What to do if an infant qualifies for therapeutic hypothermia

Before the transport team arrives:

1. **Call a referral hospital that has the capability to perform therapeutic hypothermia**
   Children's Hospital referral line is 855-850-KIDS (1-855-850-5437)
2. **Start an IV of D10W to run at 50-60 ml/kg/day**
3. **Draw labs listed below**
4. **Start passive cooling immediately - you may always call the neonatologist for help**
5. **Do a full neurologic exam at least 10 minutes after resuscitation but within 1 hour of birth or injury (see below)**

- Prompt initiation of hypothermia is critical and must occur within 6 hours of injury but as early as feasible (preferably within 2 hours).
- Passive cooling involves withholding any external heat sources and monitoring the neonate's temperature frequently.
- Due to autonomic instability in these babies, maintaining temperature within target range can be difficult
  - Overcooling may increase serious adverse effects associated with hypothermia, such as arrhythmias, electrolyte abnormalities, thrombocytopenia, and coagulopathies.

How to perform PASSIVE COOLING

1. For passive cooling, we recommend using a reliable rectal temperature thermometer and assessing the neonate's core rectal temperature every 15 minutes until transported
2. The temperature/time the temperature is taken should be clearly documented, ideally in a form that can be easily copied/printed out to transport with the patient
3. The time of the first temperature within range (33-34°C) should be noted
4. **The target rectal temperature should be between 33°C and 34°C**
   a. If the infant's temperature falls lower than 33°C, the radiant warmer should be turned on and set 0.5°C higher than the infant's current temperature. Then, continue to monitor the core temperature every 15 minutes to ensure it increases to within the target range
   b. If the rectal temp is above 34°C, turn the overhead warmer off and continue to take the temperature every 15 minutes, adjusting the warmer on and off as needed to stay between 33-34°C.
5. Centers that may not be accustomed to caring for critical newborns and do not frequently use rectal temperature measurements may consider maintaining the axillary temperature between 33.5°C and 35°C. This approach may avoid unnecessary tissue injury from incorrect technique.

Initial orders

If the infant is identified as "at risk" in the delivery room, attempt to obtain cord blood gases and ask delivery provider to send placenta for pathology

- NPO
- 8 or 10 French OG to suction
- Ampicillin at 50 mg/kg/dose and ceftazidime 50 mg/kg/dose to start after blood culture obtained
- HR and respiratory monitor with continuous pulse oximetry, BP every 15-30 minutes (HR normally 90-120 but may be lower when cooled)
- Respiratory support as needed
- If clinical signs of a seizure, give lorazepam 0.1 mg/kg IV - call the neonatologist infants needs >2 doses

Initial labs to draw

- CBC with differential
- Blood culture
- Blood gas with lactate (Arterial > venous > capillary but any gas is better than none)
- Chemistry including electrolytes, glucose, calcium, magnesium, creatinine and liver function tests
- Frequent blood sugar monitoring - at least every hour. More frequent if level is <50 or >150 mg/dL
- **Send placenta for pathology**

Neurologic Exam

	Mild	Moderate	Severe
Consciousness	Hyperalert/Irritable	Lethargic	Stupor/Obtunded
Spontaneous Activity	Normal	Decreased	Absent
Muscle tone	Normal/Mild Hypertonia	Hypotonia/Hypertonia	Flaccid
Posture	Mild distal flexion	Strong distal flexion/extension	Decerebrate
Suck	Normal/Weak	Weak/Uncoordinated	Absent
Moro	Strong	Weak/Incomplete	Absent
Pupils	Mydriasis	Miosis	Non-reactive
Seizures	Absent	Common	Frequent

Consciousness: This is the infant's response to stimuli (as opposed to spontaneous activity). Lethargy presents as slow/absent withdrawal to painful stimulus and/or response to stimuli with only brief wakefulness

Tone:

- Pull one of the infant's hands across the chest (scarf sign). A term infant's elbow should not cross the infant's midline – if it does, the infant should be considered hypotonic.
- Slowly lift one leg up toward the head (heel-to-ear sign) and evaluate the angle behind the knee. If this is >100-110, the infant should be considered hypotonic (<90 would be hypertonic)

Posture: Assess resting flexion of the distal extremities (ankle/toes and wrists/hands) as well as for extension of the proximal extremities (knees/elbows)

Weak, incomplete, or absent suck: Tested by placing a gloved finger in the infant's mouth. An abnormal suck may be weak (finger easily removed from mouth during the process of sucking), uncoordinated (biting instead of sucking), or completely absent.

Moro: A full Moro should consist of bilateral symmetric hand opening with upper extremity extension and arms thrown outward (first stage), followed by anterior flexion of the upper extremities inward as if holding something (second stage). Asymmetry, partial (completes first stage but not second), or absence of movement should all be considered abnormal.

Seizures: The presence of seizures immediately qualifies an infant for therapeutic hypothermia regardless of the remaining exam. Despite this, a full neurological exam still must be performed to allow for determination of severity and evaluation for HIE mimics/sequelae (e.g. unilateral defects suggestive of a focal insult such as stroke)