Therapeutic Hypothermia: System Overview

System	Overview of Management
Cardiovascular	1) Monitor with 3-lead EKG per routine. Expect bradycardia (< 100 bpm) when temperature < 34 ^{o}C 2) Vascular access ○ Establish peripheral IV access immediately (avoid scalp IVs) ○ Insert UVC (double lumen) if dependent on clinical scenario (For hypotension, arterial line monitoring is preferred prior to inotropic support being initiated)
Fluid and Electrolytes	1) Maintenance fluid ○ Total fluid volume of 60 ml/kg/day ○ Use Standard TPN @ 50 ml/kg/d with dextrose containing IV fluid, until custom TPN is available ○ Maintain GIR no less than 4 mg/kg/min at all times 2) After 24 hours of therapeutic hypothermia, if the infant is physiologically stable, the attending may initiate non-nutritive feeding of **10 mL/kg/day with mother's milk. This should not be advanced until after infant is rewarmed**
Respiratory	1) Ventilator Support – provide any respiratory support as needed ○ Avoid hypocapnia, and hyperoxia 2) Maintain air humidifier in normothermic range (37ºC)
Infectious Disease	1)Evaluate for Suspected Sepsis – start antibiotics after cultures obtained ○ Antibiotics should consist of Ampicillin and Cefotaxime (Cefepime may be used, if Cefotaxime not available)
Neurological	**1) Request Neurology Consultation, if not already requested** Sedation: maintain adequate sedation with **Morphine. The following guideline can only be deviated from with attending approval** ○ Loading dose 0.05 mg/kg IV (repeat PRN x 1 for shivering, severe irritability tachycardia HR > 120) ○ Start continuous infusion: 0.01 mg/kg/hr IV drip. DO NOT INCREASE THE INFUSION RATE ○ Reduce rate to 0.005 mg/kg/hr after 12 hours ○ Avoid Benzodiazepines for distress 2) Neuromonitoring: ○ Obtain full channel EEG on admission (to be ordered stat by neurology) ○ Continue full channel EEG for 24 hours or longer if seizures detected ▪ If no seizures and EEG recording considered low risk, may switch to aEEG after 24 hours (refer to aEEG CPG for details) ○ Neuromonitoring (either EEG or aEEG) should be continued until 6 hours after rewarming completed 3) Seizure control (Refer to Neonatal Seizure CPG for further details) ○ **1st choice agent for treating seizures is Phenobarbital** • Load: 20 mg/kg IV; repeat if seizures persist 20 minutes after load complete • Check serum levels 2-12 hours after load ○ If 2nd agent required: Fosphenytoin 20 mg/kg load ○ If 3rd agent required: Midazolam – load with 0.05 mg/kg IV and then infusion of 0.15 mg/kg/hour for 12 hours, taper over another 12-24 hours 4) Cranial ultrasound imaging should be ordered STAT (But do not need to wait for HUS to start therapeutic hypothermia) 5) MR imaging (NICU MRI Guidelines) ▪ If considering re-direction of care or early Exit, consider a MRI at 24-48 hours ○ Routine MRI – HIE protocol on DOL #4 (after re-warming) ○ Follow-up MRI on/after DOL #10- #21 6) Complete and document Neonatal Encephalopathy Neurological Examination at least once daily during hypothermia and re-warming, and at discharge
Skin	1) Monitor for subcutaneous fat necrosis (erythema, purple color, painful nodules, especially on the back and buttocks). May occur during hypothermia or after rewarming 2) If present monitor for hypercalcemia
Laboratory/ blood work	1) Lab schedule should be determined based on assessment of the infant's condition and evaluated daily and as needed- below is a **suggested lab plan:** ○ On admission: Blood gas, lactate, CBC, PT, PTT, INR, Fibrinogen, blood cx ○ 6 hours: BMP, Mg, ALT, AST ○ 24 h: CBC, PT, PTT, INR, Fibrinogen, BMP, Mg, P, ALT, AST ○ Daily BMP ○ Phenobarbital levels (only if patient was loaded for clinical seizures)