

Scope:

This guideline is for medical, midwifery and nursing staff involved with the care of the newborn at and after delivery in hospital or in the community.

This guideline covers the principles of:

- Prevention of heat loss in the newborn
- Management of hypothermia
- Management of hyperthermia

Related UHL documents:

- Prevention and management of symptomatic or significant hypoglycaemia in neonates
- Resuscitation of the newborn infant at birth
- Transport process for preterm and term babies born in the community to Leicester Royal Infirmary
- Admission to the neonatal unit

Background:

Hypothermia is an important cause of morbidity and, occasionally, of mortality in the newborn. The effects of hyperthermia are less well-documented but equally important.

The main principle of thermal management in the newborn is the prevention of hypothermia by providing an optimal neutral thermal environment immediately after birth. With good management the incidence of severe adverse consequences is low.

Newborn babies are unable to regulate their body temperature as effectively as older individuals, and can only tolerate limited changes in environmental temperature. Most heat is lost in the first minutes after birth and this can result in falls in body temperature of 2-4°C or more.

This guideline has been informed by the World Health Organization document: Thermal Protection of the Newborn: a practical guide (see reference list at end).

2. Recommendations:

Key Points

1. Ensure the delivery room is appropriately warm
2. Dry and wrap the baby immediately using fresh, pre-warmed towels and a hat
3. Encourage skin-to-skin contact and breast feeding as soon after delivery as possible
4. Do not bathe for at least 6 hours after birth unless medically indicated
5. Use one or two layers of loose-fitting clothing and bedding for baby
6. Use a radiant heater if resuscitation is required
7. Ensure that baby is kept warm during transportation
8. Ensure that hypothermia is identified early and managed appropriately (see algorithm)

HYPOTHERMIA (Temperature <36°C)

Prevention of hypothermia: general principles

1. *Delivery room environment*

- For term babies, the delivery room should be at a temperature of at least 25-28°C free from draughts.
- For preterm or low birth weight babies, the temperature may need to be increased to 28-33 °C.
- Temperature should not be determined according to the comfort of adults present.
- Radiant heater, pre-warmed towels, blankets, hat and suitable clothes for the baby should be available.

2. *Immediate drying*

- If possible, deliver baby onto mother's abdomen (skin-to-skin contact).
- Dry baby immediately after delivery, including the head.
- Cover the baby with a, dry towel (discard wet towel) and hat.
- If the mother is in the birthing pool, keep baby submerged in the warm water (keeping head above water), maintain skin-to-skin contact, dry and cover exposed areas with warmed towels.

3. *Skin-to-skin contact*

- Cover baby with a warm hat and towel during skin-to-skin contact.
- If skin-to-skin is not achievable, wrap the baby in a warm hat and a dry

towel after being dried and place in mother's arms.

- In theatre or recovery, the ambient temperature is significantly cooler than usual birth rooms so particular attention must be paid to supporting thermoregulation.
- Uncover the baby as little as possible whilst examining.
- Baby can be kept in skin-to-skin contact with the mother during delivery of placenta, suturing of tears, during transfer to the postnatal ward and for the first hours after birth.
- Skin-to-skin contact may be used later to keep the baby warm if the room is cool or to re-warm a baby whose temperature is 36°C – 36.4°C. Baby's temperature must be monitored to ensure that it is returning to normal.

4. *Feeding*

- Begin as soon as possible after delivery, preferably within an hour.
- Early and adequate supply of breast milk provides the newborn with calories to generate body heat.

5. *Postpone bathing and weighing*

- Bathing the baby after delivery is not necessary (unless indicated in the prevention of blood borne infections), and can cause hypothermia.
- Vernix does not need to be dried off as it is harmless, may reduce heat loss and is reabsorbed through the skin during the first days of life.
- In a healthy baby with normal temperature, if cultural tradition demands bathing, do this preferably on the second or third day of life and definitely not before 6 hours of life.
- Bathing, if indicated, should be carried out in a warm room using warm water and baby dried and wrapped immediately.
- Where bathing is indicated ensure baby's condition is stable.

6. *Appropriate clothing and bedding*

- Clothing and bedding must be appropriate for the environmental temperature.
- Newborn babies need one or two more layers of clothes and bedding than adults.
- In the first hours after birth (at least until transfer to the ward and the second temperature taken; or until early transfer home), clothing should include a hat.
- Clothing and bedding should not be too tight, to allow air spaces between the layers.
- Discourage swaddling, as it excludes air, reduces the efficiency of heat retention and restricts movement.

7. *Warm transportation*

- Keep baby warm during transportation (hat and blanket).
- Skin-to-skin contact with the mother is often an appropriate way to transport the newborn from delivery suite to the postnatal ward.

8. *Warm resuscitation*

- If resuscitation is required keep the baby warm during this procedure.

- After resuscitation, if the baby is stable and does not require admission to the neonatal unit, take temperature and, if necessary, re-warm using skin-to-skin contact and breastfeeding where possible.

9. *Training and awareness:*

- Parents and carers should be given advice and information on how to maintain a healthy body temperature in newborns.
- This may be supplemented by the Department of Health leaflet “Reduce the risk of cot death: An easy guide”.

10. *Preterm (<30 weeks) babies*

- Require special management (See algorithm)
- Neonatal team should be present at the delivery

11. *Unexpected delivery in a hospital location other than Delivery Suite*

- Dry newborn and discard wet towels
- Wrap newborn in clean dry towels, wrapping the towel around baby’s, and leaving the face uncovered
- Keep newborn warm

Early identification of hypothermia

1. *Measure the baby’s axillary temperature*

- As soon as practical after birth and ideally within the first hour.
- At 2-3 hours of age / on admission to the postnatal ward

2. *Identify presence of risk factors for hypothermia*

- Unplanned homebirth
- Suboptimal labour room temperature
- Low pre-delivery maternal body temperature
- Inadequate measures to keep the baby warm before and during transportation
- Traditional birth practices such as sprinkling cold water on the newborn
- Bathing soon after delivery
- Use of anaesthetic or analgesic drugs during delivery
- Prematurity and/or low birth weight
- The need for resuscitation at birth
- Difficulty in maintaining an optimal thermal environment postnatally

3. *Where risk factors are identified, measure baby’s temperature 4 hourly until stable (2 appropriate temperatures 4 hours apart)*

4. Aim to maintain the baby's body temperature within the normal range of 36.5 °C -37.5 °C
5. Observe for signs of hypothermia
- Cool feet and / or cold skin all over the body
 - Reduced activity / lethargy
 - Poor suck
 - Weak cry
 - Bright red face and extremities (even in non white newborns)
 - Slow, shallow and irregular breathing
 - Slow heart beat
 - Respiratory distress

Management of hypothermia on delivery suite or the postnatal ward

Any infant whose temperature falls below 36.5 °C requires the midwife to observe for overt signs of infection.

These include:

- Rapid breathing (>60/min) or grunting
- Poor tone
- Lethargy
- Duskiness
- No/very poor feeding within past 4 hours

If these signs are present, refer the baby for assessment by the neonatal team

Follow algorithm for the management of the term or preterm baby as appropriate.

Management of hypothermia within the home environment

Refer the baby for admission to hospital if:

- Temperature falls below 36.0°C, refer for admission to hospital
- Overt signs of infection are present
 - These include:
 - Rapid breathing (>60/min) or grunting
 - Poor tone
 - Lethargy
 - Duskiness
 - No/very poor feeding within past 4 hours
- If there is no significant improvement in a baby who has a temperature of 36.0-36.4 °C despite restorative measures

If the temperature is 36.0-36.4 °C and the baby has no sign of infection:

- Room temperature of at least 25°C (slightly too warm for adults)
- Skin-to-skin contact in a warm room
- Replace cold clothes with warm clothes and hat
- Review environment
 - Ensure baby's cot is off the floor
 - Is there a draught?
 - What is the parents' understanding of warm environment (consider whether advice about reducing the risk of cot death may have been misinterpreted?)
- Continue feeding the baby to provide calories and fluid
- If the baby is too weak to feed admission to hospital should be arranged
- Assess baseline observations
- Continue re-warming until a normal temperature is reached
- Review the history for risk factors for hypothermia
- *If there is no significant improvement within one hour, refer for admission to hospital*

Referral pathway for hypothermic babies (following planned and unplanned homebirth):

- Transfer by emergency ambulance
- Admit to closest Delivery Suite
- Document all care in case notes which are to accompany the baby
- Complete incident form for unexpected admission
- Use TransWarmer mattress if available

Referral pathway (following postnatal visit):

- Transfer by emergency ambulance
- Admit to Children's Admissions Unit (CAU) or Paediatric Emergency Department
- Document all care in case notes which are to accompany the baby
- Complete incident form for unexpected admission
- Use TransWarmer mattress if available

HYPERTHERMIA (Temperature >37.5 °C)

Prevention of hyperthermia: general principles

Hyperthermia may occur as a result of the environment

- Leaving the baby under a radiant warmer or an incubator that is not functioning properly and/or checked regularly, or is exposed to the sun's rays
- Wrapping the baby in too many layers of clothes / bedding
- Leaving a baby in direct sunlight
- Leaving a baby in a parked car in hot weather
- Putting a newborn too close to a fire or heater
- Putting the baby close to a hot water bottle

Hyperthermia may also be a sign of underlying infection or other illness

Examples of signs to look out for are listed. If any of these signs are present in association with a high temperature, refer the baby for assessment by the neonatal team:

- Restless, crying baby
- Baby gradually becomes lethargic
- Rapid breathing
- Rapid heart rate
- Hot skin to touch
- Flushed face and extremities
- Shock, convulsions and coma can result in severe cases

Management of hyperthermia

- If temperature $>38^{\circ}\text{C}$ refer to neonatal team for further assessment and management plan.
- If temperature 37.5°C to 38°C :
 1. Assess baby for any signs of illness and refer to neonatal team if any concerns.
 2. Move baby away from source of heat, if necessary
 3. Undress baby partially or fully
 4. If the baby is in an incubator the air temperature should be lowered
 5. Baby should be fed more frequently to replace fluids
 6. If the baby cannot feed extra fluids should be given intravenously or by tube
- *If the baby's temperature does not return to the normal range within one hour, refer to the neonatal or paediatric team*
- *Where a baby's temperature has been measured as $>37.5^{\circ}\text{C}$, measure the temperature 4 hourly until stable within normal range (2 normal temperatures 4 hours apart)*

DOCUMENTATION

In babies identified as at risk of hypo- or hyperthermia, a plan for monitoring should be documented in the health care record and communicated to relevant health care professionals.

In babies requiring treatment for hypo- or hyperthermia, all actions taken, response and where appropriate further plan of care should be documented in the health care record.

Any discussion with the parents relating to the baby's condition should also be clearly documented.

HYPOTHERMIA IN TERM BABY (≥ 37 weeks)

Prior to delivery:
 Recommended appropriate delivery room temperature: 25°C to 28°C
 Ensure availability of pre-warmed towels, bedding and clothes for baby
 Deliver baby onto mother's abdomen where possible and allow to breast feed

Immediately after delivery:
 Remove wet towel
 Dry and wrap the baby using pre-warmed towels

Does the baby require resuscitation?

NO

YES

- Wrap baby in pre-warmed blankets and hat
- Place in skin to skin contact (cover mother and baby with pre warmed blanket)
- Offer feed within 1 hour of birth

- During resuscitation:**
- Dry and wrap baby
 - Use radiant warmer
 - Use warm towels & hat

Measure baby's axillary temperature:

- Ideally within 60 minutes of delivery
- At 2-3 hours of age if remains on delivery suite or on postnatal ward admission
- Continue 4 hourly measurements if risk factors for sepsis or hypothermia are present

Does the baby require NNU admission?

NO

YES

Temperature remains within normal range (36.5-37.5°C)

Temperature between 36.0 and 36.4°C

Temperature below 36.0°C

Use skin-to-skin contact to re-warm (cover mother and baby with pre-warmed blanket)

- Nurse baby in heated cot, under radiant heater or in incubator
- Refer to neonatal medical team for assessment and evaluation for sepsis or other pathology
- Consider admission to Neonatal Unit

Continuing thermal care:

- Do not bathe before 6 hours of age.
- Bathe and dry quickly in a warm room
- Dress with several layers of clothing in first few days of life

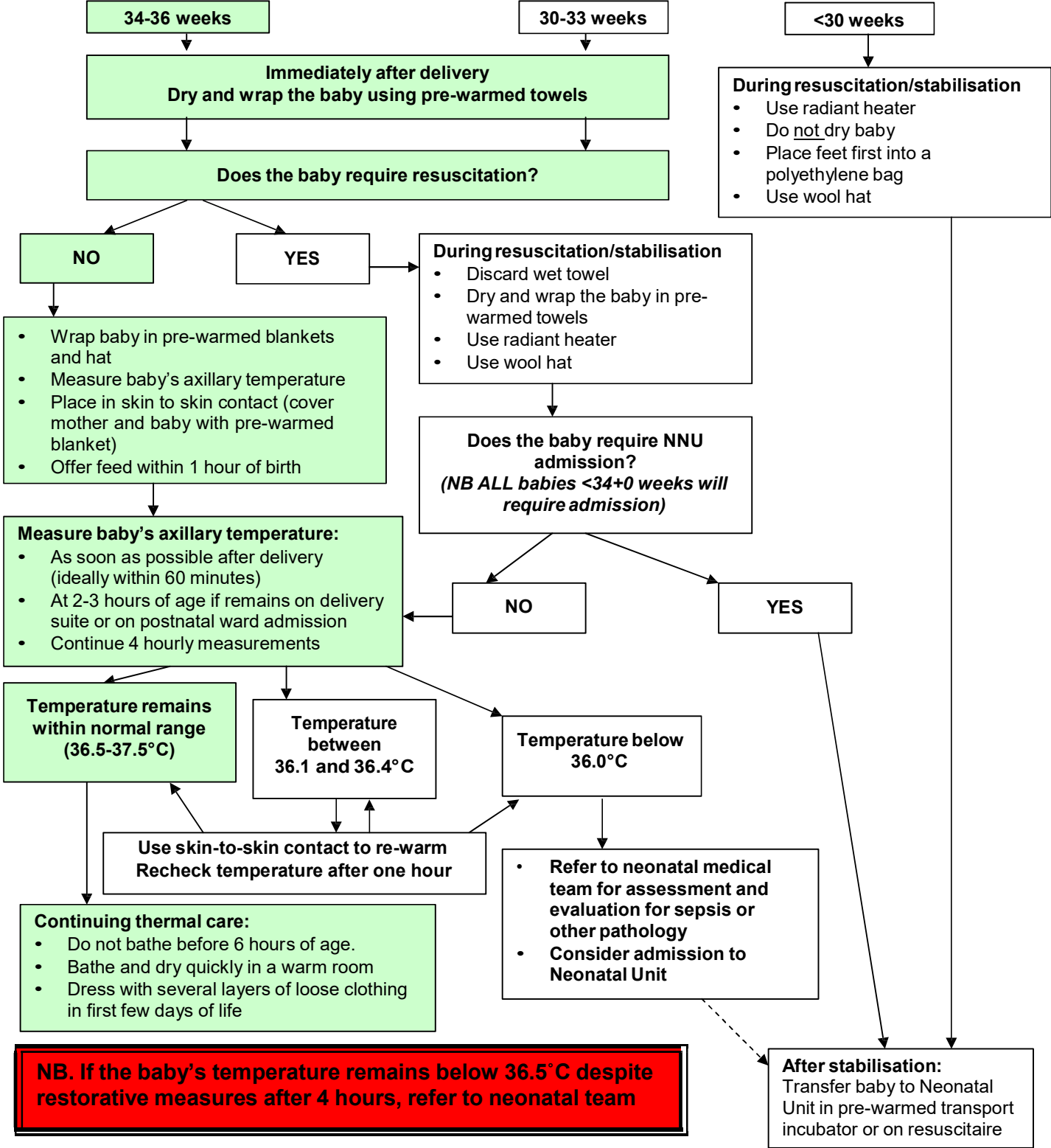
NB. If the baby's temperature remains below 36.5°C despite restorative measures after 4 hours, refer to neonatal team

After stabilisation:
 Transfer baby to Neonatal Unit in pre-warmed transport incubator or on resuscitaire

HYPOTHERMIA IN PRETERM BABY (<37 weeks)

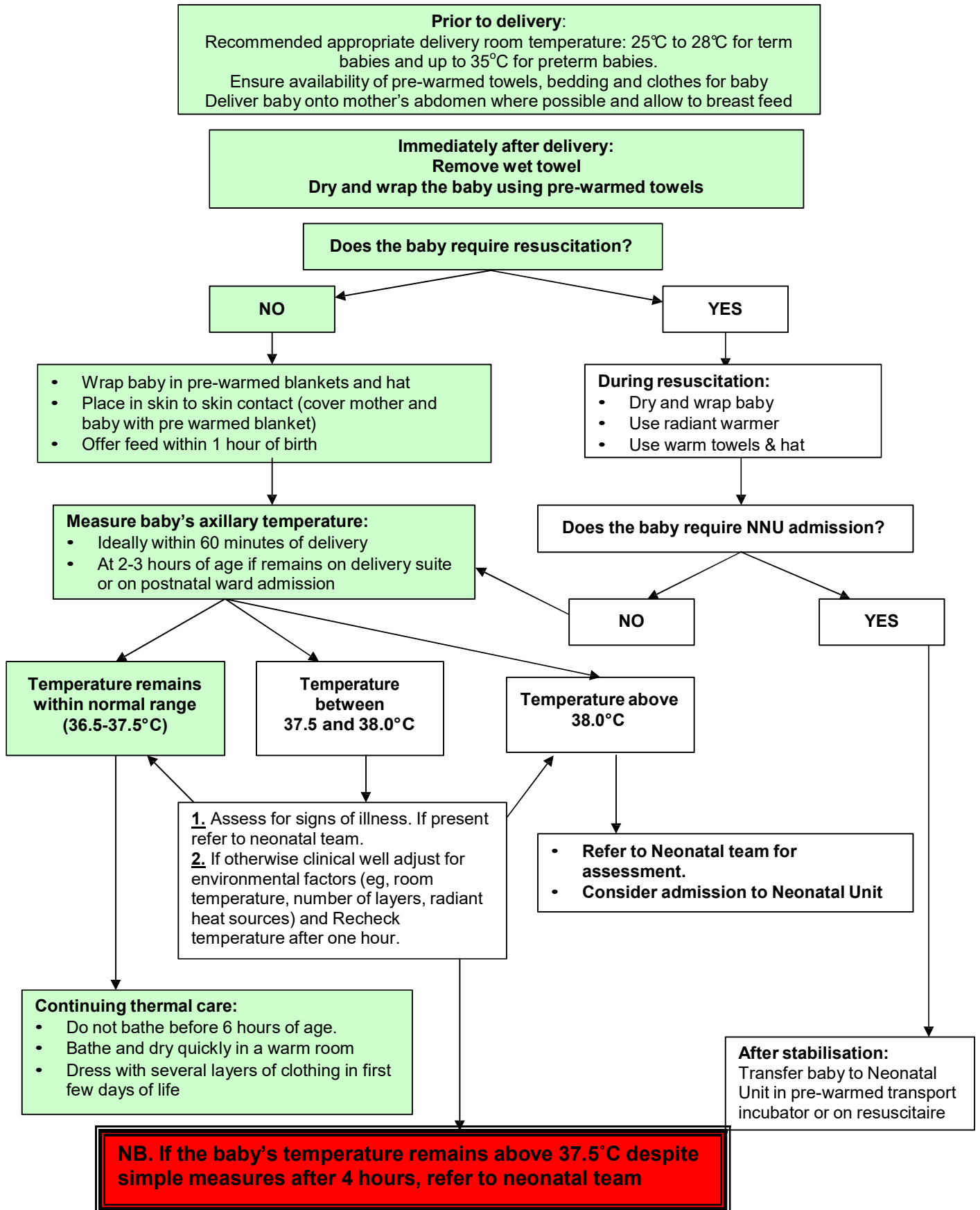
Prior to delivery:
 Recommended delivery room temperature is up to 35°C
 Ensure availability of pre-warmed towels, bedding and clothes for baby and polyethylene bag as appropriate

NB. All preterm babies are at increased risk of hypothermia



NB. If the baby's temperature remains below 36.5°C despite restorative measures after 4 hours, refer to neonatal team

Management of Hyperthermia (Temperature >37.5°C)



3. Education and Training:

None

4. References:

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5. Cheah F-C, Boo N-Y (2000) 'Risk factors associated with neonatal hypothermia during cleaning of newborn infants in labour rooms' *Journal of Tropical Pediatrics* 46:46-50.
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7. Takayama JI, Teng W, Uyemoto J, et al (2000) 'Body temperature of newborns: what is normal?' *Clinical Pediatrics* 39:503-510.
8. National Collaborating Centre for Primary Care (2006). *Postnatal care: routine postnatal care of women and their babies*. London: National Collaborating Centre for Primary Care

CONTACT AND REVIEW DETAILS	
Guideline Lead (Name and Title) E Tewley, Ward Manager , Labour Ward	Executive Lead C Fox
Details of Changes made during review: None	