



London Health Sciences Centre

Critical Care

INDUCTION OF MILD HYPOTHERMIA POST CARDIAC ARREST PREPRINTED ORDERS FOR ADULT PATIENTS Page 1 of 2

KEY: R - REQUISITIONED P - PROCESSED (KARDEX)

P & T 2003/12

NON-MEDICATION ORDERS	R	P	MEDICATION ORDERS	P
<p>INCLUSION CRITERIA:</p> <ul style="list-style-type: none"> • Post cardiac arrest, in or out of hospital, where there has been a return to spontaneous circulation, regardless of patient age or downtime. This may include other types of circulatory arrest (e.g. attempted hanging) <p>EXCLUSION CRITERIA: See reverse</p> <p>COOLING:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Initiate cooling as soon as bolus doses of medications administered. • Do not delay cooling for diagnostics, interventional cardiology, or to monitor for neurological improvement. <input type="checkbox"/> Hypothermia goal: achieve core temperature 32° - 34°C within four hours of admission and maintain for 24 hours. <input type="checkbox"/> Maintain Temp 32° - 34°C for 24 hours once goal achieved. <input type="checkbox"/> Hold cooling if T < 32°C. <input type="checkbox"/> Wrap hands and feet with dry towels to prevent frost bite and to decrease shivering. Extremity wrapping decreases stimulation of thermoreceptors in the hands (stimulation of these receptors stimulates body rewarming efforts). <input type="checkbox"/> Cover the patient with iced wet sheet. Maintain ice packs around the head, axilla and groin. Add ice and replace sheets as they become warm until T 32° - 34°C. <p>ASSESSMENT / MONITORING:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Obtain a baseline Train of Four (TOF) prior to initiation of neuromuscular blocking agents. <input type="checkbox"/> TOF q 1 h. <input type="checkbox"/> Continuous core temperature by pulmonary artery, bladder or esophageal probe. <input type="checkbox"/> Notify MD if MAP < 80 - 100 mmHg <input type="checkbox"/> Assess ECG for arrhythmias during turning or repositioning <input type="checkbox"/> Ensure pacemaker pads are not in direct contact with wet linen. <input type="checkbox"/> Assess skin for signs of frostbite q 2h. 			<ul style="list-style-type: none"> • Administer bolus doses of analgesic, sedation and neuromuscular blocking agent (NMBA) STAT, then immediately initiate IV cooling solution. <p>COOLING AGENT:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Refrigerated I.V. 0.9% NaCl 1 L bolus post administration of I.V. bolus medications. Repeat to a maximum of 4 L until T < 34°C. <p>ANALGESIC:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Fentanyl bolus: _____ mcg I.V. stat (2 - 3 mcg/kg recommended). <input type="checkbox"/> Fentanyl infusion: 1000 mcg/50 mL 0.9% NaCl _____ mcg / hr (1 - 2 mcg/kg/hr recommended). <p>SEDATION:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Midazolam bolus: _____ mg I.V. stat (0.125 - 0.2 mg/kg recommended). <input type="checkbox"/> Midazolam infusion: 100 mg/50 mL 0.9% NaCl _____ mg/hr (0.1 - 0.2 mg/kg/hr recommended). <p>NEUROMUSCULAR BLOCKING AGENT:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Cisatracurium bolus: _____ mg I.V. stat after baseline TOF assessed (0.15 - 0.2 mg/kg recommended). <input type="checkbox"/> Cisatracurium infusion: 100 mg/50 mL 0.9% NaCl _____ mg/hr. (0.03 - 0.6 mg/kg/hr recommended) <input type="checkbox"/> Adjust infusion rate to maintain TOF of 1-2/4. Wean to off if no evidence of shivering or movement and TOF > 2. <p>EYE CARE:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Lacrilube ophthalmic ointment to both eyes q 4h and p.r.n. Maintain eyelids closed. <p>REWARMING:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Discontinue all sedatives, analgesics, and NMBAs simultaneously when ready to begin rewarming. 	

ORDER CONTINUED ON PAGE 2

PRESCRIBER'S PRINTED NAME / SIGNATURE:		DATE (YYYY/MM/DD):		TIME:	
PROCESSOR'S INITIALS:	DATE (YYYY/MM/DD):	TIME:	NURSE INITIALS:	DATE (YYYY/MM/DD):	TIME:

PROCEDURE FOR IMPLEMENTING CARDIOPULMONARY-CEREBRAL RESUSCITATION

Goal is to achieve target temperature within 4 hours of arrest.

1. Exclusion Criteria:

- Patient obeys commands and opens eyes to voice prior to initiation of cooling. Agitated/combatative patients are considered comatose and should be cooled.
- Poor neurological outcome predicted by presence of myoclonus.
- Severe coagulopathy.
- Patient terminally ill from another underlying medical condition.

2. Complete preprinted orders for "Cardiopulmonary-Cerebral Resuscitation".

3. Initiate cooling immediately following an in-hospital or out-of-hospital cardiac arrest. Do not delay for line insertions, tests or procedures. If the patient is not obeying commands, do not delay hypothermia while awaiting neurological reassessment/improvement. The sooner it is started, the greater the chance that brain cells will be preserved. Cooling can be initiated up to 8 hours post event. In clinical trials initiated cooling in the field; some centres now initiate cooling prehospital.

4. Initiate Anesthesia prior to cooling to prevent shivering:

- Initiate cooling as soon as bolus of analgesic, sedative and neuromuscular blocking agent (NMBA) is administered (do not delay while preparing infusions).
- Obtain baseline TOF prior to administration of NMBA. Normal baseline should be 4 twitches out of 4 stimulations (4/4).
- Administer neuromuscular blocking agent to achieve a TOF of 1-2/4 and prevent shivering.

5. Establish Temperature Monitoring:

Monitor core temperature by one of the following methods:

- Esophageal catheter
- Bladder catheter (if available)
- Pulmonary artery catheter

Rectal temperature monitoring can be used until one of these recommended methods is established. Rectal temperature monitoring can be slow to reflect core changes, can be inaccurate when stool is in the rectum or if ice packs in the groin come in contact with the probe.

6. Initiate Cooling:

- Begin cooling by administration of refrigerated 0.9 % NaCl. Up to 4 L may be administered to achieve a target T of < 34°C. Volume expansion also helps to augment the MAP to ensure adequate cerebral perfusion.
- Turn off the heater on the ventilator and use non-heated humidification.
- Monitor skin carefully for signs of frostbite or pressure sores.
- Aim to achieve target T 32° - 34°C within 4 hours of admission/in hospital arrest.
- Maintain T 32° - 34°C for 24 hours once target achieved.
- Hold cooling if T < 32°C.
- If pacemaker pads are placed, ensure there is no direct contact with wet linen.

7. Other interventions:

- Initiate enteral feeding, DVT prophylaxis, GI prophylaxis, VAP reduction protocols and intensive insulin therapy.
- Attempt to place feeding tube in small bowel; if small bowel placement unsuccessful, obtain order to initiate gastric feeds at 10 mL/hr, as hypothermia increases risk for impaired gastric emptying.
- Administer ASA, thrombolytics and anticoagulants as required to manage Acute Coronary Syndrome.
- If antiarrhythmic therapy is required, amiodarone is recommended.