

Scholarly Activity Project Proposal (Block 6a/6b 2014)

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Mentor: Dr. Marjorie White

1. Title of Project: Using a literature search and simulation to improve patient-physician interactions and alleviate communication challenges associated with Electronic Medical Record implementation

2. Aims:

Electronic Medical Records (EMR) have been shown to improve the quality, cost effectiveness and efficiency of patient care¹. Its implementation has not been without problems and presents a barrier in patient/physician interaction. Using EMR in the clinic is a learned skill and must be taught to current and new physicians. Simulation may provide an adequate and efficient way to do EMR training. I propose to do a literature search on what has already been done using simulation to teach EMR implementation and from those findings to create a simulation to be used at UAB to teach proper MD/Patient/Computer interaction.

3. Background and Rationale:

As EMR implementation is becoming more widespread the training to go along with adequately using and integrating this technology is lagging behind². Medical students are the residents of tomorrow that will be required to effectively use EMR during patient interactions. Currently, UAB does not do any EMR training during the 1st and 2nd years of medical training and students only get limited access to EMR use during their 3rd year. EMR training is also very campus, clerkship and attending specific. Some attendings encourage students to write charted notes and offer critique after while others do not even allow students access to EMR.

Simulation provides the opportunity for enhanced learning by healthcare students and professionals while maintaining realism without compromising patient safety³. The Simulation Lab at Children's Hospital can be used to teach a wide variety of desired learning outcomes. In reviewing the literature I will be able to see if other institutes have successfully used simulation to teach EMR usage and then apply that into developing a simulation experience for UAB. While Oregon Health and Science University has used simulated patient charts to teach physician/computer interaction¹ I want to include simulated patient responses to further investigate Patient/physician/computer interactions.

4. Significance: To determine if simulation center experience is an adequate way to improve physician/patient/computer interaction via literature review and to develop a simulation experience to teach medical students using lessons learned from the literature review. Ideally these students will be able to apply the techniques they learn in the simulation lab to work in the clinic and in their future residencies.

5. Methods:

Literature review of previously studied work relating to EMR implementation and teaching this implementation using simulation. Key terms such as EMR/HER, simulation, medical school training will be used. All pertinent and validated studies will be included in order to get a wide range of information. More recent publications will be favored over ones that have not been published within the last five years. Studies from the United States will be preferred over international studies. Study population will be focused primarily on medical students and medical professionals. There will most likely not be a large enough sample size to find select subsets to research. I will seek assistance from the CCHS librarian to see what studies have answered the question "Can Simulation be used to teach EMR implementation." Afterwards I will develop a simulation center experience to apply lessons learned and teach a group of 1st,

2nd or 3rd years how to adequately appropriately use and EMR while interacting with a patient. Students will be given pre and post experience quizzes to test their knowledge of using an EMR as well as comfort level in using the computer while interacting with the patient. Learner interviews can provide subjective information to augment the objective information gathered via the questionnaire/quiz.

6. Proposed Timetable: During the 8-week scholarly activity period (Block 6a/6b), progress will be made towards completing the following objectives:

- Literature review of past studies of simulation usage to teach EMR implementation
- Develop a simulation experience to teach physician/computer/patient interaction
- Teach appropriate physician/computer/patient interaction via stimulation experience
- Judge efficacy of experience via pre and post experience quizzes and learner interviews

7. Role of the Student: As a research assistant I will conduct the literature review and compile my results. I will work alongside Dr Marjorie White to develop simulation curriculum to teach EMR implementation. Significant progress will also be made towards the objectives listed above in the “Proposed Timetable” section.

8. Ethical Approval: If project progresses to implementation of simulation and use of volunteers to teach simulation IRB approval will be required

9. Recombinant DNA, other Biohazards, or Radiation: N/A

10. Literature Cited:

1. Milano CE, Hardman JA, Plesiu A, et al. Simulated Electronic Health Record (Sim-HER) Curriculum: Teaching HER skills and Use of the HER for Disease Management and Prevention. *Academic Medicine*. 2014; 89(3); 399-403.
2. Wald HS, George P, Reis SP, et al. Electronic Health Record Training in Undergraduate Medical Education: Bridging Theory to Practice With Curricula for Empowering Patient- and Relationship-Centered Care in the Computerized Setting. *Academic Medicine*. 2014; 89(3). 380-386.
3. Khan K, Pattison T, Sherwood M. Simulation in Medical Education. *Medical Teacher*. 2011; 33(1). 1-3.

Scholarly Project Research Proposal

1. **Title:** Simulation Enhanced Third-Year Internal Medicine Clerkship

2. **Aims:** We aim to apply simulation teaching techniques to the third year internal medicine clerkship in order to improve knowledge, skills, attitudes, and inter-disciplinary communication between medical and nursing students.

3. **Background and Rationale:** Simulation allows active hands on learning while maintaining patient safety. The use of high-fidelity simulators allows students to learn emergency medical decision making and patient management through experience in a controlled setting¹. Simulation is increasingly being used as an acceptable educational method and allows for experimentation on patients not otherwise acceptable due to medical, practical, and ethical reasons².

Additionally, it allows for exposure to medical problems otherwise not encountered by students in the third year clerkship, thus helping to standardize the variety of patient exposures³. The cases require an integration of physiology, pathophysiology, pharmacology, and anatomy. Medical students will also work with nursing students on the simulations, providing a unique inter-professional opportunity for communication and learning. The use of simulation to improve communication between physicians and nurses has been shown to increase patient safety and job satisfaction⁴. This project will develop and test the effectiveness of a simulation enhanced curriculum for the third year internal medicine clerkship and senior nursing students. The medical directors of the pediatric simulation center, Drs. White and Tofil, have successfully implemented a similar program for the third year pediatrics clerkship. Students' knowledge, skills, and attitudes have significantly improved as a result.

4. **Significance:** This project will implement simulation enhanced learning as part of the third year internal medicine clerkship in order to improve knowledge and skills of core medical competencies. The project will also provide the first shared learning environment for medical and nursing students.

5. **Methods:** The study population will include third year medical students on their two month internal medicine clerkship and senior nursing students. Students will be divided into groups of 4-6 depending on enrollment and post-call status. Students will participate in 4 simulation scenarios with debriefing sessions for a total of 4 hours of exposure. With the assistance of the internal medicine faculty, goals and learning objectives will be developed for all simulation cases. Simulation scripts and scenarios will be written and programmed. Scenarios will involve specific cardiac lesions. An assessment tool evaluating Knowledge, Skills and Attitudes will be developed. Change over time, pre to post test will be analyzed with t-tests (parametric) and chi-squares (non-parametric). Both quantitative (e.g. frequencies) and qualitative (e.g. descriptive) process data will be collected and analyzed. Finally the barriers and benefits of this unique interdisciplinary educational initiative will be explored with numerous modalities including student survey, open-ending questions and rating scales. We envision both the UAB as well as the Children's Simulation Center to be used during this project.

6. **Proposed Timetable:**

- May 2- Begin attending simulation sessions and collecting data after each encounter

- June 1- Preliminary analysis of student response

7. Role of the Student:

- Attend and participate in simulation sessions
- Collect pretest and posttest data
- Enter data
- Analyze change over time from pretest to posttest with t-tests and chi-square tests
- Analyze results of student surveys, rating scales, and record open-ended question responses

8. Ethical approval: This project has UAB IRB approval

9. Use of recombinant DNA, other biohazards, or radiation: Not applicable

10. Literature Cited:

1. Weller JM. Simulation in undergraduate medical education: bridging the gap between theory and practice. *Med Educ.* 2004; 38:32-38.
2. Eppich WJ, Adler MD, McGaghie WC. Emergency and critical care pediatrics: use of medical simulation for training in acute pediatric emergencies. *Curr Opin Pediatr.* 2006; 18: 266-271.
3. Weinberg ER, Aurbach MA, Shah NB. The use of simulation for pediatric training and assessment. *Curr Opin Pediatr.* 2009; 21: 282-287.
4. Dixon J, Larison K, Zabari M. Skilled communication: Making it real. *Adv in Crit Care.* 2005; 17(4): 376-82.

Project Proposal Example (MedEd Portal Case)

1. Title of Project: 'Using Simulation As a Resource For Teaching Medical Students About Managing Exercise-Associated Hyponatremia'

2. Aims: My purpose of the simulation was for the participants to learn how to recognize and appropriately manage exercise associated hyponatremia (EAH). In addition, we hoped to improve basic science knowledge about the underlying physiology of EAH, and increase learners' abilities to utilize alternative resources to obtain a patient history when a patient is unresponsive.

3. Background and Rationale:

UAB currently provides simulation-based education to preclinical medical students throughout the year. The simulations are designed to test concepts that coincide with their current lectures, and to help incorporate those concepts into treating patients. While the simulation cases used thus far have been beneficial to learners¹, they do not take full advantage of simulation as a teaching modality for rare events. Simulation is particularly useful in that it can provide realistic exposure to unusual cases with no possibilities of harming a patient. We built a simulation case around exercise-associated hyponatremia (EAH), an infrequent but serious condition where future exposure to medical students is otherwise restricted to miniscule chance.

4. Significance: This simulation will help medical students avoid common pitfalls of treating hyponatremia in the future as a physician², and will provide adequate training to learners so that they will gain experience and knowledge in managing EAH. This will also better utilize simulation as a resource for medical students.

5. Methods: We will design a simulation case in which a marathon runner has acute symptomatic EAH. She will present with headache, nausea, and dizziness. Eventually she will develop cerebral edema and will seize in the room. The learners will be expected to order labs and confirm hyponatremia, and then formulate a treatment plan based on what they have learned in lecture. The effectiveness of this simulation will be measured using a survey that tests the students' perspectives of how useful the simulation was to their learning.

6. Proposed Timetable: I will spend 2-3 weeks doing a literature review and designing the case. I will run the simulation through several pilots, making changes as needed. Then I will spend the remainder of the time officially writing up the case and submitting it to MedEdPortal.

7. Role of the Student: My role will be to conduct the literature review, design the case, and successfully implement my learning objectives. I will do the scheduling for the pilots, and the work to write up the case into MedEdPortal.

8. Ethical Approval: The surveys being used have IRB approval.

9. Recombinant DNA, other Biohazards, or Radiation: none

10. Literature Cited:

1. Willis RE, Van Sickle KR. Current Status of Simulation-Based Training in Graduate Medical Education. *The Surgical clinics of North America*. 2015;95(4):767-779.
2. Filippatos TD, Liamis G, Elisaf MS. Ten pitfalls in the proper management of patients with hyponatremia. *Postgraduate medicine*. 2016.