

Ordered Target Temperature \_\_\_\_\_  
 Date/Time Target Temperature Reached \_\_\_\_\_ [Goal to Reach Target within 4 hours]  
 Date/Time to have Continuous EEG in place \_\_\_\_\_ [Goal within 6-12 hours of initiation of TTM]  
 Date/Time to start Rewarming Phase \_\_\_\_\_ [Rewarm goal temp is 37°C]  
 NOTE: if patients has a second cardiac arrest during TTM- restart the 24-hour clock

Pre- Cooling	Yes/ No	Was the new Penn Chart Post Cardiac Arrest TTM Orderset Used?
	Yes / No	Was Cardiology Consulted? Is patient a candidate for early revascularization?
	Yes/ No	If yes to above question, can cooling be started before transferring patient to the cath lab?
		Head CT completed
		EKG completed
		Echocardiogram completed
		Chest X-ray completed
	Yes/ No	Neurology Consult
	Yes/ No	Any other specialty consult needed ? (OB-GYN if pregnant)
Initiation of Cooling		Assess and treat initial Pain (BPS), and Agitation (RASS)
		<b>Initial Labs:</b> ABG with iCa, Mg, CBC/PT/PTT/INR, Fibrinogen, Chem 7, Phos, Lactate, CPK-MB, CK, Troponin, Cortisol as indicated, Amylase, Lipase, LFTs, Beta HCG on all women of child bearing age, Co-oximetry
		<b>Repeat for 24 hrs only:</b> CPK-MB/CK/Troponin q 6 hrs for 24 hrs
		Place cooling device, program to target temperature
	Yes/ No	Is patient a candidate for chilled NSS or LR bolus?
		Add "hypothermia management" and "bath temp" rows to assessment flowsheet
		Add "BSAS" (bedside shivering assessment scale) to vital signs flowsheet, document every 30 minutes until at target temperature, then hourly
Shivering Management Plan : Option 1 or 2		<p><b>Option 1:</b> Early Continuous NMBA</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> TO4- Goal 1-2 twitches out of 4</li> <li><input type="checkbox"/> BIS (unit based) – Goal 40-60</li> <li><input type="checkbox"/> Sedative infusion</li> <li><input type="checkbox"/> Opioid infusion</li> <li><input type="checkbox"/> Corneal protection</li> </ul> <p><b>Option 2:</b> Step-Wise Shivering Management based on BSAS. Follow algorithm contained in UPHS guideline (see next page). Individual orders are obtained as needed based on shivering status.</p>
Rewarming		Program external cooling device to warm at rate of 0.33 °C per hour to a set goal temperature of 37° C. / If internal cooling device used set to 0.30 °C per hour
		Discontinue all K+ containing fluids
		Check glucose within 30 minutes prior to rewarming, then q 1hour following insulin protocol
		Check K+ 2 hours after rewarming phase started
		If continuous NMBA agent infusing, STOP when patient at 36.5 °C
TIPS		Check BPS and RASS q 4 hours, PRN, and with all titration changes
		Neuro Checks q 2 hours and PRN
		Maintain Normothermia for 72 hours after rewarming phase; Keep cooling device in place for at least 48 hours after rewarming and re-evaluate
		Serial Labs q 6 hours: Lactate, Chem 7, iCa/Mg/Phos/ABG, CBC and daily PT/PTT/INR

<b>Shivering Pathway- Step Wise Approach</b>	
<b>Step 0</b>  <b>If BSAS &gt;1 proceed to Step 1</b>	<p>Initiate standard nursing preventive measures at induction of TTM</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Assess BSAS q 30 minutes until target temperature achieved, then q hour and PRN</li> <li><input type="checkbox"/> Surface counter warming measures, socks to hands and feet, blanket around head</li> </ul> <p>acetaminophen- <u>Do not administer to patients in fulminant hepatic failure</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 650mg liquid via enterally q 4 hours for patients WITHOUT hepatic impairment.</li> <li><input type="checkbox"/> 650 mg liquid via enterally every 8 hours not to exceed 2 grams per day for patients with chronic liver disease of acute liver injury</li> </ul> <p>bupirone</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 30 mg enterally every 8 hours</li> </ul> <p>magnesium</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Consider maintaining a higher target serum Mg level of 3.0-4.0 mg/dL</li> </ul>
<b>Step 1a</b>  <b>Step 1b</b>  <b>If BSAS ≥ 1 proceed to Step 2</b>	<p>Fentanyl</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> IV Fentanyl boluses 12.5-25 mcg every 5 minutes for 2 doses. <b>If after 15 minutes the patient continues to have BSAS ≥ 1, proceed to starting a continuous Fentanyl infusion at 25 mcg/hr, or increasing the infusion rate for patients already on a Fentanyl infusion. If BSAS ≥ 1 after another 20-30 minutes, proceed to Step 2</b></li> </ul> <p>Meperidine: Meperidine is the preferred agent in patients <u>WITHOUT</u> renal failure Warning: Meperidine Should not be given at all in late term pregnancy or for prolonged use at any time. Concurrent use of Meperidine with SSRIs or SNRIs may cause serotonin syndrome.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> IV Meperidine boluses 12.5 mg every 5 minutes for 2 doses: may administer 12.5 mg IV every 4-6 hours PRN. Maximum 100mg/24 hours. Contraindicated in renal failure, oliguria, and in patients on MAO inhibitors. <b>IF BSAS ≥ 1 within 30 minutes of bolus dose, go to Step 2</b></li> </ul>
<b>Step 2</b>	<p>Propofol <b>OR</b> benzodiazepine (if no contraindications, propofol is considered first line)</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Initiate continuous Propofol infusion (maximum 80 mcg/kg/min as tolerated), or up titrate in patients already on Propofol infusion <b>If BSAS ≥1 despite maximizing highest tolerated dose of continuous Propofol infusion add NMBA bolus in Step 3</b></li> <li><input type="checkbox"/> Bolus dose of midazolam or lorazepam <b>If BSAS ≥ 1 after 5 minutes of bolus, start a continuous infusion at the rate of the initial bolus dose and add the use of NMBA in Step 3</b></li> </ul>
<b>Step 3</b>	<p>Cisatracurium <b>OR</b> Vecuronium NMBA bolus</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cisatracurium 0.1mg/kg IV bolus every 60 minutes for 2 doses</li> <li><input type="checkbox"/> Vecuronium 0.1 mg/kg boluses every 60 minutes for 2 doses</li> </ul> <p><b>Note:</b> As the patient becomes hypothermic, the duration of neuromuscular blocking agent becomes prolonged. Monitor BSAS every 1 hour to determine the need for additional doses while cooling to target temperature. <b>If BSAS ≥ 1 after 2 boluses, proceed to Step 4, a continuous NMBA infusio</b></p>
<b>Step 4</b>	<p>Cisatracurium <b>OR</b> Vecuronium NMBA Continuous Infusion</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cisatracurium continuous infusion starting dose of 1 mcg/kg/min</li> <li><input type="checkbox"/> Vecuronium continuous infusion starting at 0.4 mcg/kg/m</li> </ul>

\*Table taken directly from the UPHS Post Cardiac Arrest Targeted Temperature Management Guideline which can be found on Penn Pathways under critical care.