RANCHO LOS AMIGOS
NATIONAL REHABILITATION CENTER

POLICY AND PROCEDURE MANUAL		CODE:	3.35.0
PHARMACY SERVICES		DATE:	12/8/2011
		REVISED:	11/27/2017, 4/19/2022, 9/27/2023
SECTION:	INPATIENT PHARMACY SERVICES	APPROVED:	Thinh Tran, Pharm. D
		MEC APPROVED:	12/14/11, 8/23/13,9/24/14
SUBJECT:	MALIGNANT HYPERTHERMIA	PAGES:	1 of 2

POLICY: Provide Malignant Hyperthermia treatment in a timely manner.

I. BACKGROUND INFORMATION

A. Malignant hyperthermia (MH) is a potentially lethal syndrome caused by a hypermetabolic response of skeletal muscle that can be triggered in susceptible individuals by succinylcholine and volatile inhalation agents such as halothane, isoflurane, desflurane, sevoflurane, and enflurane.

B. The patient experiencing an MH episode must be stabilized immediately with multiple doses of dantrolene because, in some cases, MH progresses with explosive rapidity.

II. PROCEDURE:

A. MALIGNANT HYPERTHERMIA IN THE SURGICAL AREA

1. In case of MH episode or crisis in the surgical areas, OR staff will respond.
2. The MH kit is located in the same room as the Anesthesia Pyxis MedStation.
3. MH kit will be filled by the Pharmacy Department and checked and sealed by a pharmacist.

B. MALIGNANT HYPERTHERMIA IN THE INTENSIVE CARE UNIT (ICU)

1. In case of Malignant Hyperthermia episode or crisis in the ICU area, the ICU staff will respond.
2. The MH kit is located in the ICU medication room.
3. MH kit will be filled by the Pharmacy Department and checked and sealed by a pharmacist.

C. MALIGNANT HYPERTHERMIA MEDICATION LIST (MHAUS Guidelines)

Medication	Qty	Medication	Qty
RYANODEX (dantrolene) 250 mg Vial	2	Calcium Chloride 10%,10 mL	2
Sterile Water for injection 10 mL *(preservative free, single dose)*	2	Lidocaine 100 mg/5 mL	3
		Amiodarone 150 mg/3 mL	3
Sodium Bicarbonate 8.4% 50 mL	5	Regular Insulin 100 unit/mL (in refrig)	1
Dextrose 50%, 50 mL	2	Normal Saline 1000 mL bag (in refrig)	3

*Sterile water for injection will be used to reconstitute RYANODEX. RYANODEX will not be reconstituted with any other solution (e.g. 0.9% NaCl, 5% Dextrose). A sticker will be affixed to the outside of the MH kit stating "Only Reconstitute RYANODEX with Preservative-free Sterile Water for Injection"

Reviewed: 7/6/2017bdk, 4/19/2022 TT, 9/27/2023 TT

Approved by:

D. ACUTE PHASE TREATMENT

1. Discontinue volatile agents or succinylcholine.
2. Hyperventilate with 100% oxygen at flows of 10 L/min or more.
3. Administer RYANODEX 2.5 mg/kg rapidly through large-bore IV
   a. Reconstitute each vial with 5 mL sterile, preservative free water for injection.
   b. Shake vial to ensure an orange colored, opaque suspension and inspect for any visible particulates. Vials must be used within 6 hours of reconstitution.
4. If signs and symptoms reappear, repeat administration of RYANODEX 2.5 mg/kg Q5 minutes intravenous push, with a maximum cumulative dosage of 10 mg/kg.
5. Sodium bicarbonate can be given for metabolic acidosis
6. Sodium bicarbonate infusion will be administered to alkalinize urine for the prevention of myoglobinuria-induced renal failure if necessary.
7. Cool the patient with core temperature greater than 39ºC and lavage open body cavities, stomach, bladder, and or rectum.
   a. Apply ice to surface.
   b. Infuse cold saline located in the refrigerator intravenously (to lower the body temperature).
   c. Stop cooling if temperature drops below 38ºC.
8. Treat dysrhythmias with standard medication but avoid calcium channel blockers. Calcium channel blockers in the presence of dantrolene may cause hyperkalemia and/or cardiac arrest.
9. Treat hyperkalemia with hyperventilation, sodium bicarbonate injection, glucose (50% dextrose injection), regular human insulin injection, and/or calcium injection.
10. Lidocaine should not be given if a wide-QRS complex arrhythmia is likely due to hyperkalemia: this may result in asystole.

E. POST ACUTE PHASE TREATMENT

10. Administer dantrolene 1 mg/kg every 4-6 hours or 0.25 mg/kg/hour by infusion for at least 24 hours.
11. Monitor for signs and symptoms of rhabomyolysis and myoglobinuria and initiate sodium bicarbonate infusion if necessary.