THE ASSOCIATION OF ANAESTHETISTS
of Great Britain & Ireland

Guidelines for the management of a Malignant Hyperthermia Crisis

Successful treatment of a Malignant Hyperthermia (MH) crisis depends on early diagnosis and aggressive treatment. The onset of a reaction can be within minutes of induction or may be more insidious. Previous uneventful anaesthesia **does not** exclude MH. The steps below are intended as an *aide memoire*. Presentation may vary and treatment should be modified accordingly. Know where the dantrolene is stored in your theatre. Treatment can be optimised by teamwork.

Call for Help

Diagnosis - consider MH if:

1. Unexplained, unexpected increase in end-tidal CO_2 together with
2. Unexplained, unexpected tachycardia together with
3. Unexplained, unexpected increase in oxygen consumption

Masseter muscle spasm, and especially more generalised muscle rigidity after suxamethonium, indicate a high risk of MH susceptibility but are usually self-limiting.

Take measures to halt the MH process:

1. Remove trigger drugs, turn off vaporisers, use high fresh gas flows (oxygen), use a new, clean non-rebreathing circuit, hyperventilate. Maintain anaesthesia with intravenous agents such as propofol until surgery completed.
2. Dantrolene: give 2-3 $mg.kg^{-1}$ i.v. initially and then 1 $mg.kg^{-1}$ PRN.
3. Use active body cooling but avoid vasoconstriction. Convert active warming devices to active cooling, give cold intravenous infusions, cold peritoneal lavage, extracorporeal heat exchange.

Monitor:

ECG, SpO_2, end-tidal CO_2, invasive arterial BP, CVP, core and peripheral temperature, urine output and pH, arterial blood gases, potassium, haematocrit, platelets, clotting indices, creatine kinase (peaks at 12-24 h).

Treat the effects of MH:

1. Hypoxaemia and acidosis: 100% O_2, hyperventilate, sodium bicarbonate.
2. Hyperkalaemia: sodium bicarbonate, glucose & insulin, i.v. calcium chloride (if *in extremis*).
3. Myoglobinaemia: forced alkaline diuresis (aim for urine output >3 $ml.kg^{-1}.h^{-1}$, urine pH >7.0).
4. Disseminated intravascular coagulation: fresh frozen plasma, cryoprecipitate, platelets.
5. Cardiac arrhythmias: procainamide, magnesium, amiodarone (avoid calcium channel blockers – interaction with dantrolene).

ICU management:

1. Continue monitoring and symptomatic treatment.
2. Assess for renal failure and compartment syndrome.
3. Give further dantrolene as necessary (recrudescence can occur for up to 24 h).
4. Consider other diagnoses, e.g. sepsis, phaeochromocytoma, myopathy.

Late management:

1. Counsel patient and/or family regarding implications of MH.
2. Refer patient to MH Unit.

The UK MH Investigation Unit, Academic Unit of Anaesthesia, Clinical Sciences Building, St James's University Hospital 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 Hopkins or Dr Halsall through hospital switchboard: 0113 243 3144.

This poster is produced by the Association of Anaesthetists of Great Britain and Ireland and is endorsed by the British MH Association.