### 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 box √ to activate desired orders.

### ORDERS AND PHYSICIAN’S SIGNATURE

This is not a stand alone order set; MUST be used in conjunction with unit specific admission orders.

<table>
<thead>
<tr>
<th>DATE : TIME :</th>
<th>(TIME of ROSC : )</th>
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</table>

**ADMIT STATUS :**
- □ Admit to CCU
- □ Admit to ICU

**DIAGNOSIS :**
- S/P Cardiac Arrest. Other :

**ADMITTING PHYSICIAN :**
- Allergies/Intolerances/Nature of reaction :

**CONSULTS :**
- Critical Care/Pulmonary
- Neurology on all patients
- Other

**LINE PLACEMENT :**
- □ Arterial line placement (MUST have Arterial line placed)
- Cooling device set up unless placed in ED
- CVP catheter needed
- Place temperature - sensing Foley to monitor temp (1/4 - 1/8” adapter for cooling device)

**COOLING PHASE :**
- √ (GOAL is to get core temp to 32°- 34°C within 6 hrs of onset of arrest)
- □ 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).
- □ Place foley; temperature probe to cooling device.
- □ Place rectal probe to cardiac monitor for secondary source of temperature
- □ Correlate and record secondary temp every 2 hours. Document source of secondary temp (may be rectal or central catheter).

**TIME COOLING STARTED :**

- √ If patient has recurring arrhythmias, discontinue active cooling, begin re-warming & call MD STAT.
- □ IF unable to obtain target core temperature consult MD for further cooling orders

**VITAL SIGNS :**
- □ 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.
- □ 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 :**
- □ 0.9% Sodium Chloride at mL/hr
- IF possible, fluids should be dextrose free with the exception of standard infusions or Rx of hypoglycemia.
## BP & VOLUME MANAGEMENT

**Goal is MAP > 75 and < 120 mm Hg**
- Replace urine output every 1 hour with:
  - 0.9% NaCl
  - 0.45% NaCl
  - Lactated Ringers using:
    - 0.5 mL / 1 ml IVF replacement to urine output
    - 1 mL / 1 ml IVF replacement to urine output
- Observe closely for fluid overload.
  - CVP goal of 6-10 mmHg
  - Additional IV volume support:
  - Norepinephrine IV start at 0.5 mcg/min and titrate as needed to keep MAP greater than 75.
  - Other pressor agent:
  - Nitroglycerin IV, start if MAP over 120 or

## ANALGESIA

Use nonverbal pain scale to assess for pain/discomfort prior to administering a Neuromuscular Blocking Agent
- Goal for analgesia:
  - less than 3, on the 1-10 Nonverbal Pain Scale, or minimal pain behaviors.
  - APP scale will be used for patients receiving Neuromuscular Blocking Agent or propofol.
  - 0-2 no pain
  - 3-6 moderate pain
  - 7-10 severe pain - use app
- Fentanyl ______ mcg/hr (range: 0.5-2 mcg/kg/hr) continuous infusion.
  - (Consider if patient is hemodynamically unstable or has renal insufficiency, or if GFR < 30 mL/min.)
- OR:
  - Morphine ______mg (0.1 mg/kg load; typically 5 - 10 mg), then ______mg/hr IV continuous infusion
  - If opiate overdose in differential (small pupils, unresponsive and/or track marks), consider:
    - Naloxone : 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)

## SEDATION

- Lorazepam: _____ mg IV x 1 (range 1 - 2 mg)
- Midazolam: _____ mg/hr (range 2 - 5 mg/hr)
- Propofol Infusion: mcg/kg/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.

## NEUROMUSCULAR BLOCKING AGENT

(For prevention of shivering)
- Before starting neuromuscular blocking agent, verify that the patient is adequately medicated with analgesic and sedative agents at goal and receiving mechanical ventilation.
- Obtain baseline "train of four" then every 1 hour. Adjust degree of neuromuscular blocking agent to achieve 2/4.
- If unable to obtain train of four, titrate neuromuscular blocking agent to prevent shivering.
- Vecuronium: _____ mg (0.1 mg/kg) IV bolus x 1 (unless full neuromuscular blocking agent bolus given by ED or EMS)
- Vecuronium: _____ mcg/min (range : 0.8 - 1.2 mcg/kg/min continuous infusion). Avoid in significant renal or hepatic impairment.
- If significant renal (GFR < 30) or hepatic dysfunction, consider:
  - Cisatracurium: _____ mg (0.2 mg/kg) IV bolus x 1 (unless full neuromuscular blocking agent bolus given by ED or EMS)
  - Cisatracurium: _____ mcg/min (range : 2.5 - 3 mcg/kg/min) continuous infusion

## DVT PROPHYLAXIS

- Sequential compression devices (SCDs). Use Foot Pumps if unable to use SCDs
- Heparin 5000 units subcutaneously every 8 hours
- Enoxaparin 40 mg subcutaneously daily (automatic adjustment for GFR < 30 mL/min)

## STRESS ULCER PROPHYLAXIS

- Famotidine 20mg
  - IV every 12 hours stress ulcer prophylaxis (automatic substitution permissible)
  - If GFR < 30 mL/min, give Famotidine (Pepcid) 20 mg
  - IV every 24 hours.
- Other:

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**Scanned by:**
**Date:**
**Time:**
**RN SIGNATURE:**
**Date:**
**Time:**

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### Other Medications
- **Lacrilube** to both eyes every 4 Hours and PRN while on neuromuscular blocking agent.
- For intubated/trached patients: **Follow ICU Oral Care Policy**
- Other: __________________________

### Nursing
- Insert NG/OGT to low continuous wall suction
- Intake and output hourly; Call MD if urine output is less than 0.5 mL/kg/hr despite above volume given
- Monitor CVP and A-line; use saline flush only for pressure line
- Do **NOT** bathe patient during hypothermic or rewarming period

### Vent Management
- **Vent Settings**:
  - No warm humidified air
  - ABG every___________ (maintain PaCO2 35 - 45)

### If Not Done in ED: STAT Labs:
- BMP
- Troponin
- UA

### Stat Diagnostics
- PCXR
- 12 lead ECG

### Labs Every 6 Hours X 24 Hrs
- BMP
- PT/PTT

### 12 Hours After Start of Protocol
- Blood Culture x 2
- Other: __________________________

### Daily
- PCXR
- CBC, BMP and ABG
- Other: __________________________

### Other Labs or Diagnostics
- Troponin every 8 hours x 24 hours
- CK’s every______ hours x______
- Other: __________________________

### Electrolyte Replacement
Do not replace potassium unless serum potassium is less than 3mEq/L during cooling phase. Call MD for specific replacement dose. Make sure time to rewarm phase is communicated.

**DO NOT USE PRE-EXISTING ELECTROLYTE REPLACEMENT ORDERS**
**WESTERN NEW YORK / ECMC - ADULT INDUCED HYPOTHERMIA**

**STATUS POST CARDIAC ARREST ORDERS (PG 4 OF 5)**

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<thead>
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<th>Field</th>
<th>Value</th>
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<tbody>
<tr>
<td>Name</td>
<td>Med. Rec. #</td>
</tr>
<tr>
<td>Date of Birth</td>
<td>Visit #</td>
</tr>
<tr>
<td>Age</td>
<td>Service Date</td>
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<tr>
<td>Insurance</td>
<td>Service Time</td>
</tr>
<tr>
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</tbody>
</table>

### RE-WARMING PHASE:

<table>
<thead>
<tr>
<th>Target Temperature (36.1° - 37°C)</th>
</tr>
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<tbody>
<tr>
<td>Begin rewarming 24 hours from time cooling was started</td>
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</tbody>
</table>

**Target temperature to be obtained in approximately 18 hours; STOP re-warming once (36°C) is reached to prevent overshoot. Rewarming goal of 0.17°C/hr. Remove warming garments from patient.**

- Empty foley at start of rewarming. Strict I & O (see volume replacement section)
- Activate re-warming (program warming device for 0.17°C/hr and 36°C). Call MD if warming > 0.5°C/hr.
- If external cooling devices used, remove cool packs.
- May place warm blankets (do NOT use Bair Hugger) if needed
- 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
- Continue sedation and neuromuscular blocking agent until temperature is equal to or greater than 36°C. (Discontinue neuromuscular blocking agent first, then wean sedation.)
- Do not permit temperature greater than 37°C in first 24 hours after cooling phase.
- IF temp greater than (37°C) administer acetaminophen
- Continue labs as ordered (anticipate increase in potassium)
- Continue monitoring I & O every 1 hour (anticipate hypovolemia)
- Once normothermic goal reached at end of 48 hours, consult with MD service for D/C of femoral line if present.

- Acetaminophen: Route 650 mg per feeding NG tube PR every 4 hours PRN temp above 37°C X 48 hours.
  - If given via tube, clamp x 30 min. Dosage not to exceed 4 gm / 24 hours

- Observe for shivering every 1 hour
- If off neuromuscular blockade, and shivering occurs during rewarming phase apply warm blankets.
- Hydromorphone 1 mg IV, may repeat in 5 minutes x 1
- IF above methods(s) ineffective, call MD STAT for further orders (may need to restart neuromuscular blocking agent and sedation).

### SHIVERING:

- Observe for shivering every 1 hour
- If off neuromuscular blockade, and shivering occurs during rewarming phase apply warm blankets.

**Physician signature required**: 
Transcribed by: 
Checked by (Nurse):

<table>
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<tr>
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</table>

**Beeper #**:

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Scanned by: Date: Time:
Physician Information
(Guidelines - do not replace physician judgment)

1) Potassium less than 3.4 mEq/L early in cooling (first 12 hours) - replace Potassium Chloride with 40 meq by NG

2) Potassium less than 3.0 mEq/L late in cooling (12 - 24 hours) - replace Potassium Chloride with 40 meq by NG (Potassium tends to rise on rewarming)

3) Hgb less than 10 - Transfuse PRBCs

4) Platelets less than 30,000 - transfuse 2 packs

5) Platelets 30,000 - 50,000 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 units reg insulin, 250 - 299 - 3 units reg insulin, 300 - 349 - 4 units reg insulin, 350 - 400 - 5 units reg insulin

8) INR > 2 correct with FFP 2 - 4 units ± vitamin K (if on Warfarin)

9) Temp < 31°C - consider 250 mL bolus of warmed 0.9% normal saline and warming blanket

10) Unable to cool to temp 32°- 34°C - consider 250 - 500 mL 4 degree 0.9% sodium chloride

11) Magnesium < 1.7 - 2 grams Magnesium Sulfate IV

12) Corrected Calcium < 8.4 - Calcium Chloride 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 < 30,000
Platelets 30,000 - 50,000 with bleeding
Glucose > 200

Temperature Conversion Chart

<table>
<thead>
<tr>
<th>°C</th>
<th>°F</th>
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<tbody>
<tr>
<td>31</td>
<td>87.8</td>
</tr>
<tr>
<td>32</td>
<td>89.6</td>
</tr>
<tr>
<td>33</td>
<td>91.4</td>
</tr>
<tr>
<td>34</td>
<td>93.2</td>
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<tr>
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<td>38</td>
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<tr>
<td>39</td>
<td>102.2</td>
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