

ANAESTHETIST 1: RESUSCITATION

■ DANTROLENE:

2.5 mg/kg every 10 -15 minutes IV until signs of hypermetabolism (acidosis, pyrexia, muscle rigidity) are resolving:

- DO NOT delay dantrolene to insert central venous line

Note that dantrolene can interact with calcium channel blockers (eg. verapamil) and precipitate profound hypotension.

■ MAINTENANCE OF ANAESTHESIA:

Choices include:

- Propofol 1% (30-50ml/hr or TCI 4mcg/ml)
- Midazolam 2.5-5mg IV PRN

■ HYPERKALAEMIA MANAGEMENT:

- Hyperventilation
- Insulin 0.15U/kg + 0.5ml/kg 50% dextrose as rapid IV infusion (10U insulin in 50 ml 50% dextrose in adults)
- CaCl₂ (10%) - 0.1ml /kg **OR** Ca gluconate (10%) 0.3ml/kg

■ ARRHYTHMIA MANAGEMENT:

- Amiodarone: 3mg /kg slowly IV
- Lignocaine: 1mg/kg IV
- Metoprolol: 1-2mg IV prn
- Hyperkalaemia management as above

■ ACIDOSIS MANAGEMENT:

- Dantrolene (treats primary cause)
- Hyperventilation
- Consider 0.5-1 mmol/kg sodium bicarbonate - for pH < 7.2 (8.4% is 1mmol/ml)

■ RENAL PROTECTION:

- Maintain urine output ≥ 2 ml/kg/hr by
 - maintaining intravascular volume – normal saline
 - mannitol - there is 3g mannitol / vial of dantrolene

■ INOTROPIC SUPPORT:

- Adrenaline / Noradrenaline prn

ANAESTHETIST 2: LINES & INVESTIGATIONS

ENSURE TEMPERATURE PROBE INSERTED

■ INSERT ARTERIAL LINE

- Check arterial blood gases frequently
- Notify co-ordinating anaesthetist of changes
- Pay particular attention to:
 - acidosis
 - hyperkalaemia
 - PaCO²
 - glucose level

■ SEND LABORATORY BLOODS

- Urea and electrolytes
- Creatine kinase (CK)
- Coagulation screen

Insert central venous line when appropriate

■ URINE

- Once urinary catheter in situ send urine sample for myoglobin
- Maintain urine output at >2ml/kg/hr

■ ANAESTHETIC RECORD

- Ensure an accurate anaesthetic record is being kept
- Document times, temperatures, drugs and monitor recordings
- Document blood results

ANAESTHETIC ASSISTANT

ONCE THE MH BOX & REFRIGERATED SUPPLIES ARE IN OT:

■ 1.

Lay out contents on trolley

■ 2.

Prepare arterial-line equipment and assist anaesthetist to insert arterial line

■ 3.

Assist with dantrolene mixing

■ 4.

Ensure adequate stocks of resuscitation drugs are maintained

■ 5.

Set up propofol infusion, and help anaesthetist to start TIVA

■ 6.

Set up central venous line equipment and assist anaesthetist to insert central line

Ensure volatile agent has been removed from operating theatre.

Change sodalime when required.

DANTROLENE RECONSTITUTION (HIGHEST PRIORITY)

Mixing dantrolene can be very time consuming use as many people as are available. Here is one method.

12 AMPOULES will be required for each dose in a 100kg patient up to **every 10-15 minutes**.



Dantrolene must be mixed **ONLY** with **STERILE WATER**.



60 mls water for each 20mg vial from bag or bottle.



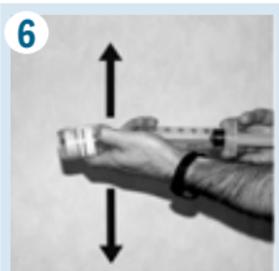
Remove metal vial cap or flip off cap.



Inject 30ml of water.



Hold syringe vertically, allow air in vial to escape, inject remaining 30mls water.



Hold together firmly or disconnect and shake to mix.

COOLING

THIS TASK MAY BE PERFORMED BY THEATRE ORDERLY WHERE AVAILABLE, OR BY ANY OTHER PERSON.

■ Ambient temperature

- Reduce operating theatre thermostat to lowest setting

■ Defibrillator

- Transport defibrillator located

■ IV fluids

- Collect 2L Normal Saline (for intravenous infusion) and Actrapid Insulin from refrigerator located

■ Obtain additional ice as needed from:

■ ICE

- Bring buckets of ice from ice machine located
- Assist packing all exposed body parts with ice bags

Tissue destruction will occur at 41.5°C

BUT do not overcool – cease active cooling at 38°C

LOGISTICS

USUALLY THE OPERATING THEATRE COORDINATOR

■ Call for additional anaesthetic support

- A minimum of TWO specialist anaesthetists should be involved

■ Call senior surgeon

- if required to complete surgery rapidly
- to notify him/her of the crisis

■ Mobilise off-site dantrolene

- 24 ampoules should be kept on site for immediate management
- Further Dantrolene stocks are held at:

Hospital 1

Stocks:

Vials:

Hospital Name/Contact Name:

Phone (Daytime):

Phone (After Hours):

Hospital 2

Stocks

Vials

Hospital Name/Contact Name:

Phone (Daytime)

Phone (After Hours)

*Organise URGENT transfer of additional stocks.
Consider rescue helicopter, fixed wing, ambulance, police escort.*

■ ICU bed or transfer

- All patients must go to an ICU
- Up to 25% of patients relapse in the first 24 hours
- Give early warning to ICU staff of the MH crisis
- Send for ICU bed or arrange transfer to another hospital

ASSIST WITH DANTROLENE MIXING

SURGICAL TEAM

■ SURGERY

- Complete or abandon surgery as soon as possible
- Call for senior help if required to complete surgery more quickly

■ URINARY CATHETER

- Set up and insert urinary catheter at earliest convenience

ASSIST WITH DANTROLENE MIXING

■ HELP COOL PATIENT

- Expose all parts of the patient outside immediate sterile field
- If abdomen open, consider washout with normal saline at 4°C
- Assist with packing all exposed body parts with ice bags

Contents of MH Box

THE FOLLOWING ARE THE RECOMMENDED CONTENTS OF AN MH BOX

Dantrolene

- 24 x 20 mg ampoules of Dantrolene
- Sterile water for injection
 - 250 ml bag from B/Braun labelled as unsuitable for IV infusion or 50ml sterile water bottles
- Drawing up needles
 - eg Baxa- two-fer needles 16g with air inlet or Braun - micro pin
- 50 ml syringes (12)

Other Drugs

- 50% dextrose 50 ml

Cold Box in fridge

- 2 litres normal saline for IV use
- Actrapid insulin

Urinary catheter

- Urine sample pot for myoglobin with form already completed

Blood tubes (Paediatric and adult) for

- Haematology, coagulation profile
- Electrolytes, creatinine, urea, creatine kinase (CK), X match
- Blood gas syringes
- Pathology forms already completed

Task Cards

- Task cards for all members of the theatre team during an MH crisis
- These are colour-coded and designed to hang around the neck so that they do not become mislaid
- They should be altered to suit the local situation and laminated so that information can be written on them
- Information about how to obtain more Dantrolene should be included in the MH box as well as a reporting form.