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1. Introduction

Throughout this guideline, the word 'mother/s' is used to describe the birthing and / or lactating parent. The term breastfeeding is used but it is recognised other terminology including chest feeding may be preferred by parents. This should be discussed with families to ensure language used by professionals is inclusive.

Early enteral feeding promotes the functional adaptation of the immature gastrointestinal tract. Gastrointestinal hormone secretion and motility are stimulated by enteral milk and delayed enteral nutrition may result in consequent intestinal dysmotility. This can result in longer periods on parenteral nutrition. Enteral nutrition has been recognised as linked with short-term morbidity and long-term neurodevelopment outcomes [(1)]. There is robust evidence that feeding maternal colostrum and breast milk is protective for necrotising enterocolitis (NEC), sepsis, retinopathy and reduced ventilator associated pneumonia. Emphasis on early positive oral experiences commencing with buccal colostrum, non nutritive sucking and skin to skin improves the transition from tube to oral feeding.

1.1 Aim of Enteral feeding:

- Achieve growth and nutrient accretion similar to intrauterine rates
- Meet nutritional requirements of the preterm infant
- Prevent feeding-related morbidities including the prevention of necrotising enterocolitis
- Promote positive transition from tube to suck feeding
- Best possible long-term outcomes including neurodevelopmental outcome

1.2 Purpose

The purpose of this guideline is to provide a consistent standardised clinical approach to enteral feeding, nutrition and growth in new-born preterm and sick babies across the North West Neonatal Operational Delivery Network (NWNODN).
This guideline is designed to be used in conjunction with individual clinical assessment for decisions regarding feeding in preterm infants.

1.3 Family Integrated Care (FiCare)

It is vital that parents are central to the care of their baby, taking an active lead role in all cares. Early feeding experiences together validate the feelings of being a parent. This will have a key impact on the establishment of breast feeding and long-term feeding outcomes. FiCare is integral to the development of feeding skills and establishment of oral feeding.

1.4 MDT/AHP

The family and baby should be supported by a full multi-disciplinary team including:

- Infant feeding leads
- Speech & Language Therapist
- Lactation Specialist
- Dietitian
- Nurses
- Medical team
- Occupational Therapist

A weekly MDT Nutrition Ward round is recommended to monitor feeding and growth.

2. Nutritional requirements of the Preterm Infant

Preterm nutritional requirements summarised below are evidence-based estimations [2, 3].

Nutrient	Preterm Infant (ESPGHAN 2022) (2)	Term infant
Energy (kcal/kg)	115 – 140 (- 160)	96 – 120
Protein (g/kg)	3.5 – 4.0 (- 4.5)	2.1
Sodium (mmol/kg)	3.0 - 5.0 (- 8.0)	1.9
Calcium (mmol/kg)	3.0 – 5.0	13.1
Phosphorus (mmol/kg)	2.2 - 3.7	13.1
Vitamin A (microgram/kg)	400 – 1000	350
Vitamin D (microgram)	10 - 17.5 /kg/day	8.5
Iron (mg)	2.0 - 3.0 (- 6.0)	1.3

3. Early pre-feeding experiences

3.1 Skin to skin

- Supporting early skin to skin is key to the development of feeding skills and infant behaviour [4]
- Supporting parents to have skin to skin during tube feeds encourages baby to explore the breast
- Supports the baby's experience at the breast; nuzzling, licking, smell, taste and touch before any expectation of milk transfer

3.2 Buccal colostrum and mouthcare

- Early colostrum should be given ideally within 6 hours of birth or as soon as available [5]
- Gives baby positive oral experience and exposure to taste and smell and this should be continued
- Mother's own breast milk (MEBM) to be the first enteral feed given to baby, whenever possible
- Provision of early colostrum to a baby is dependent on getting expressed colostrum to the neonatal unit and administered to the baby
- Buccal colostrum can reduce time to full enteral feeds, reduce oxygen therapy and prevent ventilator associated pneumonia [6]
- Buccal colostrum contains immunological and inflammatory properties
- Skin to skin contact, oral colostrum and mouth care enable the baby to experience positive multi-sensory experiences which supports the early feeding journey and transition to suck feeds

3.3 Non-Nutritive Sucking (NNS)

- NNS provides the opportunity for sucking practice as well as promoting positive oral experiences alongside satiety during tube feeding [4, 7]
- Gastric tubes should be placed in nose to support full range of tongue and lip movements required for oral feeding [8]
- Encourage parents to promote NNS at recently expressed breast or dummy and provide information as guidance to the benefits of NNS [9]

4. Probiotics

Probiotics may have benefits for preterm infants to reduce morbidity and mortality, mainly reducing the rates of NEC and sepsis [10, 11]. Only a limited number of strains have shown preliminary potential effectiveness. There is currently insufficient high-quality evidence to recommend one probiotic over the other and you will find the probiotics currently available within the UK in the appendix [11]. (See Appendix 1).

4.1 Indications for use:

- <32 weeks
- <1500g and <37 weeks
- Commence as soon as possible after birth if ready for enteral feeds
- If awaiting MEBM, still can administer either via nasogastric tube or directly into the mouth
- Parental information

4.2 Discontinuing probiotics:

- 34 weeks corrected gestation
- At discharge if >1500g and 32-37 weeks
- If a baby's feeds have been stopped or baby has become unwell or has signs of NEC, probiotics should be withheld – probiotics can be recommenced as soon as feeds re-started
- Consider continuing for longer if there has been frequent antibiotic exposure or any other clinical reason as per medical discretion

Babies transferring to another unit within the network should continue on probiotics where they still meet the indications for use. There is no evidence or adverse effects reported changing from one product to another. If probiotics are not available at the receiving unit, this needs to be discussed with the transferring unit prior to the transfer.

5. Initiating and advancing enteral feeds - See Appendix 2 for flowchart

Enteral feeds in preterm infants should commence as soon as possible [1]. Lack of enteral nutrition leads to risk of gut atrophy and can impair gut development.

5.1 Contraindications to feeding:

- Confirmed necrotising enterocolitis
- Evidence of bowel obstruction
- Congenital gut malformation

5.2 Infants considered high risk include:

- <28 weeks gestation or Extremely Low Birth Weight <1000g
- Absent or reversed end diastolic flow in infants <34 weeks
- Perinatal hypoxia-ischaemia with organ dysfunction
- Hypotensive/unstable ventilated neonates
- Commencing feeds after an episode of Necrotising enterocolitis (NEC) or following gastrointestinal surgery

5.3 Infants considered moderate risk include:

- 28+1 - 31+6 gestation or Very Low Birth Weight 1000-1500g
- Complex congenital cardiac disease
- Dexamethasone treatment
- Indomethecin or Ibuprofen treatment for PDA
- Inotropic support
- Symptomatic polycythaemia
- Previous NEC

5.4 Trophic feeds

Trophic feeds are defined as initial milk feeds of up to 1ml/kg/hr which prepare the gut for subsequent advancement of enteral feeds [12]. The benefits include stimulating peristalsis, immunomodulatory effects and the growth and maturation of the gut mucosa [13]. Trophic feeds are:

- Commenced as soon after delivery as possible where clinically indicated
- Small volumes (10–20 ml/kg/day) of milk given to stimulate the bowel for up to 7 days
- Not intended to contribute to nutrition and not included in total fluid volumes
- Considered in very premature or very high-risk infants to utilise maternal colostrum and stimulate gut trophic hormones
- Individual infants should be assessed daily for tolerance and consideration of advancing feeds

5.5 Advancing Feeds

There is no clear evidence that slow advancement of feeds in very low birth weight infants reduces the risk of NEC. Reaching full enteral feeds faster results in earlier discontinuation of parenteral nutrition and removal of vascular catheters, resulting in a reduced risk of sepsis and fewer catheter-related complications [14-19].

Feeds should be given as 1-2 hourly bolus gravity feeds for both initiation and advancing enteral feeds. Giving bolus feeds allows better establishment of beneficial intestinal hormones such as gastrin and enteroglucagon which encourage gut development and motility, as well as encouraging intestinal secretions.

Feeds can be advanced if:

- No vomits or bilious aspirates
- No significant abdominal distension
- No signs of dysregulation or intolerance

6. Feed Tolerance

Feed intolerance is common in preterm infants. Close monitoring of feed tolerance is essential to avoid parenteral nutrition dependence and a delay to full enteral feeding.

Gastric residual volume (GRV) and colour of aspirate may indicate signs of feed intolerance as a result of gastrointestinal immaturity rather than gut dysfunction and can be difficult to distinguish from early NEC [20].

6.1 Possible symptoms of feed intolerance:

- Vomiting
- Gastric residuals >50% of previous 4 hours feed volume
- Abdominal distension
- Above associated with systemic symptoms such as apnoea, bradycardia, poor perfusion, and/or haemodynamic instabilities

6.2 Possible symptoms of Necrotising Enterocolitis (NEC):

- Bilious/bloody aspirates
- Abdominal distension/abdominal discolouration/visual bowel loops
- Bloody/watery stools
- Clinical deterioration

Refer to Postnatal Surgical Referral Pathway PW-ODN-02 (pages 9 and 10)

6.3 Assessment of gastric residual volume (GRV)

- GRVs should be checked every 4 hours until babies are fully enterally fed or as per local unit policy
- Routine checking of GRV is not recommended in clinically well fully enterally fed preterm infants
- Limit GRV evaluation to infants with symptoms of gastrointestinal dysfunction
- Do not use GRV in isolation to withhold/discontinue feeds
- It is common to find small quantities of bile in GRV during feed establishment
- GRs include nutrients, gastric acid and enzymes that have a role in promoting intestinal motility and maturation therefore replacing GR is recommended

6.4 Indicative colour chart for Assessing Aspirate Colour

Colostrum may appear yellow in colour

Milk	Lemon	Mustard	Wasabi	Lime	Avocado	Spinach

NORMAL　　CHECK OTHER INDICES　　← NEEDS ASSESSMENT →

*Any bile-stained aspirates (shades of green) should be considered abnormal unless there is clinical reason to explain them.

If signs of feed intolerance:

- Medical review/consider septic screen as per local unit policy
- If no signs of NEC, consider continuing with trophic feeds rather than nil enterally

7. Target feed volumes (see also Appendix 2)

The aim for all babies is to meet their nutritional requirements for protein and energy to optimise growth and development. The target volume will differ according to the baby's gestation and the milk provided to the baby. Fortifier should be considered.

Volumes of 180ml/kg/day is often referred to as full feeds for MEBM and DEBM; however, this can increase to 200ml/kg/day in some babies if weight gain is not optimal and tolerating feeds.

Preterm formula at 150ml/kg/day meets energy and protein requirements.
Please see Appendix 2 and Paragraph 8.5 Breastmilk fortification for further details.

8. Breast milk

Mother's own breast milk is the preferred feed choice for all babies.

Lower mortality rates, lower rates of sepsis and necrotising enterocolitis, improved neurodevelopmental outcomes, lower rates of bronchopulmonary dysplasia, retinopathy of prematurity and fewer hospitalisations are reported in babies receiving mother's milk (see Appendix 3).

8.1 Ante-Natal Care

There should be a mechanism within maternity services to ensure that the neonatal unit is alerted to every pregnant woman who may have a preterm or sick baby to enable an antenatal counselling conversation. During the conversation the clinician should discuss the importance of breastmilk and expressing with the parents to corroborate earlier maternity conversations about breastmilk. Once the baby has been admitted to the neonatal unit a key member of neonatal staff should have the same conversation with families, along with the giving of written information [21]. These conversations should be handled with extra sensitivity considering their baby may have been born very sick and the mother may be very ill themselves [5].

During ante-natal care, it may be identified that harvesting colostrum may be beneficial prior to the birth and this should be discussed with the midwife as appropriate.

8.2 Breast milk expression

Expressing of breast milk should commence within 1-2 hours of giving birth to optimise long-term production and ensuring MEBM is always the first choice of feed bringing the greatest benefits to the baby. To support early expression, it is recommended that colostrum packs are used to help support staff and families in the process. The labelling and numbering of colostrum collection is important so that it is used in the order that it is expressed. Some studies suggest that colostrum should be used in order of expression, as evidence suggests that it changes to meet babies' requirements in the early hours and days after birth [21].

Mothers should be taught how to express by hand and pump from birth. Hand expressing is a useful skill and is particularly useful for expressing colostrum, as the small amounts can be collected in a syringe ready to be stored or used immediately (see Appendix 4). Frequent and simultaneous hand and pump expression from birth, gives mothers the best chance to establish a good milk supply within the first 2 weeks of giving birth. Double pumping from birth yielded a higher volume of milk up to day 7 of life than hand expressing [22].

8.3 Supporting mothers to ensure sustainability of breast milk

- To express between 8 and 10 times in 24 hours, including once at night / early hours of morning
- A gap of no longer than 5 hours between expressions
- Cluster expressing (2 to 3 times within a few hours) can increase the number of expressions that can be fitted into a day
- Mothers have access to adequate and effective expressing equipment to use on the unit and at home
- Mothers should be shown how to store and handle breast milk
- A review of expressing takes place by a key member of staff to maximise support during the first 2 weeks (UNICEF standard is 4 formal expressing assessments in first 2 weeks) [21].
- Evidence suggests that 750ml or more by day 10 is a good indicator of ongoing milk supply. If this is not achieved, then support should be given to mother in a sensitive conversation.
- Expressing is frequently checked on an informal basis after the first two weeks
- Skin to skin contact has demonstrated an increase in breast milk both in a single expression session and long-term volume

- The appropriate environment in the neonatal unit to support parent/infant participation in early feeding experiences should be considered. Environmental support factors may include space, seating, privacy and the sensory environment.

To facilitate the provision of MEBM to all babies admitted to the neonatal unit the NWNODN infant feeding SIG have devised a care plan and checklist to be used on neonatal units. See appendix 5

8.4 Donor expressed breast milk (DEBM)

If mother's own expressed breast milk is unavailable or insufficient to meet requirements, DEBM may be considered as the milk of choice to establish full enteral feeds for an infant at high risk of NEC as it is associated with reduced risk of NEC compared with preterm formula [23, 24, 25].

8.4.1 Indications for use:

- Gestational age < 32 weeks
- Birth weight <1500g
- Previous confirmed NEC
- Post GI surgery
- DEBM is ideally continued until MEBM is fully available

Parental consent is required and as part of the consent process parents should be counselled regarding the differences between DEBM and preterm formula when compared to MEBM, including benefits, risks and ongoing uncertainties [25].

Infants who are on DEBM may be transitioned to preterm formula once they are on 150ml/kg/day for at least 48 hours and greater than 32 weeks without any other risk factors. This should be done gradually over 4 days in ¼ increments.

8.5 Breast milk fortification

It should be considered adding breast milk fortifier (BMF) to MEBM or DEBM to meet the increased requirements of preterms [26, 27]. BMF provides additional protein, calories, sodium, calcium, phosphate, fat soluble vitamins, zinc, selenium and other trace elements when added to MEBM/DEBM.

8.5.1 Indications for use:

- <34 weeks gestation
- <1.8kg birth weight
- Stable infants
- On 100ml/kg for at least 24hrs
- Receiving more than 50% total feeds as EBM
- Urea level < 2mmol/l
- Weight gain is <15g/kg/day
- IUGR where birth weight for gestational age is <9th centile

8.5.2 Use with caution:

- SGA (BW < 2nd centile)
- Absent or reversed end-diastolic flow on antenatal Dopplers
- Establishing enteral feeds after episode of known or suspected septic ileus GI obstruction
- Congenital GI malformations e.g. gastroschisis or post GI surgery
- Need for inotropic support / long term dinoprostone for duct dependent lesion
- On Gaviscon
- Strong family history of cow's milk protein intolerance

8.5.3 Contraindication:

- Severe growth restriction (BW < 0.4th centile)
- Establishing enteral feeds after episode of NEC
- Babies >37 weeks gestation at birth
- BMF should never be added as a supplement to preterm formula

8.5.4 Prescribing and administration

There are two fortifiers available in the UK: Cow and Gate Nutriprem human milk fortifier and SMA fortifier (see Appendix 6)

- 1g sachet is added to 25ml MEBM/DEBM, full strength
- Can consider ½ strength for 24-48 hours and increasing to full strength
- EBM and BMF will meet the nutritional requirements of most preterm infants in 165mls/kg/day
- Some infants born <1000g may require volumes up to 180ml/kg/day to meet nutritional requirements and ensure adequate growth
- Phosphate supplements should not be added to feeds where either BMF has been added or where more than half of the feed volume is made up of formula milk due to risk of precipitation
- SMA fortifier contains iron whereas Cow and Gate Nutriprem fortifier does not therefore iron supplementation needs to be considered – see appendix 6

If combination feeds are required, the method that involves the least amount of milk handling and is easiest for each unit to practice is best for babies:

- Mixed together
- Alternating feeds of EBM and BMF, with formula
- Preterm formula given once the fresh MEBM has either run out or until the next expression

8.5.5 Breast Milk Fortifier post discharge (Appendix 7)

Some infants may benefit continuing fortifier at home to support growth as well as supporting breast feeding [28]. As this is not prescribable in the community, BMF may be provided by the unit for use at home under close supervision with the neonatal dietitian and the neonatal outreach team. Please see Appendix 6 for further guidance.

8.6 Protein supplement

- **Indication** – increased protein requirements, Urea <2mmol/l
- Available as Nutriprem protein supplement
- To meet extra protein requirements of babies <1000g and ensure adequate growth
- Only provides extensively hydrolysed protein, 1 g sachet = 0.82 g protein
- Add to MEBM/DEBM with BMF
- If blood urea is normal do not add protein supplement - discuss with your dietitian
- Stop protein supplement when urea level >6 or when baby reaches 1000g
- Use only under direction of your dietitian

9. Choice of Alternative Milk

9.1 Preterm Formulas (see also Appendix 8)

Where MEBM is not available and DEBM is not indicated, preterm formulas may be used.

Preterm formulas have a higher protein to energy ratio than term infant milks and are fortified with vitamins and minerals to meet the recommended nutrient intakes of premature infants supporting intrauterine growth rate. They are available in ready to feed (RTF) bottles for hospital use only.

There are 3 preterm formulas available in the UK:

- Nutriprem 1
- Hydrolysed Nutriprem

- SMA Gold Prem 1

9.1.6 Indications for use:

- Babies born <34 weeks with a birth weight <1800g where MEBM/DEBM is unavailable or insufficient to meet current feed volumes
- Initial total feed volume aim 150ml/kg/day
- Volumes >180ml/kg are not advised and other reasons for poor growth should be investigated before further volume increases are introduced
- Should be used until the baby reaches 1.8kg unless weight gain is suboptimal or otherwise recommended by your dietitian
- Babies who are on DEBM may be transitioned to preterm formula once they are on 150ml/kg/day for at least 48 hours
- Phosphate and iron supplements should not be added to the same bottle

9.2 Nutrient Enriched Post Discharge Formulas (NEPDF)

NEPDF are formulated to meet the ongoing enhanced nutrient needs of babies and may be clinically indicated for the following babies once they are >1.8kg and/or just before discharge:

- If MEBM supply is insufficient to meet the preterm baby's total feed volumes
- If transitioning from a preterm formula
- Preterm infants born prior to 34 weeks and <1.8kg who at discharge have higher energy requirement (e.g. CLD on home oxygen)
- Ongoing poor growth (e.g. have crossed down > 2 centiles on their growth chart during their neonatal stay). Careful post-discharge monitoring of these patients is recommended

Preterm infants on formula who have demonstrated adequate growth during their NICU stay and do not have increased energy requirements can be discharged home on standard term formula with appropriate vitamin and iron supplementation.

There are two NEPDFs available in the UK:

- Nutriprem 2
- SMA Gold Prem 2

NEPDFs are available on prescription for babies from 35 weeks until 6 months corrected age, but in practice are only likely to be required until the baby is 3 months corrected or is demonstrating good catch-up growth. Careful post-discharge monitoring is recommended.

9.3 High calorie infant formula (Appendix 9)

Where prolonged fluid restrictions are required such as in cardiac disease consider the use of nutrient dense term formulas. This should only be done under close supervision of your dietitian.

9.4 Specialised formulas (Appendix 9)

Specialised term formulas are used when a baby requires either an extensively hydrolysed formula (EHF) or an amino acid formula (AAF).
None of the specialised term formulas are designed for use in the preterm population so will not meet nutritional requirements, even at volumes of 180mls/kg. These formulas will need to be modified to increase nutritional profile and used under the close supervision of your dietitian.

10. Vitamins, Iron and Zinc (see also Appendix 10, Appendix 11 and Appendix 16)

Preterm infants are born with low levels and reduced stores of vitamins and iron.
Vitamins are essential nutrients for whole body function and homeostasis. Water-soluble vitamins are not stored in the body, so need to be provided continuously through dietary provision, whereas fat-soluble vitamins are stored in fatty tissue and the liver.
An adequate supply of iron from iron supplements is required for optimal brain development of preterm infants.
Unfortified breast milk will not meet the vitamin and iron requirements of preterm infants. If human milk is not available, preterm formula is an alternative which contains increased amounts of vitamins and iron.

Zinc is an essential trace element, meaning the body is unable to make or store it, requiring continuous dietary intake. Preterm infants not only have lower reserves and reduced absorption of zinc but will have increased requirements during the postnatal period of rapid growth. Zinc deficiency is associated with poor growth, increased risk of infection, skin rash and possible poor neurodevelopment.

The recommendations are extracted and adapted for our network from the Guideline for Clinical Practice which is based on clinical consensus upon a thorough literature search [29].

See Appendix 10 for a guide to vitamin, iron and folate supplementation in Preterm Infants and appendix 11 contains recommendation for zinc supplementation. Appendix 16 provides recommendations on alternate regimens if Abidec® is unavailable.

11. Transition from Tube to oral feeding

The transition from tube feeding to oral feeding should be led by a baby's developmental cues rather than gestational age. The success of oral feeding should not be measured on quantity achieved but rather on the quality of feed, by which we mean feeding is nurturing and developmentally appropriate to baby's cues [30].

As with other key skills baby's oral skills mature over time and therefore the oral feeding transition should not be rushed or 'forced' as this will result in detrimental effects including negative experiences, increased need for medical interventions and potential for baby to aspirate during oral trials.

Low quality evidence exists that preterm babies fed in response to hunger and satiation cues achieve full oral feeding earlier than babies fed prescribed volumes at scheduled intervals [31].

11.1 Commencement of responsive oral feeding

11.1.1 Infant-led responsive feeding / Cue-based feeding

An infant-focused approach to the transition from tube to suck feeding is known variously as; cue-based feeding, infant or baby led feeding, infant driven feeding, co-regulated, attuned or responsive feeding. These systems define oral feeding readiness not by weight or gestational age but a combination of neurodevelopmental maturity, behavioural state organisation and physiological stability [32].

- Commencement of oral trials should be considered in relation to baby's readiness cues and mother's close observations with guidance of staff
- The baby should demonstrate stable physiological status, be tolerating full enteral feeds and be able to maintain level of alertness throughout the feed

- Baby's readiness cues can be measured in several ways, but a consistent tool is key. See Appendix 12 for IDFS Tool [33]
- Each oral feeding attempt should be individually assessed by parent or staff. When babies are transitioning between tube to oral feeds it should be noted that one competent oral feed does not imply this will be consistent throughout 24hour period

11.1.2 Supportive Breast feeding

- Early skin to skin and encouraging parental involvement [4]
- Encouraging Skin to skin during administration of feeds
- Supporting early NNS at breast [4]
- Skilled support for positioning and attachment
- Encouraging time at breast even if no milk transfer
- Avoid early introduction of bottle feeds – continue with NG feeds whilst supporting pre-feeding skills
- Expressing before attachment and pacing during breast feed will support development of early skills

The use of a formal qualitative tool to support the decision around the need for added nutritional support via NG tube following a breast feed is essential. This should be carried out with parents to jointly agree the outcome. See Appendix 13 for Unicef Breast feeding assessment tool

11.1.3 Supportive bottle feeding

The use of bottle feeding to promote quicker discharge often results in over-riding the baby's feeding cues resulting in negative experiences around oral feeds.

If an informed decision has been made to introduce bottle feeds alongside tube feeds a supportive therapeutic plan should be considered. The baby may require several supportive measures including:

- Elevated sidelying and supportive swaddling
- Pacing
- Slow flow teat

These should be implemented, discussed and demonstrated to parents by staff.

See Appendix 14 for UNICEF bottle feeding assessment tool

11.1.4 Elevated Sidelying and supported swaddling

- Babies fed in elevated sidelying, swaddled with hands to face are more physiologically stable during feeds, supporting the suck/swallow/breathe coordination
- Babies fed in this position have less 'choking' episodes and the 'proportion of milk consumed was more' [34]
- Position supports clearance of oral residue and increased volume

See Appendix 15 for photos to demonstrate actual positioning during bottle feeding

11.1.5 Co-regulated Pacing

- Babies who are immature and are still developing their coordination often are unable to pause sufficiently and this can result in desaturations and apnoea's during oral feeding – this leads to an increase in medical intervention and negative oral experiences.
- Paced feeding supports the baby's coordination of the suck/swallow/breathe pattern
- Ensure the teat is 'dipped' or 'dropped' in the oral cavity removing milk from teat after a sequence of sucks to establish a pause to enable infant to breathe

11.1.6 Supportive Flow control

- Controllable flow rates through slow flow teats will support the baby with the coordination of suck/swallow/breathe sequence
- Often parents have already bought their own feeding systems and this may differ from teat being used on the Neonatal unit. Please ensure you discuss fully the benefits and importance of slow flow teat chosen with parents before trialling with baby (35)
- Avoid prodding or jiggling teat during bottle feed also as this serves to over-ride baby's cues

12. Biochemical Monitoring

- Monitor glucose closely in initial days after birth
- Measure plasma urea, electrolytes, calcium, phosphate, albumin, haemoglobin and alkaline phosphatase (ALP) weekly to 2 weekly in stable preterm babies to monitor nutritional status
- Low serum urea (<2µmol/l) can be an indicator of inadequate protein intake

13. Growth Monitoring

Intrauterine growth rate (15-20g/kg/day) is the most used and accepted standard for preterm growth, but it is difficult to achieve in practice. It is recommended to aim for preterm infant growth by maintaining weight, head circumference and length growth patterns, approximately parallel to growth chart curves (36). Accelerated growth in preterm infants should be avoided. Approximately 30g/day weight gain is expected in term infants.

- Measure head circumference weekly
- Measure weight daily in NICU where fluid balance management is critical, then less frequent when more stable. At least two to three times per week in SCBU
- Measure length weekly – Leicester Incubator Measure (37) or a length mat

13.1 Poor Growth

- Preterm babies with weight gain <15g/kg/day require further nutritional assessment
- Review growth trajectory on appropriate growth chart
- Ensure baby receiving prescribed nutritional intake
- Ensure baby on maximum feed volumes appropriate for age/gestation according to milk choice
- If receiving MEBM and BMF - increase gradually to 200ml/kg/day as tolerated
- If receiving preterm formula increase gradually to 180ml/kg/day as tolerated
- If baby receiving MEBM and BMF does not tolerate increased volumes, or if insufficient MEBM to increase volumes, replace MEBM + BMF with gestational age/weight appropriate formula
- Refer to dietitian

14. Discharge

14.1 Nasogastric feeds

A baby may be discharged home with an NG tube in situ at the discretion of the unit and dependent upon the availability of community support services. Some babies with persistent feeding difficulties may require NG tube feeding for a longer period to ensure maintenance of nutrition and ongoing development of feeding skills.

14.2 Supporting long term breast feeding

BAPM MBM Toolkit 2 identifies the importance of the following to support breast feeding once home:

- Seamless transition from neonatal unit to a paediatric ward, community neonatal outreach team and health visitor

- Importance of education and support for parents and reviewing knowledge and skills both whilst on neonatal unit and once discharged
- Importance of peer support for parents

14.3 Follow Up

- Referral to community services is beneficial to ensure families have ongoing specialist support on discharge (38)
- Referrals to Dietetic and Speech and Language Therapy services are key to monitor growth and development of eating and drinking skills
- Ongoing long-term monitoring is advisable for positive outcomes of baby's feeding and swallowing skills following discharge (39)

There are NICE guidelines identifying the need for ongoing follow-up care ensuring this is provided by multi-disciplinary team (40).

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Appendix 1 - Probiotics available in the UK

Product	**ProPrems**	**Labinic**	**Infloran**
Bacterial strains	Bifidobacterium infantis 3.5 x 10^9 Streptococcus thermophilus 3 x 10^9 Bifidobacterium lactis 3.5 x 10^9	Lactobacillus acidophilus 0.67 x 10^9 Bifidobacterium bifidum 0.67 x 10^9 Bifidobacterium infantis 0.67 x 10^9	Lactobacillus acidophilus 1 x 10^9 Bifidobacterium Bifidum 1 x 10^9
Dose	0.5g od (1 sachet)	0.2ml od (liquid)	125mg (1/2 capsule) bd
Administration directly onto tongue or Via NGT/OGT	Mix with 1-3mL Maternal Expressed Breast Milk (MEBM), DEBM or water if MEBM/DEBM not yet available	5 drops	Dissolve in 1mL MEBM/DEBM or water if MEBM/DEBM not yet available
Storage	2-year stability at room temperature	Room temperature, discard bottle once opened 30days	+2° - +8°C

Appendix 2 - Initiating and Advancing Enteral Feeds Flowchart

Commence enteral feeds as soon as possible – including trophic feeds
Buccal colostrum within 6 hours
Skin to skin / Non-nutritive sucking / supportive tube feeding
Mother's own breast milk (MEBM) is the preferred feed choice for all babies

	High risk*	Moderate risk**	Low risk
Risk/Gestation	<28 weeks	28+1 - 31+6	>32 weeks
Transition from tube to suck feeding	Ensure regular: • skin to skin • opportunity for NNS at recently expressed breast or dummy • positive mouthcare with MEBM		Document feeding readiness cues to consider infant led responsive feeding
Step 1 Initiating feeds, start with:	20ml/kg/day 1-2 hourly feeds	20-30ml/kg/day 2 hourly feeds	30-60ml/kg/day 2-3hourly feeds
Step 2 Advancing feeds, increase by:	20ml/kg/day 1-2 hourly feeds	30ml/kg/day 2 hourly feeds	30ml/kg/day 2-3 hourly feeds
Step 3 Establishing feeds, continue:	To increase until 100ml/kg/day		
Step 4 Adding Fortifier:	If MEBM/DEBM, consider fortifier (unless gut or renal compromise), for 48hours then		If formula
	Continue increasing further to 150ml/kg/day as per previous incremental steps		

*High risk: <28 weeks gestation or <1000g birth weight, absent/reversed EDF, perinatal hypoxia-ischaemia with significant organ dysfunction, hypotensive/unstable ventilated, previous NEC, post gastrointestinal surgery

**Moderate risk: 28+1 - 31+6 gestation or 1000-1500g birth weight, complex congenital cardiac disease, dexamethasone treatment, indomethecin or Ibuprofen treatment for PDA, inotropic support, symptomatic polycythaemia

If insufficient or no MEBM use DEBM if appropriate, or preterm formula
MEBM and DEBM – need to fortify to meet protein and energy requirements
Nutriprem BMF - Can increase to 165ml/kg/day (max 180ml/kg if poor weight gain)
SMA BMF - Do not usually need to feed above 150ml/kg

Appendix 3 – Maternal Breast Milk Toolkit

[Maternal Breast Milk Toolkit | British Association of Perinatal Medicine (bapm.org)]

Optimising Early Maternal Breast Milk for Preterm Infants

A Quality Improvement Toolkit

Figure 3. The impact of MBM on preterm babies

MBM maternal breast milk; VLBW very low birth weight; ELBW extremely low birth weight; NEC necrotising enterocolitis[18–23,28–32]

Exclusive MBM feeding compared to any preterm formula is associated with an odds ratio of 0.11 for severe retinopathy of prematurity (ROP) in preterm babies (Zhou 2015)

Immunological and inflammatory

- Colostrum, the first fluid provided by mothers during the first days after birth, is rich in essential immunologic and developmental components. MBM protects babies against gastrointestinal and respiratory infections and reduces the risk of sepsis (Patel 2013), retinopathy (Zhou 2015) and chronic lung disease (Patel 2017)

Gastrointestinal and nutritional

- Fatty acids in breast milk are easily digested and promote faster emptying of the stomach. Protective enzymes, hormones and growth factors are important for intestinal growth, intestinal permeability and maturation (Taylor 2019). Breast milk provision results in reduced risk of necrotising enterocolitis (Patel 2013)

VLBW babies receiving less than half of their enteral intake as MBM in the first 10 days of life had a hazard ratio of 1.6 for the combined outcome of serious infection, NEC and death in the first 60 days (Corpeleijn 2016)

Neurological

- The specific lipids and fatty acid balance of MBM is important for neurological and visual development. Exclusive breast milk feeding is associated with better long-term brain growth and neurodevelopmental outcomes, after adjusting for socioeconomic and other maternal factors (Belfort 2016)

The rate of postnatal depression is 50% higher in mothers who planned to breastfeed and were unable to do so, compared to those who planned to breastfeed and did so (Borra 2015)

Long term health outcomes

- There is a link between breastfeeding and lower risk of obesity, type II diabetes and improved cardiac function and blood pressure in later life (Lewandowski 2016). Some studies also report risk reduction in breastfed children for asthma, atopic dermatitis and eczema. The use of infant formula is associated with increased rates of sudden infant death syndrome and leukaemia, as well as increased rates of breast cancer and other adverse health outcomes for mothers (Victora 2016)

Each day that a preterm baby receives more than 50% of their enteral intake as MBM in the first month of life is associated with increased IQ, memory and motor function at age 7 years (Belfort 2016)

Maternal mental health

- Successful MBM provision and transition to breastfeeding is positive for mental health in mothers of term babies (Borra 2015) whereas when expressing and breastfeeding are felt to be going badly or there is a perception of excessive pressure on the mother this can be damaging to mental health. As preterm mothers are at even higher risk of mental health issues and PND, this can significantly affect them too.

Each increment of 10ml/kg/day of MBM received by ELBW babies before discharge is associated with a 5% decrease in risk of rehospitalisation by 30 months' corrected age (Vohr 2007)

Admissions to hospital after discharge

- Readmission rates after neonatal discharge are higher in infants given preterm formula, in a dose dependent fashion (Vohr 2007)

Health Economics

- Costs of care are lowest for very low birthweight babies receiving the largest amount of MBM, corrected for other factors (Patel 2013)

Increasing any human milk feeding in babies at discharge from the neonatal unit from 50% to 75% could lead to annual NHS savings of nearly £4 million (Renfrew 2012)

1

Appendix 4 – Hand Expressing and Breast Massage

Additional video resource:
https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/breastfeeding-resources/hand-expression-video/

Appendix 5 – Care Plan to Support Expression of Breast Milk

Available on the NWNODN website [Care-Plan-Checklist-V2.docx (live.com)]

Patient Details
Name: ______________________
Hospital No: _________________
Age: ________ **DoB:** _________
Date:________________________

Care Plan to Support Expression of Breast Milk – for use on NNU

Aim to facilitate provision of maternal EBM to all babies admitted to this Unit working in collaboration with maternity:

√ **As early as possible** **Date & Time of first expression ………………………………………….**

√ **For as long as possible**

Antenatal: Prior to delivery (if possible)	**Sign & date when undertaken**		
Discussion with mother & Family re: breast feeding			
Sign post to NWNODN Breast feeding page includes small wonders & BFI website, IFDC app & baby buddy app			
Offer colostrum pack			
Action within 2 hrs of delivery in liaison with midwife caring for mother:	**√**	**Date/Time**	**Signed**
Sign post families to the IFDC app. Offer Colostrum pack & discussed the importance of colostrum as first feed and breast milk for the preterm baby with respect to the following - Reduced risk of infection - Improved development - Improved gut tolerance - Reduced risk of NEC For mother - reduced risk of breast and ovarian cancer, osteoporosis.			
Initiating Expression Importance of frequent hand expression explained: • First expression within 2 hrs (no later than 6 hrs) of delivery ○ Initially hand express both breasts until milk flow stops then ideally pump (double pumping). • At least 8-10 x every 24hrs initially • 1 x between 2-4am			
Expressing & breast feeding journal (BFJ) and/or Apps provided and explained. Suggested Apps: IFDC, Baby Buddy, Baby Log,			
6 hours post-delivery: liaise with midwife to check mother has expressed Name of midwife discussed with …………………………………			
First Formal Review (within the first 24 hours during mother's first visit to the unit):			
Highlight hand hygiene practice in relation to breast milk expressing and skin to skin contact.			
Importance of skin to skin contact with baby explained and check the mother has watched the Small Wonders film : Holding your Baby			
Breast massage and hand expressing observed and BFJ offered			
Benefits of using colostrum and breastmilk for mouth cares explained			
Important of frequent milk expression explained i.e. 8-10 times in 24 hr (including once at night between 2 and 4am)			
Benefits of non-nutritive sucking explained (calming, maximising C-PAP, sucking practice during tube feeds)			
If mother unable to visit the unit within 24 hours go down to visit her to complete this section or if in another hospital phone her midwife to check expression has commenced			
Check mother is taking vitamin D (10microgram or 400IU per day) http://www.unicef.org.uk/babyfriendly/wp-content/uploads/sites/2/2017/01/Vitamin-D-supplementation-for-breastfed-babies-Unicef-UK-Statement.pdf			

Milk Provision			
EBM first supplied to NNU			
EBM first given to baby • If no contraindications, milk should be given as soon as available			
EBM given as mouth care • If only small amount available (<0.5ml) / feeds specifically ruled out			

Increasing Supply : Days 0 – 9
Regular review of expression, paying particular attention to: Frequency Timing Stimulation of lactation Method of expression Breast health Volumes

Sustaining supply : Review Day 10-14 and then weekly
Check total volume expressed every 24 hours (Target 750-900mls by day 14) Approx volume: ____

Breast Milk Expression Assessment Tool – for use on NNU									
Observe / Ask about	<12 hours	Day 1	Day 2	Day 3	Day 4	Day 5	Days 6-8	Days 9-12	Day 14
<u>Frequency of expression</u> First expression within 1-2 hrs of delivery and no later than 6 hrs At least 8 – 10 x every 24 hrs thereafter 1 x between 2-4am	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
<u>Timings of expression</u> No gaps longer than 4 hrs during the day No gaps longer than 6 hrs during the night	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
<u>Stimulating lactation</u> Frequent Kangaroo care Baby photos / items available Breast massage / Relaxation	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
<u>Method of expression</u> (refer to information provided in Colostrum Pack) Hand expression to obtain colostrum combined with electric pump (if Medela use Initiate setting) Correct hand massage and expressing technique taught Access to electric breast pump and double pumping Correct use of breast pump Correct fitting of breast pump eg shields	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
<u>Breast Health</u> Breasts full prior to expressing Breasts soft post expressing No lumps / pain / heat / trauma	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
<u>Milk Volumes</u> Drops only initially Steady increase every 24 hrs	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
<u>Action</u> – if answers ‘N’ to any, consider: • Review and encourage expressing journal • Discuss with midwife looking after mum • Make Infant Feeding Co-Ordinator aware • Liaise with (names and contacts………………)									
Continue the assessment process at weekly intervals using the continuation page of this tool									

Breast Milk Expression Assessment Tool – Continuation Page									
Observe / Ask about	Day …….	Day …….	Day …….	Day …….	Day …….	Day …….	Day …….	Day …….	Day …….
Frequency of expression First expression within 1-2 hrs of delivery and no later than 6 hrs At least 8 – 10 x every 24 hrs thereafter 1 x between 2-4am	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Timings of expression No gaps longer than 4 hrs during the day No gaps longer than 6 hrs during the night	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Stimulating lactation Frequent Kangaroo care Baby photos / items available Breast massage / Relaxation	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Method of expression (refer to information provided in Colostrum Pack) Hand expression to obtain colostrum combined with electric pump (if Medela use Initiate setting) Correct hand massage and expressing technique taught Access to electric breast pump and double pumping Correct use of breast pump Correct fitting of breast pump eg shields	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Breast Health Breasts full prior to expressing Breasts soft post expressing No lumps / pain / heat / trauma	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Milk Volumes Drops only initially Steady increase every 24 hrs	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Action – if answers 'N' to any, consider: • Review and encourage expressing journal • Discuss with midwife looking after mum • Make Infant Feeding Co-Ordinator aware • Liaise with (names and contacts……………….)									
Continue the assessment process at weekly intervals using the continuation page of this tool									

Appendix 6 - Breast Milk Fortifiers

- Cow and Gate Nutriprem Human milk fortifier
  - Extensively hydrolysed, 50% whey based protein
  - 1g sachet – add to 25ml
  - Osmolality 410mOsmol/kg H_2O in breastmilk
  - Does not contain iron
  - Halal certified

- SMA Fortifier
  - Partially hydrolysed, 100% whey based protein
  - 1g sachet – add to 25ml
  - Contains iron (0.45mg/sachet, 1.87mg/100ml) therefore if fully fed on EBM with SMA fortifier iron supplementation not required
  - Osmolality 390 mOsmol/kg H_2O in breastmilk
  - Halal certified

Appendix 7 - Breast Milk Fortifier post discharge

BMF may be provided by the unit for use at home under close supervision with the neonatal dietitian and the neonatal outreach team as per local unit agreement.

Preparation instructions:

- This can be given as a fortified breastmilk supplement prior to a breast or in a bottle feed of expressed breast milk
- 1g sachet added to 5ml of EBM in a sterile bottle
- Gently swirl the bottle until the powder has dissolved
- The fortifier will dissolve much more easily if the expressed breast milk is at least at room temperature, ideally body temperature
- Use immediately, do not store

Breast feeding:

- Offer the BMF supplement from a bottle or syringe, if a bottle is not being introduced before each full breast feed**,** up to 8 times per day
- Then offer breast feed

For bottle feeding:

- Add the BMF supplement into a bottle with EBM for each feed, up to 8 times per day

When to discontinue:

- Continue giving the fortified breastmilk supplement up to 8 weeks after your baby's due date - e.g. 48 weeks of age depending on baby’s growth
- Monitor baby’s growth with regular weights and length

Appendix 8– Preterm Formulas

	Nutriprem 1	**Hydrolysed Nutriprem**	**SMA Gold Prem 1**
Protein	Whole protein 59% whey	Extensively hydrolysed protein 57% whey	Partially hydrolysed protein 100% whey
Protein in 150ml/kg	4.05g/kg	3.9g/kg	4.35g/kg
Energy in 150ml/kg	120kcal/kg	120kcal/kg	120kcal/kg
Protein in 165ml/kg	4.45g/kg	4.29g/kg	4.78g/kg
Energy in 165ml/kg	132kcal/kg	132kcal/kg	132kcal/kg
Lactose	60%	60%	46%
MCT	8.7%	7.2%	12.5%
Osmolality	340 mOsmol/kg H_2O	410 mOsmol/kg H_2O	367 mOsmol/kg H_2O
Halal/Vegetarians	Not suitable for vegetarians	Not suitable for vegetarians	Not suitable for Halal or vegetarians

Appendix 9 - Specialised Formulas

(To be used under the supervision of the dietitian)

Formula	Indication	Nutrient Modification
Aptamil Pepti Junior	Malabsorption / post GI surgery	Hydrolysed protein / clinically lactose free / MCT fat Needs modifying to meet preterm requirements
Nutramigen LGG	Cow's milk protein intolerance – first choice	Extensively hydrolysed protein Lactose free Needs modifying to help meet preterm requirements
Aptamil Pepti 1 / Althera	Cow's milk protein intolerance – first choice	Extensively hydrolysed protein Contains lactose – not suitable if concerns of malabsorption Needs modifying to help meet preterm requirements
Neocate / Alfamino / Puramino	Severe malabsorption Failure with Extensively hydrolysed protein formula	Amino acid Needs modifying to help meet preterm requirements
Similac High Energy / Infatrini	Infants >37 weeks (>2kg) with increased requirements/fluid restrictions	Nutrient enriched
SMA High Energy	Infants >37 weeks (>2kg) with increased requirements/fluid restrictions	Nutrient enriched Partially hydrolysed protein
Infatrini Peptisorb	Infants >37 weeks (>2kg) with increased requirements/fluid restrictions Malabsorption	Nutrient enriched Extensively hydrolysed protein
Monogen	Chylothorax	80% MCT fat May need modifying to help meet preterm requirements

Appendix 10 - Vitamin, Folate and Iron Supplementation in Preterm Infants

The NWNODN recommendations for vitamin supplementation in high-risk preterm infants only include licensed medicinal products.

Abidec® Multivitamin drops 0.6 mL contains vitamin A 1333 units, ergocalciferol 400 units, thiamine 0.4mg, Riboflavin 0.8mg, pyridoxine 0.8mg, nicotinamide 8mg ascorbic acid 40mg

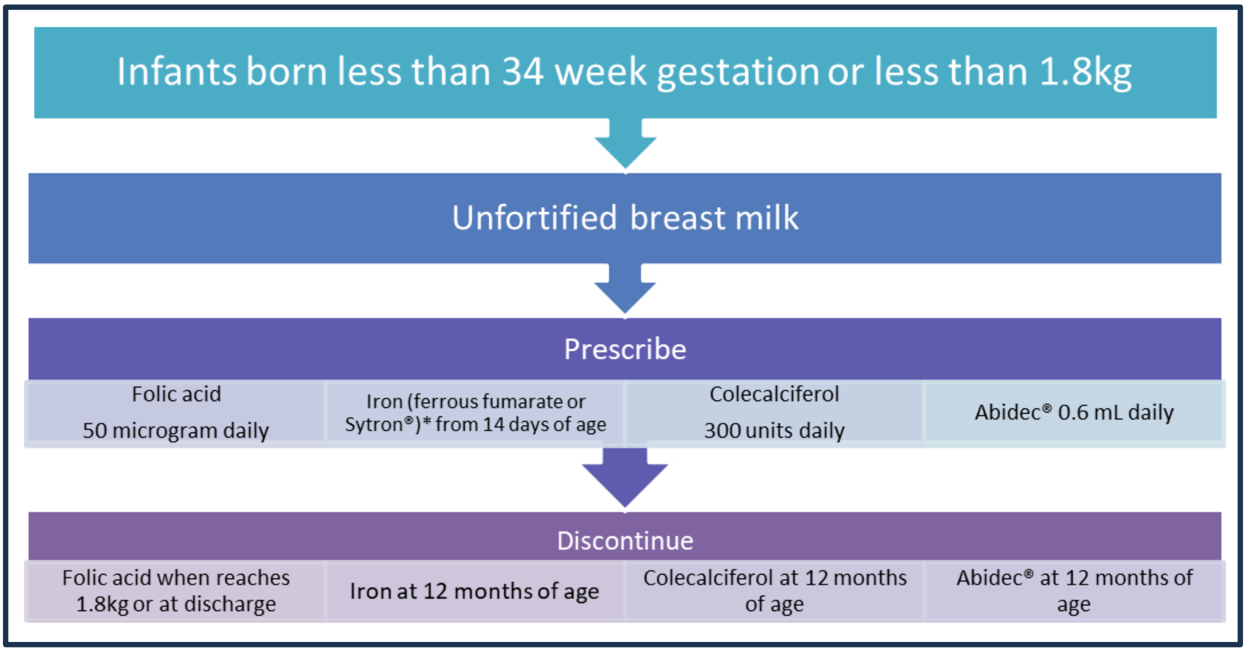
On discontinuation of prescribed vitamins families should be sign posted to NHS recommendations for vitamin supplementation in children.

The dose of Iron (Sytron® or ferrous fumarate) is dependent on product and infant weight
The following feeds do not require iron supplementation: Nutriprem 1, Nutriprem 2, SMA Gold Prem 1, SMA Gold Prem 2, SMA Gold Prem fortifier

<u>Sytron® (Sodium feredetate 27.5 mg elemental iron / 5 mL)</u>
Less than 1.5 kg : 0.5 mL Once daily
More than 1.5 kg : 1 mL Once daily

<u>Ferrous Fumarate (140mg / 5mL oral solution)</u>
Less than 1.5 kg : 0.25 mL or 0.3 mL Once daily
More than 1.5 kg : 0.5 mL or 0.6 mL Once daily

If an infant is combination fed, follow guidance for whichever feed makes up the majority and if formula is 50% or more, follow this guidance



Infants born less than 34 week gestation or less than 1.8kg

Fortified breast milk (Nutriprem®)

OR

Term formula

Prescribe

Iron (ferrous fumarate or Sytron®)* from 14 days of age	Abidec® 0.6 mL daily

Discontinue

Iron at 12 months of age	Abidec® at 12 months of age

Infants born less than 34 week gestation or less than 1.8kg

Fortified breast milk (SMA fortifier)

OR

preterm formula

Prescribe

Abidec® 0.6 mL daily

Discontinue

Abidec® at 12 months of age

Infants born 34-37 weeks gestation and 1.8 -2.5 kg

Unfortified breast milk

Prescribe

Iron (ferrous fumarate or Sytron®)* from 14 days of age	Abidec® 0.6 mL daily

Discontinue

Iron at 6 months of age	Abidec® at 6 months of age

Infants born 34-37 weeks gestation and 1.8 -2.5 kg

↓

Preterm

OR

Term formula

↓

Prescribe

Abidec® 0.6 mL daily

↓

Discontinue

Abidec® at 6 months of age

Appendix 11 - Recommendations for Zinc management in cases of deficiency

Step One: Assess

If zinc levels are below local laboratory reference range with a CRP <10, zinc supplementation should be commenced at a dose of 2mg/kg/day of elemental zinc for 4 weeks

Step Two: Review

After 4 weeks do growth, skin or biochemical abnormalities persist?

Yes

Step Three

Continue zinc supplementation at 2mg/kg/day of elemental zinc for a further 4 weeks (total 8 weeks) and reassess

No

Step Three

Stop zinc supplementation and aim to provide age appropriate RNI for zinc

Step Four (redress imbalances)

- During this time ensure there is adequate nutritional intake. Optimise enteral nutrition intake of zinc via fortified breastmilk and routine vitamin/mineral supplement of age-appropriate alternative preterm infant formula in line with RNI
- Review medication and possible contributory factors as able

Things to consider:

- Low serum zinc levels (with normal CRP) will not be redressed through enteral feeds alone and zinc supplementation will be required for 4-8 weeks
- For infants with ileostomies, supplements should only be started once full feeds have been established, other electrolyte supplements have been commenced and tolerated
- Zinc, iron and copper compete for the same site of absorption, so when provided as individual mineral supplements, they should be administered at differing time points
- Zinc has a low toxicity, but prolonged use of high dose supplements will impair copper bioavailability

Appendix 12 - Infant Driven Feeding Scale [33]

Infant-Driven Feeding Scales © - Readiness

Score	Description
1	Alert or fussy prior to care. Rooting and/or hands to mouth behaviour. Good tone.
2	Alert once handled. Some rooting or takes dummy. Adequate tone.
3	Briefly alert with care. No hunger behaviours (i.e. rooting, sucking). No change in tone.
4	Sleeping throughout care. No hunger cues. No change in tone.
5	Significant autonomic changes outside of safe parameters – HR, RR, O2, or work of breathing.

Infant-Driven Feeding Scales © - Quality

Score	Description
1	Sucks with a strong coordinated suck, swallow, breathe (SSB) throughout the feed.
2	Sucks with a strong coordinated SSB but fatigues with progression.
3	Difficulty coordinating SSB despite consistent suck.
4	Sucks with a weak/inconsistent SSB. Little to no rhythm.
5	Unable to coordinate SSB pattern. Significant autonomic changes – HR, RR, O2, work of breathing – outside of safe parameters or clinically unsafe swallow during feeding

Infant-Driven Feeding Scales © - Caregiver Techniques

Score	Description
A	Modified side-lying: Position infant in inclined side-lying position with head in midline to assist with bolus management.
B	External pacing: Tip bottle downwards/break seal at breast to remove or decrease the flow of liquid to facilitate SSB pattern.
C	Speciality teat: Use teat other than standard for specific purposes, i.e. nipple shield, slow-flow, cross-cut Nuk, Haberman (only if recommended by Cleft team).
D	Cheek support: Provide gentle unilateral support to improve intra-oral pressure.
E	Frequent burping: Burp infant based on behavioural cues, not on time or volume completed.
F	Chin support: Provide gentle forward pressure on lower jaw if small chin or wide jaw excursion ('chomping' on teat) to facilitate effective tongue movements.

This guide is colour coded –

Green - proceed

Amber - proceed with caution

Red – stop

Appendix 13 - Unicef Breastfeeding Tool

[Breastfeeding assessment tool - neonatal (unicef.org.uk)]

Breastfeeding assessment tool: Neonatal

How you and your nurse/midwife can recognise that your baby is feeding well							
What to look for/ask about	✓	✓	✓	✓	✓	✓	✓
Your baby: Is not interested, when offered breast, sleepy **(*A)**							
Is showing feeding cues but not attaching **(*B)**							
Attaches at the breast but quickly falls asleep **(*C)**							
Attaches for short bursts with long pauses **(*D)**							
Attaches well with long rhythmical sucking and swallowing for a short feed (requiring stimulation) **(*E)**							
Attaches well for a sustained period with long rhythmical sucking and swallowing **(*F)**							
Normal skin colour and tone							
Gaining weight appropriately							
Your baby's nappies: At least 5-6 heavy, wet nappies in 24 hours							
At least 2 dirty nappies in 24hrs, at least £2 coin size, yellow and runny							
Your breasts: Breasts and nipples are comfortable							
Nipples are the same shape at the end of the feed as at the start							
Referred for additional breastfeeding support							
Date							
Midwife/nurse initials							
Midwife/nurse: If any responses not ticked: watch a full breastfeed, develop a care plan including revisiting positioning and attachment and/or refer for additional support. Consider specialist support if needed.							

***please see reverse of form for guidance on top-ups post-breastfeed**
Wet nappies: Day 1-2 = 1-2 or more in 24 hours Day 3-4 = 3-4 or more in 24 hours, heavier Day 6 plus = 6 or more in 24 hours, heavy
Stools/dirty nappies: Day 1-2 = 1 or more in 24 hours, meconium Day 3-4 = 2 (preferably more) in 24 hours changing stools By day 10-14 babies should pass frequent soft, runny stools everyday; 2 dirty nappies in 24 hours being the minimum you would expect. Exclusively breastfed babies should not have a day when they do not pass stool within the first 4-6 weeks. If they do then a full breastfeed should be observed to check for effective feeding. However, it is recognised that very preterm babies who transition to breastfeeding later may have developed their individual stooling pattern before beginning to breastfeed, and therefore this may be used as a guide to what is normal for each baby.
Feed frequency: Babies who are born preterm/sick may not be able to feed responsively in the way a term baby does. It is important that they have 8-10 feeds in 24 hours and they may need to be wakened if they don't show feeding cues after 3 hours. During this time it is important that you protect your milk supply by continuing to express. Being responsive to your baby's need to breastfeed for food, drink, comfort and security will ensure you have a good milk supply and a secure, happy baby.

Breastfeeding assessment score to determine tube top ups
adapted from Imperial College Hospitals NHS Trust
To be used in conjunction with the assessment of maternal lactation, attachment and signs of effective milk transfer

Score	Definition	Action
A	Offered the breast, not showing feeding cues, sleepy	Full top up
B	Some interest in feeding (licking and mouth opening/head turning) but does not attach	Full top up
C	Attaches onto the breast but comes on and off or falls asleep	Full top up
D	Attaches only for a short burst of sucking, uncoordinated with breathing and swallowing and/or frequent long pauses	Half top up if the mother is available for next feed. The baby may wake early
E	Attaches well, long, slow, rhythmical sucking and swallowing – sustained for a short time with breasts not softened throughout	Half top up if mother is not available for next feed. If mother is available for next feed do not top up, and assess effectiveness of next feed.
F	Attaches well, long, slow, rhythmical sucking and swallowing – sustained for a longer time with breasts feeling soft following feed	No top up

Appendix 14 – Unicef Bottle Feeding Assessment Tool

[Bottle feeding assessment tool - Baby Friendly Initiative (unicef.org.uk)]

UNICEF UK BABY FRIENDLY INITIATIVE

BOTTLE FEEDING ASSESSMENT TOOL

How parents and midwives/health visitors can recognise that bottle feeding is going well				
What to look for/ask about	✓	✓	✓	✓
General health and wellbeing of the baby				
Around six heavy, wet nappies a day by day five				
At least one soft stool a day				
Appropriate weight gain/growth				
Is generally calm and relaxed when feeding and is content after most feeds				
Has a normal skin colour and is alert and waking for feeds				
Feed preparation				
Equipment washed and sterilised appropriately				
Parents know how to make up feeds as per manufacturer's guidelines				
Responsive bottle feeding				
Parents are giving most of the feeds and limiting the number of caregivers				
Parents recognise early feeding cues				
Parents hold their baby close and semi-upright and maintain eye contact				
Pacing the feed				
Bottle held horizontally allowing just enough milk to cover the teat				
Baby invited to take the teat				
Baby observed for signs of needing a break and teat removed or bottle lowered to cut off flow				
Finishing the feed				
Parents recognise signs when baby has had enough milk (turning away, splaying hands, spitting out milk)				
Baby is not forced to finish the feed if showing cues that they have had enough				
Expressed breastmilk				
Mother is expressing her breastmilk effectively and storing it safely				
Mother is maximising her breastmilk if that is her goal				
Infant formula				
First stage milk is used				
Leftover milk is discarded at the end of the feed				
Date:				
Midwife/health visitor's initials:				
Care plan commenced:				

Note: If any responses are not ticked, consider watching a feed and developing a care plan. Refer for additional support if needed.

Appendix 15 - Elevated Sidelying

Baby is fed swaddled in elevated sidelying by mum

Picture to demonstrate positioning under swaddle

Baby's bottom is against feeder's tummy. The Feeders legs are elevated as demonstrated. A pillow can also be used if required to support positioning of baby on feeders' legs.

Appendix 16 – Alternative enteral vitamin recommendations if Abidec® is unavailable

Infants born less than 34 week gestation or less than 1.8kg

↓

Unfortified breast milk

↓

Prescribe

Folic acid	Iron (ferrous fumarate or Sytron®)* from 14 days of age	Colecalciferol	Dalivit
50 microgram daily		400 units daily	0.3 mL daily

↓

Discontinue

Folic acid when reaches 1.8kg or at discharge	Iron at 12 months of age	Colecalciferol at 12 months of age	DaliVit® at 12 months of age

Infants born less than 34 week gestation or less than 1.8kg

↓

Fortified breast milk (Nutriprem®)

OR

Term formula

↓

Prescribe

Iron (ferrous fumarate or Sytron®)* from 14 days of age	Colecalciferol 400 units daily

↓

Discontinue

Iron at 12 months of age	Colecalciferol at 12 months of age

Infants born less than 34 week gestation or less than 1.8kg

↓

Fortified breast milk (SMA fortifier)

OR

preterm formula

↓

Prescribe

Colecalciferol 400 units daily

↓

Discontinue

Colecalciferol at 12 months of age

Infants born 34-37 weeks gestation and 1.8 -2.5 kg

Unfortified breast milk

Prescribe

Iron (ferrous fumarate or Sytron®)* from 14 days of age	Colecalciferol 400 units daily

Discontinue

Iron at 6 months of age	Colecalciferol at 6 months of age

Infants born 34-37 weeks gestation and 1.8 -2.5 kg

Preterm

OR

Term formula

Prescribe

Colecalciferol 400 units daily

Discontinue

Colecalciferol at 6 months of age