

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 learners<sup>1</sup>, 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 physician<sup>2</sup>, 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 schedule an official implementation of the case based on the timeline and needs of the simulation center.

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 facilitate the official implementation of the case in collaboration with the Office of Interprofessional Simulation.

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.