PATIENT CARE
- Insert central line.
- Insert arterial line.
- Consult immediately:
  - Pulmonologist/Critical Care Medicine
  - Admitting MD
  - Neurologist
  - Cardiologist
- Obtain and record an accurate weight. Height: ___________ (cm) Weight: _________ (kg)
- Place CritiCore foley for core temperature management.
- Insert oral gastric tube.
- Sequential compression devices (SCD’s).
- Begin Sedation & Analgesia PRIOR to applying cooling pads to patient.

LABORATORY
- CBC with Diff
- Magnesium
- Lipase
- PT-INR
- CPK-MB
- D-Dimer
- ABG with ionized calcium and lactic acid
- If temperature > 38º C (100.4º F), obtain:
  - Two peripheral blood cultures
  - Sputum culture
  - UA with culture and sensitivity

DIAGNOSTIC TESTING
- 12 lead EKG every 8 hours

Scan orderset to pharmacy
Fax first page to trauma office: 4191

PATIENT IDENTIFICATION

Physician Signature: ___________________________ MD/DO
Date: ___________________________ Time: ___________

Preprinted Order Name: Critical Care Therapeutic Temperature Management (Arctic Sun) OrderSet - COOLING
Approving Individual/Group
Critical Care/Dr Campo
Reviewed: 9/09
Revised: 9/10
Page 1 of 7
MEDICATIONS

ANALGESIA
- fentanyl (Sublimaze PCA Adult 1500 mcg/30 mL) Fentanyl 20 mcg/hour, may give 25 mcg IVP q 30 min if needed to obtain adequate sedation, may increase hourly infusion rate by 10 mcg q2h if patient requires more than 2 IVP bolus doses in previous 2 hours.

SEDATION
- propofol (Diprivan) 1 Gm IV drip 100 mL. Begin continuous infusion at 5 mcg/kg/min. Titrate upward in 5 mcg/kg/min increments every 10 minutes until desired level of sedation is achieved.
- midazolam (Versed) 50 mg in NS 50 mL. Begin continuous IV infusion at 2 mg/hr and titrate until desired level of sedation is achieved.

SEIZURE CONTROL
- lorazepam (Ativan) 1 - 4 mg IV once PRN to stop seizure activity, may repeat in 5 minutes as needed to stop seizure activity and notify MD.
- phenytoin (Dilantin) 20 mg/kg (_______ mg) IV once PRN loading dose. Max rate 50 mg/min THEN phenytoin (Dilantin) 100 mg every 8 hours if patient continues to seize.
- fosphenytoin (CereBYX) 20 mg/kg (_______ mg) IV one PRN loading dose over 30 minutes THEN phenytoin (Dilantin) 100 mg every 8 hours if patient continues to seize.
- levetiracetam (Keppra) 1000 mg IV once PRN loading dose over 30 minutes, then levetiracetam (Keppra IV) 500 mg IV every 12 hours.

BLOOD PRESSURE MANAGEMENT
- Do not discontinue sedation if patient develops hypotension.
- norepinephrine (Levophed) 8 mg/D5W 250 ml. Start IV infusion at 4 mcg/min and titrate to achieve a MAP of 70 mmHg.
- dopamine (Intropin) 400 mg/D5W 250 ml. Start IV infusion at 2 mcg/kg/min and titrate to achieve a MAP of 70 mmHg.
- nitroglycerin (Tridil) 100 mg/D5W 250 ml. Start IV infusion at 5 mcg/min and titrate to achieve a MAP of ______________ mmHg. (Max 200 mcg/min.)
- nicardipine (Cardene) 20 mg/NS 200 ml. Start IV infusion at 5 mg/hour and titrate by 2.4 mg every 10 minutes to a maximum of 15 mg/hour to maintain MAP of ____________ mmHg.

DVT PROPHYLAXIS
- heparin 5000 Units subCUTaneously Inj Every 8 hours
- dalteparin (Fragmin) 5000 units subCUTaneously Syr Every 24 Hours

Physician Signature: ___________________________ MD/DO
Date: ___________________________ Time: ____________
STRESS ULCER PROPHYLAXIS
- eSOmeprazole (Nexium) 40 mg IV Inj Every 24 hours
- Other

SHIVERING SUPPRESSION
- buspirone (BuSpar) 30 mg OG every 8 hours until rewarmed to target temperature and then discontinue.
- meperidine (Demerol PCA 300 mg/30 mL) in addition to BuSpar if shivering score still ≥ 1, Administer 25 mg bolus loading dose followed by continuous infusion if shivering score is 1 or greater. Start infusion at 12.5 mg/hour. If shivering continues after 15 minutes may rebolus with 25 mg and titrate infusion up to 25 mg/hr.
- magnesium sulfate 2 Gm/NS 100 mL IV every 2 hours PRN shivering inspite of BuSpar and Demerol. If shivering score still ≥ 1, Start at 1 Gm/hour and titrate to serum magnesium of 3 mmol/L. Check serum magnesium level every 2 hours while infusing. (use concurrently with BuSpar and Demerol)
- fentanyl (Sublimaze PCA Adult 1500 mcg/30mL) IV. If shivering score still ≥ 1, Administer 25 mcg bolus dose followed by 50 mcg/hour continuous infusion and titrate to 150 mcg/hr. (use concurrently with BuSpar, Demerol and magnesium)

PARALYSIS INDUCTION (if continues to shiver with medications listed above)
- vecuronium (Norcuron) 20 mg/NS 100 mL – 0.1 mg/kg bolus; then after 20 – 30 minutes start 1 mcg/kg/minute IV infusion to prevent shivering. Discontinue when core temperature is 36°C.
- rocuronium (Zemuron) 250 mg/NS 250 mL. Start 10 mcg/kg/minute IV infusion to prevent shivering. Discontinue when core temperature is 36°C.
- Other:

MISCELLANEOUS MEDICATIONS
- Ocular lubricant (Lacrilube SOP ointment) 1 app both eyes Ophth Oint every 8 hours while receiving paralytics.

COOLING TREATMENT

PATIENT CARE
- Assure patient’s head, hands, and feet are covered with warm towels or blankets to help prevent shivering.
- Place Equator warming blanket on patient if shivering score greater than 1 at any time.
- Train of Four (TOF) monitoring, using Peripheral Nerve Stimulation on all patients receiving a continuous infusion of a neuromuscular blocking agent.
- Insert CritiCore temperature foley if not already done. Place patient on Arctic Sun cooling unit.

Physician Signature: ___________________________ MD/DO

Date: ___________________________ Time: ____________
**Preprinted Order Name:**

**Critical Care Therapeutic Temperature Management**

(Arctic Sun) OrderSet - COOLING

<table>
<thead>
<tr>
<th>Approving Individual/Group</th>
<th>Reviewed: 9/09</th>
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<th>Page 4 of 7</th>
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</table>

- Set target temperature for post cardiac arrest set target temperature of 33 °C (91.4 °F).
- Activate Automatic Mode on the cooling unit.
- Document patient temperature, Arctic Sun water temperature, Basic Shivering Assessment Score (BSAS), and vital signs on the Arctic Sun flow sheet.
- Notify MD for uncontrolled shivering or if water temperature drops >10°C after target temperature achieved.
- Document date and time target temperature achieved: Date _______________ Time: ________________
- For post cardiac arrest initiate Critical Care Therapeutic Temperature Management (Arctic Sun) – Re-warming Orderset 24 hours after target temperature is reached.
- Document:
  - Time cooling is started
  - Temperature every 15 min during induction of hypothermia, then 30 min x 2, and then every hour.
  - Intake and Output every hour
  - Vital Signs & Arctic Sun Water Temperature every hour
  - Cardiac rhythm every shift and pm changes
  - End tidal CO2 every hour
  - Train of Four to be checked every 2 hours when neuromuscular blockade is given.
  - Shivering every hour using Bedside Shivering Assessment Score (BSAS). If BSAS is 1 or more initiate Shivering Suppression Protocol
  - Skin checks every 6 hours. Apply tegaderm or Mepilex border to areas of breakdown pm
- Notify MD for:
  - Inability to reach target temperature within 8 hours
  - Electrolyte abnormalities not responding to treatment
  - Shivering uncontrolled with medication
  - Arrhythmias
  - Hemodynamic changes unresponsive to intervention
  - Urine output < 30cc/hr x 2 consecutive hours OR > 200cc/hr x 2 consecutive hours
  - Skin breakdown

Physician Signature: ___________________________ MD/DO
Date: ___________________________ Time: ____________

PATIENT IDENTIFICATION

Tallahassee Memorial Hospital
Tallahassee Memorial Healthcare
LABORATORY

- To be drawn every 6 hours during cooling
  - BMP
  - ABG with ionized Calcium and Lactic Acid
  - Phosphorus
  - Magnesium
  - Troponin
  - CPK-MB

- To be drawn every 12 hours during cooling
  - CBC
  - PT/INR
  - PTT

- Dilantin level daily if receiving Dilantin
- Serum potassium 1 hour after supplement given
- Serum magnesium 1 hour after supplement given
- Serum calcium 4 hours after supplement given
- Serum Phosphorous 1 hour after supplement given

DIAGNOSTIC TESTING

- 12 Lead EKG every 8 hours while patient cooled

MEDICATIONS

- Potassium chloride (KCL) 20 mEq/100 ml Premixed IV PRN
  - Give 40 mEq IV over 2 hours q 3 hours PRN potassium 3 – 3.5 mEq/L.
  - Give 60 mEq IV over 3 hours q 4 hours PRN potassium 2.5 – 3 mEq/L
  - Give 80 mEq IV over 4 hours q 5 hours PRN potassium less than 2.5 mEq/L
  - Recheck potassium value 1 hour post infusion.

- Magnesium Sulfate 2 Gm/100 mL IV q 2 hours PRN over 1 hour for magnesium less than 1.8 mg/dL.
  - Recheck magnesium value 1 hour post infusion

- Calcium chloride 1 Gm IV q 4 hours PRN ionized calcium less than 0.9 mg/dL Recheck calcium value 4 hours post infusion.

- Sodium phosphate IV PRN
  - 10 mMol IV over 2 hours q 3 hours PRN phosphorus 2 -2.5 mg/dL.
  - 20 mMol IV over 4 hours q 5 hours PRN phosphorus less than 2 mg/dL
  - Recheck phosphorus value 1 hour post infusion.

INFUSION

- NS bolus (sodium chloride 0.9%) __________ liters (30 ml/kg up to 3 liters maximum) IV once if not done already
- Use refrigerator cooled Normal Saline
- Use room temperature Normal Saline
- NS (sodium chloride 0.9%) 1000 ml at __________ ml/hour with NO BOLUS.

PATIENT IDENTIFICATION

Physician Signature: ___________________________ MD/DO
Date: ___________________________ Time: ____________
# ARCTIC SUN FLOWSHEET

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**Document date and time target temperature achieved:** Date ______ Time: ______

Remember “Hour 1” of 24 starts when target temperature is reached.

**DOCUMENTATION GUIDELINES**

1. Document temperature every 15 minutes during induction of hypothermia, then 30 minutes x 2 then every hour. Then every 30 minutes when re-warming
2. Document Train of Four every 2 hours when neuromuscular blockade is given. (Do baseline prior to use of NMBA initiation and use this setting as the maximum setting)
3. Document Intake and Output every hour
4. Document Vital Signs & Arctic Sun Water Temperature every one hour.
5. Continuously monitor cardiac rhythm and ETCO₂. Document strip q shift and prn, End tidal CO₂ q 1 hour
6. Obtain 12 lead EKG every eight hours while cooling then DC when re-warming or normothermic
7. Document/Assess shivering every hour using Bedside Shivering Assessment Score (BSAS). If BSAS is 1 or more initiate Shivering Suppression Protocol
8. Document skin checks q 6 hrs
9. While rewarming - Document temp q 30 minutes and vital signs hourly

**BEDSIDE SHIVERING ASSESSMENT SCORE (BSAS)**

0 - No Shivering noted on palpation of the masseter, neck, or chest wall
1 - Mild: Shivering localized to neck and/or thorax only (may also see EKG artifact)
2 - Moderate: Shivering involves gross movement of upper extremities (in addition to neck and thorax)
3 - Severe: Shivering involves gross movements of the trunk and upper and lower extremities

**PATIENT IDENTIFICATION**

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**Labs/Diagnostics**

**Pre-cooling**
- CBC with Diff, CMP, Mg++, Phosphorus, Lipase, PT/INR, PTT, CPK-MB, Troponin, D-Dimer, Beta-HCG (if female, childbearing age), ABG with ionized Ca++ and lactic acid
- If temperature > 38°C (100.4°F) obtain 2 peripheral blood cultures, sputum culture, UA with C&S
- EKG

**During cooling**
- BMP, Mg++, Phosphorous, PT, PTT/INR, CPK-MB, Troponin, and ABG with ionized Ca++ and lactic acid **q 6 hours**
- PT/INR, PTT, CBC **q 12 hours**
- Dilantin level daily if on dilantin
- EKG **q 8 hours**

**Rewarming**
- BMP, Phosphorus, Troponin, ABG with ionized Ca++ and lactic acid, Mg++, CPK-MB **q 4 hours**
- DC scheduled EKGs, do PRN Changes Only
- Replace, K+, Phosphorus, Mg++ and Ca++ as per orders
- If K+, Phosphorus, or Mg++ is replaced, repeat level 1 hour after dose replacement given
- If Ca++ is replaced, repeat Ca++ level in 4 hours

### Table: ARCTIC SUN FLOWSHEET

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**PATIENT IDENTIFICATION**

Scan to Pharmacy this end first