has no known allergies to medications.

Mr. Garrison's medications include:

Enalapril (Vasotec) 10mg once a day
Carvedil (Coreg) 12.5 mg BID
Furosemide (Lasix) 40 mg. BID
Digoxin (Lanoxin) 0.25 mg once a day
Aspirin 325 mg. once a day
Plavix 75 mg. once a day
Lipitor 20 mg. once a day

He states he has difficulty remembering to take his medications regularly.

Mr. Garrison is divorced, and lives alone in a single-family dwelling. His son has been notified and will be visiting later in the day.

This is Mr. Garrison's third admission for heart failure in the last two years. He was seen in the Emergency Department this morning complaining of increased orthopnea, and dyspnea on exertion, cough, nausea, and edema of his legs.

We inserted a # 22 Jelco IV in his right forearm, a foley catheter (300 mL output while in ED), put him on 2 liters of oxygen via nasal cannula and did a 12-lead EKG and chest Xray. He has IV fluid of 0.9% at 50 mL/hr rate. He is on the telemetry monitor and he is currently in atrial fibrillation which is a new rhythm for him. We gave him Lasix 40 mg IV several hours ago.

His vital signs are: Temperature 98 degrees, BP 140/80, Pulse 96, Respiratory Rate 22 and O2 Sat of 95% on 2 liters. He has JVD, an S3, and 3 + edema of the lower extremities.
His labs have been drawn. EKG and Chest Xray results are on the computer.

Garrison, Raymond
ID = 7022111 DOB = 6/10/1933

Computer Laboratory Results:

Na = 145 mEq/L	(136 - 145 mEq/L)
K = 5.8 mEq/L	(3.5 - 5.0 mEq/L)
Cl = 106 mEq/L	(98 - 106 mEq/L)
BUN = 20 mg/dl	(10 - 20 mg/dl)
Ca = 4.8 mg/dl	(4.5 - 5.6 mg/dl)
CO2 = 23 mEq/L	(23 - 30 mEq/L)
Creatinine = 1.2 mg/dl	(0.6 - 1.2 mg/dl)
Glucose = 120 mg/dl	(70 - 110 mg/dl)
BNP = 1,200 pg/ml	(<100 pg/ml)
Digoxin level = 0.7 ng/ml	(0.8 - 2.0 ng/dl)
RBC count = 4.0	(4.7 – 6.1)
Hgb = 11 g/dl	(14-18 g/dl)
HCT = 35 %	(42 – 52 %)
MCV = 75 um3	(80 – 95 um3)
MCH = 25 pg	(27-31 pg)
MCHC = 29 g/dl	(32 – 36 g/dl)
RDW = 10%	(11%- 14.5%)
WBC count = 9, 500	(5,000-10,000/mm3)
Neutrophils = 65%	(55% - 70%)
Lymphoctyes = 30%	(20% - 40%)
Monoctyes = 2%	(2% - 8%)
Esosinophils = 2%	(1% - 4%)
Basophils = 1%	(0.5% - 1%)
Blood smear = nl	(nl size, shape and color or RBCs)
Platelet count = 170,000 mm3	(150,000 - 400,000/mm3)
MPV = 8.5 fL	(7.4 – 10.4 fL)
PT = 11.8 seconds	(11.0 – 12.5 seconds)
PTT = 24	(20 – 34 seconds)
Troponin T = 0.1 ng/ml	(<0.2 mg/dL)
Troponin I = 0.02 ng/ml	(<0.03 ng/ml)
CPK = 160 units/L	(55 – 170 units/L)
CPK - MM 100%	(100%)
CPK - MB = 0%	(0%)
CPK – BB = 0%	(0%)

Garrison, Raymond
ID = 7022111 DOB = 6/10/1933

Chest Xray Report
Bilateral pleural effusions

12-lead EKG Report
Atrial fibrillation with a ventricular response rate of 74

Simulation set-up

Male patient in supine position
Alcohol hand rub available at bedside
Oxygen is at 2 liters via nasal cannula
Patient identification band on {Raymond Garrison, DOB 6/10/33, ID = 7022111]
Bilateral leg edema
EKG rhythm = atrial fibrillation
Pulse oximeter probe on
Lung sounds = crackles bilaterally
Cardiac sounds = presence of S3
Side rails up, bed in low position, call bell within reach
IV pump with 1,000 mL of 0.9 NS at 50 mL /hr
IV site right forearm (# 22 Jelco), dressing labeled with correct date
IV fluid (9 % NS at 20 cc/hr) via pump, tubing labeled with correct date
Foley catheter with yellow urine (50 cc in bag) with leg stabilizing device
Medication cart or pixis
10 mL syringes with needles
Normal saline flush syringes
Syringe labels
Alcohol wipes
Vial with Lasix 40 mg
Vial with Cardizem 20 mg
Telephone in room
Pen and note paper in room

Initial vital signs
Telemetry monitor =Atrial Fibrillation (rate of 90)
VS= BP 110/70, P= 90, RR = 20, Temp = 98.6 degrees, O2 sat = 94%

Ten minutes into scenario, Mr. Garrison states he is having trouble breathing and states heart is pounding rapidly

Deteriorating vital signs
BP decreases to 90/60, P = 120.RR = 30
O2 sat decreases to 89% on 2 liters

Physician orders when called:
Give IV meds (Lasix 40 mg IV push)
Cardizem 20 mg (IV push)
Increase O2 to 4 liters
I will be up to see him shortly

APPENDIX D

Table 1. *Sim Hours and Sim Events Correlations (n=26)*

		SimHrs	SimEvents
SimHrs	Pearson Correlation	1	.943
	Sig. (2-tailed)		
	N	27	27
TotalScore	Pearson Correlation	.353	.300
	Sig. (2-tailed)	.077	.136
	N	26*	26*

*One participant's score was incomplete