South London Neonatal Network

Hypoxic Ischemic Encephalopathy Transfer Guidelines

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South London Neonatal Network
Hypoxic ischemic encephalopathy transfer guidelines

Infants with moderate or severe hypoxic ischemic encephalopathy (HIE) should be routinely considered for total body therapeutic hypothermia treatment. This treatment is recommended in the national neonatal service specification to be delivered in NICUs (level 3 units). It is also currently being provided in two Local Neonatal Units (LNUs, level 2 units) in south west London.

Although the evidence base for Total Body Hypothermia (TH) in moderate and severe HIE is strong, there is currently no randomised controlled trial (RCT) evidence of improved outcome for babies with mild HIE; and resource implications of a full period of TH are significant. It is therefore important to assess a baby carefully, with senior support, before decision to start.

TOTAL BODY HYPOTHERMIA

Inclusion criteria

The infant will be assessed sequentially by criteria A, B and C listed below:

A. Infants >36 completed weeks gestation admitted to the NICU with at least one of the following:

- Apgar score of <5 at 10 minutes after birth
- Continued need for resuscitation, including endotracheal or mask
- ventilation, at 10 minutes after birth
- Acidosis within 60 minutes of birth (defined as any occurrence of
- umbilical cord, arterial or capillary pH <7.00)
- Base Deficit > 16 mmol/L in umbilical cord or any blood sample
- (arterial, venous or capillary) within 60 minutes of birth

Infants that meet criteria A will be assessed for whether they meet the neurological abnormality entry criteria (B)

B. Moderate to severe encephalopathy, consisting of either:
B1. Altered state of consciousness (lethargy, stupor or coma) AND **at least one** of the following:

- hypotonia
- abnormal reflexes including oculomotor or pupillary abnormalities
- absent or weak suck
- clinical seizures

OR

B2. For units that have access to amplitude integrated EEG, at least 30 minutes duration of recording that shows abnormal background aEEG activity or seizures. There must be one of the following:

- normal background with some seizure activity
- moderately abnormal activity
- suppressed activity
- continuous seizure activity

Differentiation between initial recovery from transient hypoxia-ischemia, mild HIE and moderate HIE, and therefore whether a baby qualifies for TH, can be challenging. In these circumstances, it is recommended to discuss with a Consultant and assess neurological status no sooner than an hour of age before decision to cool is made.

The following table can help to grade the severity of encephalopathy

Parameter	Moderate Encephalopathy	Severe Encephalopathy
Level of consciousness	Lethargic	Stupor or coma
Spontaneous activity	Decreased	No activity
Posture	Distal flexion, complete extension	Decerebrate
Tone	Hypotonia (focal or general)	Flaccid
Suck	Weak	Absent
Moro's	Incomplete	Absent
Pupils	Constricted	Dilated, non- reactive or deviated
Respiration	Periodic breathing	Apnoea
Heart rate	Bradycardia	Variable

Transfer guidelines

A decision to initiate cooling treatment must be made by the Consultant Paediatrician covering the neonatal unit or on call, in discussion with the Consultant Neonatologist on call at the local tertiary unit.

Once a decision is made to institute TH, the babies should be referred to the Neonatal Transport Service for transfer to a NICU for provision of this treatment.

In the interim, the following steps can be initiated:

Commence passive cooling (see TOBY protocol attached): this should be done once a decision is made to institute TH. It should not be done indiscriminately, and certainly not while resuscitation is in progress on the labour ward.
Turn off incubator, sources of external heat, remove clothes
Monitor rectal temperature continuously or axillary temperature every 15 minutes
Do not place frozen bags
Continue all other treatment including restricted intravenous fluids, antibiotics, sedation etc. as applicable

Transfer guidelines for Level 2 Units equipped to perform TH

It is expected that all babies assessed as fulfilling criteria for TH will be transferred to a NICU for ongoing care, in line with the national service specification.
If the network NICU activity is such that the Level 3 unit at St George's Hospital which covers these units does not have capacity to accept the transfer, the baby may stay in the LNU if the following criteria are NOT present:

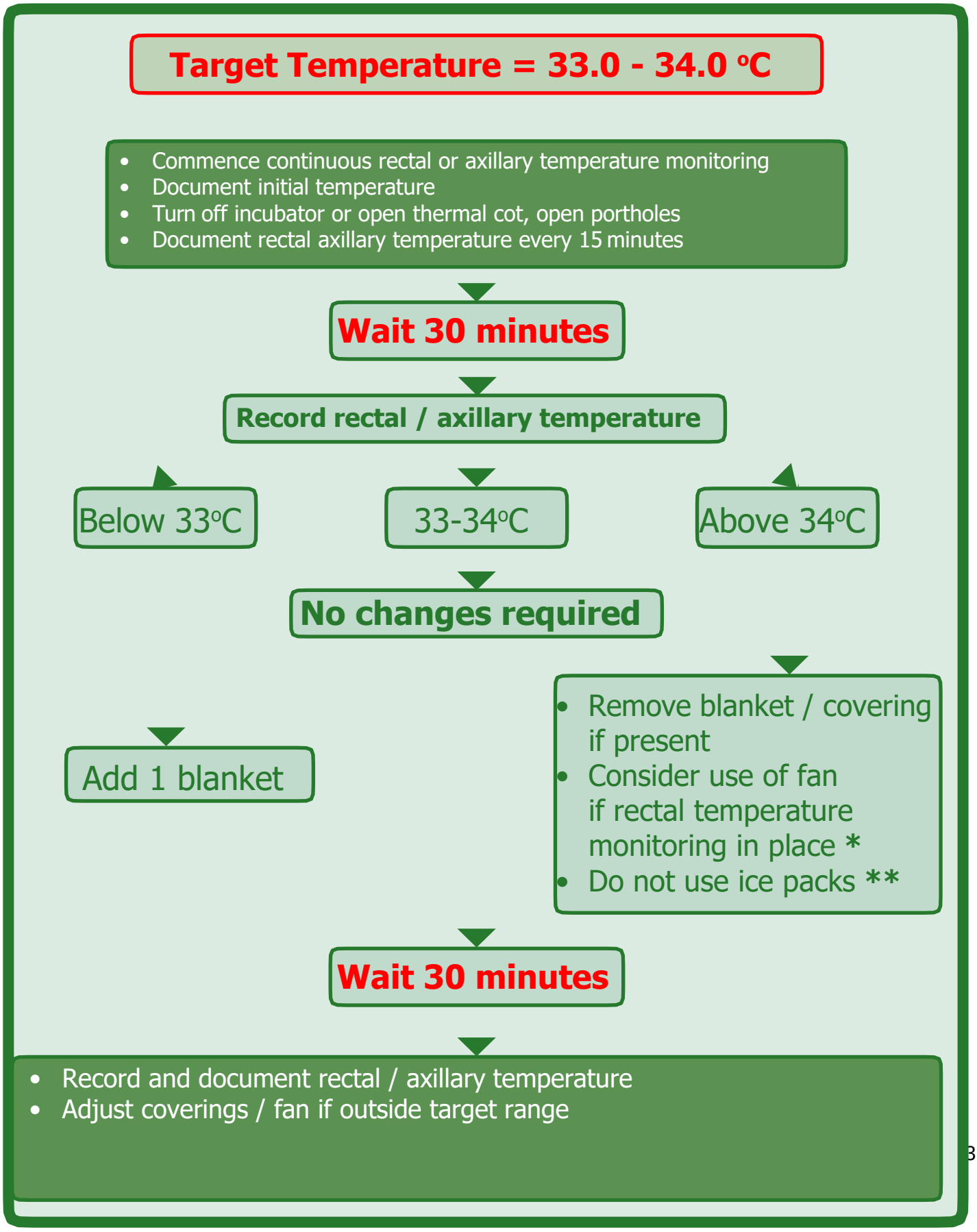
- Need for intubation and mechanical ventilation, likely to be required for more than 48 hours
- Persistent pulmonary hypertension
- Requirement for inotropic support
- Recurrent seizures (three or more, or not responsive to iv phenobarbitone)
- aEEG evidence of continuous seizures

A decision to keep the baby in the LNU and the discussion with the Level 3 unit must be clearly documented in the case notes**. This is an interim arrangement pending the outcome of a review of the national service specification for neonatal care currently in progress. If this exercise recommends that total body hypothermia should be a Level 3 activity, this guideline will be modified accordingly.**

Passive cooling protocol

A flow chart from the TOBY protocol is appended.
Passive cooling should not be commenced during resuscitation or on transfer to the neonatal unit from labour ward/theatre/A+E: Temperature should be monitored regularly during resuscitation and transfer. Both hypothermia (<36.5) and hyperthermia (>37.5) should be avoided during this time.

Appendix 1: Passive cooling - how to do it



* Active cooling with a fan should not be used unless rectal temperature monitoring is in place or advised by cooling center Consultant.

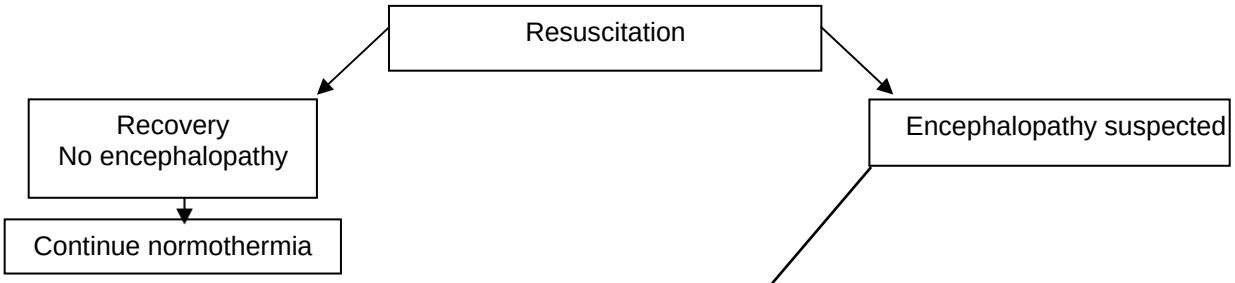
** Ice packs should not be used for cooling as these can result in severe hypothermia and skin damage.

Appendix 2

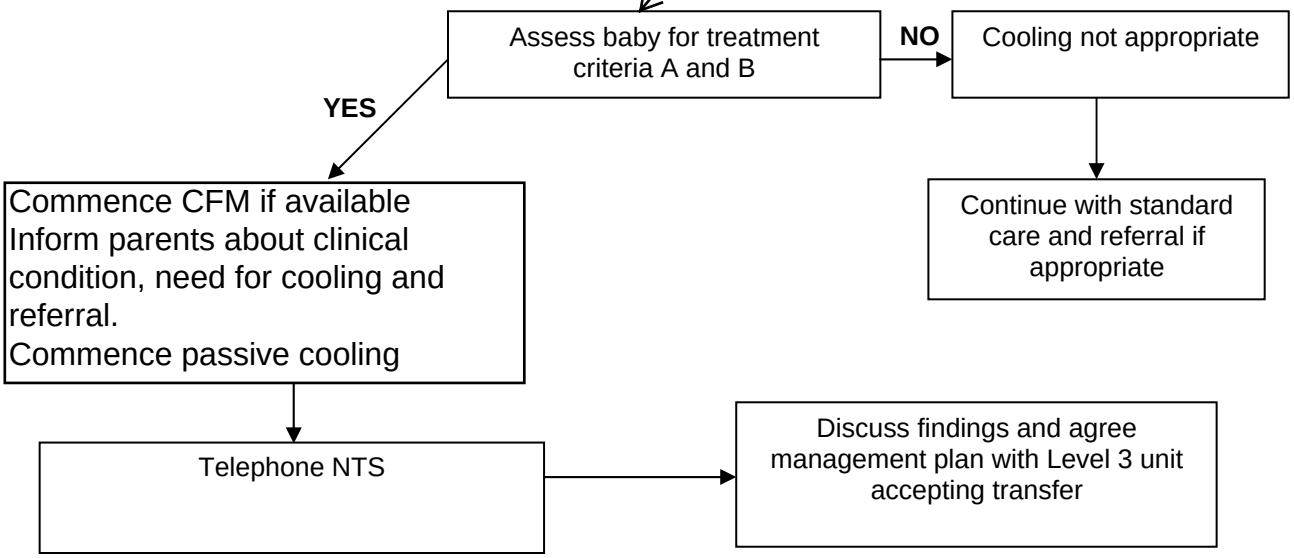
Referral of a Baby for Cooling Treatment
(≥ 36 completed weeks gestation)

Actions for Referring Hospitals not equipped to initiate cooling

Step 1 (birth to 1 hour of age)



Step 2 (1 - 6 hours of age)



While awaiting transport team:

- Keep parents informed about baby's condition
- Arrange <u>now</u> for mother to be transferred and give father information about how to get to the receiving NNU.
- Monitor vital signs, rectal / axillary temperature and manage baby's clinical condition
- Complete all documentation to accompany baby on transfer and transfer x-rays via IEP