

Use of Porcine Model of Malignant Hyperthermia (MH) to supplement High Fidelity Simulation in Residency Training

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Learner audience: Anesthesia Residents, all levels

Needs Assessment: MH is only 1 of 27 crises addressed in our crisis course. Few residents have seen MH. Most crises we address are either relatively common (difficult airway, obstruction) or share physiologic concepts (hypotension, sepsis, bradycardia, myocardial ischemia). MH identification and management is unique. While there are many excellent ways to use simulation for learning MH management^{1,2}, our status as an MH center provides a unique possibility. We also want learners to internalize the advantages of cognitive aids in crisis management.

Curriculum: Teams of 2 residents (aware only that they would manage a simulated crisis) managed MH in a simulator and were videotaped. An extensive debriefing was integrated with a PowerPoint emphasizing resource management and cognitive aids. Then, small groups triggered MH in susceptible pigs. Participants diagnosed, decided when and how to treat, mixed and administered dantrolene, and followed recovery clinically and with labs. They repeated a simulated MH episode, conducted a general debriefing, and completed questionnaires. This program was intended to be “affect rich”, fostering internalization of the severity of MH. Our institutional Animal Use Committee approved the protocol; we complied fully with all institutional guidelines.

Impact: Twenty residents participated. All rated it worthwhile. Eighteen felt their knowledge was greatly augmented, 19 rated their affective appreciation for the severity of MH improved, and 13 said the pig lab added significantly to the experience. Fourteen had already carried memory aids; the remaining 6 resolved to do so. Our informal assessment of the enthusiasm of the residents was positive. We hope to repeat this yearly, although future participants will likely know in advance what will transpire. While we don't suggest that all residencies provide this lab, many conduct animal research. Learning with high affective value can be “piggybacked” onto this resource.

References:

1. I Gardi T et al: How do anaesthesiologists treat malignant hyperthermia in a full-scale anaesthesia simulator? *Acta Anaes Scand* 45:1023-25, 2001
2. Harrison TK et al: Use of Cognitive Aids in a Simulated Anesthetic Crisis. *Anesth Analg* 103(3):551-56, 2006