

# 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 \(1-855-850-5437\)](tel:855-850-KIDS)**
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)

## How to perform PASSIVE COOLING

Prompt initiation of hypothermia is critical and must occur within 6 hours of injury. Moreover, expert opinion indicates that cooling should be initiated as early as feasible, preferably within 2 hours. Passive cooling involves withholding any external heat sources and monitoring the neonate's temperature frequently. Maintaining the temperature within a target range is difficult, and infants often arrive to the tertiary NICU with temperatures outside of the target range. In addition, overcooling may increase serious adverse effects associated with hypothermia, such as arrhythmias, electrolyte abnormalities, thrombocytopenia, and coagulopathies.

When passive cooling is applied before transport, we recommend using a reliable rectal temperature thermometer and assessing the neonate's core rectal temperature every 15 minutes until transported. **The target rectal temperature should be between 33°C and 34°C.** 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. 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.

Each center must ensure their rectal thermometers accurately display temperatures within the target range, as some commercial thermometers do not register lower than a specific degree. Of note, the most accurate measurement technique is by inserting the rectal thermometer 2 to 3 cm into the rectum.

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. Furthermore, the use of mild hypothermia in this setting will minimize systemic adverse effects while continuing to provide a degree of neuroprotection.

## Initial labs to draw

- CBC with differential
- Blood culture
- Blood gas with lactate (Arterial is better than venous is better than capillary - get whatever you can)

- Chemistry including electrolytes, glucose, calcium, magnesium, creatinine and liver function tests
- Frequent blood sugar monitoring - at least every hour. More frequent if level is <60 mg/dL
- Send placenta for pathology

**Initial orders**

If the infant is identified as “at risk” in the delivery room, attempt to obtain cord blood gases

- NPO
- 8 or 10 French OG to suction
- Start Ampicillin at 100 mg/kg/dose every 12 hours and Cefotaxime 50 mg/kg/dose every 12 hours
- 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 as needed - call the neonatologist if you need to give >2 doses

**Neurologic Exam**

|                      | Mild                 | Moderate                    | Severe                        |
|----------------------|----------------------|-----------------------------|-------------------------------|
| <b>Consciousness</b> | Hyperalert/Irritable | Lethargic/Poorly responsive | Stupor/Obtunded               |
| <b>Muscle tone</b>   | Normal/Hypertonia    | Hypotonia                   | Flaccid                       |
| <b>Reflexes</b>      | Hyperreflexia        | Hyporeflexia                | Absent reflexes               |
| <b>Suck</b>          | Normal/Weak          | Weak/Uncoordinated          | Absent                        |
| <b>Moro</b>          | Strong               | Weak/Incomplete             | Absent                        |
| <b>Seizures</b>      | Absent               | Common                      | Frequent/Difficult to control |

Infants with moderate or severe encephalopathy will demonstrate one or more of the following signs:

**Decreased level of consciousness:** Slow or absent withdrawal to painful stimulus, limited or no spontaneous eye opening or movement of limbs.

**Hypotonia:**

- A healthy term infant should maintain flexion at knees, hips, and elbows when at rest and the head is midline (to avoid tonic neck reflex). If any of these joints are fully extended while the infant is at rest, the tone should be considered abnormal.
- 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.
- If the infant is not on respiratory support, lift the infant off the table by holding the chest under the infant’s arms and into an upright position - if the infant’s arms elevate and it feels as though the infant is going to slip through your hands, he/she is hypotonic.

**Decreased or absent reflexes:** The easiest reflexes to elicit in a newborn are patellar and biceps. Plantar response is generally unhelpful due to several competing signals. Sustained ankle clonus (>10 beats) should also be considered abnormal.

**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.