Implementation of a Malignant Hyperthermia (MH) Simulation-based Training in the Electroconvulsive Therapy (ECT) Department of a Freestanding Behavioral Health Hospital

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Purpose Statement

The purpose of the project was to improve the method of training to increase staff confidence in their ability to respond to a patient experiencing malignant hyperthermia (MH).

The goal was that staff develop increased confidence to recognize the early signs and symptoms of MH, calculate and mix correct dosages of dantrolene, operationalize creating ice packs and infusing cooled normal saline to mitigate hyperthermia, and improve communication among staff responders.

Description of the Innovation

An interdisciplinary team developed a formal MH simulation-based training event. The planning timeline included a monthly MH meeting where we identified structure and process gaps. The team then developed the following interventions:

- Modification of the malignant hyperthermia learning module
- MH competency update for specificity to the ECT dept.
- Development of a simulation scenario (case study)
- Role delineation/task cards
- Emphasis on teamwork and utilization of float staff
- Education on pharmaceutical agents, drug reconstitution, conversion calculations, and route
- Utilized mock drug solution to practice drug reconstitution
- Utilized actual equipment: 60ml syringes, vented spikes, mock IV sites, liter bag of NS, 10ml normal saline pushes
- Demonstrate the rationale for having 2 IV sites
- Equipped a simulation manikin with mock IV sites to practice pushing meds and infusing cooled normal saline
- Developed a process with necessary supplies to quickly make ice packs to cool the patient

Outcomes

ECT staff were surveyed on the effectiveness of the modified learning module and the simulation training as well as their level of confidence.

- 83% agreed that the modified learning module was more effective than the original version
- 100% agreed that the simulation training more effectively prepared them to respond to an actual MH emergency
- 100% are more confident in their ability to recognize early signs and symptoms of MH
- 100% are more confident in their ability to reconstitute and administer dantrolene via IV push
- 100% are more confident in their ability to operationalize the various roles involved in responding to an MH event
- 83% are more confident in their ability to obtain ice, make ice packs and cool the patient
- 100% are more confident to infuse cooled NS through a second peripheral IV

Background/Problem

Malignant Hyperthermia (MH) is a life-threatening disorder of the skeletal muscle, triggered in most instances, by certain general anesthetics and/or succinylcholine.

This hospital identified the need to establish a MH protocol in the Electroconvulsive Therapy (ECT) department related to the use of succinylcholine, a neuromuscular blocker administered just prior to seizure induction ECT.

The ECT Advanced Clinician, Safe Medication Pharmacist, and Senior Nurse Specialist recognized the need for additional staff training to prepare for the possibility of an actual malignant hyperthermia event.

This interdisciplinary team collaborated to develop an educational simulation-based training event to immerse clinicians in the ECT department on how to operationalize the MH protocol should an actual MH event occur.

Implications/Significance

Although using simulation methods for nursing education is well documented in the literature, using simulation-based methods to train the staff in the ECT department of this freestanding psychiatric hospital was novel.

- 2016 – MH protocol was established; training included a PowerPoint self-learning module and a competency
- 2017 – Simple in-service was provided
- 2018 – Simulation-based training was implemented

References: Upon Request