

Appendix 1: Contents of an MH Cart/Kit

MHAUS recommends that the following drugs and equipment are available to treat an MH crisis.¹⁸

Drugs

1. Dantrolene
 - a. Dantrium® / Revonto® – 36 vials should be available in each institution where MH can occur, each vial to be diluted at the time of use with 60 ml sterile water, USP (without a bacteriostatic agent). There are 3 grams of mannitol in each vial of 20 mg of dantrolene (0.15 g mannitol/ 1 mg dantrolene).
 - b. Ryanodex® – 3 vials should be available in each institution where MH can occur, each to be diluted at the time of use with 5 ml of sterile water for injection, USP (without a bacteriostatic agent). There are 0.125 grams of mannitol in each vial of 250 mg of Ryanodex® (0.0005 grams mannitol/1 mg dantrolene).
2. Sterile water for injection USP (without a bacteriostatic agent)
3. Sodium bicarbonate (8.4 percent) – 50 ml x 5
4. Dextrose 50 percent – 50 ml vials x 2
5. Calcium chloride (10 percent) – 10 ml vial x 2
6. Regular insulin – 100 units/ml x 1 (refrigerated)
7. Lidocaine* for injection (2 percent) – 100 mg/5 ml or 100 mg/10 ml in preloaded syringes (3). Amiodarone is also acceptable. Advanced Cardiac Life Support protocols, as prescribed by the American Hospital Association, should be followed when treating all cardiac derangements caused by MH.
8. Refrigerated cold saline solution – A minimum of 3,000 ml for IV cooling

* Lidocaine or procainamide should not be given if a wide-QRS complex arrhythmia is likely due to hyper-kalemia; this may result in asystole.

General Equipment

1. Charcoal Filters - Two pairs of activated charcoal filters (Vapor-Clean™, Dynasthetics, Salt Lake City, UT). Attach activated charcoal filters to inspiratory and expiratory ports of the anesthesia machine to quickly reduce the concentration of gas (<5 ppm) from the anesthesia machine. In this situation, even though the anesthetic gas has been discontinued when MH was first suspected, the Vapor-Clean™ filter may become saturated after one hour; therefore, a replacement set of filters should be substituted after each hour of use.
2. Syringes – (60 ml x 5) to dilute dantrolene
3. Intravenous catheters – 16G, 18G, 20G, 2-inch; 22G, 1-inch; 24G, 3/4-inch (4 each) (for IV access and arterial line)
4. NG tubes – sizes appropriate for patient population
5. Toomey irrigation syringes – (60 ml x 2) with adapter for NG irrigation

Monitoring Equipment

1. Esophageal or other core (e.g., nasopharyngeal, tympanic membrane, rectal, bladder, pulmonary artery catheter) temperature probes.
2. CVP kits (sizes appropriate for patient population). It is recommended that these be used in patients who are critically ill.
3. Transducer kits for arterial and central venous cannulation.

Nursing Supplies

1. Large sterile Steri-Drape (for rapid drape of wound)
2. Urine meter x 1
3. Irrigation tray with piston (60cc irrigation) syringe
4. Large clear plastic bags for ice x 4
5. Small plastic bags for ice x 4
6. Bucket for ice
7. Test strips for urine hemoglobin

Laboratory Testing Supplies

1. Syringes (3 ml) for blood gas analysis or ABG kits x 6 or point of care monitors; ISTAT with TB syringes (the point of care ISTAT device has replaced lab blood gas and electrolyte measurement).
2. Blood specimen tubes for CK, myoglobin, SMA 19 (LDH, electrolytes, thyroid studies), PT/PTT, fibrinogen, fibrin split products; and lactate, CBC, platelets. If no immediate laboratory analysis is available, samples should be kept on ice for later analysis. This may well prove useful on retrospective review and diagnosis. Blood cultures are very useful and should be included to rule out bacteremia.
3. Urine collection container for myoglobin level. Pigmenturia (e.g., brown or red urine and heme positive dipstick) indicates that renal protection is mandated, when the urine is centrifuged or allowed to settle, and the sample shows clear supernatant, i.e., the coloration is due to red cells in the sample.

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