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**Association
of Anaesthetists**

Malignant Hyperthermia Crisis

AAGBI Safety Guideline



Successful management of malignant hyperthermia depends upon early diagnosis and treatment; onset can be within minutes of induction or may be insidious. The standard operating procedure below is intended to ease the burden of managing this rare but life threatening emergency.

<h3>1</h3> <h4>Recognition</h4>	<ul style="list-style-type: none">• Unexplained increase in ETCO₂ AND• Unexplained tachycardia AND• Unexplained increase in oxygen requirement (Previous uneventful anaesthesia does not rule out MH)• Temperature changes are a late sign		
<h3>2</h3> <h4>Immediate management</h4>	<ul style="list-style-type: none">• STOP all trigger agents• CALL FOR HELP. Allocate specific tasks (action plan in MH kit)• Install clean breathing system and HYPERVENTILATE with 100% O₂ high flow• Maintain anaesthesia with intravenous agent• ABANDON/FINISH surgery as soon as possible• Muscle relaxation with non-depolarising neuromuscular blocking drug		
<h3>3</h3> <h4>Monitoring & treatment</h4>	<table border="0"><tr><td data-bbox="432 831 1007 1682"><ul style="list-style-type: none">• Give dantrolene• Initiate active cooling avoiding vasoconstriction• TREAT:<ul style="list-style-type: none">• Hyperkalaemia: calcium chloride, glucose/insulin, NaHCO₃⁻• Arrhythmias: magnesium/amiodarone/metoprolol AVOID calcium channel blockers - interaction with dantrolene• Metabolic acidosis: hyperventilate, NaHCO₃⁻• Myoglobinaemia: forced alkaline diuresis (mannitol/furosemide + NaHCO₃⁻); may require renal replacement therapy later• DIC: FFP, cryoprecipitate, platelets• Check plasma CK as soon as able</td><td data-bbox="1007 831 1514 1682"><p>DANTROLENE 2.5mg/kg immediate iv bolus. Repeat 1mg/kg boluses as required to max 10mg/kg</p><p>For a 70kg adult</p><ul style="list-style-type: none">• Initial bolus: 9 vials dantrolene 20mg (each vial mixed with 60ml sterile water)• Further boluses of 4 vials dantrolene 20mg repeated up to 7 times.<p>Continuous monitoring Core & peripheral temperature ETCO₂ SpO₂ ECG Invasive blood pressure CVP</p><p>Repeated bloods ABG U&Es (potassium) FBC (haematocrit/platelets) Coagulation</p></td></tr></table>	<ul style="list-style-type: none">• Give dantrolene• Initiate active cooling avoiding vasoconstriction• TREAT:<ul style="list-style-type: none">• Hyperkalaemia: calcium chloride, glucose/insulin, NaHCO₃⁻• Arrhythmias: magnesium/amiodarone/metoprolol AVOID calcium channel blockers - interaction with dantrolene• Metabolic acidosis: hyperventilate, NaHCO₃⁻• Myoglobinaemia: forced alkaline diuresis (mannitol/furosemide + NaHCO₃⁻); may require renal replacement therapy later• DIC: FFP, cryoprecipitate, platelets• Check plasma CK as soon as able	<p>DANTROLENE 2.5mg/kg immediate iv bolus. Repeat 1mg/kg boluses as required to max 10mg/kg</p> <p>For a 70kg adult</p> <ul style="list-style-type: none">• Initial bolus: 9 vials dantrolene 20mg (each vial mixed with 60ml sterile water)• Further boluses of 4 vials dantrolene 20mg repeated up to 7 times. <p>Continuous monitoring Core & peripheral temperature ETCO₂ SpO₂ ECG Invasive blood pressure CVP</p> <p>Repeated bloods ABG U&Es (potassium) FBC (haematocrit/platelets) Coagulation</p>
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<h3>4</h3> <h4>Follow-up</h4>	<ul style="list-style-type: none">• Continue monitoring on ICU, repeat dantrolene as necessary• Monitor for acute kidney injury and compartment syndrome• Repeat CK• Consider alternative diagnoses (sepsis, pheochromocytoma, thyroid storm, myopathy)• Counsel patient & family members• Refer to MH unit (see contact details below)		

The UK MH Investigation Unit, Academic Unit of Anaesthesia, Clinical Sciences Building, Leeds Teaching Hospitals NHS Trust, Leeds LS9 7TF. **Direct line: 0113 206 5270.** Fax: 0113 206 4140. Emergency Hotline: 07947 609601 (usually available outside office hours). Alternatively, contact Prof P Hopkins, Dr E Watkins or Dr P Gupta through hospital switchboard: 0113 243 3144.

Your nearest MH kit is stored

This guideline is not a standard of medical care. The ultimate judgement with regard to a particular clinical procedure or treatment plan must be made by the clinician in the light of the clinical data presented and the diagnostic and treatment options available.