



Simulation for Innovation

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Introduction

In an effort to advance oncology clinical pathways to the next level, a novel partnership was developed between the department of Clinical Effectiveness (CE) and the Clinical Simulation Center at a Comprehensive Cancer Center.

The Clinical Effectiveness Department's mission is to support the implementation of the best and most current evidence through developing, maintaining, and evaluating patient care management tools (practice algorithms, electronic ordering tools, and plans of care). All patient care management tools are developed using current evidence, and they are maintained, implemented and evaluated ensuring the utmost safety and quality. They align with national and regulatory bodies for cancer and clinical management measures as well as with national quality and clinical measures requirements [1].

The vision of the Simulation Center is to be the bridge between knowledge acquisition and application to real life situations while promoting multidisciplinary collaboration, safety awareness and excellence in cancer care. Building on the learner's existing knowledge base allows the learner to relate new information in context with existing knowledge, which forms a broader knowledge base that can be transferred to new situations. Thus, clinical reasoning and problem solving are improved. Constructed knowledge can then be applied effectively in the health care environment [2].

The intended collaboration involves testing the application of selected clinical algorithms in a simulated setting in order to look at clinician decision making during critical flow pathways. The results of the clinicians' responses determine whether the algorithm decision points are valid in a clinical scenario and should be retained, deleted or adapted. This is known as "simulation for innovation." Thus, the clinician-learner has an integral role in translating the evidence into practice.

Some of the initial algorithms undergoing testing in the simulation environment include Early Intervention for Sepsis and Sepsis Management (Progressing to Septic Shock). Early Sepsis or the new nomenclature, Systemic Inflammatory Response Syndrome (SIRS), is marked by several clinical parameters, including: Temperature, heart rate, respiratory rate, PaCO₂ levels, and WBC count. These parameters are addressed in the algorithm and demonstrated on a test patient in the simulation environment. Sepsis in an oncology setting is a serious challenge, carrying a 29% mortality rate [3]; therefore, this is an ideal topic for a first effort at launching this collaboration.

The Sepsis Simulation was implemented as a partnership between the simulation center, inpatient nursing, and nursing education with approximately 40 nursing staff members across two units. This was an instructional design simulation. The goal of this simulation was to optimize the treatment of early onset sepsis in a standardized patient

environment. The nursing staff exercised the institutional core value of discovery by openly and actively participating in this simulation event.

Recognition of inclusion and exclusion criteria for sepsis was a primary intended learning outcome of the simulation exercise. The clinical nursing staff did an exceptional job of recognizing the signs and symptoms associated with early onset sepsis. During the physical assessment of the patient, the nurses noted the decreased breath sounds in the left lower lobe and associated productive cough, erythema around the central line insertion site, multiple decubiti and mucositis. These physical findings were directly related to possible sites of infection. Each group recognized, commented and intervened in regards to the abnormal vital signs, often recommending the on call physician be notified. The clinical nursing staff did an excellent job of notifying the on-call physician and recommending the patient be escalated to a higher level of care when the initial interventions did not improve the patient's condition.

A secondary learning outcome was for the nurses to request and perform early interventions, utilizing the Early Sepsis Intervention order set. This was the most frequent opportunity for improvement during the deliberate practice simulation. Locating the Sepsis Early Intervention order set, having the order set displayed while providing report in SBAR format to the physician or mid-level provider, and utilizing this tool to make informed suggestions regarding the interventions for the patient seemed to be an area the nursing staff were less familiar with yet very receptive to when guided by the simulation instructors.

Each nurse received credit in the simulation center's data base for their participation in this event. Each nurse will also be sent a survey to obtain feedback on the simulation in order to improve the practice in the future. The idea of being able to bring the simulation to the units has been proposed; it is difficult for nurses to leave the units for required classes and simulations. Moving forward, the plans for simulation in the Hematology Services are as follow:

- Lymphoma/Myeloma- Phase 2 simulation leading to Code Blue
- Lymphoma/Myeloma- Falls simulation
- Stem Cell- Sepsis simulation
- Leukemia- The nurse educators of the service will be contacted for their simulation needs

Additional future efforts from the CE/Simulation marriage include: Neutropenic fever, cancer pain and nurse-initiated management of hypersensitivity reactions to medications and blood products.

References

1. M.D. Anderson Cancer Center (2016) Clinical Effectiveness Department homepage.
2. M.D. Anderson Cancer Center (2016) Simulation Center homepage.

3. Kuderer NM, Dale DC, Crawford J, Cosler LE, Lyman GH (2006) Mortality, morbidity and cost associated with febrile neutropenia in adult cancer patients. *Cancer* 106: 2258-2266.