British Association of Perinatal Medicine

# Early Postnatal Care of the Moderate-Late Preterm Infant
# A DRAFT Framework for Practice

## Contents

## Executive summary

1. Moderately preterm and late preterm infants are at increased risk of mortality and morbidity in the neonatal period and throughout later life and have different needs compared to infants born at full term.

2. Moderately preterm and late preterm infants require enhanced postnatal monitoring for the prevention, identification, and management of common morbidities including hypothermia, hypoglycaemia, jaundice and feeding difficulties.

3. Respiratory distress and infection are also more common in moderately preterm and late preterm infants.

4. Mothers of moderately preterm and late preterm infants should be encouraged to breastfeed, with additional support as necessary.

5. The initial setting for the care of moderately preterm and late preterm infants should be guided by gestational age, weight at birth and known risk factors.

6. Early discharge of late preterm infants before 24-48 hours is not advised, to allow effective feeding to be established.

7. Information should be provided to parents about common problems encountered by moderately preterm and late preterm infants in the neonatal period.

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# Introduction

## Definitions and terminology

### Gestational age

It is increasingly recognised that dichotomous definitions historically used for preterm (< 37 weeks of gestation) and term birth (≥ 37 weeks of gestation) are no longer appropriate. This reflects relatively recent evidence that risks associated with preterm birth form a continuum that extends from extremely preterm to full term birth[1,2].

For the purposes of this framework, the following definitions are used:

Very preterm: < $32^{+0}$ weeks of gestation
Moderately preterm: $32^{+0}$ – $33^{+6}$ weeks of gestation
Late preterm: $34^{+0}$ – $36^{+6}$ weeks of gestation
Early term: $37^{+0}$ – $38^{+6}$ weeks of gestation
Full term: $39^{+0}$ – $41^{+6}$ weeks of gestation
Post term: ≥ $42^{+0}$ weeks of gestation

### Categories of neonatal care

Terminology regarding categories of neonatal care throughout this document is in line with recommendations of the Neonatal Critical Care Minimum Data Set (NCCMDS) Expert Working Group and Neonatal Clinical Reference Group (CRG) New Healthcare Resource Groups (HRGs) 2016. *Special Care, Carer resident at cotside* and caring for baby will be referred to as Neonatal Transitional Care (NTC), and will use the definition proposed by the BAPM document "A Framework for Neonatal Transitional Care, October 2017". This states "NTC is care additional to normal infant care, provided in a postnatal clinical environment by the mother or an alternative resident carer, supported by appropriately trained healthcare professionals". (https://hubble-live-assets.s3.amazonaws.com/bapm/attachment/file/31/TC_Framework-20.10.17.pdf)

## Background

Babies born moderately preterm and late preterm have been poorly studied and their outcomes often assumed to be similar to those of more mature babies. Recent studies have, however, consistently highlighted increased adverse neonatal outcomes[3-8] and poorer long-term outcomes[9-12] in these groups, when compared with babies born at or beyond 37 weeks of gestation. Increased risks have also been demonstrated following early term birth compared with full term birth, but this is beyond the scope of this framework.

Common neonatal morbidities in moderate-late preterm babies include hypothermia, hypoglycaemia, jaundice and feeding difficulties[3]. Moderate-late preterm babies are also at higher risk of infection and of being investigated for sepsis[3,13] than those born at term, and there is an increased burden of respiratory disease[6,7,14-17]. Breast milk feeding rates are lower than in more mature babies and in some studies have been lower than rates in very preterm babies[18-23]. There are also substantial increased costs associated with the perinatal care for this group of infants[24].

Hospital emergency department attendances and readmissions to paediatric services are common in the first year of life, and particularly so in the first month after discharge from hospital following moderate-late preterm birth[25]. Longitudinal follow-up studies suggest that health, neurodevelopmental and educational outcomes are worse when compared to their full term counterparts[11,12,26-29].

The model for care of moderately preterm infants is reasonably clear, with recognition that these babies require at least Special Care (SC) because of their immaturity. However, this is not the case for late preterm babies, where there is little consensus or guidance. Anecdotal report and limited evidence from UK observational research suggest that practice is extremely variable[30]. In some centres, the majority of babies born at 34 – 36 weeks of gestation are admitted to a neonatal unit. In others, some babies born at 34 weeks of gestation and with low birth weight receive normal care (HRG definition, Appendix 1) on a postnatal ward, at least for a period of time. In the Late And Moderately preterm Birth Study (LAMBS), more than 80% of late preterm babies who were never admitted to a neonatal unit nevertheless received at least one review by a member of the neonatal medical team, with most of these reviews being for unanticipated problems or deterioration in condition[3]. In more than half of babies admitted to a neonatal unit, the decision to admit was taken more than two hours after birth, suggesting that expectations of the baby managing without additional support may sometimes be unrealistic. The impact of delaying neonatal unit admission in this way is not known, but raises concerns that a baby's condition may be suboptimal for a period of time before the need for additional support is recognised or acknowledged. Parental anxiety is raised during this period and there may be loss of confidence in the assessment of their baby's needs and wellbeing.

To date, no data are available from large randomised controlled trials for any aspect of care of late preterm infants and there is only limited information accessible to parents. There is also uncertainty among clinicians about whether routine follow-up in this group is desirable; this is not currently offered for the majority of late preterm infants.

In the absence of clear evidence-based guidance, it was agreed by the Executive Committee of the British Association of Perinatal Medicine that a multidisciplinary Working Group should be formed to develop a consensus-based Framework for Practice for the care of infants born at moderate-late preterm gestation.

## Scope of the framework

To consider and develop guidance for the following:

- Settings in which care for moderately preterm and late preterm infants may be optimally provided;
- Appropriate routine monitoring to reduce risks of common neonatal conditions (hypothermia, hypoglycaemia, jaundice, feeding difficulties, respiratory distress) associated with moderate-late preterm birth;
- Minimum level of care appropriate for late preterm infants;
- Supporting development and growth;
- Enhancing breastfeeding in late preterm infants;
- Appropriate discharge criteria and follow-up planning for late preterm infants;
- Post-discharge support for families of late preterm infants including liaison with community teams.

This Framework for Practice is intended to support and guide the management of babies born at $32^{+0}$ to $36^{+6}$ weeks of gestation who do **not** require medical intervention at birth and are well enough to remain with their mothers for normal care or NTC, or who require SC. Care of moderate-late preterm infants requiring neonatal intensive care interventions and those with more complex needs is beyond the scope of this document.

Evidence and data supporting the recommendations are detailed in section 3.

## Process

Members of the working group met to discuss the scope of the Framework for Practice and determine content to allow appropriate inclusion of key areas of practice for the management of infants born at 32 to 36 weeks of gestation. Members of the group then each undertook a literature search around specific topic areas. These topics were discussed using telephone conferences and email exchanges to agree the content of the framework based on published evidence where available and where evidence was sparse or conflicting, to agree practice points based on consensus.

# Management of Moderate-Late Preterm Infants

## Settings for the care of moderately preterm and late preterm babies

**Moderately preterm babies**

- Babies born at $32^{+0}$ - $33^{+6}$ weeks of gestation, where the pregnancy has been uncomplicated, may be delivered in any maternity unit with facilities to provide SC.
- Moderately preterm babies who do not meet the criteria for intensive or high dependency support should be admitted to a special care neonatal unit (SCU).

**Late preterm babies**

Wherever possible, mothers and babies should remain together in the postnatal period. However, decisions about the most appropriate setting for care should be guided by the baby's gestation and weight at birth.

- Babies born at $34^{+0}$ – $35^{+6}$ weeks of gestation with birth weight $\leq$1600g should normally be admitted to a neonatal unit for SC.
- Babies born at $34^{+0}$ – $35^{+6}$ weeks of gestation with birth weight >1600g should normally receive SC or NTC.
- Babies born at $36^{+0}$ – $36^{+6}$ weeks of gestation with birth weight >1600g and ≤2000g should normally receive NTC.
- Babies born at $36^{+0}$ – $36^{+6}$ weeks of gestation with a birth weight >2000g may be offered normal care with enhanced monitoring (Section 2.4) on a postnatal ward with the mother.

## Figure 1: Suggested settings for the initial care of moderate-late preterm babies

| Gestation at birth | Birth weight | Appropriate neonatal care |
|---|---|---|
| $32^{+0}$ - $33^{+6}$ weeks | Any | Special Care |
| $34^{+0}$ – $35^{+6}$ weeks | $\leq$1600g | Special Care |
| $34^{+0}$ – $35^{+6}$ weeks | >1600g | Special Care or Neonatal Transitional Care |
| $36^{+0}$ – $36^{+6}$ | 1600g – 2000g | Neonatal Transitional Care |
| $36^{+0}$ – $36^{+6}$ | >2000g | Normal Care with enhanced monitoring (See Section 2.4) |

## Parent counselling prior to anticipated delivery of a moderate-late preterm baby

Figure 2 below identifies the important points to be covered in antenatal conversations supporting families with an anticipated delivery of their baby either moderately or late preterm. This can be an extremely stressful time for families and requires excellent communication skills responsive to the needs of individual families. Information should be delivered in a variety of formats including parent leaflets (see Appendix 2 for suggested format), websites and other relevant online resources.

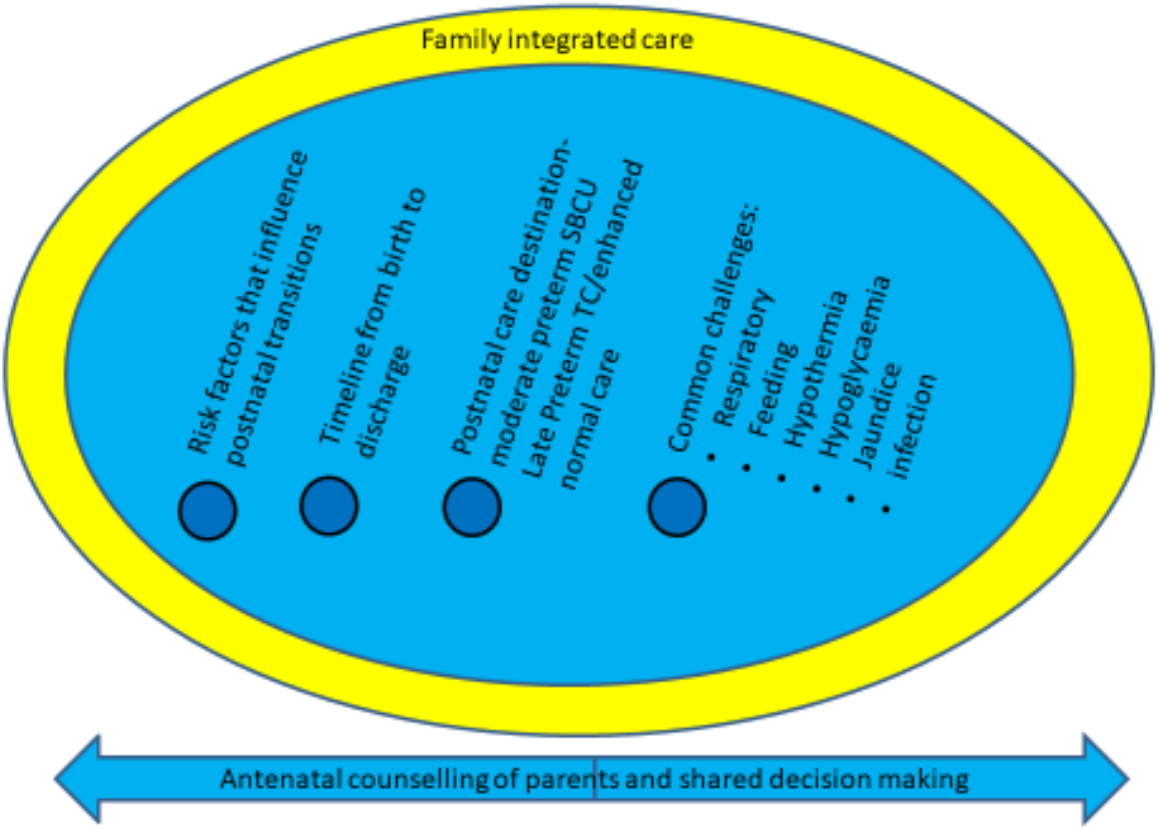



**Figure 2: Antenatal counselling of parents and shared decision making**

- Do not minimise the importance of being born moderate-late preterm when speaking to parents. Their baby is immature and the clinical course of babies born at 32-36 weeks of gestation is unpredictable and often different from those born at 37 weeks of gestation and above.
- For parents, the early birth may be unexpected and they may need emotional support. They may not be psychologically prepared for the birth of their baby or have all preparations in place at home for the new baby.
- Introduce the concept of family integrated care and reassure parents that they have a vital role to play in their baby's care and wellbeing post-delivery with the support from staff in the hospital.
- Discuss the importance of human milk and breastfeeding for preterm babies and encourage the mother to express breast milk early, ideally within two hours of birth.
- Explain the importance of establishing effective feeding before going home.

## Stabilisation and initial management of the moderate-late preterm infant

- Ensure that a member of the neonatal team is present at the delivery of any baby born between $32^{+0}$ and $35^{+6}$ weeks of gestation.
- Assess babies at birth according to Newborn Life Support (NLS) guidance.
- Ensure an appropriate thermal environment with no draughts. Ideally the ambient temperature of the room should be 25-28°C.
- Actively prevent heat loss: dry the baby thoroughly after birth and encourage skin-to skin contact with the baby's back covered with a warm blanket. Ensure the head is covered. Position the baby so that the face can be seen. Use warm towels on the weighing scales to minimise heat loss by conduction.

**Moderately preterm babies**

- If the baby's condition allows, enable parents to cuddle their baby and have skin-to-skin contact before transfer to the SCU.
- Remind parents of the benefits of breast milk for preterm babies and encourage the mother to begin expressing breast milk within two hours of birth; ensure that early and appropriate support is available.
- Transfer the baby to the SCU, ensuring attention to thermoregulatory care.
- Update parents:
    - Identify key people with whom the parents will interact, and explain their role
    - Explain key elements of unfamiliar terminology and acronyms in basic language.

Provision of ongoing care for moderately preterm babies during a SCU stay should be according to local guidelines.

**Late preterm infants**

- Place the baby in skin-to-skin contact with the mother after birth and cover with a warm blanket.
- Remind parents of the benefits of breast milk for preterm babies and encourage uninterrupted skin-to-skin contact, leading to a first breast feed within an hour of birth, but with ongoing observation to ensure the baby remains well during this time.
- If a baby does not feed, support the mother with expressing. Teach hand expressing in combination with double pumping. Give any colostrum obtained via a syringe.
- For mothers choosing to feed infant formula, this should be offered in skin-to-skin contact within an hour of birth.
- Any baby showing signs of illness or reluctance to feed will require further observations ± medical review.
- Decide on the most appropriate setting for the baby's ongoing care, based on the suggested criteria (Figure 1) and make appropriate arrangements for this.
- Explain to the parents where their baby will be cared for, and the reasons for this decision.

## Ongoing care

**Enhanced monitoring and minimum care and for late preterm babies receiving normal care on a postnatal ward**

- Identify maternal or fetal risk factors that may increase the risk of the baby developing common morbidities (see below – section 2.5).
- Monitor all late preterm babies fulfilling the criteria for care on a normal postnatal ward using a newborn early warning score (NEWTT or equivalent) to allow early detection of any deterioration.
- Encourage the baby's mother to provide basic newborn care, with midwives determining vital signs for calculation of early warning score(s).
- Deviation from normal should prompt timely review by a member of the neonatal team and, if appropriate, institution of NTC, SC or higher level of care.

**Enhanced monitoring should include:**

- Regular observation of colour, activity, temperature, heart rate and respiratory rate for the first 24 hours (NEWTT or equivalent).
- Thermoregulatory management.
- Monitoring of blood glucose and prevention of hypoglycaemia.
- Supporting the initiation of lactation and ongoing assessment of effective feeding using the UNICEF Baby Friendly expressing and breastfeeding assessment tools[31].
- Monitoring of serum bilirubin for babies with physiological jaundice.

**Information for parents of babies admitted to SCU**

- Discuss, in basic language, how their baby is monitored and the equipment being used.
    - Provide parent stories indicating "what it was like for us?" (1-2 stories that can add a personal view of what it is like to have a baby in SCU).
- Highlight facilities available for parents and explain local processes such as car-parking, places to eat or buy food, and any additional support available.
- Encourage and support parents to become partners in care, feed, provide skin-to-skin care, change and care for their baby for as much time as possible.
- Give effective and ongoing support to initiate expressing and the transition to breastfeeding as appropriate. Parents who choose to formula feed should be supported in this decision.
- Identify whom parents should ask if they have questions, and explain local resources available to them. Signpost reliable resources available to parents such as BLISS, TAMBA, relevant support groups etc.
- Provide ongoing information on the baby's condition and progress, updating the timeline of what to expect. More detailed information about milestones at this stage can help parents plan and understand.

**Planning discharge from SCU with the baby's parents**

- Begin discharge planning with parents well in advance.
- Consider facilities to enable parents to spend extended periods of time with their baby.
- When approaching the time for discharge home, ensure parents and families are well prepared:
    - Develop a feeding plan, agreed in partnership with the parents.
    - Explain any support that will be given, who can help, what to expect, things to prepare (for example, registering with the GP).

## Prevention, identification and management of common neonatal morbidities

The commonest morbidities in late preterm babies are hypothermia, hypoglycaemia and jaundice, which often occur together, and are all associated with immaturity of feeding and metabolic control[32,33]. There is also a substantial burden of respiratory disease among the moderate-late preterm population, and an increased risk of infection. It is important to identify risk factors that may put the baby at increased risk of morbidity (*e.g.* low birth weight, difficult delivery or delivery by caesarean section, maternal diabetes, maternal medication). Adopting a proactive approach will optimise successful feeding, minimise risk and make it more likely that mother and baby will remain together during the postnatal period.

### Hypothermia

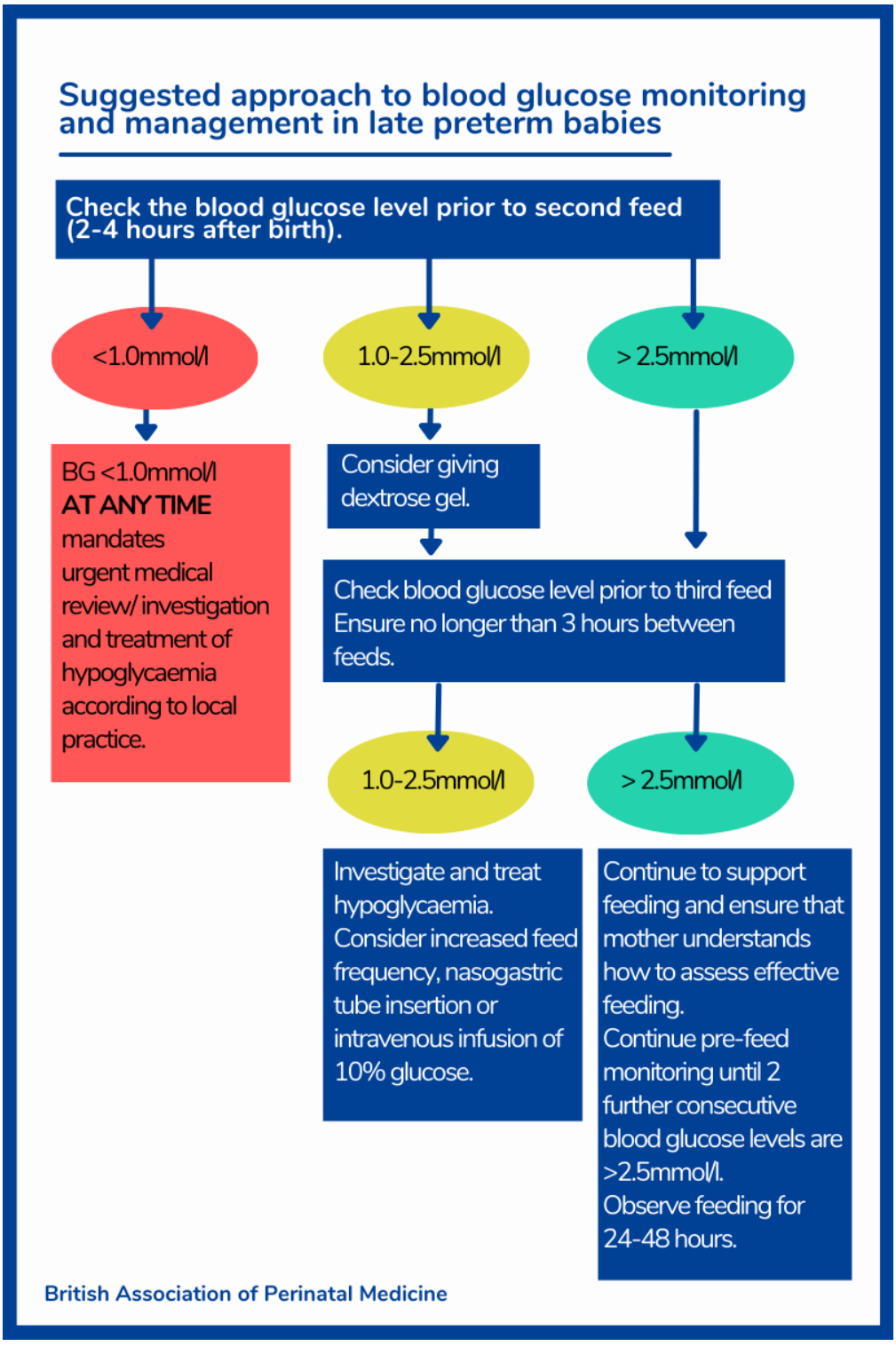
- Educate the baby's mother and family on the importance of a proactive approach to thermal management
    - In antenatal discussions, focus on the benefits of skin-to-skin contact and how skin-to-skin care is delivered (*e.g.* importance of covering the baby's back).
    - Babies may require an additional layer of light clothing or blanket.
    - If the baby's temperature falls below 36.5°C, consider the use of a radiant heater.
    - If the temperature falls below 36.0°C, despite attempts to warm, consider the possibility of sepsis, arrange medical review and admission to SCU.
    - At least 24 hours of normal temperature should be observed prior to discharge.
    - Delay bathing the baby until all observations and blood glucose are stable and within normal limits.

### Hypoglycaemia

- Develop a feeding plan
    - Support families to optimise lactation and the transition to breastfeeding or formula feeding as per the family's choice (Appendix A).
    - Instigate early feeding – within one hour of birth
    - Support responsive feeding with a modified approach (8-10 feeds per 24 hours).

- Monitor blood glucose levels:
    - Measure a blood glucose level before the second feed (2-4 hours after birth) to allow for the physiological nadir in the first 1-2 hours.
    - If the baby shows clinical signs suggestive of hypoglycaemia, measure the blood glucose immediately.
    - Normal blood sugar levels (>2.5mmol/l) should be consistently demonstrated over 24-48 hours prior to transfer to community care.
    - Early discharge before 24-48 hours is not advised. At least 24 hours of successful feeding should be observed prior to discharge.

## Figure 3. Suggested approach to blood glucose monitoring and management in late preterm babies



**Respiratory distress**

- Do not feed a baby enterally if there is significant respiratory distress.
- A baby with persistent or worsening respiratory distress (increased respiratory rate, increased work of breathing, grunting) requires immediate medical review, monitoring of oxygen saturation and admission to the neonatal unit (NNU).

**Infection**

- Identify any antenatal factors that may put a baby at increased risk of infection (*e.g*. maternal Group B streptococcal colonisation, chorioamnionitis, maternal fever, prolonged rupture of membranes, fetal tachycardia).
- Remember that decreased activity, temperature instability, hypoglycaemia, poor feeding and respiratory distress can all be early signs of infection.
- If the baby develops signs indicating possible infection, an urgent medical review is required.
- If infection is suspected, perform an infection screen (FBC, blood culture, CRP).
    - Consider chest x-ray, lumbar puncture and urine culture depending on history and presentation.
    - Start antibiotics while awaiting results of cultures, guided by local protocol.
- A baby who is unwell, has persistent signs of infection or does not respond to early management requires urgent admission to a NNU for observation ± further treatment.

**Jaundice in the late preterm infant; <28 days of age**

Throughout the neonatal period, ensuring adequate support to achieve effective feeding is important in preventing and minimising the risk of significant jaundice. Guidance from the National Institute for Health and Clinical Excellence 2010 should be followed[34].

- Assess for additional risk factors; where these are identified, observe carefully for signs of visible jaundice, and have a low threshold for testing.
- Examine the baby regularly for signs of jaundice in the first 72 hours after birth; an additional visual inspection by a healthcare professional during the first 48 hours is recommended.
- Interpret serum bilirubin (SBR) levels according to the baby's postnatal age in hours and manage hyperbilirubinaemia according to the appropriate table and the treatment threshold graphs for gestational age (NICE 2010) [35].

***Visible jaundice in the first 24 hours of life***

NB. Jaundice within 24 hours of life is identified as a non-red flag risk factor for sepsis, so have a low threshold for screening for infection

- Measure and record SBR within 2 hours.
- Exclude pathology as soon as possible, and within 6 hours.
- Continue to measure SBR 6 hourly until the level is both below the threshold and stable and/or falling.

***Visible jaundice in babies >24 hours old***

- Measure and record the bilirubin level within 6 hours in all babies more than 24 hours old with suspected or obvious jaundice, in accordance with NICE guidance.

***Measuring and monitoring bilirubin thresholds before and during phototherapy***

*Before starting phototherapy*

- In late preterm babies who are clinically well, >24 hours old, and whose SBR level is below the phototherapy threshold but within 50 micromol/l of the threshold, repeat SBR measurement within **12 hours.**
- In late preterm babies who are clinically well, >24 hours old, and whose SBR level is below the phototherapy threshold by more than 50 micromol/l, do not routinely repeat SBR measurement (NICE 2016).

*During phototherapy*

- Repeat SBR measurement 4–6 hours after initiating phototherapy.
- Repeat SBR measurement every 6–12 hours when level is stable or falling.

*Stopping phototherapy*

- Stop phototherapy once SBR has fallen to a level at least 50 micromol/l below the appropriate phototherapy threshold
- Check for rebound of significant hyperbilirubinaemia with a repeat serum bilirubin measurement 12–18 hours after stopping phototherapy. Babies do not necessarily need to remain in hospital for this.

***Pre-discharge Jaundice Screening and Follow-up.***

- Please refer to the flow chart concerning pre-discharge screening for jaundice in Appendix 4.

## Promoting development

We strongly recommend that moderate-late preterm infants are managed using the principles of family centred care, which has been shown to promote normal development[36]and is supported in the UK by Bliss[37] and internationally by UNICEF UK Baby Friendly Initiative (BFI)[38].

Ideally, care will be further developed using the principles of family integrated care (FICare), which supports parents becoming primary care givers in partnership with the clinical team. The introduction and development of this model require cultural change on the neonatal unit. [39,40]. Although not yet specifically evaluated in late preterm infants, evaluation of FICare in more preterm infants has been associated with improved weight gain, reduced parental stress and shorter length of hospital stay[41].

## Promoting growth

**Principles of growth monitoring**

- Ensure accurate measurements by trained personnel using standardised techniques.
- Obtain head circumference at birth unless the baby is clinically unstable and plot on a growth chart appropriate for the baby's gestational age. Ideally, the baby's length should also be recorded in the first 24 hours.
- Repeat weighing on day 3. Thereafter, weigh every 2-3 days, or more frequently if there are feeding concerns. Daily weight measurements are not necessary for most babies and may generate parental anxiety.

- Plot and review weekly measurements of head circumference, weight and length on an appropriate growth chart.
- Monitor growth (weight, length, head circumference) and feed intake at discharge, at term corrected age, and every 2-4 weeks after discharge until indices of growth are >-2 SD on an appropriate growth curve (*i.e.* corrected for prematurity) [43].
- A minority of late preterm babies may require additional specialist breastfeeding support and occasionally nutritional intervention.

**Supporting feeding**

- Ensure all staff caring for the late preterm infant are appropriately trained to understand the particular vulnerabilities of this group.
- Promote open, non-judgemental discussions with parents about choice of feeding and the approach to encouraging expression of colostrum. Be flexible and supportive of the parents' wishes, whilst ensuring they are aware of all the positive benefits of even a brief period of giving colostrum.
- If a baby is uncoordinated and not feeding effectively, offer naso-gastric feeds in preference to oral feeds by cup/syringe/bottle. A naso-gastric tube can be used while the baby is at the breast. Be ready to give top-up feeds by naso-gastric tube immediately following a breastfeed (expression from the previous feed). The UNICEF BFI neonatal breastfeeding assessment tool can be used with parents to guide top-up volumes as required.

## Safe discharge from hospital

**Discharge planning**

- Ideally, observe the baby for at least 24-48 hrs in a NTC setting.
- Assess baby and parenting skills. Develop a clear, written plan of care with the parents, which should be updated regularly and accompany the baby when discharged.
- Do not discharge a baby to the community until
    - the parents are confident with feeding
    - the baby's condition is stable
    - weight loss is less than 10% of birth weight and preferably being regained.
- Assess effectiveness of feeding using an assessment tool such as the BFI Feeding Assessment Tool[31].
- Provide easily understandable information leaflets for parents on discharge, informing them of what to expect with respect to the development and progress of their baby.
- Ensure appropriate liaison with community and primary care teams.

**Transfer of care to the community team at discharge**

- Ongoing care post discharge from hospital should be seamless with robust handover of care and sharing of information
- Give clear and concise information on handover to community staff about the vulnerability of the baby, potential need for prompt assessment and/or feeding support throughout at least the first 7 to 10 days to ensure adequate and effective feeding.
- Document all important aspects of neonatal care
    - Diagnosis of moderately preterm or late preterm birth
    - Identified factors (if any) that were thought to lead to the preterm birth
    - Delivery details and level of neonatal hospital care required
    - Clinical problems associated with preterm birth
    - Feeding competence and feeding plan

    - Weight recorded within 48 hours of discharge
- Provide a clear pathway for contact in case of problems (*e.g.* jaundice action plan) highlighting readmission criteria

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# Appendix 1: Supporting Evidence

**Settings for care of late preterm infants**

A variety of care settings including neonatal units, transitional care and postnatal wards currently exist and there is little evidence as to where optimal care is delivered. Well babies who are not expected to need medical input are usually cared for by midwives on a postnatal ward and are only reviewed by a medical practitioner if problems arise.

The New NCCMDS, Neonatal HRGs 2016 and Reference Costs A Guide for Clinicians[44] classified the babies described below as requiring "normal care":

- Gestational age at birth ≥$36^{+0}$ weeks AND birth weight ≥2 kg
- Birth weight <2 kg AND/OR gestational age ≥35 weeks, after first 48 hours of life
- Baby's gestational age 34 weeks, after first 7 days (168 hours) of life.

Keeping mothers and babies together has clear advantages, including improved maternal and infant bonding and easier facilitation of breastfeeding[45]. A national survey of admission practices for late preterm infants in England[30] found that for the majority of maternity units, care of some late preterm infants on the postnatal ward is possible and that, in addition to the maternal and baby benefits, this practice results in a significant cost saving. However, there is an increased need for postnatal support for these babies, including phototherapy, nasogastric feeding, intravenous antibiotic administration, temperature management and other regular monitoring. NTC enables the mother to care for her baby with support from health professionals, but practice varies across the UK. The BAPM has produced a Framework for Practice providing guidance about provision of NTC[46].

**Decisions around admission to a postnatal ward**

All infants at birth must have a carefully documented assessment of gestational age and birth weight. Antenatally, it is important to identify and highlight risk factors in either the mother or fetus that might put the baby at increased risk of problems during transition to extrauterine life or of common neonatal morbidities[47,48]. This should include history of maternal pre-pregnancy or gestational diabetes as risk factors for early respiratory disease, diabetes[49], chorioamnionitis, maternal fever in labour and maternal group B streptococcus and/or prolonged rupture of membranes as risk factors for early onset sepsis [50] maternal hypertensive disease, placental insufficiency or poor fetal growth and fetal compromise during labour, which are associated with common neonatal morbidities[51]. Administration of antenatal corticosteroids and antibiotics should be documented[52-55]. Late preterm infants on the postnatal ward should be carefully observed for successful adaptation, using a NEWTT chart or similar[56], in order to allow early identification of problems and appropriate escalation of care if necessary.

**Hypothermia in late preterm babies**

Late preterm babies are at risk for poor thermal, metabolic and cardiovascular adaptation to extra-uterine life[32] with less brown fat to metabolise and less white fat to provide thermal insulation. This is further exacerbated by physiological immaturity and lack of ability to self-regulate. Thermal instability can last from a few hours to several days after birth[58] . A proactive approach to support thermal stability in late preterm babies should be adopted, remembering that temperature instability can be an early sign of sepsis.

**Hypoglycaemia in late preterm babies**

Glucose is the primary substrate for cerebral metabolism[59,60]. Severe neonatal hypoglycaemia is associated with brain injury[61]. Late preterm babies have lower metabolic reserves of glycogen and this is further complicated by immaturity of liver enzymes resulting in difficulty mobilising glucose stores. Physiological immaturity is exacerbated by higher glucose utilisation and poorer suck-swallow coordination, and late preterm babies are 24 times more likely to develop hypoglycaemia than their term-born counterparts[62]. Symptoms of neonatal hypoglycaemia include irritability, jitteriness, increased heart and respiratory rates, poor feeding, change in consciousness, and seizures[60], but babies with very low blood glucose levels are frequently asymptomatic . Hypoglycaemia may be undetected in 25% of at-risk babies[63,64].

**Threshold for treatment of hypoglycaemia**

During transition to extra-uterine life, some reduction in blood glucose levels is physiological, but it is not known if normative reference ranges should be interpreted similarly in both low risk babies and those with risk factors. There is little consensus about 'normal' levels, or optimal management to avoid adverse neurological outcomes, but the most commonly used threshold for treatment has been 2.5 mmol/l. A survey of UK NNUs showed variation in hypoglycaemia management, but most reported using <2.6 mmol/l as a threshold for treatment[65]. Criteria for stopping monitoring also varied; 44% required three normal pre-feed levels, 46% required two pre-feed levels and others used clinical judgement or a fixed period of monitoring.

Established guidelines also vary. The American Academy of Pediatrics guidance for late preterm and term neonates recommends targeting 2.5 mmol/l before feeds in the first four hours after birth and different levels for treatment depending on postnatal age[59]. The BAPM "Identification and Management of Neonatal Hypoglycaemia in the Full Term Infant – A Framework for Practice"[66] recommends treatment for blood glucose levels of 1.0 mmol/l in any baby, 2.0 mmol/l in asymptomatic babies, and 2.5 mmol/l in symptomatic babies. Two blood glucose levels above 2.0 mmol/l are required to stop monitoring, but this guidance applies only to neonates above 37 weeks of gestation. The New Zealand CHYLD study of 528 babies above 35 weeks' gestation at risk of hypoglycaemia and treated to maintain blood glucose above 2.6 mmol/L found no association with adverse neurological outcomes at two years[63]. However, in the same cohort at 4.5 years, increased risk of poor executive and visual motor function was observed not only in children exposed to severe or recurrent hypoglycaemia, but also in those where hypoglycaemia had not been detected by usual monitoring[67]. A more recently published randomised controlled non-inferiority trial conducted in at-risk babies born at ≥35 weeks of gestation has reported no significant difference in cognitive and motor outcomes at 18 months of age between children who received treatment for neonatal hypoglycaemia at a threshold of 2.0 mmol/L compared with 2.6 mmol/L[131]. However, in this study only approximately 25% of included babies were born before 37 weeks of gestation and none at 34 weeks so it was inadequately powered to detect a difference in the late preterm group. In addition, while outcomes in other studies have also been acceptable at up to two years, later follow-up has consistently identified deficits in children who were hypoglycaemic[68,69], so longer term follow-up is probably needed.

No universally accepted recommendations currently exist for the prevention or management of hypoglycaemia in late preterm babies. However, given the additional vulnerability and immature counter-regulatory responses to hypoglycaemia associated with prematurity as well as the known poorer outcomes in late preterm babies compared with term born babies, it seems reasonable to adopt a more cautious threshold of 2.5 mmol/l as used in recent studies including both term and

late preterm babies.

**Use of dextrose gel in late preterm neonates**

Oral dextrose gel has been studied in a small number of late preterm babies. The Sugar Babies Trial, which used dextrose gel as treatment for hypoglycaemia recruited 90 late preterm babies, of whom 41 received dextrose gel[70]. In the later pre hPOD dose-finding study, 27 babies were late preterm, and of these only 21 had dextrose gel[71]. The recently published, hPOD multicentre randomised controlled trial of prophylactic dextrose gel sought to demonstrate a reduction in NICU admissions[72]. It failed to demonstrate this, but the study did show a reduction in the incidence of hypoglycaemia in babies at risk[73]. The majority of babies included in this study were infants of diabetic mothers, and only 7% were preterm babies born between 35 and 36 weeks of gestation. Within the hPOD trial the use of dextrose gel appeared to be safe and well tolerated in babies in the first hours of life who are at risk of hypoglycaemia. There are no data for the use of dextrose gel in babies of 34 weeks of gestation.

**Respiratory Distress**

Transient, mild respiratory distress is common following birth, and is related to transition of the baby from the intra-uterine to extra-uterine environment, and establishment of breathing in air. This usually settles within the first hour after birth, but in a substantial minority, respiratory compromise will persist and/or worsen, and symptoms will represent serious respiratory disease. These babies may show rapid and profound deterioration.

**Common neonatal respiratory problems**

Transient tachypnoea of the newborn (TTN) is a common condition in mature babies; unless signs disappear rapidly within an hour of birth, it is not possible to distinguish between TTN and other causes of respiratory distress, such as respiratory distress syndrome (RDS) and respiratory infections[5,76]. X-ray changes are often non-specific. Babies with suspected congenital or acquired pneumonia require prompt investigation and treatment with an appropriate antibiotic agent. The treatment for RDS is exogenous surfactant, which is most effective if given early in the course of the respiratory disease[74]. Lung maturity is often assumed in babies born closer to full term but RDS is commonly seen in moderately preterm and late preterm babies[5,17]. Indeed, RDS is the most frequent respiratory diagnosis in late preterm babies [7,75]. The disease can progress quickly and it is therefore important to consider the possibility of RDS in any late preterm infant with respiratory distress in order to ensure early and appropriate observation and treatment.

**Long term respiratory outcomes**

Mounting research evidence shows that significantly reduced lung function and clinically relevant respiratory disease is common in children born late preterm [10,77-80]. Infants are more likely to be admitted to hospital in the first year of life for bronchiolitis, respiratory infections and recurrent wheeze than infants born at full term, placing a significant burden on inpatient paediatric services[81]. All observational studies examining hospital admissions have demonstrated statistically significant increases in admissions for asthma and other respiratory problems in this group when compared with children born full term, and this effect persists at least until 18 years of age[81]. Studies have not

yet explored risks in later adulthood. Data are sparse, but there may be a relationship between severity of illness in the neonatal period and later respiratory disease, so early recognition and prompt treatment of respiratory disease may be important for long term respiratory health.

## Infection

Infection in neonates is important and results in significant mortality and morbidity. Early identification and treatment is paramount. Late preterm infants, in view of their immune system immaturity, are at increased risk for sepsis when compared with full term born infants. In addition, morbidities that are common in late preterm infants share signs that may be associated with serious infection. In a baby who develops hypothermia, hypoglycaemia, feeding difficulties or respiratory distress, it can often be challenging to rule out the presence of infection, without extensive and invasive investigation. Studies have shown that late preterm babies are disproportionately investigated for suspected early onset sepsis and exposed to antibiotics during the first few days after birth. While the presence of confirmed infection is extremely important[13], the yield of positive cultures in late preterm and term neonates is low[82,83]. Although there are multiple potential reasons for a low yield in positive blood cultures, this suggests that babies may be separated from their mother and subjected to investigation and treatment unnecessarily.

Practice and guidelines vary considerably at the international level[84]. NICE guidance for the prevention and treatment of neonatal sepsis was established in 2012 and updated recently[85]. While this national guideline is not specifically targeted at late preterm babies, the principles apply and it is appropriate to refer to and implement this guidance in local guidelines for the management of moderate-late preterm infants.

## Jaundice

Neonatal jaundice is a common and generally harmless condition that usually resolves without the need for any medical intervention or treatment[86],[87]. The most serious consequence of severe hyperbilirubinaemia is kernicterus, a chronic, irreversible neurological disorder characterised by dyskinetic cerebral palsy, auditory neuropathy, oculomotor impairments and dental enamel hypoplasia of the primary teeth[86,87].

Precise safe thresholds and length of exposure to unconjugated bilirubin are unknown and may be affected by genetic factors [86,88].

A review of claims related to neonatal hyperbilirubinemia made against the National Health Service (NHS) has recently been undertaken[86]. Twenty cases were reviewed, of which 25% included babies born between 34 and 36 weeks of gestation. Since late preterm births represent only 5-6% of all live births in England and Wales, this suggests increased risk of kernicterus[92]and concurs with 24% of all voluntarily reported cases of kernicterus (1992-2003) within a North American database being described as late preterm[91,93]. Both the cost implications to the NHS in settling these claims for damage due to kernicterus and the life-changing effects on both the child and their family justify focusing on the early identification and management of jaundice in late preterm babies [(86)] .

Jaundice presents more commonly in late preterm babies compared to their term counterparts, and the reasons for this are multifactorial[94]. Relative hepatic immaturity decreases enzymatic conjugation of bilirubin; other mechanisms that may affect late preterm babies include increased

volume of red cells with a shorter life span, and increased enterohepatic circulation[94,95,91]. Exclusively breastfed, late preterm infants are at particularly high risk of developing severe hyperbilirubinemia, especially those infants with feeding problems in whom poor enteral intake results in increased enterohepatic circulation [91].

Jaundice is the most common cause of re-admission to hospital from home for the neonate and disproportionately affects those born late preterm [96,97] [81,90,95]. Given the association between early (< 4 days) discharge and the need for hospital readmission for treatment of jaundice, careful pre-discharge assessment and screening for clinical jaundice and associated factors, such as adequacy of feeding in late preterm babies is advised[95].

Prompt recognition of risk factors for developing jaundice, in addition to regular visual assessments for signs of jaundice in late preterm infants by trained health professionals is critical to the early identification of neonatal jaundice, with the aim of improving outcomes and reducing the risk of the development of kernicterus in this vulnerable patient population.

**Observation and monitoring of late preterm babies**

While monitoring of otherwise well, moderately preterm babies should be carried out in a SC setting, late preterm babies are often able to be cared for with their mother in a postnatal ward or NTC setting. There are no UK standards specific to the monitoring of late preterm infants but it is recommended that, as a minimum, a newborn early warning score (NEWTT[56] or equivalent) should be feasible in all postnatal settings. Evaluation should include core temperature, blood glucose and vital signs. Infants should be wrapped, and core temperatures measured and documented. Bathing should await the establishment of a core body temperature of at least 36.5°C[98,99]. If babies have been assessed as stable enough to be admitted to a postnatal ward, close attention should be given to the thermal environment including room temperature, clothing and bedding. Help is also required to support breastfeeding.

**Promoting growth**

Late preterm babies who are not admitted to the neonatal unit are at greater risk of later hospital readmission, particularly if breastfed[100]. The challenges of breastfeeding the late preterm infant continue after discharge and families often need on-going support.

Late preterm babies have unique, and commonly unrecognised, medical vulnerabilities and nutritional needs that predispose them to greater rates of morbidity and hospital re-admissions[43]. The aims of nutritional support should therefore be the same as those for more immature preterm babies: to achieve a rate of growth and body composition equal to that of a fetus of the same gestational age, to maintain normal concentrations of blood and tissue nutrients, and to achieve a satisfactory functional development[101].

There is limited evidence for specific recommendations for late preterm babies, but standardised feeding guidelines have a positive impact on achievement of nutritional and growth milestones[102]. Feeding plans allow parents and maternity teams to give due consideration to, and compensate for, the immature suck of the late preterm infant and associated weaker lactation stimulation. In addition to good breastfeeding support, appropriate choice of formula if required, together with growth monitoring is essential to identify any problems in a timely fashion and instigate suitable intervention.

Further research is required to formalise the impact on long-term neurodevelopmental and behavioural outcomes in relation to nutritional intake and early and later growth in this cohort of babies.

**Nutritional requirements**
The nutritional requirements of late preterm babies are relatively greater than those of full term babies, especially in relation to energy, protein, calcium and phosphorus requirements. Similar intakes of essential nutrients to those of other preterm babies are recommended in light of a lack of data to suggest otherwise[43]. Babies who are small for gestational age are at greater risk of long term growth failure and will require particular attention[103].

The advantages of breastfeeding for late preterm babies appear to be even greater than those for term babies[43]. However rates of establishing breastfeeding for this group are even lower than those for very preterm babies. Emphasis should therefore be placed on adequate feeding support and tailored feeding plans to meet the needs of individual babies. Continue growth monitoring should help to guide use of fortifiers and supplements (if required) to meet the nutritional needs of individual babies.

**Human milk fortifiers and enriched formulas**
These are effective ways of addressing poor growth and early nutrient deficits. However their use should be limited to the period of poor feeding or poor growth and discontinued in a timely fashion in order to prevent overfeeding and accelerated growth velocity. A pragmatic approach would be to give babies born between 34 and 36 weeks of gestation human milk fortifiers/nutrient enriched preterm formula/ multivitamin supplementation including vitamin A and iron (at least 2mg/kg/day (ESPGHAN 2010)) if they are under 2kg at birth, and implement a close monitoring strategy to adjust supplementation according to growth.

**Vitamin D**
Current SACN (Scientific Advisory Committee Nutrition) recommendations for term babies are 8.5 – 10 micrograms (340 - 400 I.U.) per day[104]. There is no evidence to suggest that preterm babies require a greater amount than this. All predominantly breast fed babies should receive this; for formula fed babies sufficient vitamin D may be provided without additional supplementation.

**Post discharge**
Even if feeding is successful during hospitalisation, it is imperative to have close monitoring of growth following discharge from hospital of moderate-late preterm infants[43]. Monitoring should include weight, length and head circumference.

**Enhancing breastfeeding**
It is widely recognised that breastmilk is the optimal nutrition for all babies[105-108]. For preterm babies it brings additional benefits and is linked to a reduction in morbidity and mortality within this group[109]. This in turn is linked to shorter duration of stay in hospital, which is associated with a reduction in healthcare costs and less separation for families whose babies require care in a neonatal unit[110,111].

Breast milk provides protection against necrotising enterocolitis (NEC) and sepsis and is neuroprotective[109,112]. For mothers who breast feed, as well as the health benefits, providing breast milk can help with feelings of guilt and trauma which are often associated with preterm birth[22,113].

Despite this there are inconsistencies around knowledge of staff and the availability of mother centred effective support[114-116] Implementing the UNICEF Baby Friendly standards within maternity and neonatal services will help improve this through ensuring minimum standards are met to support families[31,38].

Effective antenatal conversations where possible with families who are thought to be at risk of having their baby early will empower them with the knowledge they need in the early days[117]. These should include the benefits of breastmilk and early expressing, the importance of early/prolonged skin contact and realistic expectations around feeding in the early days. A conversation tool for less experienced staff will ensure consistency around information provision. For families, an information sheet which reinforces what has been discussed may be helpful. This will support families to make a fully informed choice regarding feeding their baby. Where it is not possible to have this conversation antenatally then it should be as soon as possible after birth.

Babies who are born at moderate-late preterm gestation miss out on essential brain growth and development which normally takes place *in utero* during the last weeks of pregnancy. This means that they are often not developmentally ready to feed independently. They also struggle to maintain deep sleep/wake cycles, which results in them quickly tiring during feeding. This means the mother's breasts are not effectively emptied which can impact on supply[118]. The combination of maternal health and psychological factors which exist alongside preterm birth and can impact on milk production together with the physiological immaturity of a baby who is born preterm makes breastfeeding very challenging[20,22,119-121]. For mothers who have multiple births, the challenges of breastfeeding two or more late preterm babies are even greater[122]. Mothers of late preterm infants who have adequate support for breastfeeding during the hospital admission around birth, and who receive information on leaving hospital about available community breastfeeding support are more likely to continue breastfeeding after discharge [123].

**Skin contact and its role in supporting breastfeeding**

Skin to skin contact between a mother and baby as soon as possible after delivery and for extended spells has a huge impact on breastfeeding success in moderate-late preterm babies[124-127]. Maintaining closeness and minimising separation by rooming in with baby throughout their time in hospital is essential to support effective feeding and also has a positive impact on later mother-infant interaction [9,13,128,129]. For babies who are cared for in the neonatal unit every effort should be made to support parents to be with their baby for extended spells and overnight if they wish, to allow baby-led feeding to be established. Thought should be given to a place for parents to rest, food provision/access to kitchen facilities and support with travel and parking costs.

**Supporting lactation in a mother with a moderate/late preterm baby**

Mothers who deliver their baby before term have missed out of the later stages of breast maturation which prepare them for lactation[118]. Separation from their baby may result in high levels of anxiety in the mother which impacts on hormonal responses necessary for breastmilk production. If the baby is not feeding effectively enough to drain the breast this can also can compromise supply[118]. Establishing a milk supply and transitioning to the breast can be challenging for these mothers and needs effective, timely support[122,123]

**Discharge planning**

Availability of community healthcare practitioners with appropriate knowledge and skills to assess and provide for the care of the baby and support parents is likely to differ across regions. It is

therefore essential that the documentation provided at the time of discharge home is relevant and uses proven methods of effective communication to supplement verbal or informal contacts and targets all the relevant issues likely to be encountered by the community team. Staff to whom care is transferred at discharge may be from a range of backgrounds and have differing training and experience, *e.g*. neonatal outreach nursing/community neonatal team/community children's nursing/ community midwifery as well as the Health Visitor or Family Nurse. The level of knowledge and skills of members of each of these groups varies with local job plans and experience and the curriculum for each post may have contained limited detail about sequelae of prematurity. Numbers of preterm infants under the care of the primary care team will vary, as will training in preterm birth.

Moderately preterm and late preterm infants vary greatly in their ongoing health and developmental needs at the time they no longer require hospital care. They are more likely to be readmitted following discharge than term-born infants[25,130]. It is likely that readmission is sometimes is related to poor discharge planning and decision making, and this may sometimes be the case in babies with feeding difficulties or jaundice, particularly in babies who are first born and/or breast fed[23]. However, severe jaundice of later onset in late preterm infants may only be manifest after discharge. Jaundice is common in late preterm neonates and has consistently been found to be the most frequent reason for readmission to hospital in the first month of life. In many cases, this is due to the increased risk of difficulties in establishing breastfeeding in a late preterm baby, secondary to immature suck and swallow coordination, and a lower degree of wakefulness (6). Careful consideration of the timing of discharge is required, in addition to a detailed assessment of the overall wellbeing of the baby with adequate discharge follow up arranged[91,131]. Prior to discharge, the mother should feel confident in feeding her baby. Services should consider developing specific criteria for discharge following neonatal care, including liaison with outreach or community midwifery services for the late preterm infant. The community care provider should receive a copy of the transition/discharge summary from the in- hospital care provider.

***Suggested discharge criteria***

1. Stable weight with anticipated adequate weight gain
2. Stable baby-led feeding pattern.
3. Stable temperature with baby dressed in light clothing at normal room temperature.
5. Appropriate nutritional supplementation, where indicated
7. Written copy of discharge summary for parents.
8. Parent confidence with baby care and feeding.
9. Review of medications with parents.
10. Home environment evaluation and availability of community support services.
11. Community-based assessment within 48 h of discharge.

**Follow-up**

Moderate-late preterm birth carries a risk of adverse longer term outcomes that may be helped by timely recognition and intervention. It is the responsibility of the healthcare team to ensure that relevant information is shared with parents and, with their consent, with the services that will play a role in their child's development and learning as well as their physical and mental health and wellbeing.

Parents vary in their willingness to consider long term outcomes for their baby when they are first discharged home but they and their child have a right to relevant information and access to reliable advice, support and appropriate services. Provision of early years services may vary with locality and so it is helpful to include a 'person centred' as well as family integrated plan for the longer term care of infants at the time of handover to Primary Care and community services. This should include any plan for hospital based review as well as who is responsible and available for advice if required.

For infants who have identified ongoing medical problems at the time of hospital discharge, there will be individual plans for local or specialist follow up. However, most infants are well at the time of discharge home. Long term medical follow up of all moderate-late preterm infants is currently not routine practice and would be a significant logistic and financial challenge for healthcare services. For those who are thriving and achieving predicted developmental progress according to standard community health surveillance, it is probably not necessary. 'Correcting for prematurity' is useful for early growth chart monitoring in the first year, and parents should be helped to understand this concept. Developmental assessment should be individualised to encompass the specific need to identify any early signs of sensory processing difficulties and potential need for early intervention.

For any moderate-late preterm infant displaying concerning delay in growth, motor or cognitive development, behavioural, communication or education issues, these should be noted early and discussed with the parents in order that prompt and appropriate referral can be made for further assessment and intervention if required.

# Appendix 2: Supporting Breastfeeding

Provide information for the family to allow them to recognise feeding difficulties using the UNICEF baby friendly expressing/effective breastfeeding assessment tools.

https://www.unicef.org.uk/babyfriendly/wp-content/uploads/sites/2/2016/10/Assessment-of-breastmilk-expression-checklist-2017.pdf

https://www.unicef.org.uk/babyfriendly/wp-content/uploads/sites/2/2016/10/mothers_breastfeeding_checklist.pdf

- Ensure early feeding
    - Support skin to skin contact to encourage early attachment at the breast within an hour of delivery where there is no respiratory distress
    - Where early skin-to-skin contact is not possible or the baby does not attach at the breast, encourage early expressing by hand and pump giving any colostrum obtained to the baby.
    - For women who choose to formula feed, offer 10-15ml/kg within one hour of birth.
    - Help the mother with recognition of early feeding cues (rapid eye movements under the eyelids, mouth and tongue movements, body movements and sounds, sucking on a fist) and signs of effective attachment, including appropriate urine and stool output. Reassure her that it is normal for these signs to be delayed or absent in a preterm baby, and that babies may need waking for feeds.

## Promoting and enhancing breastfeeding

***For all mothers***

- Ensure all staff caring for the late preterm infant are appropriately trained to understand the particular vulnerabilities of this group.
- Ensure all staff have the knowledge and skills to assist mothers to fully and exclusively breastfeed their babies.
- Make information available to parents about benefits of colostrum, breastfeeding and skin to skin contact, and the needs of this gestational age group, prior to the birth if possible, and also after birth.
- Ensure that parents are made aware colostrum is present from birth, but that it will take 3 to 4 days to increase breast milk quantity following birth. Some babies may require supplementation donor expressed breast milk or infant formula during this transition.
- Promote open, non-judgemental discussions with parents about choice of feeding and the approach to encouraging expression of colostrum. Be flexible and supportive of the parents' wishes, whilst ensuring they are aware of all the positive benefits of even a brief period of giving colostrum.
- At birth, if both mother and baby are well and stable, encourage skin to skin care in a semi-upright position for as long as possible (at least an hour). Allow the baby to find the way to the breast and feed within the first hour. If circumstances prevent this, offer it as soon as

possible, and repeat at regular intervals, particularly prior to expressing.

- Encourage mothers to feed babies responsively in a modified way, observing for stress cues, and ensuring at least 8 feeds per 24 hour period.
- Promote careful observation of breastfeeding by appropriately trained staff, who can also check the mother's breasts, nipples and baby's latch to detect deviations from normal that may need extra care and support.
- Encourage breastfeeding to continue up to 6 months' postnatal age, before offering solids along with breastfeeding up to at least 12 months of age, and then for as long as the baby wishes.

### *Supporting expression of breast milk where needed*

- Begin hand expression of colostrum when the baby is nuzzling the breast or whilst the mother is cuddling or sitting beside the baby
- Encourage the mother to repeat hand expression at least 8-10 times a day, including at least once at night following birth. The mother can also use an electric pump to commence expression of milk.
- Stimulation of the breast regularly (8-10 times/24 hours) during the first 10-14 days has been shown to increase the mother's milk production significantly, as has dual pumping.
- Massaging and compressing the breast whilst the baby is feeding helps increase the amount of milk transferred to the baby, and improves supply.
- As a mother becomes more skilled, expressing from the second breast whilst feeding may help increase milk production and reduce the time taken for each feed.
- If a baby is uncoordinated and not feeding effectively, offer naso-gastric feeds in preference to oral feeds by cup/syringe/bottle. A naso-gastic tube can be used while the baby is at the breast. Be ready to give top-up feeds by naso-gastric tube immediately following a breastfeed (expression from the previous feed). The UNICEF BFI neonatal breastfeeding assessment tool can be used with parents to guide top-up volumes as required.
- As the baby grows, sucking and coordination should improve, so that expression and supplementation will be needed less frequently, with the aim of full and exclusive breastfeeding.

# Appendix 3 – Parents' Guide

**Example of a parents' guide from NHS Greater Glasgow and Clyde**

**A Parent's Guide to Their New Baby Born a Little Early**

**Congratulations on the birth of your baby.**
As your baby was born a little earlier than you may have expected (between 34 and 37 weeks) we call your baby "a late preterm baby". A baby is called a term birth if they are born after 37 weeks. Every year in the UK many babies are born a little early just like your baby. It is important for you as a parent to understand why your baby has slightly different care needs.
Babies who were born "late preterm" need a bit more time in hospital as they are not quite as ready for home as babies born after 37 weeks. Usually they need to stay in hospital for 4-6 days after their birth.

We hope to keep you and your baby together in the same ward during your time in hospital. As your baby is a "late preterm" baby the Doctor on the wards will review your baby every day.
This leaflet will explain the extra care that your baby needs and why the Doctors and Midwives caring for your baby will be looking at certain things at each review such as:
• Keeping your baby warm
• Monitoring blood sugar levels
• Jaundice
• Feeding Support, and
• Letting you know what care you can expect for your baby, whether your baby is a single baby or a twin or triplet.

**Keeping Your Baby Warm**
Your baby may find it more difficult to keep themselves warm. In the Labour Ward we keep the rooms as warm as possible and use warm towels to dry your baby after their birth.
You can help your baby keep warm by "Skin-to-Skin" contact. This is where, your baby lies against you, naked apart from a nappy and a hat, next to your chest. This is a fantastic way to keep your baby cosy!

We may initially care for your baby in a heated cot, either on the Labour Ward or on the Postnatal Ward. Your baby will stay in one of these cots until their body temperature is stable and we can nurse them in a standard cot. This can take several days as we need to slowly lower the temperature of the heated cot. Doctors and Midwives will look at this every day.

**Monitoring of Blood Sugar**
Babies born a little early do not have the same stores of sugar at the time of their birth to keep their blood sugar steady in the first hours after birth. Therefore, it is important to monitor sugar levels after birth if your baby is born less than 36 weeks or weighs less than 2.5kg (5.5lbs).
Keeping babies warm helps keep sugar levels in the normal range.
We monitor your baby's sugar levels using heel-prick blood tests. If needed, we do this just before your baby's second feed, and we record this in your baby's medical notes. If sugar levels drop lower than what we aim for, the Doctors or Midwife will explain if your baby needs extra feeds.
If the sugar level drops lower despite extra feeds then a small number of babies will need to be admitted to the Neonatal Unit (for more specialised care). We aim to avoid this if at all possible.

**Jaundice**

Jaundice (yellowing of the skin and whites of the eyes) is common in all babies but is even more common in babies born a few weeks early. Jaundice after birth is only a short-term problem and your baby will not have any liver problems or be prone to jaundice in the long term.
Medical staff will monitor your baby for jaundice using a monitor against your baby's skin called a "Bilimeter" or by blood tests. We check the blood tests every 18-24hours.
Your baby might need treatment with phototherapy (a blue coloured light), which helps the body clear the jaundice. Phototherapy can be in the form of a blanket that your baby lies on, or sometimes your baby may lie under an overhead light. It can be frustrating having your baby on phototherapy but it is important to keep them on the mattress or under the light as much as possible to allow the jaundice level to come down.
Your baby will have a further blood test called a "rebound" level, 8-12 hours after we stop the phototherapy. This is to check that the level of jaundice stays low enough for your baby to go home.
After your baby goes home the community midwives will visit you both to monitor the jaundice.
Sometimes "late preterm" babies need to be re-admitted to hospital for phototherapy if the jaundice level rises again.

**Feeding support**
Late preterm babies are often a little sleepy and can be more difficult to feed. Keeping them warm and their sugar levels normal improves feeding.
The breastfeeding support team and midwives on the ward will help you to position and attach if you are breastfeeding and show you how to use a pump as almost all late preterm babies need a combination of breast feeds and some extra top-ups of expressed breast milk in the first days and weeks. If you are expressing breast milk then you should do this 8-10 times in 24-hours to help develop a good milk supply. It is important to begin expressing breast milk as soon as you can after birth, preferably within the first two hours but no longer than six hours after delivery. We often make a feeding plan with your input to help you know whether your baby is getting the correct amount of milk.
We will encourage you to offer your baby a feed in response to your baby's feeding cues. However your baby may not wake for feeds and it is important that your baby has 8-10 feeds in 24 hours. Your baby should be fed at least 3 hourly and you may need to wake your baby for feeds.
Looking at your baby's nappies will allow you to tell how well feeding is going. Around the ward there are posters, which will guide you as to what to expect. In the first day or so there will only be one or two wet and dirty nappies, which will increase over the next few days. Please ask staff for help if you are worried about how your baby is feeding.

**Review Before Going Home**
The Doctors on the wards will review your baby every day.
From experience we know the average length of stay on the wards for babies born a few weeks early is 4-6 days, therefore your baby cannot go home after 6 hours.
All babies are expected to lose some weight after birth and babies are normally weighed at 60 hours and more often if needed. A Senior Doctor will confirm if your late preterm baby is ready for home.
Your late preterm baby will be ready for home:
• If they have a stable temperature outside of a hot cot
• If they are feeding well (and have a feeding plan if needed)
• If they are not jaundiced and are otherwise well
Your baby will have a discharge check before going home.
Before going home, we will give the Community Midwifery staff a summary of the care your baby has had whilst in hospital. The Community Midwife will visit you and your baby at home to make sure that all is going well. After 2 weeks they will hand over this information to your Health Visitor.

**The First Few Days at Home**

Your baby is still different to a term baby. You should continue to feed your baby responsively, leaving no more than 3 hours between feeds and if we have given you a feeding plan please continue with this until your Community Midwife or Health Visitor advises you to change.
If you have any questions please ask the staff.

## Appendix 4 – Flowchart