

**WESTERN NEW YORK / ECMC - ADULT INDUCED HYPOTHERMIA
STATUS POST CARDIAC ARREST ORDERS (PG 1 OF 5)**



Name: _____ Date of Birth: _____ Age: _____
 Med. Rec. #: _____ Insurance: _____
 Visit #: _____ Service Time: _____ Room: _____
 Service Date: _____

Inclusion Criteria

- Non Traumatic Cardiac Arrest with Return of Spontaneous Circulation (ROSC)
- Core Temperature greater than (34°C) at presentation
- Time to initiation of hypothermia is less than 6 hours
- Comatose after ROSC : GCS less than 8 and no purposeful movements to pain

Exclusion Criteria

- Uncontrolled GI bleeding
- Severe CHF known to be present at baseline (NY Heart Association class III or IV)
- Known terminal illness or pre-arrest impaired cognitive status (unable to perform ADL independently)
- Conflict with Advanced Directives or DNR status
- Cardiovascular instability as evidenced by : Uncontrollable arrhythmias
- Refractory hypotension (unable to achieve target MAP of 75 mm Hg despite interventions)
- Sepsis as suspected cause of cardiac arrest
- Suspected intracranial hemorrhage
- Major intracranial, intrathoracic or intrabdominal surgery within 14 days
- Gravid pregnancy

Check boxes where appropriate. Mark through undesired orders.

ORDERS AND PHYSICIAN'S SIGNATURE	
<i>This is not a stand alone order set; MUST be used in conjunction with unit specific admission orders)</i>	
DATE : _____	TIME : _____ (TIME of ROSC : _____)
ADMIT STATUS : <input type="checkbox"/> Admit to CCU <input type="checkbox"/> Admit to ICU _____	
DIAGNOSIS : S/P Cardiac Arrest. Other : _____	
ADMITTING PHYSICIAN : _____	Allergies/Intolerances/Nature of reaction : _____
CONSULTS :	<input type="checkbox"/> Critical Care/Pulmonary _____ <input type="checkbox"/> Other _____ <input checked="" type="checkbox"/> Neurology on all patients
LINE PLACEMENT :	<input checked="" type="checkbox"/> A-line placement (MUST have Arterial line placed) <input checked="" type="checkbox"/> Gaymar cooling set up unless placed in ED <input checked="" type="checkbox"/> CVP catheter needed <input checked="" type="checkbox"/> Place temperature - sensing foley to monitor temp (1/4 - 1/8" adapter for cooling device stored with Gaymar)
COOLING PHASE :	<p>(GOAL is to get core temp to 32° - 34°C within 6 hrs of onset of arrest)</p> <input checked="" type="checkbox"/> If core temperature is greater than (34°C) at initiation of protocol, bolus with refrigerated (4°C) 0.9% NaCL until patient's core temperature is (34°C). Bolus at 100mL/min with a maximum of 2 liters total; this is to include ED and EMS volume. May obtain cold saline from ED. (Omit if 2 L already given by EMS or ED). Place ice packs around head, neck, axillary areas, and groin for 20-25 min (include EMS time). <input checked="" type="checkbox"/> Initiate Gaymar protocol for 24 hours with machine to 33°C, unless to cath lab, start protocol after lab. <input checked="" type="checkbox"/> Place foley; temperature probe to Gaymar cooling device. <input checked="" type="checkbox"/> Place rectal probe to cardiac monitor for secondary source of temperature <input checked="" type="checkbox"/> Correlate and record secondary temp every 2 hours. Document source of secondary temp (may be rectal or central catheter). STOP IF patient has recurring arrhythmias, discontinue active cooling, begin re-warming & call MD STAT. STOP IF unable to obtain target core temperature consult MD for further cooling orders
TIME COOLING STARTED : _____	
VITAL SIGNS :	<input checked="" type="checkbox"/> BP, MAP, HR, O2 sat, and cardiac rhythm every 15 min x 4, every 30 min x 4 then hourly and prn. Check CVP every hour. <input checked="" type="checkbox"/> Record foley temperature every 15 minutes until (32° - 34°C) is achieved. Then every 30 minutes until rewarming completed. Do not cool less than (32°C)
IV :	<input type="checkbox"/> 0.9% Sodium Chloride at _____ mL/hr If possible, fluids should be dextrose free with the exception of standard infusions or rx of hypoglycemia.

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<p>BP & VOLUME MANAGEMENT :</p>	<p>* (Goal MAP to be at least 75 mm Hg)</p> <p><input type="checkbox"/> Replace urine output every 1 hour with : <input type="checkbox"/> 0.9% NaCl <input type="checkbox"/> 0.45% NaCl <input type="checkbox"/> Lactated Ringers using : <input type="checkbox"/> 0.5 mL / 1 ml IVF replacement to urine output <input type="checkbox"/> 1 mL / 1 ml IVF replacement to urine output</p> <p>Observe closely for fluid overload.</p> <p><input type="checkbox"/> CVP goal of 6-10 mmHg <input type="checkbox"/> Additional IV volume support : _____ <input type="checkbox"/> Norepinephrine (Levophed) IV start at 0.5 mcg/min and titrate as needed to keep MAP greater than 75. <input type="checkbox"/> Other pressor agent : _____ <input type="checkbox"/> Nitroglycerin IV, start if MAP over 120 or _____. Start at 5 mcg/min, increase by 5 mcg/min increments every 3-5 min until a BP response is noted. Goal is to keep MAP* less than 120 OR <input type="checkbox"/> _____</p>
<p>ANALGESIA</p>	<p>Use nonverbal pain scale to assess for pain/discomfort prior to administering a Neuromuscular Blocking Agent (NMBA)</p> <p>Goal for analgesia : <input type="checkbox"/> less than 3, on the 1-10 Nonverbal Pain Scale, or minimal pain behaviors. <input type="checkbox"/> app scale will be used for patients receiving NMBA or propofol.</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-left: 150px;"> <p>0-2 no pain 3-6 moderate pain 7-10 severe pain - use app</p> </div> <p><input type="checkbox"/> Fentanyl _____ mcg/hr (range: 0.5-2 mcg/kg/hr) continuous infusion. (Standard pharmacy solution). <i>(Consider if patient is hemodynamically unstable or has renal insufficiency, or if GFR < 30 mL/min.)</i></p> <p>OR :</p> <p><input type="checkbox"/> Morphine _____ mg (0.1 mg/kg load; typically 5 - 10 mg), then _____ mg/hr IV continuous infusion (range: 0.8 - 10 mg/hr IV)</p> <p>If opiate overdose in differential (small pupils, unresponsive and/or track marks), consider :</p> <p><input type="checkbox"/> Naloxone (Narcan) : 0.4 mg IV ; (may order every 2 -3 min as needed up to 2 mg, do not cool further if awakens and neurologic deficit resolves)</p>
<p>SEDATION</p>	<p><input type="checkbox"/> Lorazepam (Ativan) : _____ mg IV x 1 (range 1 - 2 mg)</p> <p><input type="checkbox"/> Versed drip _____ mg/hr (range 2 - 5 mg)</p> <p><input type="checkbox"/> Propofol (Diprivan) : _____ mcg/min (5 mcg/kg/min initially) continuous infusion, titrate every 5 minutes until at goal (range : 5 - 50 mcg/kg/min IV). Monitor triglycerides after 48 hours. Dosing not to exceed 80 mcg/kg/min. Vial and tubing must be changed every 12 hours. Consider discontinuing propofol after 2 days; consult with MD for further sedation requirements.</p>
<p>NEUROMUSCULAR BLOCKING AGENT (NMBA) (For prevention of shivering)</p>	<p>Before starting neuromuscular blocking agent (NMBA), verify that the patient is adequately medicated with analgesic and sedative agents at goal and receiving mechanical ventilation.</p> <p>Obtain baseline "train of four" (TOF) then every 1 hour. Adjust degree of NMBA to achieve 2/4. If unable to obtain TOF, titrate NMBA to prevent shivering.</p> <p><input type="checkbox"/> Vecuronium (Norcuron) : _____ mg (0.1 mg/kg) IV bolus x 1 (unless full NMBA bolus given by ED or EMS) Vecuronium (Norcuron) : _____ mcg/min (range : 0.8 - 1.2 mcg/kg/min) continuous infusion. (Standard pharmacy solution). Avoid in significant renal or hepatic impairment.</p> <p>If significant renal (GFR < 30) or hepatic dysfunction, consider:</p> <p><input type="checkbox"/> Cisatracurium (Nimbex) : _____ mg (0.2 mg/kg) IV bolus x 1 (unless full NMBA bolus given by ED or EMS) Cisatracurium (Nimbex) : _____ mcg/min (range : 2.5 - 3 mcg/kg/min) continuous infusion</p>
<p>DVT PROPHYLAXIS</p>	<p><input checked="" type="checkbox"/> Sequential compression devices (SCDs). Use Foot Pumps if unable to use SCDs</p> <p><input type="checkbox"/> Heparin 5000 units subcutaneously every 8 hours</p> <p>OR :</p> <p><input type="checkbox"/> Lovenox (Enoxaparin) 40 mg subcutaneously daily (automatic adjustment for decreased GFR)</p> <p><input type="checkbox"/> Other : _____</p>
<p>STRESS ULCER PROPHYLAXIS</p>	<p><input type="checkbox"/> Famotidine (Pepcid) 20mg PO/NG tube/IV every 12 hours stress ulcer prophylaxis (automatic substitution OK) <input type="checkbox"/> If GFR < 30 mL/min, give Famotidine (Pepcid) 20 mg PO/NG tube/IV every 24 hours.</p> <p><input type="checkbox"/> Other : _____</p>

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OTHER MEDICATIONS	<input type="checkbox"/> Lacrilube to both eyes every 4 Hours and PRN while on NMBA. <input type="checkbox"/> For intubated/trached patients : Follow ICU Oral Care Policy <input type="checkbox"/> Acetaminophen (Tylenol) * 650 mg per feeding / NG tube / PR (circle choice of route) every 4 hours PRN hyperthermia (which is temp above 98.6°F / 37°C) during re-warming phase. If given via tube, clamp x 30 min. *Dosage not to exceed 4 gm / 24 hours. <input type="checkbox"/> Other : _____ _____ _____ _____ _____ _____ _____ _____ _____			
NURSING :	<input checked="" type="checkbox"/> Insert NG/OG to low continuous wall suction <input checked="" type="checkbox"/> Intake and output hourly; Call MD if urine output is less than 0.5 mL/kg/hr despite above volume given <input checked="" type="checkbox"/> Monitor CVP and A-line; use saline flush only for pressure line <input checked="" type="checkbox"/> Do NOT bathe patient during hypothermic or rewarming period			
VENT MANAGEMENT :	Vent Settings : _____ <input checked="" type="checkbox"/> No warm humidified air <input type="checkbox"/> ABG every _____ (maintain PaCO ₂ 35 - 45)			
IF NOT DONE IN ED : STAT LABS :	<input checked="" type="checkbox"/> BMP <input checked="" type="checkbox"/> Troponin <input checked="" type="checkbox"/> UA	<input checked="" type="checkbox"/> CBC <input checked="" type="checkbox"/> PT/PTT <input checked="" type="checkbox"/> Serum & Urine Tox <input checked="" type="checkbox"/> Serum Albumin	<input checked="" type="checkbox"/> Ca/Mag/Phos <input checked="" type="checkbox"/> Lactate <input checked="" type="checkbox"/> Type & Screen Notify MD if Hgb < 10	<input checked="" type="checkbox"/> ABG (temp corrected) <input type="checkbox"/> Urine HCG Female (Age 10-55) <input type="checkbox"/> Other: _____
STAT DIAGNOSTICS	<input checked="" type="checkbox"/> PCXR	<input checked="" type="checkbox"/> 12 lead ECG	<input type="checkbox"/> Other: _____	
LABS EVERY 6 HOURS X 24 HRS	<input checked="" type="checkbox"/> BMP <input checked="" type="checkbox"/> PT/PTT	<input checked="" type="checkbox"/> Ca/Mag/Phos <input checked="" type="checkbox"/> CBC with diff	<input type="checkbox"/> Other: _____	
12 HOURS AFTER START OF PROTOCOL	<input type="checkbox"/> Blood Culture x 2 <input type="checkbox"/> Other: _____			
DAILY	<input checked="" type="checkbox"/> PCXR <input checked="" type="checkbox"/> CBC and BMP ABG <input type="checkbox"/> Other: _____			
OTHER LABS OR DIAGNOSTICS	<input checked="" type="checkbox"/> Troponin every 8 hours x 24 hours <input type="checkbox"/> CK's every _____ hours x _____ <input type="checkbox"/> Other: _____			
ELECTROLYTE REPLACEMENT	** Do not replace potassium unless serum potassium is less than 3 mEq cooling phase. Call MD for specific replacement dose. Make sure time to rewarm phase is communicated. DO NOT USE PRE-EXISTING ELECTROLYTE REPLACEMENT ORDERS			

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RE-WARMING PHASE: <div style="border: 1px solid black; padding: 2px; margin-bottom: 10px;"> A. TIME RE-WARMING STARTED: _____ _____ </div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 10px;"> B. TIME COOLING STARTED IN ED: _____ _____ </div> <div style="border: 1px solid black; padding: 2px;"> C. TIME RE-WARMING FINISHED: _____ _____ </div> SHIVERING :	Target Temperature (36.1° - 37°C) <input checked="" type="checkbox"/> Begin rewarming 24 hours from time cooling was started Target temperature to be obtained in 12-16 hours; STOP re-warming once (36.0°C) is reached to prevent overshoot. Rewarming goal of 0.25°C/hr. Remove warming garments from patient. <input checked="" type="checkbox"/> Empty foley at start of rewarming. Strict I & O (see volume replacement section) <input checked="" type="checkbox"/> Activate re-warming (program Gaymar for 0.25°C/hr and 36.0°C). Call MD if warming > 0.5°C/hr. <input checked="" type="checkbox"/> If external cooling devices used, remove cool packs. <input checked="" type="checkbox"/> May place warm blankets (do NOT use Bair Hugger) if needed <input checked="" type="checkbox"/> Monitor temp/Vs/rhythm closely every 30 minutes until target temp is reached, then every 1 hour x 12 additional hours, followed by temp/Vs every 4 hours IF patient remains normothermic or more if condition warrants <input checked="" type="checkbox"/> Continue sedation and neuromuscular blocking agent (NMBA) until temperature is equal to or greater than 36.0°C. (Discontinue NMBA first, then wean sedation.) <input checked="" type="checkbox"/> Do not permit Hyperthermia in first 24 hours after cooling phase. IF temp greater than (37°C) administer Acetaminophen (Tylenol) <input checked="" type="checkbox"/> Continue labs as ordered (anticipate increase in potassium) <input checked="" type="checkbox"/> Continue monitoring I & O every 1 hour (anticipate hypovolemia) <input checked="" type="checkbox"/> Once normothermic goal reached at end of 48 hours, consult with MD service for D/C of femoral line if present. <input checked="" type="checkbox"/> Observe for shivering every 1 hour <input checked="" type="checkbox"/> If off neuromuscular blockade, and shivering occurs during rewarming phase apply warm blankets. <input type="checkbox"/> Hydromorphone (Dilaudid) 1 mg IV, may repeat in 5 minutes x 1 <input checked="" type="checkbox"/> IF above methods(s) ineffective, call MD STAT for further orders (may need to restart NMBA and sedation).	
Physician signature required : _____ Date : _____ Time : _____ Beeper # : _____ --- _____	Transcribed by : _____ Date : _____ Time : _____	Checked by (Nurse) : _____ Date : _____ Time : _____

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Physician Information
(Guidelines - do not replace physician judgment)

- 1) Potassium less than 3.4 mmol/L early in cooling (first 12 hours) - replace potassium with 40 meq by NG
- 2) Potassium less than 3.0 mmol/L late in cooling (12 - 24 hours) - replace potassium with 40 meq by NG - potassium tends to rise on rewarming
- 3) Hgb less than 10 - Transfuse PRBCs
- 4) Platelets less than 30 K - transfuse 2 packs
- 5) Platelets 30 - 50K with bleeding transfuse 2 packs
- 6) During rewarming there is an osmotic diuresis - replace volume slightly greater than 1 : 1 to urine output
- 7) Treatment of Hyperglycemia (non-diabetic) : glucose 200 - 249 - 2 u reg insulin, 250 - 299 - 3 u reg insulin, 300 - 349 - 4 u reg insulin, 350 - 400 - 5 u reg insulin
- 8) INR > 2 correct with FFP 2 - 4 units ± vit k (if on Coumadin)
- 9) Temp < 31 - consider 250 cc bolus of warmed 0.9% normal saline and warming blanket
- 10) Unable to cool to temp 32 - 34 degrees - consider 250 - 500 cc 4 degree 0.9% normal saline
- 11) Magnesium < 1.7 - 2 grams MagSO4 IV
- 12) Corrected Calcium < 8.4 - CaCl 1 gram IV (Calcium level should be corrected for decreased albumin :
 Corrected calcium (mg/dL) = measured total Ca (mg/dL) + 0.8 (4.0 - serum albumin [g/dL]), where 4.0 represents the average albumin level)

**** NOTIFY MD IF :**

- Magnesium < 1.7
- Corrected Calcium < 8.4
- Potassium < 3.4
- Hgb < 10
- Platelets < 30 K
- Platelets 30 - 50K with bleeding
- Glucose ≥ 200

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