

Emergency Treatment for An Acute Malignant Hyperthermia (MH) Event

1. **Discontinue volatile agents and succinylcholine.**
2. **Obtain Dantrolene/ MH Cart:**
 - A) *If in Operating Room (OR):*
Call for cart located in the unit by the OR Med Room or in Burn Unit OR depending on patient surgical location.
If after hours, activate Code Blue as if outside of OR (see below).
 - B) *If outside of Operating Rooms:*
Call '2222,' state location, Code Blue (or Pediatric Code Blue)- Malignant Hyperthermia as indicated by patient situation. **Nursing Supervisor will obtain cart and bring to location.**
3. **Designate team member to call MHAUS** (Malignant Hyperthermia Association of the United States) Hotline for additional advice: 1-800-644-9737
4. **Hyperventilate with 100% oxygen at flows of 10L/min** to flush volatile anesthetics and lower ETCO₂.
5. **Give IV dantrolene 2.5 mg/kg rapidly through large-bore IV**, if possible. Repeat as frequently as needed until the patient responds with a decrease in ETCO₂, decreased muscle rigidity, and/or lowered heart rate.
 - A) **Designate 2 to 3 people to reconstitute the Dantrolene.**
 - B) Dantrium® /Revonto® – Each 20 mg vial should be reconstituted by adding 60 ml of sterile water for injection, USP (without a bacteriostatic agent) and the vial shaken until the solution is clear.
 - C) If giving large doses (>10 mg/kg) without symptom resolution, consider alternative diagnoses.
6. **Obtain blood gas (venous or arterial)** to determine degree of metabolic acidosis. Consider administration of sodium bicarbonate, 1-2 mEq/kg dose, for base excess greater than -8 (maximum dose 50 mEq).
7. **Cool the patient if core temperature is >39 degrees C or less if rapidly rising. Stop cooling when the temperature has decreased to <38 degrees C.**
8. If hyperkalemia (K >5.9 or less with ECG changes) is present, treat with:



- A) Calcium chloride 10 mg/kg (maximum dose 2,000 mg) or calcium gluconate 30 mg/kg (maximum dose 3,000 mg) for life-threatening hyperkalemia.
 - B) Sodium bicarbonate: 1-2 mEq/kg (maximum dose 50 mEq)
 - C) Glucose/insulin:
 - 1. For pediatric patients: 0.1 units regular insulin/kg IV and 0.5 grams/kg dextrose
 - 2. For adult patients: 10 units regular insulin IV and 50 ml 50% glucose
 - 3. Check glucose levels hourly
 - D) For refractory hyperkalemia, consider albuterol (or other beta-agonist), kayexalate, or dialysis if patient is in cardiac arrest.
9. Treat dysrhythmias with standard medication but avoid calcium channel blockers. Treat acidosis and hyperkalemia if present (see above).
- A) Diurese to >1ml/kg/hr urine output. If CK or K⁺ rise, assume myoglobinuria and give bicarbonate infusion of 1 mEq/kg/hr, to alkalinize urine
10. **Institute appropriate monitoring including: core temperature, urine output with bladder catheter, and consider arterial and/or central venous monitoring if warranted by the clinical severity of the patient.**
11. **Monitor heart rate, core temperature, ETCO₂, minute ventilation, blood gases, K⁺, CK, urine myoglobin, and coagulation studies as warranted by the clinical severity of the patient.**
12. **When stable, transfer to post anesthesia care unit or intensive care unit for at least 24 hours.**
13. **Notify pharmacy of the crisis** so that Dantrolene can be kept adequately stocked at all times.

Delayed onset/recurrence with patient no longer in critical care areas:

- 1. Call '2222,' state location, Code Blue (or Pediatric Code Blue)- Malignant Hyperthermia as indicated by patient situation. **Nursing Supervisor will obtain MH cart and bring to location.**
- 2. Alert responders to the patient's post-procedure status.
- 3. Begin with Section A, Step 3 if it is determined the patient is having a MH reaction.