Induced Hypothermia for Adult Management of Coma in the Intubated Patient Post Cardiac Arrest in ED/ICU/CVRU

Standing Orders

SAH #: 218 0808

Standing Orders

Induced Hypothermia

Allergies & Reactions __________________________________________________________ Ht. _____ Weight ____ kg.

Time arrived to ED________

Time cooling initiated by EMS ______

1. Exclusion considerations: Notify House supervisor for possible ICU bed need.
   - Awakens spontaneously & follows commands
   - Initial temperature < 30 C
   - Known or suspected sepsis
   - SBP < 90 after fluid resuscitation and vasopressors
   - Known coagulopathy, hemorrhage
   - Multisystem trauma
   - Major surgery within 14 days
   - Previously in vegetative or comatose state

2. Notify Radiology and Respiratory departments of estimated arrival time.

3. Cooling device primed and at bedside upon EMS arrival to ED

4. Cooled 0.9 NaCl at bedside upon EMS arrival. Recommended that chilled/cool IV solution be administered through peripheral or femoral line.

5. EKG upon arrival. If AMI or ST elevation, add AMI orders.

6. Verify initial IV patency. Start 3 additional large bore IV site, if no central line planned.

7. Lab Stat on arrival:
   a. CBC
   b. Comprehensive panel, Magnesium, Phosphate, Lactic Acid
   c. PT/INR, PTT
   d. Type & Screen, unless drawn in the last 4 hours
   e. Cardiac enzymes
   f. Cultures: Urine, ET sputum, and bld from 2 different sites at the same time (one set may be a line draw)
   g. UA
   h. ABG
   i. Other: ________________________________

8. Intubation equipment, art line, central line insertion equipment to the bedside

9. Insert esophageal probe or other core temperature monitoring device and record temperature

10. Portable CXR to confirm placement of ET and/or central line post procedure

11. Imaging other: ____________________ (Consider CT of head)

12. O2 therapy titrate to keep SpO2 > 92%

13. Insert foley catheter.

14. Follow Therapeutic Goals
   - 1st Goal: Induced Hypothermia 33 Celsius within 4 hours
   - 2nd Goal: Maintained Hypothermia of 32-33 Celsius 24 hours from initiation of cooling
   - 3rd Goal: Controlled re-warming 0.5 Celsius (.09 F) – 1C (.18 F) per hour until 36 degrees

Induction

- Cooling device applied to patient set to target temperature of 33
- Pack patient with ice packs (groin, chest, axilla)
- Ventilator warmer OFF & No heated humidifier until re-warming phase.
- Protect fingers and toes.
- Monitor core temperature frequently during induction
- Monitor vital signs (Target: SBP > 90 mmHg; MAP > 80 mmHg.
- Observe for arrhythmias and/or widening QRS
- If core temperature > 34 C: In concert with MD consider boluses with chilled/cold 0.9 NaCl (through peripheral or femoral line) until temperature < 34
  - Max 2L/hour, then run @ _________________ ml/hour to achieve a CVP of 8 mm Hg
  - If no CVP line. IV fluids: __________________________ ml/hr.
- Sedation/Anaglesia:
  - Fentanyl 25 - 50 mcg IV every 15 minutes PRN sedation/shivering
  OR
  - Initiate continuous infusion at 25 mcg/hr and titrate for shivering.
  - Midazolam (Versed) 0.05 mg/kg, not to exceed 5 mg bolus, followed by 0.04-0.2 mg/kg/hr continuous infusion titrate to desired effect for sedation/shivering.

For continued Shivering and/or Myclonus/Posturing:
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- Propofol 5 mcg/kg/min continuous infusion for 5 minutes, then titrate 5-50 mcg/kg/min. *Call MD if exceed 50 mcg/kg/min.*

For continued Shivering and/or Myclonus/Posturing:
- Obtain TOF then add:
  - Decrease to 1-2 mcg/kg/min as needed
    - Maintain Train of Four (T.O.F.) ¼ or BIS reading between 40-60 to prevent shivering.
    - Lacrilube lubricant to both eyes q 8 hrs or liquid tears 1-2 drops each eye 4 hrs. while on Cisatricurium
  - ABGs q 4 hours, or as ordered and PRN until temperature is 33 C.
  - Call for PaCO2 < than 35 mm Hg or greater than 45 mm Hg.
  - If goal is reached proceed to Maintenance

### Maintenance

- Labs at 6 hours: Troponin, BMP, PT/PTT, ABG. Call for PaCO2 less than 35 mm Hg or greater than 45 mm Hg.
- Labs at 12 hours: Troponin, CBC, BMP, ABG, Magnesium, Phosphate, Lactic Acid, PT/INR, PTT, Blood cultures X 2, LFTs. Notify MD if lipase is greater than 300 units/L, and or transaminases are greater than 500 units/L. Call for PaCO2 less than 35 mm Hg or greater than 45 mm Hg.
- Monitor core temperature frequently during maintenance
- Monitor vital signs, monitor for arrhythmias, QT prolongation
- Assess for wounds and skin breakdown.
- Via a central line or arterial Line with vamp set up: (preferred method) Accuchecks q 1 hour x 2, if < 130 mg/dl, then q 2 hours x 2, if < then 130 mg/dl, then q 4 hours. X 2 , if < 130 mg/dl then discontinue
- Begin Continuous Insulin Infusion Protocol if blood sugar is greater than 130mg/dl x 2
- For sustained MAP < 80mmHg and CVP > 7mmHg (if CVP inplace), begin norepinephrine infusion at 4 mcg/min. Increase infusion by 2-4 mcg/minute every 10 minutes until MAP > 80 mmHg, but not to exceed MAP >100 mmHg.
- Alert physician if MAP continues at < 80mmHg with norepinephrine running at 30 mcg/minute.
- 16 hours after target temperature is reached, discontinue all IVF containing potassium. Replete only K of 3.4 or less as with re-warming potassium exits cells and hyperkalemia may occur
- ABGs every 4 hours or as ordered and PRN during re-warming
- Program the device to rewarm passively temperature 0.5-1 C per hour until 36 C is reached
- If re-warming exceeds 0.5 °C per hour, initiate external cooling device
- At 36 C, discontinue the Cisatricurium if infusing.
  - Two hour post discontinuation of paralytic, if patient on continuous infusing of Fentanyl discontinue &. Wean sedation infusion (Midazolam/Propofol). Goal: Achieve TOF.
  - Sedation protocol if needed for ventilator management.
  - At 36 C, titrate vasopressors for hypotension maintaining MAP ≥ 65 during re-warming.
- If patient temperature 37.5C or greater, obtain blood cultures x 2

### Rewarming until 37 C is reached

- Labs at 24 hours: Troponin, CBC, BMP, ABG, Magnesium, Phosphate, Lactic Acid, PT/INR, PTT
- ABG every 4 hours or as ordered and PRN during re-warming
- Program the device to rewarm passively temperature 0.5-1 C per hour until 36 C is reached
- If re-warming exceeds 0.5 °C per hour, initiate external cooling device
- At 36 C, discontinue the Cisatricurium if infusing.
  - Two hour post discontinuation of paralytic, if patient on continuous infusing of Fentanyl discontinue &. Wean sedation infusion (Midazolam/Propofol). Goal: Achieve TOF.
  - Sedation protocol if needed for ventilator management.
- At 36 C, titrate vasopressors for hypotension maintaining MAP ≥ 65 during re-warming.
- If patient temperature 37.5C or greater, obtain blood cultures x 2

Continue to reassess the patient for changes in CVP, MAP at least every hour until stabilized

15. Weigh on admission to ICU/CVRU and q AM

### Ventilator Management (if applicable)

- Ventilator initial settings (if applicable) Mode_______RR_______Vt_______FiO2-_______PEEP_____
- Other:
- Once stabilized, titrate FiO2 to keep Sat ≥ 92 %. Alert physician if ordered saturation cannot be maintained on FiO2 < 60%.
- CXR after intubation & q AM while intubated
- Additional orders per pulmonologist or if in place initiate ARDS protocol.

16. DVT Prophylaxis
- Pharmacist to review and adjust per renal function as appropriate.
- Heparin 5,000 units SQ q 8 hours

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**StDavid's**

**South Austin Hospital**

Induced Hypothermia

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SAH #: 218 0000

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Standing Orders

☐ Enoxaparin (Lovenox) 40 mg SQ Every Day
☐ Sequential Compression Device

17. PUD prophylaxis-
Pharmacist to review and adjust per renal function as appropriate.
☐ H2 blocker (per formulary) IV or PT q 24 hours
☐ PPI (as per formulary) IV q day

18. Diet: ☐ NPO ☐ NG to LIS ☐ NG to LIS x Meds

Nursing Orders
If patient known to have Advanced Directive obtain copy for chart. Notify TOSA
Keep HOB at 30-45 degrees unless contraindicated or specifically ordered otherwise.
Daily assessment of readiness for a spontaneous breathing trial. RT to chart in progress notes.
Mouthcare/lipcare Q 2-4 hrs while mechanically ventilated. Post extubation mouth/lip care Q4-8 hours and prn
Nutrition consult/evaluation.
Record Vital signs, CVP, SpO2 and urine output least hourly. Alert physician if urine output < 0.5ml/kg/hour times 2 consecutive hours, SBP < 90 or > 150, MAP < 80, CVP < 8, HR < 60 or >90
PT assessment/evaluation and treatment when appropriate
Cardiac rehab consult when appropriate
WOCN/Chaplin consults PRN.
Post extubation if patient has swallowing difficulties, seek order for swallow evaluation
Provide information sheet to family

19. Additional Orders: ____________________________________________________________

20. Additional Medications: _______________________________________________________

MD's Signature   Date/Time   Nurse's Signature   Date/Time

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