

HIE (Hypoxic-Ischemic Encephalopathy)

SAINT BARNABAS MEDICAL CENTER
NEONATAL INTENSIVE CARE UNIT

What is HIE and what are the causes?

HIE (Hypoxic-Ischemic Encephalopathy) is where your baby's supply of oxygen and/or blood flow to the brain is interrupted during, or before, birth which may cause injury to the brain. The interruption of oxygen and/or blood flow can affect all of your baby's organs including the lungs, liver, heart, and the kidneys.

This can be caused by placental abruption, placental insufficiency, uterine rupture, true umbilical cord knots, cord compression, cord prolapse, extremely low maternal blood pressure, or trauma during delivery.

How is HIE diagnosed?

Diagnosis of HIE in a newborn is done by evaluating the risk factors for HIE before, during, and after delivery. Assessing the baby for clinical and neurological status, including the APGAR score, changes in breathing and heart rate, changes in mental status (decreased alertness), increased or decreased muscle tone, seizures, abnormal pupils, or changes in reflexes. Lab values are also reviewed and other diagnostic tests including MRI, Video EEG and CT scan are used.

How is HIE treated?

Therapeutic Hypothermia (Cooling) is the treatment of choice for HIE. A diagnostic tool that assesses the baby lets us know if they are eligible for Therapeutic Hypothermia.

Therapeutic Hypothermia is where a baby's temperature is lowered to 33.5 degrees Celsius (92 degrees Fahrenheit) from the usual temperature of 37 degrees Celsius (98.6 degrees Fahrenheit). Cooling occurs for 72 hours (3 days) and then the baby is re-warmed slowly over 24 hours until reaching their normal temperature.

Research has shown that cooling a baby can improve the long-term outcomes for these babies.

During cooling, your baby will be placed on a mattress filled with water that is cooled or warmed to keep your baby's temperature at the target. Your baby's temperature will be monitored closely to ensure that it stays at the target temperature of 33.5 degrees Celsius. Your baby will also have their heart rate and blood pressure monitored, and receive IV fluids until they are re-warmed. They will also have standard blood tests done.

Treatment is also supportive and may include your baby requiring mechanical ventilation if they cannot breathe completely on their own. Medications may be given to control seizures, to help maintain blood pressure, and to rest comfortably.

Equipment, Tests and Procedures your baby may have:

Umbilical Catheters: will deliver fluids and medications to your baby and allow continuous monitoring for Blood Pressure and obtaining blood samples.

Ventilator/CPAP: will help your baby breathe if they need some help with this.

Bloodwork: routine bloodwork will be done on your baby.

TPN (Total Parenteral Nutrition) & Lipids: this is IV (intravenous) nutrition your baby will get until they can have regular feedings.

Blood Products: your baby may receive blood products via transfusion if needed.

Video EEG: continuous monitoring of your baby's brain to check for seizures.

Chest x-ray: x-ray to assess baby's lungs.

Head Ultrasound: ultrasound of the brain to check for bleeding or swelling.

MRI (magnetic resonance imaging): another type of assessment of the brain, usually done after re-warming is complete.

Medications your baby may receive:

Antibiotics: may be given if an infection is suspected

Pain Medications: will be given to your baby to help keep them calm and comfortable during cooling therapy

Blood Pressure (BP) medication: will be given to your baby if they are unable to maintain their BP

Seizure medication: may be given to your baby if needed.

What can I do for my baby?

- When at your baby's bedside talk, read or sing softly to them. They like to hear your voice.
- While your baby is being cooled you can hold their hand, foot or gently touch them to let them know you are there.
- You can pump to establish your milk supply. You can swab the inside of your baby's mouth with breast milk so they get the important properties of breast milk before they are even feeding.
- You may also participate in their care by changing their diaper
- Your baby is recovering and needs quiet and rest; you may want to limit your baby's visitors.
- Make sure you take care of yourself by resting, eating and talking with the Social worker or Nurses about your feelings. Seek support from family and friends.
- Ask as many questions as you need to understand your baby's treatment and progress.
- Once cooling is complete, hold your baby as soon as possible to build a close bond with them.

How will my baby look and act?

- Your baby will be attached to several types of monitoring equipment including a cardiac monitor, EEG monitor and the cooling machine.
- Your baby will be cool to touch and may be shivering at times (this is a normal response).
- Your baby may have seizure activity; (uncontrolled movements of arms and legs) they will get medication to help control these.
- Your baby may be agitated at times or be very sleepy depending on how they respond to the cooling process and the medications they are getting.

If you have any further questions, please ask your nurse or doctor.