

One Size Doesn't Fit All: Multimodal Education for Malignant Hyperthermia in Perianesthesia

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BACKGROUND

Malignant Hyperthermia (MH) is a rare but life-threatening emergency requiring rapid team response. These high acuity settings demand rapid, coordinated responses, yet staff confidence and readiness to manage MH events varied widely, especially among nurses with limited exposure to such scenarios. Multimodal education strengthens awareness and preparedness.



Multidisciplinary Team

- Table-top Exercise
- Online Module



Micro-Learning

- Documentation
- Gamification



Simulation

- In-Situ simulation
- PACU Simulation

OBJECTIVE

To enhance clinical preparedness and staff confidence in MH response by implementing a multimodal education strategy tailored to diverse learning styles and experience levels.

Figure 1



Laminated cards placed near the physical location of these items on the unit. Teams collect during the scenario and turn in with completed activity

TEAM-BASED STRATEGIES

Tabletop Case Study

- **Participants:** All Surgical Services personnel, including operating room staff, anesthesia providers, surgical technologists, and perianesthesia staff
- **Setting:** Flexible, low-resource environments such as unused perianesthesia room, nursing workstations, or conference rooms
- **Skill Focus:** To promote role clarity across Surgical Services and enhance awareness of critical supply and resource locations within the clinical unit
- **Education Description:**
 - Structured tabletop activity utilizing a case-based learning packet with guided discussion questions
 - Unit-based resource scavenger hunt to reinforce identification and retrieval of essential equipment and supplies- **Figure 1**
 - Interprofessional collaboration to define and articulate each team member's scope of practice during crisis scenarios

Figure 2



Preceptee PACU Simulation

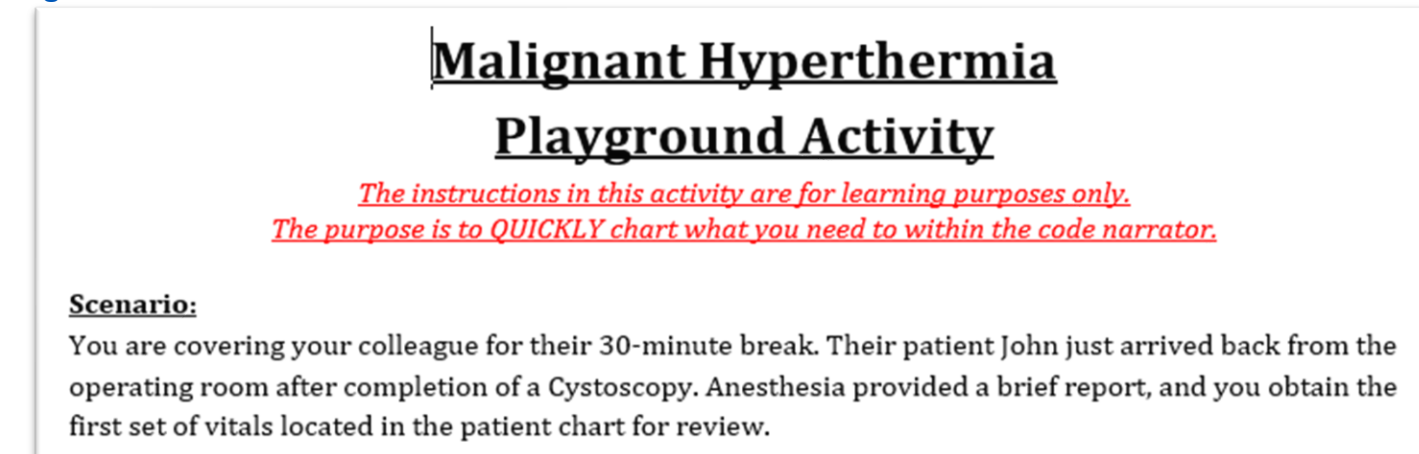
- **Participants:** Registered Nurses newly onboarding to a perianesthesia unit
- **Setting:** Multidisciplinary simulation center
- **Skill Focus:** To bridge foundational education with applied clinical decision-making in a simulated environment prior to real-world patient care
- **Education Description:**
 - High-fidelity simulation scenario conducted within a multidisciplinary simulation center
 - Hands-on, real-time clinical response to an evolving patient crisis scenario to reinforce assessment, prioritization, and escalation skills- **Figure 2**

MICRO-LEARNING IN CLINICAL PRACTICE

Documentation Case Study

- **Participants:** Perianesthesia Registered Nurses
- **Setting:** Any clinical or non-clinical space with access to a computer and the electronic medical record
- **Skill Focus:** To strengthen the connection between patient assessment findings, nursing interventions, and accurate, timely documentation within the medical record
- **Intervention Description:**
 - Case-based scenario requiring participants to document assessments, interventions, and related orders within the electronic medical record environment- **Figure 3**

Figure 3



Medication Mixing Gamification

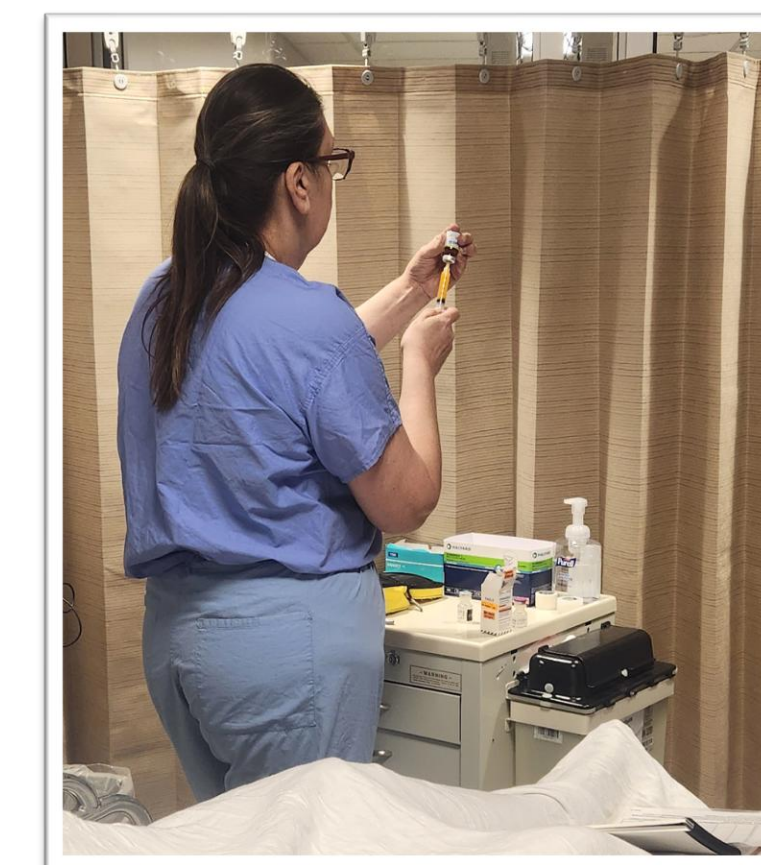
- **Participants:** Perianesthesia Registered Nurses
- **Setting:** Any clinical or non-clinical space, including perianesthesia rooms, nursing stations, or conference rooms
- **Skill Focus:** To provide hands-on practice in medication preparation while reinforcing accuracy, dosing calculations, and readiness during high-stakes, time-sensitive scenarios
- **Intervention Description:**
 - Simulated reconstitution and dosing of dantrolene (Ryanodex®) based on patient weight
 - Gamification elements designed to introduce time pressure and mimic urgency associated with crisis response scenarios- **Figure 4**

Assessment of Patient (In Situ Simulation)

- **Participants:** Perianesthesia staff
- **Setting:** Perianesthesia unit, utilizing an open patient room or conference room within the clinical environment
- **Skill Focus:** To build clinician confidence in synthesizing assessment data and applying appropriate interventions, including identification and retrieval of necessary supplies, within the real clinical workspace
- **Education Description:**
 - Mid-fidelity simulation scenario staged within the Perianesthesia clinical environment
 - Use of a simulation mannequin to replicate dynamic patient symptom changes
 - Integration of assessment skills with crisis response and intervention execution within the physical care setting

Flexible MH education can be successfully embedded into daily workflow without removing staff from patient care.

Figure 4



It allowed me to review under pressure, the location of important life-saving medications and equipment... I feel more confident responding to an emergency.”

-Gamification participant

CONCLUSIONS

- Customized, multimodal education improved staff confidence and preparedness for malignant hyperthermia response.
- Flexible, workflow-integrated learning supported engagement across experience levels and learning styles.
- Embedding education into daily practice strengthened readiness for high-risk clinical events.

LESSONS LEARNED

- Connecting with team members to clarify individual roles within the response improved confidence in delegation and notification during an event.
- Adapting education to learner comfort levels increased engagement; in-situ simulations ranged from formal scenarios to discussion-based formats depending on team experience and confidence.
- Limited physical space required the education to remain flexible, allowing delivery to be independent off the environment to maintain proximity to learners.

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