1. All intubated patients should receive therapeutic hypothermia after cardiac arrest unless:
   i. The patient can follow verbal commands
   ii. More than 8 hours have elapsed since ROSC (flexible)
   iii. There is life-threatening bleeding or infection
   iv. Cardiopulmonary collapse is imminent, despite vasopressor support
   v. Aggressive care not warranted
2. Use the SCM “therapeutic hypothermia” order set.
3. Therapeutic hypothermia patients should preferentially be admitted to rooms compatible with continuous EEG (cEEG).
4. Please notify the SCU Research office when a cardiac arrest patient is admitted (662-2066).
5. Physician performs and document the neurologic exam (see worksheet), vitals. If seizure activity is suspected, arrange for cEEG through neurology consultation, and treat seizure activity.*
6. Infuse 30-40cc/kg (for < 60kg infuse 2L, 60-95 kg infuse 3L, >95 kg infuse 4L) as a rapid infusion (15-30 minutes/L) of cold NS or LR solution – this is kept in the CICU medication refrigerator and must be replaced after usage.
7. Insert esophageal temperature probe and initiate cooling with Arctic Sun device set to 33°C. A bladder probe may be substituted if UOP > 30cc/hr. Cooling pads are expensive and must be sized properly. The cooling pads are stored in the Clean Supply room in CICU, and are a chargeable item through Par-X. If the machine is unavailable, use rubber cooling mats, cold fluids, and ice packs to the groin, axillae, and neck.
8. The Alsius intravascular cooling catheter may be employed in place of the Arctic Sun – this may be preferable in morbidly obese patients or in patients with skin disorders. When the Alsius device is employed, the BAIR Hugger is NOT used. Please see the Alsius protocol for additional details.
9. Place a Bair hugger set to maximum temperature over the patient and the Arctic Sun pads. This will help control shivering. Leave the device in place for the full 72h of therapy.
10. Defibrillation can be performed, if necessary, in several ways. Hands-off defibrillation can be performed with defibrillation pads placed under the hypothermia pads. Cath lab radiolucent pads can be used in the same way. Hypothermia pads can also be peeled back to deliver a shock directly to the skin.
11. Place the BIS monitor. Call SCU research or the SCU coordinator if there is no device or if you need extra help.
12. It is standard practice for patients with severe brain injury after cardiac arrest to have arterial lines for blood pressure monitoring, central venous catheters for medication administration and CVP monitoring, and sometimes jugular venous oximetry catheters for cerebral hemodynamic monitoring. These devices are placed under strict sterile conditions in compliance with standard MMC central venous catheter insertion practices.
13. Please refer to the Jugular venous oximetry protocol for blood pressure and fluid titration based on \( \text{SjvO}_2 \) data.
15. Record hourly vitals, BIS score, bedside shivering assessment score (BSAS, sedation, all NMB doses, \( \text{SjvO}_2 \) data, and any unusual circumstances or events on the nursing flow sheet.
16. During hypothermia and rewarming, monitor q4h electrolytes. Correct low K aggressively at the onset of therapy!
17. Any patient with pulmonary infiltrates on CXR, or with suspected aspiration should receive empiric antibiotic therapy with cefuroxime 1500mg q12h x 2 doses or ampicillin-sulbactam 1.5g IV q6h x 3 days (adjust dosing to renal function).
18. **Any patient receiving a paralytic drug must also be sedated.** Propofol is the preferred sedative with midazolam infusion as a second choice if severe hemodynamic instability is present. During rewarming, paralytics should be avoided, if possible.
19. Shivering management should be performed using the shivering protocols for intubated or non-intubated patients. Paralytics must NEVER be administered to a non-intubated patient.
20. The daily lightening of sedation is suspended until the patient is no longer paralyzed and core temperature is > 36°C.
21. Rapid rewarming is dangerous and should only be performed in extraordinary circumstances, such as active and life-threatening bleeding. Patients with severe sepsis, or severe bleeding should be withdrawn from the cooling protocol and slowly rewarmed to 35-37°C. Use caution in refractory shock because patients will vasodilate and may become more hypotensive during rewarming.
22. After 24 hours of active cooling, set the Arctic Sun patient goal temperature to reach 36.5°C over 12 hours. The rate of rewarming should be between 0.25 and 0.35°C per hour.
23. During rewarming, the natural tendency is for patients to rewarl too quickly. Often the machine will be cooling patients during the rewarming phase. Allow the device to do this – it reflects normal function of the Arctic Sun.
24. Leave the Arctic Sun pads or the Alsius intravascular catheter in place and keep the machine set to 36.5°C for a total of 72 hours after initiation of therapeutic hypothermia. If shivering cannot easily be controlled after rewarming with basic measures, then reset target temperature to 37.0°C.
25. Formal neurologic assessment should be performed and documented when normothermia is achieved and sedating drugs have cleared from the circulation. It is strongly recommended to withhold neurological prognostication for at least 72 hours after rewarming.
26. All brain-injured patients should be considered potential organ donors, and the New England Organ Bank notified at the time of admission (800-446-6362).
27. Please allow the **neurologist and/or attending MD** to offer prognostic information to family members. Prognostication after brain injury is complex and difficult, with profound ethical and legal repercussions. “Informal” bedside prognostication is not professionally appropriate.
Physician Neurological Assessment
To be performed prior to onset of therapeutic hypothermia

Time and Date of arrest: _______________ Time and Date of assessment: _______________
Most recent atropine_____ Most recent NMB______ Most recent sedation__________________

Glasgow Coma Scale _______
Cranial Nerves:
  Pupillary reflex: ________________________________
  Corneal reflex: ________________________________
  Oculocephalic reflex:____________________________
  Gag reflex___________________________________
Eye movements:
  Purposeful___________________________________
  Roving_____________________________________
  Nil_____________________________________

Generalized Motor Tone_________________________

Motor response to noxious stimulus: _______________________________________________________

Myoclonus present? Describe: ____________________________________________________________

Seizure activity? Describe: _______________________________________________________________

EEG performed? Findings: _________________________________________________________________

Other findings:
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Clinician signature __________________________ Time and date ____________________________

Glasgow Coma Scale (GCS)
scoing worksheet
Circle one from each category and add points together

<table>
<thead>
<tr>
<th>Motor</th>
<th>Points</th>
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<tr>
<td>Obeys</td>
<td>6</td>
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<tr>
<td>Localizes</td>
<td>5</td>
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<tr>
<td>Withdraws</td>
<td>4</td>
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<tr>
<td>Abnormal flexion</td>
<td>3</td>
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<tr>
<td>Extends</td>
<td>2</td>
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<td>Nil</td>
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<tr>
<th>Eye</th>
<th>Points</th>
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<tbody>
<tr>
<td>Oriented</td>
<td>5</td>
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<tr>
<td>Confused conversation</td>
<td>4</td>
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<tr>
<td>Inappropriate words</td>
<td>3</td>
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<tr>
<td>Incomprehensible Sounds</td>
<td>2</td>
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<tr>
<td>Nil</td>
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<td>Intubated</td>
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TOTAL POINTS (OF 15) _______
**Maine Medical Center**  
**Therapeutic Hypothermia Nursing Worksheet**

**Shivering Scale**
0: None: no shivering noted on palpation of the masseter, neck or chest wall  
1: Mild: shivering localized to the neck and/or thorax only  
2: Moderate: shivering involves gross movement of the upper extremities (in addition to neck & thorax)  
3: Severe: shivering involves gross movements of the trunk and upper extremities

| Date/Time TH Initiated: __________________________ |

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<thead>
<tr>
<th>Time</th>
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<th>Water Temp q 1 hr</th>
<th>BIS Score q 1 hr &amp; prn</th>
<th>Shivering Score 0-3 q 1 hr &amp; prn</th>
<th>SjvO2 q 1 hr &amp; prn</th>
<th>Paralytic Med / Dose PRN</th>
<th>Sedation Medication / Dose Continuous/Intermittent</th>
<th>Notes: CO/CI/SVV</th>
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