

## **Optimizing the Management of Malignant Hyperthermia Through Quality Improvement Initiatives**

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**Introduction:** Malignant Hyperthermia (MH) is a life-threatening pharmacogenetic disorder triggered by certain anesthetic agents and succinylcholine, resulting in a hypermetabolic state within skeletal muscles. Symptoms include hyperthermia, muscle rigidity, metabolic acidosis, hyperkalemia, and cardiac dysrhythmias. Early identification and treatment are imperative to preventing severe complications or death.

**Identification of the Problem:** MH simulations conducted in 2024 revealed inconsistencies among MH carts across all six of NGHS campuses. Clinical educators identified the need to standardize MH carts and other associated processes. This included intradisciplinary collaboration with the rapid response team, Labor & Delivery, pharmacy, and our anesthesia teams.

**QI Question/Purpose of the Study:** This project aimed to evaluate the impact of updated protocols, standardized MH carts, enhanced educational resources, and simulation-based training on staff knowledge, preparedness, and confidence in managing MH emergencies.

**Methods:** MH carts were standardized system-wide for consistency and rapid access. Each cart was clearly labeled and equipped with the MHAUS MH algorithm and Ryanodex dosing chart. A series of MH simulations were conducted across various departments and shifts to ensure broad participation. Policy and process were reviewed across multiple departments.

**Outcomes/Results:** Between August and October 2025, 422 licensed and unlicensed staff members across multiple departments participated in MH simulations. Post-simulation surveys indicated significant improvements in staff knowledge and confidence. Participants reported increased familiarity with MH symptoms, clearer understanding of roles, greater confidence in treatment delivery, and improved awareness of supply locations. Staff expressed interest in more frequent simulations and larger training spaces.

**Discussion:** Simulation-based training proved highly effective in enhancing clinical preparedness. Feedback emphasized the value of realistic, hands-on practice and highlighted areas for future improvement, including increased frequency of training and expanded learning environment.

**Conclusion:** The QI initiative successfully improved staff readiness for MH emergencies. Structured simulations and standardized resources fostered confidence and competency across multiple departments. Ongoing evaluation and adaptation based on staff feedback are essential to sustaining progress.

**Implications for perianesthesia nurses and future research:** This study reinforces the importance of continuous education and hands-on training for perianesthesia nurses.

Staying current with protocols, equipment, and supplies is vital for optimal patient outcomes.