

## **Whole-Body Hypothermia for Hypoxic-Ischemic Encephalopathy (HIE)**

**Screening Criteria:** Screen term infants for eligibility if they had poor respiratory effort at birth and needed resuscitation or appear encephalopathic.

**Inclusion Criteria:** Infants  $\geq 36$  weeks **and**  $> 1800$  grams with **Perinatal Depression (Part A)** and **HIE (Part B)**.

### **Part A: Physiologic Criteria for Acute Perinatal Depression:**

- 1) Cord gas or first postnatal blood gas at  $< 1$  hour of age with either  $\text{pH} \leq 7.0$  or base deficit  $\geq 16$  mmol/L.

**OR**

- 2) If cord gas or first postnatal blood gas at  $< 1$  hour of age has either a pH of 7.01 - 7.15 or a base deficit of 10 - 15.9 mmol/L or if a blood gas is not available then **the following additional criteria are required.**
  - a. An acute perinatal event (e.g., late or variable decelerations, cord prolapse, cord rupture, uterine rupture, maternal trauma, hemorrhage, abruptio placenta, etc.) **and either:**
    - i. Apgar score of  $\leq 5$  at **10** minutes **or**
    - ii. Need for ventilation initiated at birth and continued for at least 10 minutes

### **Exclusion Criteria:**

- a. Inability to initiate cooling by 6 hours after birth.
- b. Known chromosomal anomaly (excluding Trisomy 21, Turners, etc).
- c. Presence of major congenital anomalies.
- d. Infants *in extremis* for whom no additional intensive therapy will be offered.

If an infant meets either criteria A1 or A2, proceed to Part B (neurological criteria and exam).

**Part B - Neurological Criteria:** Infants meet criteria if either **seizures** or **HIE** is present.

**Evidence for HIE:**

Moderate/severe hypoxic-ischemic encephalopathy (HIE) will be defined as either **seizures** or in the absence of seizures, the presence of signs in **3 of 6** categories from the neurological exam.

<b>Category</b>	<b>Moderate Encephalopathy</b>	<b>Severe Encephalopathy</b>
<b>1. Spontaneous activity</b>	Decreased activity	No activity
<b>2. Posture</b>	Distal flexion or complete extension	Decerebrate
<b>3. <u>Autonomic system</u></b> Pupils Heart rate Respirations	Constricted Bradycardia Periodic breathing	Skew deviation/dilated/non-reactive Variable HR Apnea
<b>4. Tone</b>	Hypotonia (focal or general)	Flaccid
<b>5. <u>Primitive reflexes</u></b> Suck Moro	Weak Incomplete	Absent Absent
<b>6. Level of consciousness</b>	Lethargic	Stupor or coma

**Timing of the examination:** The exam should be done in the first **1 - 3 hours of life** once the patient’s cardiopulmonary status has been stabilized.

**Performance of the neurological examination for Whole Body Cooling:**

The neurological examination should take 10 - 15 minutes to complete and be performed by the attending and/or fellow. The exam is to be recorded in the admit note and performed in the following order: Spontaneous activity, posture, autonomic system, tone (via ROM), primitive reflexes and level of consciousness (response to stimuli).

Patients who have HIE as defined by seizures will still need to have a neurological exam for cooling performed and documented.

**If the infant meets physiologic criteria A1 or A2 and neurologic criteria B without exclusion criteria, then whole body cooling can be initiated by ordering “Cooling per protocol”.**

**Reference:** N Engl J Med 2005; 353:1574-84.