“Improving Inter-Professional Clinical Competence, Communication and Teamwork Through Simulation Based Education.”

Jason Bates, MA, Mark Bauman, MS, RN, CCRN and Vanzetta James, MS, RN, CCRN

Led by nurse manager Vanzetta James, MS, RN, CCRN, Mark Bauman, MS, RN, CCRN, Adam Rabinowitz, CRNP, Karen McQuillan MS, RN, CNS-BC, CCRN, CNRN, FAAN, and Raymond Rector, CCP, a 3 day in-situ inter-professional simulation event was conducted to prepare the new LRU team for patient care in the unit.
Leadership Uses Simulation to Meet Inter-Professional Challenges

The R Adams Cowley Shock Trauma Center’s (STC) new Lung Rescue Unit (LRU), is a 4 bed unit that focuses on the treatment of patients with acute pulmonary dysfunction utilizing treatment options, including prone positional therapy and extracorporeal membrane oxygenation (ECMO). Under the leadership of medical director, Jay Menaker, MD, surgical director, Si Pham, MD, and nurse manager, Vanzetta James, MS, RN, CCRN, the unit is staffed with attending physicians, nurse practitioners, physician assistants, nurses, patient care technicians, unit secretaries, perfusionists, respiratory therapists and individuals from rehabilitative services. The LRU provides specialized care for some of the most critically ill patients in the region.

The LRU education and training team, consisting of Nurse Manager Vanzetta James, MS, RN, CCRN, senior clinical nurse Mark Bauman, MS, RN, CCRN unit provider Adam Rabinowitz, CRNP, clinical nurse specialist, Karen McQuillan, MS, RN, CNS-BC, CCRN, CNRN, FAAN and lead perfusionist Raymond Rector, CCP, faced the major challenge of bringing together a diverse group of healthcare providers with varying experiences and skill sets, educating them on care of the ECMO patient and preparing them to function as a team. Confronted with creating and implementing training objectives to facilitate opening the unit, the inter-professional team developed simulated events focusing on the development of clinical skills, communication, and team building to help the group operate as a highly functioning unit. A week-long educational session with emphasis on theory and best practice had already been held the previous month. Now the challenge became in integrating the theory with “hands on,” real life application over a three day period. To meet this goal, the team developed 5 simulated events focusing on team dynamics, communication, recognition and management of emergent situations, orientation to a new environment, correct treatment processes, and proper documentation.

Inter-professional Education Development to Meet Teamwork and Communication Objectives

To ensure the success of this new unit, the LRU team collaborated with the Shock Trauma Center Training and Simulation Manager, Jason Bates, MA. Over the course of 2 months, they jointly developed a plan of instruction (POI) that identified the target audience and audience specific performance objectives, and provided a summation of the simulated events. In addition, case scenarios, simulation specific performance checklists and training evaluations were developed. Logistics planning, scheduling and coordination for the in-situ training were conducted. The scenarios developed were designed to
mirror the potential LRU patient population and checklists were utilized to monitor performance throughout each of the simulations. Given that the participating staff are all experienced healthcare providers, the scenarios were designed to focus on inter-professional skills and closed-loop communication. This method involves acknowledgment and repetition. For instance, after a provider gives an order, such as the administration of medicine, a nurse repeats, receives confirmation and, when administering the medication, repeats once more. Some of the leadership team also attended a simulation debriefing course developed and conducted by Mary Fey, PhD, and her team of simulation experts at the University Of Maryland School Of Nursing.

The table below describes the simulated patient profile, skills and frequency of each scenario:

<table>
<thead>
<tr>
<th>Day of Training</th>
<th>Scenario</th>
<th>Inter-Professional Skills Assessed/Developed</th>
<th>Number of Iterations per Team</th>
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</table>
| 1               | Decompensating patient due to a tension pneumothorax                     | • Team Dynamics  
                   |                                              | • Leadership  
                   |                                              | • Communication  
                   |                                              | • Personnel Management  
                   |                                              | • Workflow  
                   |                                              | • Emergent /Non-Emergent Situation Management  
                   |                                              | • Orientation to the Environment  
                   |                                              | • Treatment processes and Protocols  
                   |                                              | • Documentation  
                   |                                              | Once                                          | Twice                                      | Once                                      |
| 2               | Manual prone positioning of ECMO patients                                |                                                                                                             |                              |
|                 | Sedation/Analgesia in ECMO patients                                      |                                                                                                             |                              |
|                 | Transporting ECMO patients with catastrophic incidents/mass transfusion  |                                                                                                             |                              |
| 3               | Cannulation of an ECMO patient                                           |                                                                                                             |                              |

**Coordination across UMMC Simulation Programs**

Kerry Murphy, DVM, simulation educator of the MASTRI Center and Robert Dibiase, BS, program coordinator of the Air Force CSTARS simulation program, supported Mr. Bates in developing a logistical plan to ensure all simulation equipment needed was available and accessible for training; creating moulage (the art of applying mock injuries for the purpose of training); integrating the patient profile with specific simulated presentations (i.e. making sure the simulated experience followed the
designated scenario); and, running the 3 days of simulated training – ensuring familiarity and continuity during the course of training.

**Executing the Simulated Events**

To create a comprehensive simulated experience that would closely resemble what a typical day might be like, the simulated events included inter-professional teams comprised of respiratory therapists, perfusionists, nurses, providers, technicians, and unit secretaries. Nursing peers from the Critical Care Resuscitation Unit (CCRU) were generous in volunteering their time and expertise toward assisting in the training. The personnel who assisted (non-participants) in the execution are listed below:

- Vanzetta James, RN
- Mark Bauman, RN
- Adam Rabinowitz, NP
- Karen McQuillan, RN
- Raymond Rector, CCP
- Ryan King, Unit Secretary
- Maria Madden, RRT
- Vicky Chan, RRT (ECMO specialist)
- Brittany Rub, RRT
- Allison Giammanco, RRT
- Tiffany Hogan, RRT
- Kristen George, RN (CCRU)
- Louie Lee, RN (CCRU)
- Eric Hochberg, PA-C

![Figure 1: Cannulation of an ECMO Patient](image)

The participant population was divided into 3 patient care teams that would work together through the simulated events. Rotating through each of the scenarios, individual participants were given the opportunity to manage the clinical situation and direct the inter-professional team during each event. In some cases, process documents were provided to assist in the management of the simulated patients and, in all cases, the teams were allowed time to discover the location of equipment and use them as they would with real patients. Practicing as they would in an actual situation, the teams soon discovered several unknown aspects of treatment that each scenario presented. For instance, identifying where and how long it would take to receive blood from the blood bank in an emergency, the process of getting unmatched blood from the trauma resuscitation unit (TRU), and identifying which elevators would allow for the transport of an EMCO patient with a full complement of equipment. In
essence, the teams were experiencing (and learning from) the potential pitfalls of an emergent situation without affecting an actual patient.

**Lessons Learned and Results from the Simulated Events**

Based on observations made during these simulations and corroborated by staff evaluations, it was apparent that staff thoroughly enjoyed and benefitted from the simulation experience. Some consistent themes emerged, both in oral and written feedback, and include the following:

- **Trust was built and teamwork enhanced by these exercises.** The social integration and familiarization with one another was just as important as the clinical skills.

- **Absolute “buy in” from participants, instructors and designers was crucial if the simulations were to have a meaningful impact.** Professional instruction and equipment was essential, but a pre-simulation briefing on the importance of running the scenario as in an actual clinical situation was just as important. The actual paging of someone or running to the blood bank was crucial in reinforcing the objectives identified.

- **Conducting the simulation scenarios in the unit’s patient rooms with the actual supplies, monitors, etc.** that would be used on actual patients, increased environmental awareness and raised the comfort level of all participants dramatically. One of the biggest fears identified by team members in the pre-simulation training was in not knowing where things were located, especially in an emergency. While not always practical, this in-situ training helped immensely in alleviating some of the anxiety in opening a new unit. During this process, we also discovered some minor issues, such as overhead lights not working, and some more problematic issues, such as the trauma elevators not being able to accommodate an ECMO transport with attendant bed, IV pumps, ECMO machine, ventilator, and accompanying medical personnel.

- **Debriefing was an important, if not the most important component of simulation training.** Involving individuals with previous experience and/or theoretical knowledge of how to debrief a simulation was imperative for successful simulation training. Employing a check list of critical objectives for consistency and asking open-ended questions, (as opposed to grading a test), allowed for constructive interchange.

- **Providing each discipline with the opportunity to participate as they would in a “real life” was important.** Not only did it lend credibility to the scenario, but it allowed each discipline an
opportunity to make adjustment where necessary to their part of the scenario, in order to add realism and avoid predictability.

Overall, the combined efforts of those involved led to 3 days of very successful simulation training. Based on the enthusiasm of the team participants and the feedback that was garnered from post simulation evaluations, the entire exercise was well received. Moreover, the benefit of the simulation training was reflected almost immediately. When this new unit opened the following week, several ECMO patients were transferred from the CSICU to the LRU. The personnel involved in these transports commented on how the simulations provided them confidence in understanding how to safely transport their patients. Moreover, it gave them an even greater appreciation of role delegation and the importance of good communication among team members, including critical situations to hopefully avoid or mitigate.

The Future of Education in the LRU

The staff and leadership of the LRU believe that simulation training will serve as the foundation of a comprehensive education and training program as they strive for excellence in the care of this complex patient population. The intention is to hold simulation training on a quarterly basis, focusing on the implementation of Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS), to further hone skills, refine processes, and facilitate quality improvement on the unit. Moreover, by following this strategy, it is the hope that these efforts will continue to advance the position of the R Adams Cowley Shock Trauma Center as the world leader in trauma and critical care management.