

# 3-8 Malignant hyperthermia crisis v.1

Unexplained increase in ETCO<sub>2</sub> AND tachycardia AND increased oxygen requirement. Temperature rise is a late sign. MH is rare. Always consider other, more common causes (see 2-8 Peri-operative hyperthermia).

## START

- 1 Call for help and inform theatre team of problem, note the time.
- 2 Allocate tasks as scenario develops (see Box A).
- 3 Aim to abandon or finish surgery as soon as possible.
- 4 Call for MH treatment pack/dantrolene and cardiac arrest trolley.
- 5 Remove vaporisers from machine.
- 6 Give highest possible fresh gas flow and hyperventilate lungs:
  - Change breathing system is NOT a priority.
- 7 Maintain anaesthesia with intravenous hypnotic agent and muscle relaxation with a non-depolarising neuromuscular blocking agent.
- 8 Give dantrolene (see Box B). Delegate mixing – it is time and labour intensive
- 9 Begin active cooling:
  - Reduce the operating room ambient temperature.
  - Cooling jackets or blankets.
  - Ice packing in groin, axillae and anterior neck.
  - Bladder, gastric or peritoneal lavage with boluses 10 ml.kg<sup>-1</sup> iced water.
- 10 Begin continuous monitoring of: core and peripheral temperature, invasive BP, CVP.
- 11 Send urgent blood samples and repeat as indicated (Box C).
- 12 Treat complications (see Box D).
- 13 Plan admission to critical care.

## EMERGENCY HELP

**Leeds MH Hotline:** Direct 0113 206 5270, Switchboard: 0113 243 3144, Out of hours mobile 07947 609601

## Box A: SUGGESTED TASK ALLOCATION

**1<sup>st</sup> nurse/ODP:** Collect MH treatment pack/dantrolene and cold saline and insulin. Set up lines (arterial/CVC). Runner for resuscitation drugs/equipment  
**2<sup>nd</sup> nurse/ODP** (ideally two people): Draw up dantrolene as directed, keep notes of times of key events  
**Surgeon:** Complete/abandon surgery ASAP, catheterise, commence cooling manoeuvres  
**2<sup>nd</sup> anaesthetist:** Give dantrolene, start TIVA, manage hyperkalaemia, arrhythmias, acidosis. Renal protection (forced alkaline diuresis)  
**3<sup>rd</sup> anaesthetist:** Arterial line. Send bloods. Central venous access. Urinary myoglobin. Monitor core and peripheral temperatures

## Box B: DANTROLENE

2.5 mg.kg<sup>-1</sup> immediate i.v. bolus (Adult approx. 200 mg)  
Repeat 1 mg.kg<sup>-1</sup> every 10-15 mins thereafter as required  
Maximum dose 10 mg.kg<sup>-1</sup>

## Box C: INVESTIGATIONS

Arterial blood gases every 30 mins, U&E, CK, FBC, coagulation screen, group and save/cross-match blood as indicated

## Box D: COMPLICATIONS AND OUTLINE TREATMENTS

**AVOID calcium channel blockers - interaction with dantrolene**  
**Hyperkalaemia:** calcium chloride, glucose/insulin, bicarbonate  
**Arrhythmias:** magnesium/amiodarone/metoprolol  
**Metabolic acidosis:** hyperventilate, sodium bicarbonate  
**Myoglobinaemia:** forced alkaline diuresis (mannitol/furosemide + bicarbonate); may require renal replacement therapy later  
**DIC:** FFP, cryoprecipitate, platelets