Interprofessional Pharmacology Based Simulation

Mary Rinella
St. Catherine University
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Mary Rinella

St. Catherine University

Scholarly Project

Emily Nowak

May 23, 2014
Interprofessional Pharmacology Based Simulation

Literature indicates that when entering the workforce, the graduate nurse is underprepared to apply pharmacological theory to manage medications safely (Banning, 2003, Cordeau, 2010, Meechan, Jones, & Valler-Jones, 2011). The registered nurses’ (RN) knowledge, skills, and abilities (KSA) of safe medication management, including the theoretical application of pharmacology and the ability to communicate with interprofessional team members is necessary to assure positive patient outcomes, particularly in an environment where complexity continues to increase (Garbee et al., 2013; Meechan et al., 2011). This project is an innovative approach to embed an applied learning activity addressing safe medication management and interprofessional communication in one undergraduate nursing program in the upper Midwest.

Background and Significance

One and a half million people experience complications related to medication errors per year in the United States resulting in 3.5 billion dollars of unnecessary expenses (Jeongeun and Bates, 2012). While errors can occur for many reasons, one study purported that “ineffective communication is the root cause of medical errors” (Garbee et al., 2013, p. 340). As nurses are the last line of defense for safe medication administration and management, it is necessary for schools of nursing to assure that students are provided opportunities to practice pharmacology KSAs as well as interprofessional communication skills in a safe setting (Benner et al., 2010, Jeongeun & Bates, 2012, Mikkelsen Kyrkjebo, Brattebo, & Smith-Strom, 2006).

Traditionally, students experience applying pharmacological theory and safe medication management in a clinical site while working with live patients and a clinical instructor. Several barriers to achieving student learning outcomes exist, including limited faculty oversight and
availability of appropriate clinical sites (Cordeau, 2010, Meechan et al., 2011). As a result, many organizations are turning to controlled settings through the use of simulation (Alinier, Hunt, Gordon, & Harwood, 2006, Cordeau, 2010).

Specific to pharmacology, a recent study by Meechan et al., (2011) examined the value of the early introduction of pharmacy simulations for nursing students in enhancing patient safety and safe medication management. The authors compared KSAs of three groups of undergraduate nursing students, each at different levels of their studies (freshman, sophomore, and junior level). Findings indicated that the early introduction of pharmacy based simulation improved the KSA of safe medication management of nursing students in the freshman and sophomore level students while junior level students needed further education.

The interprofessional nature of patient safety and medication management leads to interprofessional (IP) simulation. Research has previously demonstrated the value of IP training as a means to improve learning for nurses and enhance patient safety. In one pilot study by Mikkelsin-Kykjebo et al. (2006) three care disciplines, including general care nurses, intensive care nurses, and medical students, participated in an interprofessional simulation which required hanging blood for two different patients. The authors reported that participants felt that the training was valuable in highlighting the difficulties of IP communication in the clinical setting. While challenging, participants also reported a sense of improved interprofessional interactions and subsequently enhanced patient safety.

In a more recent quasi-experimental study, Garbee et al. (2013) examined how four IP disciplines (undergraduate nursing, nurse anesthesia, medical, and respiratory therapy) collaborated during several mock code simulations. Each simulation measured the knowledge and retention of teamwork principles over an academic year using three methods of evaluation,
team-based behavior, shared mental model and an adaptive communication and response model. Findings demonstrated that there was an improvement in IP communication, cooperation, coordination, and situational awareness for the time measured.

The literature reviewed demonstrates the effectiveness of simulation in enhancing safe patient care and therapeutic communication through applied learning in the cognitive, psychomotor, and effective domains (Alinier, Hunt, Gordon, & Harwood, 2006, Cordeau, 2010). As such, using interprofessional pharmacological simulations in nursing education to facilitate student development and socialization is appropriate (Alinier et al., 2006). In the following section, a detailed explanation of the development, implementation and evaluation of an interprofessional pharmacology based simulation is provided.

Design of Simulation

This scholarly project was developed to meet the knowledge, skills and attitudes necessary for interprofessional medication management in the department of nursing at St. Catherine University. This project is proposed as a supplement to the Pharmacology course that will be required for the new program of study nursing students at St. Catherine University in Fall 2014. The development of this new pharmacy course offered an opportunity to introduce an innovative teaching strategy to enhance student learning outcomes. To meet curriculum design requirements, this simulation incorporated the National Council of Educational Licensure Examination for Registered Nurses (NCLEX-RN) test plan statement. As such, this project acts in accordance with the pharmacology course being developed by St. Catherine University (V. Schug, personal communication, February 4, 2014). Opportunities for collaboration with other disciplines of study are possible with slight modifications to the student learning outcomes. It is
intended that this simulation will enhance student learning and bridge pharmacological theory and interprofessional communication techniques to the clinical site (Alinier et al., 2006).

**Guiding Standards**

Standards and guidelines for nursing practice are important to consider when developing any curricular change. The standards used to develop this simulation include the NCLEX-RN (National Council of State Board of Nursing, 2013), the Joint Commission (2014) National Patient Safety Goals (NPSG) and the National League of Nursing (NLN) Core Competencies for Nurse Educators (2014).

**NCLEX-RN**

Two of the detailed test plan environments for the NCLEX-RN (National Council of State Boards of Nursing, 2013) were used in this simulation. These include safe and effective care and pharmacological and parenteral therapies (NCSBN, 2013). The first environment of safe and effective care was chosen as it pertains to the collaboration of health care members across disciplines when providing patient care, the ability of the nurse to prioritize the delivery of client care, and requires nurses to provide and receive report on assigned clients. These statements focus on elements to enhance the care delivery setting by protecting both the patient and health care personnel, as well as to direct nursing care that safely manages conflict among patients and health care staff.

The second environment, the pharmacological and parenteral therapy environment, was chosen as it includes performing medication calculations safely, evaluation of the patient response to medication, and assessment for actual or potential side effects and adverse effects of medications. Additional topics include patient education on medication management. Student
competence in these two detailed test plan areas assures competent practitioners in the live environment.

**Joint Commission NPSGs**

To assure patient safety in the hospital, the Joint Commission publishes expectations for implementing NPSGs each year. These goals enhance health care safety. The NPSGs included in this simulation include: 1) identifying patients correctly and, 2) using medicines safely (The Joint Commission, 2014). Weaving these NPSGs into the scenario demonstrates that standards from multiple sources are important to providing safe patient care and ensuring positive patient outcomes.

**NLN Core Competencies**

Lastly, the simulation was designed to address the first two NLN’s Core Competencies for Nurse Educators, 1) facilitation of learning and 2) facilitate learner development and socialization (National League for Nursing, 2014). Not only does this simulation provide a creative learning environment for students to demonstrate safe practice, it offers an opportunity for students to practice learner socialization through interprofessional communication.

**Theoretical Framework**

The theoretical framework used in developing this simulation was created by Jeffries in 2005 (Schlairret, 2011). This framework is known as the Nursing Education Simulation Framework (NESF) and is used by nurse educators for designing, implementing, and evaluating simulations. The NESF includes the facilitator (teacher), participant, (student), educational applications, project characteristics, and student outcomes. This framework was chosen as the site that this simulation will be implemented in currently uses NESF, minimizing the potential
for faculty and staff confusion. The template for this simulation was retrieved from NLN’s website (Simulation Innovation and Resource Center, 2014).

**Simulation: Student Learning Objectives (SLOs)**

The objectives of this simulation include cognitive, behavioral, and the psychomotor learning domains. In the cognitive domain the student will be evaluated on their ability to prioritize patient needs and recognize changes in patient status. Students who demonstrate an ability to correctly assess and evaluate the alarms and/or changes in vital signs of their patient will be considered as having successfully met the learning objective related to the critical thinking concept of respiratory distress. By demonstrating appropriate nursing interventions to promote positive patient outcomes, students will have met the objective of prioritizing patient care. The student’s ability to provide safe medication management will demonstrate an understanding of the principles related to pharmacology objective.

Behavioral objectives include using appropriate communication techniques such as SBAR (situation, background, assessments and recommendation) while collaborating with the IP team and, demonstration of interventions with the IP team that assist and support the safety of the patient. In the psychomotor learning environment the students will be evaluated on proper medication administration through the use of the six rights (patient, medication, dose, route, time, and documentation) and demonstration of proper positioning of the patient to avoid aspiration.

**Design**

This procedural sedation scenario was designed to mimic a complex medication management regimen for both the disciplines of nursing and the interprofessional gastrointestinal (GI) team. A procedural sedation was chosen for this simulation as it provides an environment
that facilitates the desired student learner objectives of; a) enhancing communication, b) enhancing collaboration with the IP team, and c) demonstration of medication management KSAs while simultaneously exposing nursing students to common procedures in the intensive care unit.

A procedural sedation protocol used at area hospital was used as a resource for development of this simulation. Content was reviewed by facility experts to assure validity. For ease of delivery, the scenario was divided into several stages with trigger points to address each student learning outcome. This also allowed for easier facilitation of evaluating the scenario. Implementation of the scenario was trialed at a local simulation center giving the project designer the opportunity to identify gaps and the fluidity of the simulation.

A description of the scenario follows.

Scenario Synopsis: Procedural Sedation

In this scenario two nurses are caring for Jack Johnson, a 55 year old male, admitted with the chief complaint of abdominal pain and symptoms of gastric distress with the possibility of a bleeding ulcer. Jack has been seen in the emergency department by the IP GI team. It was determined that Jack would be admitted to the impatient medical intensive care unit and would undergo an esophagastroduodenoscopy (EGD). The IP GI team will need to schedule and administer the EGD at his bedside. The assigned nurse must be present throughout the procedure and will be the individual responsible for delivering procedural sedation to the patient. At the beginning of the simulation, the patient will appear anxious and ask questions about the procedure. The nurse is required to administer the pre-procedural medications ordered. During administration, the patient has an additive reaction to the combination of benzodiazepines and opioids. The nurse is expected to prioritize care appropriate for the changes she/he is seeing in
the patient’s condition. Effective communication and collaboration is necessary by both the nurse and the IP team to deliver safe medication management for the patient. The scenario concludes when the nurse administers the reversal medication to the patient as ordered by the physician (see Simulation Design, Appendices A-I for complete prep, scenario, debriefing, and role descriptions).

**Evaluation**

Evaluation strategies are directly linked to the students’ ability to demonstrate the NPSGs and safe KSA of medication management. Performances evaluated include the students’ live performance, the videotaped simulation, and the debriefing session. When appropriate, student competence is determined using a rubric which can be found in Appendix J. Additionally, each student is also required to complete a survey before leaving the debriefing. The survey is used to determine the student’s perception of whether or not student learning outcomes were met, and gives students an opportunity to give faculty feedback for future implementation of the simulation.

**Recommendations**

Nurses prepared to safely manage medications and communicate across interprofessional teams are needed. These skills must be learned prior to the nurse transitioning to an active clinical role. Research has demonstrated that both IP and pharmacology based simulations have the potential to improve nurses KSA for safe medication management and assist with their transition to the nursing profession (Banning, 2003, Garbee et al., 2013, Meechan, et al., Mikkelsen Kyrkjebo et al., 2006). As such, it is appropriate to recommend that an interprofessional pharmacology simulation be integrated into programs of nursing. Further, as an
interprofessional simulation, opportunities to incorporate other professions and disciplines across the University are abundant.

Conclusion

The development of this simulation was an exciting process that all nurse educators could benefit from. The development of a simulation for this writer was an exceptionally complex and detailed experience. An opportunity to practice this simulation was a valued experience that allowed for small adjustments to the original simulation. This simulation has the potential to reach many different disciplines at St. Catherine University as well as many clinical institutions interested in enhancing patient safety in their practice setting. Future research evaluating nurses’ self-confidence and preparedness for safe medication management following this type of simulation would provide valuable data. Obtaining data from employers related to new graduate competence for KSA in medication management would be an added value in evaluating this simulation. This project is an example of how nurse educators can continue to challenge themselves with delivering innovative teaching strategies such as this simulation to enhance the learning environment and create a stimulating setting for students to learn.
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Appendix A
Simulation Design

St. Catherine University
Simulation Design

Interprofessional/Pharmacology Based Simulation
JACK JOHNSON
By Mary Rinella

“In a nutshell”
Simulation: Jack Johnson
Date: May 1, 2014

Interprofessional/Pharmacology
Discipline: Nursing
Student Level: Senior level students

Expected Simulation Run Time:
Pre: 10 min     Actual simulation: 30 min
Guided Reflection: Time: 20 min
Location: Simulation lab
Location for Reflection: Rm 7B

Admission Date: May 1, 2014

Today’s Date: May 1, 2014

Brief Description of Client
Patient is a 55 year old male with increased abdominal pain last 2 weeks with worsening abdominal pain in last 48hrs with nausea and vomiting coffee ground like emesis, and dizziness while standing.
Name: Jack Jackson
Gender: M Age: 55 DOB 03-31-1959
Weight: 88 kg Height: 5ft 11 inch
Religion: Catholic Major Support: Wife - Mimi
Phone: 651-555-5555
Allergies: NKDA
Immunizations: up to date/ influenza Oct, 2013
Attending Physician/Team: Dr. Smith
GI Consult/Team: Dr. Jones
Past Medical History: GERD
History of Present Illness: Increased abdominal pain last 2 weeks and complains of

Psychomotor Skills Required Prior to Simulation:
Perform Medication dispensing using 6 rights; drug, dose, time, route, patient, documentation. Perform correct patient positioning for procedure and prevention of aspiration.

Cognitive Activities Required prior to Simulation Review:
Procedural Sedation/Analgesia Adult and Pediatric: Policy of Regions Hospital # RH-PC-PC-09-50 posted on D2L. Utilize and bring Davis Drug Guide (Vallerd, Sanoski, & Deglin, 2013).

Review: Pharmacologic principles regarding opioids and benzodiazepines. For example; additive effects, adverse drug event, adverse drug reaction, adverse effects, agonist, antagonist, generic name, onset, half-life, & duration as well as reversal for these drugs.

Read: Article posted on D2L; Pharmacy of procedural sedation (Adams & Dervay, 2012).

Review: The Joint Commission National Patient Safety Goals: NPSG .01.01.01 Identifying Patients Correctly and NPSG
increased abdominal pain last 48 hours with nausea and coffee ground emesis, and dizziness while standing. Was unable to go to work today. Wife brought into ED at 0600.

**Social History:** Married for 20 years lives with wife Mimi in a townhouse Employed as a FedEx manager. Has one adult son Richard who lives with his wife and 2 children short distance from patients home.

**Primary Medical Diagnosis:** Upper GI Bleed and r/o Ulcer.

**Surgeries/Procedures & Dates:** none known

**Nursing Diagnoses:** Alteration in comfort r/t abdominal pain, alteration in fluid balance r/t to nausea/vomiting, and risk for Falls r/t bleeding.

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**Simulation Learning Objectives**

**Cognitive**
1. Prioritize patient needs.
2. Recognizes signs and symptoms of respiratory distress.
3. List effective communications skill used with the interprofessional team to provide best care for the patient.
4. Apply basic pharmacology principles to administer medications safely.

**Behavior**
5. Demonstrate proper situation, background, assessment, and recommendations (SBAR).
6. Identifies and expresses the implications of change in LOC in the patient.
7. Collaborate and communicate with interprofessional team to provide safe patient care.

**Psychomotor**
8. Demonstrate proper medication administration using the 6 rights.
9. Demonstrate proper patient positioning for airway
Fidelity (choose all that apply to this simulation)

<table>
<thead>
<tr>
<th>Setting/Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
</tr>
<tr>
<td>Med-Surg</td>
</tr>
<tr>
<td>Peds</td>
</tr>
<tr>
<td>ICU</td>
</tr>
<tr>
<td>OR / PACU</td>
</tr>
<tr>
<td>Women’s Center</td>
</tr>
<tr>
<td>Behavioral Health</td>
</tr>
<tr>
<td>Home Health</td>
</tr>
<tr>
<td>Pre-Hospital</td>
</tr>
<tr>
<td>Other:</td>
</tr>
</tbody>
</table>

Simulator Manikin/s Needed: Hal, Laerdal 3G

Props: Male wig, Hospital gown, slippers, emesis basis with coffee ground emesis. NKA band, ID band, and Falls band. NC, oral suction. Endoscopy scope. Ambu Bag.

Equipment attached to manikin:
- IV tubing with primary line 0.9% Normal Saline (NS) fluids running at 150 mL/hr infusing in #18 PIV
- Second IV line Nexium 80mg/100ml NS at 8mg/hr (10 mL/hr) infusing in #18 PIV
- 2 IV pumps
- Foley catheter mL output
- PCA pump running
- IVPB with running at mL/hr
- 02 at 2L NC
- Monitor attached
- ID band: MR # 123456789, Jack Johnson, DOB 3/31/59, NKA, and Falls band
- Other: etCO2 detector monitor applied pre procedure by GI RN

Equipment available in room
- Urinal
- Foley kit
- Straight Catheter Kit
- Incentive Spirometer
- Fluids
- IV start kit
- IV tubing
- IVPB Tubing
- IV Pump
- Feeding Pump
- Pressure Bag
- 02 delivery device (type) NC 2L
- Crash cart with airway devices and

Medications and Fluids
- IV Fluids: 0.9% NS, Nexium 80mg/100ml NS
- Oral Meds:
- IVPB:
- IV Push: Fentanyl 100mcg, midazolam (Versed) 6mg, naloxone (Narcan) 0.4mg, flumazenil 0.2mg, and ondansetron (Zoran) 4mg-8mg.
- IM or SC:

Diagnostics Available
- Labs
- X-rays (Images)
- 12-Lead EKG
- Other:

Documentation Forms
- Physician Orders (New GI orders)
- Admit Orders
- Flow sheet
- Medication Administration Record
- Kardex
- Graphic Record
- Shift Assessment
- Triage Forms
- Code Record
- Anesthesia / PACU Record
- Standing (Protocol) Orders
- Transfer Orders
- Other: Procedural Sedation Template.

Recommended Mode for Simulation (i.e. manual, programmed, etc.)

Manual, follow directions on simulation.
### Emergency Medications
- Defibrillator/Pacer
- Suction: oral suction
- Other: Endoscopy scope outside room with cart.

### Roles/Guidelines for Roles
- Primary Nurse
- Secondary Nurse
- Charge Nurse available
- Family Member #1
- Family Member #2
- Observer/s
- Recorder
- Physician/GI MD
- Respiratory Therapy
- Anesthesia
- Pharmacy
- Lab
- Imaging
- Social Services
- Clergy
- Unlicensed Assistive Personnel
- Code Team
- Other: GI RN

### Important Information Related to Roles:
GI MD gives verbal orders at the bedside to give specific doses of prepared medications, these medications are ordered for procedure on the MAR and RN has been directed by GI RN to prepare for procedure before GI MD arrives.

### Significant Lab Values:
- Hgb 7.9 g/dl, INR 1.0. T&H completed.

### Physician Orders:
- NPO
- Midazolam (Versed) 1mg/1ml; 0.5mg-6mg IVP PRN procedure
- Fentanyl 50mcg/ml; 0.5mcg-100 mcg IVP PRN procedure
- Flumazenil 0.1mg/ml (Romazicon); 0.2mg IVP PRN procedure.
- Naloxone 1mg/ml (Narcan) 0.4mg IVP PRN procedure
- Nexium IV 80mg/100ml 0.9 NS continuous rate 8mg/hr (10ml/hr)
- 0.9 % NS/1000ml continuous rate 150ml/hr.
- Odansetron (Zofran) 4mg-8mg IVP every 6 hours PRN for nausea/vomiting

### Student Information Needed Prior to Scenario:
- Has been oriented to simulator
- Understands guidelines /expectations for scenario
- Has accomplished all pre-simulation requirements
- All participants understand their assigned roles
- Has been given time frame expectations
- Other:

### Report Students Will Receive Before Simulation
Time: 1500: Jack Johnson was admitted from the ED to the Medical Intensive Care Unit before lunch with nausea/vomiting and coffee brown emesis. Chief complaint: abdominal pain/N/V and dizziness when standing. Patient states stomach has been feeling better after the emergency room nurse administer 8mg Zofran IV at 1400. Mr. Johnson has medical hx of GERD but does not take any prescription medications, he has been taking ranitidine (Zantac) 75mg (over the counter) on occasion but not every day. While in the ED Dr. Jones has seen Jack and assessed he needs an Esophagogastroduodenoscopy (EGD). The consent is signed and in his chart. Mrs. Johnson is on her way in, she has been delayed in traffic and thought she may arrive by 1800. The GI nurse just called and will be up shortly to set up for the EGD. Nexium gtt is at 8mg/hr or 10ml/hr infusing and IVF infusing 0.9% NS 150ml/hr both separately in #18 g PIVs. H&P, Procedural Sedation Document, Dr. Orders, and Pre-procedural meds are ordered on MAR in chart.

### Labs/results drawn in ED
Type and Hold for 2units of PRBC
- Hgb 7.9 g/dl
- INR 1.0
- Cr. 0.5mg/dL
- K+ 4.0 mEq/L

### Current Vital Signs at 1500
- BP 110/50(70), RR 20, HR 100, T 98.0 F. Patient is on 2L NC with O2 Sats 98%.
- Emesis basin and urinal at bedside.

### Questions?
References


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Appendix B
Simulation Design

Report Students will receive before Simulation: Time: 1500 shift Report

Jack Johnson is a 55 year old male was admitted from the ED to the Medical Intensive Care Unit before lunch with nausea/vomiting and coffee brown emesis. Chief complaint: abdominal pain/N/V and dizziness when standing. Patient states stomach has been feeling better and has not had emesis since the emergency room nurse administered 8mg Zofran IVP at 1100. Mr. Johnson has medical history of GERD but does not take any prescription medications, he has been taking ranitidine (Zantac) 75mg (an over the counter med) on occasion by not every day. Voided once in ED 400ml dark yellow urine. While in the ED Dr. Jones has seen Jack and assessed he needs an Esophagogastroduodenoscopy (EGD). The consent is signed and in his chart. Mrs. Johnson is on her way in, she has been delayed in traffic and thought she may be in by 1800. The GI nurse just called and will be up shortly to set up for the EGD. Nexium gtt is infusing at 8mg/hr or 10ml/hr in #18 g PIV in left forearm vein and 0.9% NS IVF at 150ml/hr in 2nd #18g PIV in left antecubital vein. Pre-procedural meds are ordered on MAR. Procedural documentation form is in chart. Emesis basin and urinal at bedside.

Labs results drawn in ED:
Type and Hold for 2units of PRBC
Hgb 7.9 g/dl
INR 1.0
Cr. 0.5mg/dL
K+ 4.0 mEq/L

Current Vital Signs at 1500
BP 110/50(70)
RR 20
HR 100
T 98.0 F
O2 Sats 98% - on 2L NC

Physician Orders:
NPO
Midazolam (Versed) 1mg/1ml; 0.5mg-6mg IVP Procedure
FENTanyl 50mcg/ml; 0.5mcg-100 mcg IVP Procedure
Flumazenil 0.1mg/ml (Romazicon); 0.2mg IVP Procedure
Naloxone 1mg/ml (Narcan) 0.4mg IVP Procedure
Nexium IV 80mg/100ml 0.9 NS continuous rate 8mg/hr (10ml/hr)
0.9 % NS/1000ml continuous rate 150ml/hr.
Odansetron (Zofran) 4mg-8mg IVP every 6 hours PRN for nausea/vomiting
Appendix C
Simulation Design

Brief to operator: Jack Johnson

You are Jack Johnson, DOB 03-31-1959, 55 year old man with history of nausea/vomiting (coffee ground emesis) and abdominal pain, currently you are awaiting endoscopy, a bit anxious and asking questions about the procedure and if anyone dies form this procedure. His wife is in route to hospital. After first dose of fentanyl and versed slightly sedated and attempting to talk (restless and pulls at tubes). After second dose of Fentanyl you go into a deep sedation, do not respond to stimuli or verbal command. When reversal is given to you, you wake up and ask what happened.
Appendix D
Simulation Design

Brief to embedded actor: GI Physician

You enter room and orders the RNs to give 50mcg fentanyl and 2mgs versed and procedure will start, when patient continues to be restless order another 50mcg fentanyl. You comment GI RN how cooperative/calm the patient is and scope and inject gastric ulcer. Alarms are ringing, RNs should be stimulating patient, increasing oxygen delivery, and asking to rescue patient and give reversal for narcotic: Narcan; if not prompt them to assess alarms, and give reversal Narcan if not suggested by the RNs (Alternative to give Flumazenil 0.2mg is perfectly acceptable).
Appendix E
Simulation Design

Brief to embedded Actor: GI RN

You enter room following RN’s assessment and direct RN’s to pre-procedure medications on MAR. If RN’s question how much medication or which ones to prepare, repeat and reinforce that all of the medications ordered for procedure and full dose ordered. You than proceed to set up Endoscopy cart and chat with patient, place oxygen on him if not in place, verify suction equipment available, and place etCO2 monitor, verbalize these actions to RNs when they enter the room. Also, when RNs enter room with meds GI RN prompts RNs to retrieve necessary meds if missing any including saline flushes (5-10mls). The meds prepared are Fentanyl 100mcgs/2ml, versed 6mg/6mls, Narcan 0.4mg/.4ml, and flumazenil 0.2mg/2mls. GI RN calls Dr. Jones when meds are all prepared and in room.
# Appendix F
## Simulation Design

### Scenario Progression Outline

<table>
<thead>
<tr>
<th>Timing (approximate)</th>
<th>Manikin Actions</th>
<th>Expected Interventions</th>
<th>May Use the Following Cues</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 minutes</td>
<td>A &amp; O X 4</td>
<td>Assigned RNs: Primary RN and Secondary RN will Introduce themselves and Identify patient by verbal and wrist band. Demonstrate quick head to toe assessment of patient, ask patient if he has questions about procedure</td>
<td>Role member providing cue: Patient asks about procedure “can you tell me about what is going to happen?”</td>
</tr>
<tr>
<td></td>
<td>Jack Johnson</td>
<td></td>
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<tr>
<td></td>
<td>3/31/59</td>
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<tr>
<td></td>
<td>BP 120/65, RR16, HR 108</td>
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<td></td>
<td>02 Sats 95% on 2L NC</td>
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<tr>
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<td>Eyes blink 15/mn</td>
<td></td>
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</tr>
</tbody>
</table>
| 10 minutes           | Jack continues to chat with GI Nurse, asks if they ever loose anyone with this procedure | RNs will clearly label medications in syringes accordingly with name of medication/concentration/dose. Patient has 2 PIVs, one with NS and 1 with Nexium. RN should take time to check compatibilities with NS line should be used. Meds prepared and labeled Fentanyl/midazolam/naloxone/flumazenil. Charting meds on Procedural Sedation Form | Role member providing cue: GI Nurse  
Cue: GI nurse comes into room with Endoscopy cart. Communicates to nurses that they should prepare procedural medications ordered for procedure. If nurse questions how much versed/fentanyl GI nurse will say prepare the meds as ordered at full dose. |
|                      | HR 110           |                        |                            |
|                      | BP 130/80        |                        |                            |
| 5 minutes            | GI RN and RNs position patient for procedure with oxygen, CO2 detector. Suction is available for patient. | RNs should ideally have clearly labeled medications, if they have to separate at this time, 1 RN should stay with procedural meds, and if they both leave they should take meds with them or make sure GI nurse can keep eye on them. | Role member providing cue: GI Nurses: What meds do you have? RNs should reply midazolam, fentanyl, naloxone, & flumazenil. Cues by GI nurse: make sure you have plenty of saline flushes, I am going to call the GI MD & let him know we are ready. |
|                      | BP 120/65, RR16, HR 98 |                        |                            |
|                      | 02 Sats 95% CO2 25 |                        |                            |
| 5 minutes | If medications are given too fast patient will get feel a little dizzy. If given correctly changes in vital signs Eyes Blink 10/mn, half open, BP 90/50, RR 10. O2 Sats 93, CO2 28 |
| 5 minutes | Fentanyl and midazolam (Versed) should be given each over 1-2 minutes with 10 ML NS flush in-between (verbally states as meds given if not watching clock) |
| 5 minutes | Role member providing cue: GI MD 
Cue: GI MD arrives on unit and request Primary RN to give fentanyl 50mcgs IVP and midazolam (Versed) 2 mg IVP. Please let me know when medications are in. RN verbalizes meds are in. GI MD/RN start procedures and quickly see gastric ulcer that needs and injects with epinephrine. |

| 5 minutes | Patient tries to touch scope and receives additional dose of Fentanyl 50mcg IVP and immediately goes into deep sedation with ↓ LOC, RR 8 and O2 Sats drop ↓ 86% and CO2 level goes ↑ 35. BP 90/50, HR 80. Eyes closed. Sats ↑ 90 after oxygen is ↑, patient not arousing to stimulus by RN. When Narcan is given patient arouses Sats ↑ 98% and CO2 ↓ 25 and patient eyes open and patient awakens and ask “when are you going to start procedure?” |
| 5 minutes | RN should give fentanyl 50mcgs & should identify patient’s change of status after administration of med, clear communication to GI MD and attempt to rescue. RNs Interventions: ↑oxygen, verbally and physically attempt to arouse patient. Ask GI MD if reversal is warranted, and is directed to given Narcan 0.4mg IVP |
| 5 minutes | Role member providing cue: GI MD. Cue When patient tries to touch scope RN is instructed by GI MD to repeat Fentanyl 50mcg IVP. Both GI MD & GI RN comment how well the patient is sedated. Finishes procedure & pulls out scope. 
Cue by GI MD: What are all the alarms, if RN fails to alert to changes. 
Cue by GI MD: if RN doesn’t suggest reversal GI MD orders Narcan 0.4mg stat IVP. If RN does prompt to give reversal, agree & order Narcan 0.4mg IVP. |
Appendix G
Simulation Design

Debriefing/Guided Reflection Questions for This Simulation
(Remember to identify important concepts or curricular threads that are specific to your program)

- How did you feel throughout the simulation experience?
- Describe the objectives you were able to achieve?
- Which ones were you unable to achieve (if any)?
- Did you have the knowledge and skills to meet objectives?
- Were you satisfied with your ability to work through the simulation?
- To Observer: Could the nurses have handled any aspects of the simulation differently?
- If you were able to do this again, how could you have handled the situation differently?
- What did the group do well?
- What did the team feel was the primary nursing diagnosis?
- What were the key assessments and interventions?

Debriefing Guidelines to further assist faculty with procedural sedation simulation

- What were your thoughts entering room?
- What did you notice unusual about patient or vital signs?
- How did you feel about patient’s questions?
- How did you determine you had the correct patient?
- How did you assess pain level?
  - P: What provokes pain?
  - Q: What is quality of pain if present, dull, sharp, ache, throbbing?
  - R: Is pain radiating or staying in same area?
  - S: Severity, scale of 1-10, 10 is worst ever.
  - T: How long does pain last
  - U: Do you understand medications that are for pain and availability?
- How did you feel communicating with the GI RN?
- What was going through your thoughts when you were told to prepare meds, did you feel you received enough clarification?
- How difficult was it to prepare several meds?
- Did you feel preparing several meds at once?
- How did it feel if you had to return to the med room and reorganize?
- What steps do we as RNs take to administer medications safely?
- Lists 6 rights of medication administration
  - Patient
  - Medication
  - Route
  - Dose
  - Time
  - Document
- How did it feel to have a syringe with such a large dose of medication and giving partial doses of meds prepared?
• How did you decide which IV to give meds
• How fast can you give fentanyl? (2min)
• How fast can you give versed? (2min)
• What concerns do we have with additive effects of opioids/benzodiazepines?
• Did you recognize change in vital signs/patient status?
• What changes were you most concerned with and why?
• Why did GI MD decrease the dose of fentanyl?
• What may we of expected to see with patients symptoms if patient received 50mcgs of fentanyl?
• What is reversal for opioids/narcotics and how fast can you administer? (30 sec, every 2 min, total dose may give continual gtt titrate to patient response)
• What is reversal for benzodiazepines? And how fast can you administer it? (30 sec; every 1 min total dose 1mg)
• Did you feel prepared, read about NPSGs, view video, read article?
• What other equipment is needed at bedside for patient safety?
• Why do we use etCO2 monitoring devices?
• How long should the RN stay at the bedside after patient has received reversal drug Narcan?
• Why do we stay with the patient for determined time? (30 minute to 1 hour, back to baseline)
• What else could RN of done if struggling with situation? (call for charge nurse)
• Why is important is interprofessional communication?

Questions?

Additional Conversation Points for Debriefing
(In addition to debriefing conversation for either advanced level critical thinking or adjustments to complexity of scenario)

Complexity – Simple to Complex
Suggestions for Changing the Complexity of This Scenario to Adapt to Different Levels of Learners
Increasing the level of complexity for ICU/ED nurses discuss or adjust simulation identifying variance such as massive bleeding or unanticipated cardiac complications. Uncommonly a patient may start to hemorrhage during an upper endoscopy and the patient will become acutely hypotensive and need mass transfusions (utilization of a “Rapid Infusion” or “Ranger” pump) or requirement to stop procedure and intubate patient to protect airway.
Debriefing for Meaningful Learning (DML)
Faculty Guide for Jack Johnson
Interprofessional Communication & Medication Management

DML Student Worksheet

Bullet Points 1-3 should do quietly and complete in 2-3 minutes (dumping)

1. What is the first thing that comes to mind about the simulation
2. What went right and why?
   Positives
3. What would you do differently and why?
   1sr Reflect back on what happened during the simulation
   Areas for Improvement

Framing: (What is the client’s story?) Who was the patient? What did you learn later? Story not assessments. Faculty begin here and start gathering the story, history and facts. He lives with wife: 55 years old, major support wife Mimi, adult child lives close by, relatively healthy and works at FedEx in management.

Key points: What is important, does Jack have any new stress, any old stressor in life?
Focused Key Problem: Faculty list Key problems that students identify. What are the most important problems? Why are these problems important? Spend at least 3-4 minutes here.
Key Problems: Epigastric distress, low Hgb 7.9 and possible ulcer, anxiety for procedure, fear of death, potential complication with procedural sedation medication management/additive effects: Oxygenation, LOC, and Circulation. Effective interprofessional Communication.
Problem
Goal
Desired Outcome: What are you trying to accomplish?
Recognize signs & symptoms of deep sedation, hypoxia, and hypoventilation

Include Assessments and actions

PROPER SURVEILANCE
1. Administer complex regime of medications (Benzo-Opioid) Assess and evaluation of Additive effects of both medications.
2. Oxygen (O2)- Sats- decreasing- need for more O2
3. Assess vital signs- HR-increasing BP-decreasing- fluids increased or at least going at ordered rate
4. Deep sedation, gently stimulate patient, increase oxygenation, question second dose of fentanyl.
5. Eventually give reversal for opioid or benzodiazepine

Associated Client Response: Why did you do what you did?
How did she respond? What happened?
Rationale for actions?
- Hypoventilation and decrease gas exchange, improve oxygenation.
- Decreased perfusion and oxygenation r/t hypotensive effect of sedation
- Possible fluid volume deficit r/t GI bleed and low Hgb
- Did you give Narcan or Flumazenil? Why one or the other?

Evaluation & Summary of Client Progress Toward Desired Outcome: how much progress did you get towards your desired outcome? What else needs to be done? What are other interventions that need to be completed?
Proper Effective Communications with Interprofessional GI Team During Procedure for Safe patient care.
Include Assessments and Actions
1. Safely prepare medications for procedure. Including name of med, dose, and concentration.
2. Verbally Identify patient, and med as well as amount when ordered to give by MD.
3. Safely administer in NS line and properly flush medication.
4. Communicate effectively both symptoms, vital signs and actions to IP team
5. Collaborate effectively while rescuing patients with reversal medication.

- 6 rights of medication administration
- Following protocol/standards reviewed for procedural sedation
- Communication out loud to verify medications to give and as given
- Continue to assess patient and evaluate medication effectiveness as well as additive effects.
- Collaborate/Communicate with IP team informing of patient status, focused assessment pre-during-post procedure.
- Safely administer reversal medication ordered and verify dose.
Appendix H
Simulation Design

St. Catherine Hospital
History & Physical/Patient Information

Name: Jack Johnson
DOB: 03/31/1959
ID: 123456789
Date of Evaluation: HD 1 May 1, 2014

Chief Complaint:
Abdominal pain with nausea and vomiting.

History of Present Illness:
Increased abdominal pain last 2 weeks with worsening abdominal pain in last 48hrs with nausea and vomiting coffee ground like emesis, and dizziness while standing.

Past Medical History:
GERD

Baseline Vital Signs:
B/P 110/50 (70), HR 100, RR 20, T 98.0°, O2 Sats 98% on 2L NC

Past Surgical/Anesthetic History:
None

Current Medications:
Over the counter 75mg ranitidine (Zantac) prn

Allergies:
NKA

Social/Family History:
Married for 20 years and lives with wife Mimi in townhome, and is employed as a FedEx manager. Has one adult son Richard who is married and has 2 kids and live short distance from patient.

Review of Systems:
- General: No complaints other that stated
- HEENT: No issues
- Neck: No issues
- Pulmonary: Clear bilateral
- Cardiovascular: Dizzy when standing
- CNS: No issues
GI/GU/Hepatic: Abdominal pain, non-tender to touch, coffee ground emesis in the ED, voiding in dark yellow urine once in ED.

Endocrine: no issues
Heme/Coag: Hgb 7.9g/dl and INR 1.0
Reproductive: No issues
Skin: Pale

Physical Examination:
General: Slightly dehydrated, UGI Bleed, stable
Weight, Height: 88kg, 5ft 11 inches
Vital Signs: B/P 110/50 (70), HR 100, RR 20, T 98.0°, O2 Sats 98% on 2L NC
CNS/Neuro: Intact
HEENT: Intact
Neck: Intact
Lungs: Clear bilateral
Heart: S1S2, regular sinus tachycardia, complaints of dizzy when up.
Abdomen: Non-tender, soft
Extremities: Moves all extremities well
Skin: Pale, warm, and dry.
Wound: None
Labs: Hgb 7.9g/dl and INR 1.0
NPO since early am approximately 0600
IV: Nexium infusion at 8mg/hr and IVF 0.9% Normal Saline at 150ml.hr

Assessment: 55 year old male with anemia and signs/symptoms of Upper GI bleed.
Plan: Consult GI team and admit to Medical Intensive Care to prepare for endoscopy.
Signed: Dr. Mary Smith, M.D.
## Appendix I

### Simulation Design

St. Catherine Hospital

MEDICATION SCHEDULE

Name: Jack Johnson  DOB: 03/31/1959 ID: 123456789  Primary physician: Mary Smith MD

<table>
<thead>
<tr>
<th>Medication</th>
<th>Time</th>
<th>5-1-2014</th>
<th>5-2-2014</th>
<th>5-3-2014</th>
<th>5-4-2014</th>
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<tbody>
<tr>
<td>Odansetron (Zofran) 4mg-8mg prn every 6 hours</td>
<td>7-3</td>
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<td></td>
<td></td>
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<td></td>
<td>3-11</td>
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<td></td>
<td>11-7</td>
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<tr>
<td>Fentanyl 25mcgs-100mcgs IVP Procedure</td>
<td>7-3</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td>11-7</td>
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<tr>
<td>Midazolam (versed) 1mg-6mg IVP Procedure</td>
<td>7-3</td>
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<td></td>
<td>3-11</td>
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<td></td>
<td>11-7</td>
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<tr>
<td>Naloxone (Narcan) 0.4mg IVP Procedure</td>
<td>7-3</td>
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<td>11-7</td>
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<tr>
<td>Flumazenil 0.2mg IVP Procedure</td>
<td>7-3</td>
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<td></td>
<td>3-11</td>
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<td></td>
<td>11-7</td>
<td></td>
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<tr>
<td>Continues Nexium (Esomeprazole) IV 8mg/hr</td>
<td>7-3</td>
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<td>11-7</td>
<td></td>
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<tr>
<td>IV Maintenance 0.9% Normal Saline 150 ml/hr</td>
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<tr>
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<td>3-11</td>
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<td></td>
<td>11-7</td>
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Initial/Signatures
# Appendix J
## Simulation Rubric

<table>
<thead>
<tr>
<th></th>
<th>BASIC</th>
<th>PROFICIENT</th>
<th>EXEMPLARY</th>
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<tbody>
<tr>
<td></td>
<td>0-2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>PRIORITY SETTING FOR THE PATIENT</strong></td>
<td>Prioritizes care with assistance</td>
<td>Independent prioritization of care</td>
<td>Independent prioritization of care with rationale for actions</td>
</tr>
<tr>
<td><strong>COMMUNICATIONS</strong></td>
<td>Demonstrates beginning skill in IP communication</td>
<td>Demonstrates effective skills with communication with IP team</td>
<td>Demonstrates effective skills with communication with IP team and follow with accurate nursing actions</td>
</tr>
<tr>
<td><strong>MEDICATION MANAGEMENT</strong></td>
<td>Administers medications safely with assistance</td>
<td>Independently administers and labels medications</td>
<td>Independently administers and labels medications and communications out loud when given</td>
</tr>
<tr>
<td><strong>CRITICAL THINKING AND RECOGNIZING CHANGES</strong></td>
<td>Recognizes some changes only after prompted</td>
<td>Recognizes majority of changes with few prompts</td>
<td>Recognizes subtle changes without any prompts</td>
</tr>
<tr>
<td>Final Score (pass 12 points)</td>
<td>Total Points</td>
<td>__________________</td>
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</table>
Purpose

The overall goal of this systems project was to assist the nursing student to graduate with the knowledge, skills, and abilities needed in pharmacology to function as a nurse. This project is an interprofessional pharmacology based simulation for St. Catherine educators to utilize in the new pharmacology course for senior nursing students.

Relevance/Significance

Supporting evidence for this project include: The Joint Commission’s National Patient Safety Goal Using Medicines Safely and the 2010 Affordable Care Act; which calls for quality safe care. This systems project was developed in response to the literature that reports nursing students enter the workforce underprepared for medication management. In the area of patient safety, the nurse and the interprofessional team communication skills combine in the process of improving patient outcomes by decreasing medication errors in the clinical setting. Ineffective communication within the interprofessional team is reported as the “root cause for medication errors”. Researchers have reported that the introduction of innovative teaching strategies such as simulation, enhance the student’s ability to manage medication, and improve their pharmacology knowledge, skills and assessments.

Strategy and Implementation

The sample group of this project was directed at the senior level nursing student enrolled in a newly developed pharmacology course at St. Catherine University. In addition the interprofessional roles may include other health care concentrations such as respiratory therapy
students. The objectives of the classroom session that the simulation is paired with will correlate to the objectives of the simulation. The framework of the simulation design is based on the Nursing Education Simulation Framework used by the NLN. This simulation scenario is a patient in the intensive care unit that is receiving procedural sedation for an endoscopy for symptoms related to upper gastrointestinal bleeding. The stages of the simulation encourage the student to safely: Identify, prepare, and administer the medications for the procedure. Along with evaluating the effectiveness or adverse effects of the medication and effectively communicate with the interprofessional team during the procedure.

**Evaluation**

The evaluation of this project will be measured by student(s): Satisfaction, safe medication management, effect interprofessional communication skills, and preparedness for the role of the nurse. The debriefing phase will allow faculty to further evaluate if objectives have been met by students and will end with a 5 point Likert questionnaire for the student to answer. Plans are in place for piloting this simulation at HealthPartners Simulation Lab with new nurses in the medical intensive care unit.

**Implications for Practice**

Student’s improved performance with medication management and self-confidence with real patients in the practicum setting. Future evaluations and research will be helpful post-graduation and assist faculty in assessing the student’s competency with medication management as they transition into the workforce.
PURPOSE
An interprofessional pharmacology based simulation was designed for St. Catherine University senior nursing students. The propose of this simulation was to prepare the pre-licensure students to use the knowledge, skills, and abilities (KSA) necessary for safe medication management in clinical practice. The Scenarios should enhance student learning and bridge theory to the clinical site.

RELEVANCE
Literature reports nursing students enter the workforce underprepared for medication management KSAs. As a result more than 1.5 million people per year experience complications from medication errors. Errors can also be attributed to poor communication within the interprofessional team.

OBJECTIVES
Following this simulation the student will:
1. Prioritize patient care
2. Demonstrate safe medication administration
3. Recognize changes in patient status
4. Effectively communicate with the interprofessional (IP) team
5. Intervene appropriately in response to patient status change

SIMULATION STRATEGY

Procedural Sedation Scenario

Scenario: A patient is receiving an esophagogastroduodenoscopy (EGD), requiring effective communication and collaboration between the nurses and the Gastrointestinal (GI) team. The students will be the Registered Nurse (RN) participants. Embedded actors will be a GI Medical Doctor (MD), GI RN, an available charge nurse, and an operator for the high fidelity mannequin. The scenario evolves over 20-30 minutes in which the patient has an additive response to the combination of benzodiazepines and narcotics given.

Brief to Participant(s): Time: 1500, 55 year old, Jack Johnson was admitted from the Emergency Department (ED) to the Medical Intensive Care Unit before lunch with nausea and vomiting, coffee brown in color. Chief complaint: abdominal pain, nausea, vomiting, and dizziness when standing. Patient states stomach has been feeling better and has not had emesis since the ED nurse administered 8mg Zofran at 1100. Mr. Johnson has a medical history of reflux but does not take any prescription medications, he has been taking ranitidine (Zantac) 75mg on occasion by not every day. Patient has voided once in ED 400ml dark yellow urine. While in the ED Dr. Jones assessed Jack and determined that he should have an EGD. The consent was signed and it is in his chart. Mrs. Johnson is on her way in, she has been delayed in traffic and thought she may be in by 1800. The GI nurse just called and will be up shortly to set up for the EGD. Nexium is infusing intravenously (IV) at 8mg/hr or 10ml/hr. A 0.9% normal saline IV is also running at 150ml/hr. Each are running separately in their own 18 gauge peripheral IVs. Pre-procedural meds are ordered, the History and Physical and Procedural Sedation documentation forms are in chart.

Key components: This scenario requires the RN to clarify with the IP team the correct meds and dosages to be prepared. Medications must then be prepared with proper labels. The RN must identify the patient, and verbalize what medication is administered. The simulation requires the RN to recognize changes in the patient condition during the procedure, prioritize patient care, attempt to stimulate patient, communicate with the GI team, and administer the appropriate reversal med that is ordered for patient. When appropriate actions are taken, the scenario ends with the patient arousing and responding to stimuli.

EVALUATION RUBRIC

<table>
<thead>
<tr>
<th>Priority Setting</th>
<th>Communication</th>
<th>Medication Management</th>
<th>Critical Thinking</th>
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</thead>
<tbody>
<tr>
<td>For the patient</td>
<td>Demonstrates beginning skills with assistance</td>
<td>Administrates meds safely with assistance</td>
<td>Recognizes some changes only after prompted</td>
</tr>
<tr>
<td></td>
<td>Demonstrates effective skills with the GI team</td>
<td>Independently administers &amp; labels meds</td>
<td>Recognizes majority of changes with few prompts</td>
</tr>
<tr>
<td></td>
<td>Independent prioritization of care</td>
<td>Independently administers &amp; labels meds</td>
<td>Recognizes subtle changes without any prompts &amp;...</td>
</tr>
</tbody>
</table>

IMPLICATIONS
• Decrease in medication errors.
• More efficient collaboration amongst IP teams.
• Prepared students with medication management for the transition to nurse.
• Safe medication management could save thousand of lives and save money for both the patient and healthcare institutions.

Acknowledgements
Questions contact: Mary Rinella mtrinella@stkate.edu
Gratitude to all my professors in my graduate studies at St. Kate's.
References available upon request