Malignant Hyperthermia (MH)

Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson’s specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient’s care. This algorithm should not be used to treat pregnant women.

INITIAL EVALUATION

A. Assess signs and symptoms of MH:
   - Early signs and symptoms:
     - Tachycardia/tachypnea
     - Abrupt increase in end tidal carbon dioxide (ETCO₂)
     - Masseter muscle rigidity
     - Hyperthermia (temperature > 38.8°C)
     - Metabolic/respiratory acidosis
     - Hyperkalemia
     - Hypotension
     - Rhabdomyolysis/myalgia
     - Cardiac arrhythmias
     - Hypoxia
     - Profuse sweating
     - Mottling of the skin
   - Late signs and symptoms:
     - Acute renal/circulatory failure
     - Dark colored urine due to myoglobinuria
     - Disseminated intravascular coagulation
     - Rhabdomyolysis (myalgia, elevated blood creatinine phosphokinase levels, blood myoglobin levels)
     - Hyperkalemia
     - Hyperthermia (temperature > 38.8°C)
     - Hypotension
     - Cardiac arrhythmias

MH team lead (anesthesiologist)³ assembles crisis team
- Assigns MH team member roles
- Assists with drawing arterial blood gases (ABG) as needed
- Calls MH hotline (800-644-9737)

- If MH suspected, page Anesthesiologist¹ and notify Central Pharmacy² STAT
- Bring MH cart* to bedside
- Monitor in current location and make arrangements for patient to transfer to higher level of care, if needed
- Notify ICU/PICS regarding possible transfer

ACUTE PHASE TREATMENT

Cooling team member:
- Initiates cooling process only if patient’s temperature exceeds 39°C
- Brings cold normal saline (NS) and ice, packs IV NS bags in ice for infusion
- Prepares ice packs
- Surface cooling measures:
  - Ice packs to body surfaces
  - Cooling blankets, sets temperature at 32°C if available
- Internal cooling measures:
  - Nasogastric (NG) tube for stomach lavage using cold NS
  - Indwelling Foley catheter for irrigation using cold NS
  - Continuously monitors patient’s temperature
  - Discontinues cooling measures when temperature decreases to 38°C

Dantrolene team member:
- Administers dantrolene 2.5 mg/kg IV push
- Repeats dose per Anesthesia request until symptoms subside or a cumulative dose of 10 mg/kg is reached (note: up to 30 mg/kg may be needed)

Medication team member:
- Assists with preparation and administration of dantrolene and other medications
- Primary nurse:
  - Maintains documentation of all medications administered, procedures performed, and continued patient assessment
  - Infuses cold NS intravenously
  - Inserts NG tube for cold NS lavage
  - Assists MH team leader
  - Labs: arterial blood gases, electrolytes, creatine kinase, myoglobin, coagulation studies, and additional labs as clinically indicated

³ Anesthesia providers may refer to the Optime Malignant Hyperthermia Intra-op Care Guidelines in OneConnect for an additional reference regarding management of patients with MH

¹ See Appendix A for Contact Information
² MH cart locations:
- Main building
  - Main OR
  - Main IR near G3.3301A
  - GS PACU
  - G3.3625
- Mays building
  - ACB PACU near ACB4.1951
  - Anesthesia storage room ACB4.2517
  - Proton center
  - Near PTCB.2075

1. Transfer patient to higher level of care
2. Notify ICU/PICS regarding transfer
3. Complete a safety intelligence (SI) report
4. Report to Malignant Hyperthermia Association of the United States (MHAUS)
   - Call MH hotline (800-644-9737)
5. Provide patient education regarding MH and future precautions
6. Perform ongoing evaluation for signs and symptoms of MH (see Box A)
APPENDIX A: Contact Information

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<thead>
<tr>
<th>Location</th>
<th>Hours</th>
<th>Contact number</th>
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<tr>
<td><strong>Anesthesia</strong></td>
<td>Monday - Friday 06:00 AM – 09:00 PM</td>
<td>713-792-2524 (phone)</td>
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<td>After hours (09:00 PM – 06:00 AM) and weekends coverage</td>
<td>713-404-2946 (pager)</td>
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<td></td>
<td>713-834-6520 (phone)</td>
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<td><strong>Main OR Pharmacy</strong></td>
<td>Monday - Friday 06:00 AM – 11:30 PM</td>
<td>713-794-1258 (phone)</td>
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<td></td>
<td>After hours coverage 11:30 PM – 06:00 AM</td>
<td>713-404-2946 (pager)</td>
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<tr>
<td><strong>ACB OR Pharmacy</strong></td>
<td>Monday - Friday 06:00 AM – 07:00 PM</td>
<td>713-563-8242 (phone)</td>
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<td></td>
<td>For coverage between 07:00 PM – 10:00 PM</td>
<td>713-745-1010 (phone)</td>
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<td></td>
<td>call ATC Pharmacy</td>
<td>713-404-2946 (pager)</td>
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<tr>
<td></td>
<td>After hours coverage 10:00 PM – 06:00 AM</td>
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SUGGESTED READINGS


This practice consensus algorithm is based on majority expert opinion of Malignant Hyperthermia work group at the University of Texas MD Anderson Cancer Center for the patient population. These experts include:

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