3-8 Malignant hyperthermia crisis v.1

Unexplained increase in $ETCO_2$ 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 $ml.kg^{-1}$ 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

1st nurse/ODP: Collect MH treatment pack/dantrolene and cold saline and insulin. Set up lines (arterial/CVC). Runner for resuscitation drugs/equipment
2nd 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
2nd anaesthetist: Give dantrolene, start TIVA, manage hyperkalaemia, arrhythmias, acidosis. Renal protection (forced alkaline diuresis)
3rd anaesthetist: Arterial line. Send bloods. Central venous access. Urinary myoglobin. Monitor core and peripheral temperatures

Box B: DANTROLENE

2.5 $mg.kg^{-1}$ immediate i.v. bolus (Adult approx. 200 mg)
Repeat 1 $mg.kg^{-1}$ every 10-15 mins thereafter as required
Maximum dose 10 $mg.kg^{-1}$

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