

# Hypoxic Ischaemic Encephalopathy (HIE)

## Definitions:

Hypoxic = Not enough oxygen

Ischaemic = Not enough blood flow

Encephalopathy = Brain injury

## What is HIE?

Your baby was not very well at birth because there was a lack of oxygen or circulation getting from the placenta to him/her during the delivery process. This can affect all your baby's organs but especially the brain.

Your baby may be displaying symptoms like restlessness, irritability, struggling to breathe, eye rolling, twitching, seizures, or your baby may be very quiet.

## What causes HIE?

In many cases, the causes of HIE are unknown. Maternal bleeding or problems with the uterus, placenta, or umbilical cord can cause HIE.

It can happen any time- before birth, during birth, or even after birth.

## How is HIE treated?

Therapeutic cooling (hypothermia) is the recommended treatment for infants affected by HIE. Cooling slows down the basic functioning of the body and has been shown to decrease injury to the brain caused by the lack of oxygen and blood flow.

Your baby will be placed on a cooling blanket and cooled to a core temperature of 33-34 degrees Celsius for up to 72 hours.

During this time, your baby will usually:

- Have some electrodes placed onto the scalp to record brain activity (BRAINZ).
- Have temperature monitored continuously with a probe in the rectum (back passage).
- Have lines in the umbilical cord to provide fluid, any medication required, and to monitor baby's blood pressure
- Have vital signs monitored regularly (heart rate, respirations, blood pressure, oxygen saturations).

- Have regular blood tests taken.
- Have urine output monitored, usually with the insertion of a catheter (fine tube) inserted into the bladder.
- Be given medicine for pain, if required.

Other interventions that may be expected:

- You will be asked whether you are happy for your baby to use a pacifier during this time. A pacifier might help calm your baby sometimes.
- Your baby may not be able to suck feeds during the cooling period. A tube may be placed into the stomach via nose or mouth and this may be used for feeding, if able.
- If seizures are present, your baby will be given medication to stop the seizures.
- Medications to support your baby's blood pressure (Dopamine and/or Dobutamine) may be required.
- Your baby may require assistance with breathing. A breathing tube and ventilator or CPAP (Continuous Positive Airway Pressure) may be used.
- If your baby is stable after 72 hours, the cooling will stop and your baby will be very slowly re-warmed to normal body temperature.

## How will I know if there is permanent brain damage?

Most babies with HIE recover fully, whilst a small proportion can go on to have long-term problems with strength, mental capacity and so on. There are also infants with severe HIE who do not survive. The doctors treating your baby will use the information from examining your baby, BRAINZ monitoring, etc. to give you information on how your baby is doing. Sometimes the doctors may ask for a scan of your baby's brain to help predict neurological outcomes. This is called an MRI scan.

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### **What can I do to help my baby during this treatment?**

You are encouraged to spend as much time as possible with your baby during this period. For the first few days, it is very important that your baby gets plenty of rest. We will try to provide a calm, quiet environment for your baby. You can help support your baby with your presence by talking to him/her quietly, or singing and humming using a soft voice.

Your nurse and the developmental therapist will support you to learn how to assist with your baby's cares and to recognise baby's cues for both handling and resting. You will be shown how to touch your baby so you can care for your baby in a supportive way. This may involve assisting with the nappy changes, wiping baby's eyes and mouth, and changing of linens. It is important not to over-handle or over-stimulate your baby as they begin to wake up.

### **What support will my baby need after treatment?**

Some infants can take at least a week or longer before being able to breast or bottle feed, to establish a routine, to keep warm, and to grow. We will keep you informed at all times how your baby is progressing and when they are ready to try something else.

The Speech Language Therapist and Lactation Consultant may be asked to come and assist you and your baby with early breastfeeding skills. The Developmental Therapist may give recommendations for intervention and follow-up care if required. The NICU community nurse may also follow-up your baby once discharged home, and your baby may also need follow-up care with a neonatologist/ paediatrician.

Depending on the extent of brain injury (if any), your baby *may* be at risk of difficulty swallowing and developmental delay in learning, speaking, and movement.

### **BRAINZ Monitor and Cooling Machine**



Photo of needle placement on baby's scalp for BRAINZ monitoring



Photo of baby in BRAINZ monitoring and cooling blanket

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We realise this is a difficult time for you and your whanau. The stress of having a sick baby in NICU and seeing unfamiliar equipment and procedures may be frightening. We encourage you to ask questions about your baby's care and condition.

### **Contact details**

NICU Direct dial number (04) 8060 800