

Neonatal Unit Nutrition and Feeding Guidelines

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Index

	Page
Contents	2
General Information	3
Standardised feeding regime on Neonatal Unit	4
Feeding Preterm Babies	5
Managing the transition between IV fluids and feeds	8
Feeding Problems	8
Breast feeding	11
Use of donor EBM	12
Kangaroo Care and Non-nutritive sucking	12
When to commence oral feeds	12
Transition from tube to breast	12
Use of bottles feeds	13
Discharge planning	13
Post discharge management	13
Appendix 1: Feeds for use on the Neonatal Unit	14
Appendix 2: Nasogastric / Orogastic tube measurement, checking and flushing	15
Domperidone for lactation – Template Letter to GP	16 - 17
Appendix 4: Breast Milk Additives – Breast Milk fortifier, Duocal, Maxijul, Carobel	18
Appendix 5: Breast Milk fortifier – dosing regime	19
Appendix 6: Guidelines for the use of Preterm and Term Formula and Vitamins	20 - 21
Appendix 7: Discharge Home Letter	22
GP letter for post discharge preterm formula	23

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General Information

The best milk for infants is the mother's own breast milk. It is therefore our aim to promote the feeding of a mother's own breast milk to her infant on the neonatal unit and full breastfeeding on discharge and beyond. The Trust is committed to the UNICEF UK Baby Friendly Initiative and aims to achieve the UNICEF standards for breastfeeding.

The Trust has a breastfeeding guideline (<http://trustnet/docsdata/maternity/Breastfeeding%20guideline1.doc>). The Neonatal Intensive Care feeding guideline is complementary to this and also addresses issues associated with feeding infants on the neonatal unit and transitional care.

Each family may have specific ideas and beliefs about breastfeeding or expression of breast milk; these also need to be taken into consideration. Any decisions must be made as a team including medical and nursing staff along with parents.

Many mothers feel empowered by giving breast-milk as it consolidates their role as a parent and can be a rewarding experience. It is thus our aim to respect and facilitate the wishes of every mother who wishes to provide milk and/or breastfeed. The initiation of breastfeeding is based exclusively on physiologic stability and bottles are not routinely offered in Neonatal care

It is important to remember that at any age or weight, each individual infant may need assessment to decide on the optimal formula.

This guideline has been drawn up using the best available evidence and practice, including the latest Tsang (2005) recommendations:

	VLBW	ELBW
Energy (kcal/kg/day)	110-130	130-150
Protein (g/kg/day)	3.4-4.2	3.8-4.4
Calcium (mmols/kg)	2.2-5.5	
Phosphorus (mmols/kg)	1.9-4.5	
Vitamin A (IU/kg)	700-1500	
Vitamin D (IU/kg)	400 IU/day	
Iron (mg/kg)	2.0-4.0 (from 21 days)	

Please use the Nutritional Calculator on the intranet to work out the intakes for individual infants

Evidence for Feeding Policy

Standardised Feeding Regimes: Meta-analysis have shown that introduction of a standardised feeding protocol reduces the incidence of Necrotising Enterocolitis (NEC) by 87% of what it was prior to its introduction in preterm and Low Birth Weight (LBW) neonates.

Breast milk: Studies show that giving breast milk to 20 preterm infants will prevent one case of NEC. Breast milk (including donor milk) is strongly preferred for all infants and the beneficial effects of breast milk should be explained to parents at the earliest appropriate opportunity by the nursing and medical staff. Donor breast milk is a useful resource until maternal milk is available, particularly for infants born weighing less than 1500g. It is usually not practical to have infants sustained on donor milk. Donor milk is not as beneficial as maternal milk.

Timing & increasing feeds: Meta-analysis of minimal enteral feeding showed no effects on the risk of NEC. There is also no conclusive evidence that strategies such as delaying initiation of feeds or prolonging trophic feeds reduce the risks of developing NEC. All babies should be fed as soon as possible with a minimum of 10ml/kg of milk, 2 hourly, increasing twice daily

Intra Uterine Growth Retardation (IUGR) and Antenatal Dopplers: There is no evidence that commencing feeds at 10ml/kg increasing bd increases the risk of NEC. Approximately a quarter of ADEPT (Abnormal Doppler Enteral Prescription Trial) patients developed gastrointestinal symptoms. A high incidence of NEC was found in babies <29 weeks gestation with abnormal antenatal Dopplers. The full ADEPT study was published in April 2012. The incidence of NEC was not influenced by the time of introduction of the first enteral feed, so there is no reason to delay the onset of feeds, starting at 10ml/kg increasing bd as tolerated.

Bolus feeds: Milk feeds given by intermittent boluses are thought to be more physiological because they promote the cyclical surges of gut hormones normally seen in healthy term infants

Non nutritive sucking (NNS)

There has been a long debate about the impact of non-nutritive sucking (NNS) on breast feeding success. One large random controlled trial showed that pacifier use reduced breast feeding rates in term infants. Another trial demonstrated no impact of NNS on breastfeeding in preterm infants. A Cochrane review supported benefits with respect to reduced length of stay with no adverse outcomes noted, although breastfeeding rates were not mentioned

Overall principles of this guideline

- The use of breast milk is actively encouraged
- It is to be used in conjunction with the current intravenous fluids policy
- It is important to think in ml/kg/day, so that an appropriate feed volume is given to the infant
- A total increment of 20 - 30ml/kg/day (depending on weight, gestation and clinical status) is considered to be safe and appropriate. This will usually be divided into 2 x 12-hourly increments. Occasionally higher increment volumes are used at the discretion of the doctor.

Feeding Preterm Babies

	24 – 26 weeks	27 – 32 weeks
Initiation of milk (ml/kg/day) on day 0	10ml/kg/day	10 -20ml /kg/day
Feed volume increments (ml/kg/day)	10ml/kg/day BD	10-20ml/kg/day BD/ TDS
Type of milk	MEBM DEBM	MEBM DEBM *Preterm formula
Frequency of feeds at onset	2 hourly	2 hourly

Breast milk is strongly preferred for all babies. Maternal breast milk is the first choice if it is available. Even the tiniest amount of colostrum should be used. Donor breast milk should be the **next** choice if no maternal breast milk is available for the extremely preterm and high risk babies

Term formula can be used on appropriately grown babies of ≥ 36 weeks gestation if the mother does not wish to breast feed. The risks/ benefits should be fully explained

Preterm formula should not be used in infants less than 1500g without discussion with the attending consultant
 For infants between 1500 – 1800g consider risk factors but breast milk would be preferable
 Preterm follow – on formula (e.g. NP2) can be used on babies who weigh >1800gm

33 -36 weeks : The risk of NEC is low in stable babies. A preterm or term formula can be used in the absence of any risk factors

37 weeks : Demand feed when appropriate supporting mother with choice of feeding

High risk cases of any gestation should be discussed with the attending consultant

Starting Enteral Feeding is a priority

Initiation of EBM:

All babies, once born, should start enteral feeds unless there is a clear and documented reason not to. **Start as soon after birth as practicable, ideally within 6 hours**, unless clear contraindications are present. The first 20 ml/kg/day of feeds should not be included in the total fluid prescribed for the infant. i.e. given as extra

Increasing milk feeds:

- Continue to increase the volume every 12 hours if tolerated. Higher rates of increase can be used at the discretion of the attending consultant
- When the enteral intake is 120ml/kg/day out of 150ml/kg/day total fluids then no further PN is usually needed – just allow the bag to reach the end of its 'lifespan'.
- Occasionally smaller babies may be on 180ml/kg/day or more total fluids. Under these circumstances, PN should aim to stop when enteral feeds are about 80% of total fluids.
- There should be no need to give extra intravenous fluids (e.g. dextrose) to make up a temporary "shortfall" in fluid intake, unless blood sugar levels are low or if electrolyte supplements are required. Enteral feeds are then increased at the same regular increment rates until the total ml/kg/day required is achieved
- Change from 2 to 3 hourly feeds once tolerating full enteral feeds

Stopping Feeds:

Stopping enteral feeds is a critical decision. The only clear non-surgical indication is NEC. Stopping for prolonged periods for small aspirates, gaseous distension, extubations, intubations, long line or umbilical line insertions is of dubious benefit and deprives babies of nutrition and regular gastrointestinal activity. If a feed is omitted it should be documented.

Aspirates:

Much is made of milky/light/dark aspirates. It usually signifies gastrointestinal stasis. The majority of the time, stasis in preterm babies especially in the first few days, is due to physiological dysmotility of prematurity. The baby will be well, the abdomen will examine normally. Under these circumstances, feeds should be continued and the use of glycerine suppositories considered to promote development of more effective peristalsis

High risk cases (e.g. abnormal dopplers, IUGR):

Breast milk feeds can still be started on the day of birth in these cases and there is no evidence to support a slower rate of increase than 10ml/kg bd.

Desired milk intake:

Aim for 180mls/kg/day of breast milk. Some infants may require and tolerate a higher amount (200mls/kg/day or more).

Note that preterm and preterm follow on milk can be given at a maximum of 180ml/kg/day if required in infants with poor weight gain

See appendix 6 for when to use preterm formula, follow on formula and term formula

Parenteral Nutrition:

- can be given through a peripheral vein as long as the dextrose concentration does not exceed 12.5% and calcium concentration is not greater than 1mmol/kg/day
- does not need to be prescribed for infants >1500gm unless there are concerns about feed intolerance as full feeds should be established by day 4-5

- **Standard PN** comes as sodium free and sodium containing (high and low). Start preterm babies (<27 weeks) on 90ml/kg sodium free, and aim to change to standard with sodium when the serum Na starts to fall (around day 3)
- **Standard SMOF (Lipid)** is prescribed from birth, and the rate is calculated on the PN prescription chart.

Milk intake in terms of ml per feed required can be rounded up to the nearest 0.2mls for easier measurement or the following table can be used

When to give oral medication?

Many medications can be switched from IV to oral before the baby is on full enteral feeds. Therefore caffeine, sodium supplements etc can be given orally once the baby is tolerating 100ml/kg/day 2 hourly. Care is needed to ensure that oral medications are spaced out to minimise the effects of any increase in feed osmolality

Vitamins: Abidec 0.6ml (Dalavit 0.3ml is an alternative if Abidec not available) orally once daily is started when the infant is receiving 150ml/kg/day of MEBM, DEBM. Folic acid (500 micrograms) is prescribed weekly at the same time as vitamins. On day 21 the baby will normally receive iron as ferrous fumarate

Sodium: In PN the infant should receive sodium to ensure that the serum Na⁺ is maintained to a target range of 135-140 mmol/l. The amount of sodium prescribed may not be the same as the amount being received and this should be calculated in mmol/kg/day. The transition to enteral feeds may mean that oral sodium is required. Sodium (and other) supplements can be hypertonic and should be given frequently in small amounts diluted in the milk feeds.

A recent local audit indicated that **sodium acid phosphate should be started routinely in babies <28 weeks.**

Table to convert ml/kg/day into ml per 2 hourly feed

Weight in grams	10ml/kg/day	15ml/kg/day
500	0.4ml (feeds 2hrly)	-
600	0.6ml (feeds 2hrly)	-
700	0.6ml (feeds 2hrly)	0.8ml (feeds 2hrly)
800	0.6ml (feeds 2hrly)	1.0ml (feeds 2hrly)
900	0.8ml (feeds 2hrly)	1.0ml (feeds 2hrly)
1000	0.8ml (feeds 2hrly)	1.2ml (feeds 2hrly)
1100	1.0ml (feeds 2hrly)	1.4ml (feeds 2hrly)
1200	1.0ml (feeds 2hrly)	1.6ml (feeds 2hrly)

Feeding Problems associated with Enteral Feeds

Intolerance of feeds

NEC, gastro-intestinal obstruction and complete ileus are the only absolute contraindications to feeding.

Bile staining implies that there is a degree of duodenogastric reflux / stasis. There are many causes for this in infants and, in the preterm and/or growth restricted infant the most likely cause is gut immaturity or a malpositioned NGT/OGT. Ileus due to sepsis is probably the next most common cause.

It is common, in the early stages of increasing milk feeds, to find small volumes of lightly bile stained aspirates. Bile stained aspirates should prompt clinical examination and review, but **not necessarily cessation of feeds**. Clinical judgement needs to be used, as many of these infants will be stable, well and active, with normal abdominal examination.

In preterm gut dysmotility, the infants remain well and feeding should be continued (at amounts to be prescribed by the clinical team. Prokinetics (Domperidone or low dose Erythromycin 3 -5mg/kg qds) may be prescribed for short term use.

Obstruction and NEC should be considered, particularly if the infant appears unwell.

In cases of presumed malabsorption of feeds (repeatedly large aspirates) or post gut surgery, a hydrolysed formula is indicated with some Medium Chain Triglyceride (MCT) component. The suggested formula is either Peptijunior (an extensively hydrolysed term formula based on whey protein with approximately 50% MCT fat) or Pregestimil (an extensively hydrolysed term formula based on casein protein with approximately 50% MCT fat). This is a consultant decision

Breast milk fortifier (BMF)

Breast milk fortifier can be considered if:

- Weight gain is not satisfactory and the infant is on a maximum tolerable volume
- The blood urea is less than 2mmol/l
- **There are no contraindications to its use and any or both of the above reasons apply**

Breast milk fortifier needs to be started at 1% and then slowly increased, if needed, to 3% (full strength). In practice, 1% may be sufficient and we usually stay at 1% for a few days to evaluate the change.

In specific circumstances 4% can be used (see below). Contact the Dietician to verify the recipe for BMF to ensure the correct dosage is used. An agreed working weight should be established BMF will need to be weighed accurately to provide a safe/appropriate dose. See Appendix 5 for a guide to BMF dosing and contraindications

Fortified feeds should be kept in the fridge for not more than 4 hours.

Hypoglycaemia [click for guideline](#)

The aim is to keep the blood sugar level at or above 2.6mmol/l.

There are occasionally infants who are borderline hypoglycaemic on a maximum regular feeding regime. Consider doing a hypoglycaemia screen.

The addition of fortifier or Maxijul (MJ) to breast milk, the use of Infatrini or preterm formula will all increase the carbohydrate intake (see table)

Per100mls	Calories	Carbohydrate
Breast milk	68	7.3
MEBM +3% BMF	78	9.3
MEBM +4% BMF	81	10.0
MEBM +3% MJ	79	10.2
MEBM + 4% MJ	82	11.1
Infatrini	100	10.3
Preterm follow on milk	80	7.6

Recommendations:

- If on EBM and growing – 4% Maxijul
- If on EBM and growth is faltering – 4% BMF
- If formula fed – change to Infatrini

Weight must be monitored carefully

Gastro-Oesophageal Reflux

Suspected significant reflux that does not respond to conservative management can be treated without the need for intense/invasive investigations. Acidity on a cotton bud placed at the back of the mouth when the infant is refluxing, then pressed onto pH paper may be sufficient evidence. Not all reflux is related to an increase in acid production

If the infant is completely stable on examination consider increasing the frequency of feeds prior to reducing the total volume (for example, choose to feed every 3 hours instead of every 4 hours). If the total volume is reduced the infant's weight gain should be considered.

As long as there are no contraindications and reflux is significant, a milk thickener or a change in the type or milk may be used:

- Carobel or Gaviscon Sachets can be used with MEBM or other specialist feeds
- Enfamil AR or SMA stay down can be used if formula fed
- Consider the use of Domperidone as a motility agent and Ranitidine or Omeprazole for acid suppression

Breast feeding

St Peter's is working towards Baby Friendly accreditation. All neonatal nursing and midwifery staff caring for mothers and their babies receive breastfeeding training and should be able to offer advice. We also have infant feeding advisors. For all breast fed babies the aim should be to ensure that their needs are met as far as possible by breast feeding or, when the baby is unable to breast feed effectively the mother should be encouraged to express her milk to maximise lactation. The Bliss booklet and the ASPH guide to breastfeeding policy are available on the unit

Each mother should be asked about any medication she is taking and informed if any are contraindicated during lactation. Refer to 'Medications and Mothers Milk' book kept in NICU. Discuss with the pharmacist if still unsure

For diabetic mothers (insulin dependant and gestational) it is beneficial to express colostrum prior to delivery. This can be stored and used post delivery to avoid the use of formula milk. It has also been shown to have a positive effect on mothers' milk production

Mothers should be encouraged to express as soon as possible after delivery (ideally within 6 hours) and then frequently. Aim for 6 – 8 expressions per 24hrs. Breast massage prior to expression has been shown to improve milk production as has simultaneous pumping of both breasts if a breast pump is being used. The nurse looking after the infant should ensure this is communicated to the parents and the staff on the postnatal ward

All neonatal nurses and midwives will be able to show mothers how to hand express and use a pump. Mothers should be supervised during their first use of the breast pump. Mothers can express at the cot side or alternatively there is an expression room on the neonatal unit and mothers should be shown this soon after the admission of their infant to the neonatal unit. Alternatively, they can express at the cot-side if they wish to. All women should be instructed on hygiene practices to minimise bacterial contamination of their expressed milk. There should be instructions attached to each breast pump.

Use of Donor EBM

Consent for use of donor breast milk

- If a mother's own milk is not available or contra-indicated, consent for the use of donor breast milk should be sought from the mother and recorded together with the feeding intention in the admission form. Since we aim to feed babies very soon after birth, written consent should be routinely sought from parents, and it is normally nursing staff who will obtain this.

Which infants should be considered for donor breast milk?

Babies where maternal milk is not available or is in short supply and are

- <1500g
- Recovering from necrotising enterocolitis
- Had consistently Absent or Reversed End Diastolic Flow
- Intra Uterine Growth Restricted with birth weight less than 1800g

Documentation

- Each bottle of donor milk has a batch number which should be recorded on the infant's fluid / feeding chart and in the donor EBM record book kept on the fridge.

How long to use DEBM

- Until mothers can establish their own adequate milk supply,
- Transition from full DEBM to formula feeds
- If transfer is planned to another hospital which doesn't have a milk bank, it may be possible to send a small supply with the infant.

Grading on to formula – use the quarters rule

If mother's milk is unavailable

- Start with $\frac{1}{4}$ formula for 24hr (i.e. 3 MEBM to 1 formula feed, 3:1)
- Increase by $\frac{1}{4}$ every 24hr as tolerated i.e. regrading should take 3 days (2:1 → 1-1 → all formula feeds). If donor milk is to be supplied to another hospital, the regrading steps should be explained clearly to the parents and to the hospital as they may be unfamiliar with using donor EBM

Supplies of donor breast milk

- Milk Bank coordinators will inform the nurse in charge when supplies are low. The amount of available milk is also displayed on the unit

Storage

- Expressed milk can only be accepted if it has been collected and stored in milk collection containers provided by, or accepted to, the ASPH milk bank
- Milk collection for donation should be frozen as soon as possible to maintain its nutritional and microbiological quality and it should be kept frozen
- If necessary, refrigerate expressed milk collected over 24hours and then freeze the batch
- Frozen milk should be transported to the milk bank as soon as possible
- Expressed milk can be stored before transport to the milk bank for up to 3 months in a domestic freezer at -18degrees or lower

Kangaroo Care and Non Nutritive Sucking (NNS)

Skin to skin contact (kangaroo care) is encouraged. This will give the infant time to be near the breast and benefit from their mother's smell. It may also help to improve mothers milk supply and encourage bonding.

An ideal time for kangaroo care is during a tube feed.

Non nutritive sucking (NNS) can be defined as sucking on any object which is not providing liquid or nutrition and can include sucking on a pacifier (dummy).

Early frequent NNS at the breast has been associated with increased chance of exclusive breast feeding post discharge

Pacifiers may be used by infants on nasal CPAP and usefully they may help to stabilise the PEEP delivered by sealing the mouth.

When to Commence Oral Feeding

The more coordinated action of suck-swallow-breathe develops in short bursts from 32 weeks gestation and is usually consolidated by 36 weeks. It can be delayed in very premature, IUGR or sick infants. Some may manage earlier but there is evidence that coordinated safe oral feeding matures along a developmental clock and cannot be accelerated

Some infants can demonstrate some licking, immature attachment and/or short sucking bursts at the breast as early as 30 weeks gestation and therefore should be encouraged during skin to skin contact to attempt breast-feeding

Key points to consider when starting breastfeeding:

- Infant is stable (generally a nurse-led decision)
- Infant is showing signs of trying to suck
- Infant shows rooting behaviour
- Infant has reached 30 weeks gestational age

Nasal CPAP and vapotherm are not a contraindication to breastfeeding

Transition from Tube to Breast Feeding

The transition from tube to breast will be gradual and is managed by the nursing staff who will devise an individual regimen. Mothers will be encouraged to follow a breast-feeding regimen i.e. an increase in length and frequency of breast feeds and a reduction in volume and frequency of tube top ups.

In the transition stage, it is advisable for the mother to express the milk remaining in her breast after a breast feed.

When an infant is unsettled after an apparently good breastfeed there may be other reasons besides a need for more food; these reasons should be considered before giving a top up. For example gastro-oesophageal reflux, vomiting, changes in drugs, medical interventions.

If an infant is not on full feeds by 36 weeks and still requires large top-ups via tube, but is showing a satisfactory growth rate with nutritional serum biochemistry within the normal range a trial period where the tube removed should be considered. Total volumes may be significantly reduced. This should be discussed on a ward round and documented. If oral intake does not improve, continued support via tube feeding is indicated to maintain growth and optimal nutritional status and to help establish the infant on full breast-feeding. The infant could be discharged home tube feeding.

Weighing too frequently may increase parental anxiety at a period when weight gain may not be so rapid due to the transition from tube to oral feeding. Our current practice of weighing infants on the neonatal unit twice a week should therefore be adhered to (usually Sundays and Wednesdays).

Before demand feeding the infant should be:

- waking before feeds are due
- taking almost all feeds by suck
- growing / gaining weight satisfactorily

Domperidone may be useful for the mother to take **when all other interventions to increase milk supply have been tried**. Ideally, mothers should be assessed individually by a nurse, midwife or the obstetrician and if suitable, a letter provided to their GP requesting them to prescribe it. See appendix 3 for GP template letter.

Use of Bottle Feeds

Bottle feeds will not be offered to babies establishing breast feeding unless specifically requested by the parents and after all the risks and benefits have been fully explained to them

Contra-indications to bottle feeding

- If parents have requested that no bottles be given this must be documented on the admission sheet
- If the infant has had a good attempt at breastfeeding it is better to top up with the tube rather than offer milk by bottle as this can result in fatigue

Considerations for bottle feeding

Bottle feeding must be discussed with the parents prior to its use

- When parents want to only bottle feed
- If the mother wants to mix feed (breast and bottle)
- When it is inappropriate to breast feed (maternal medication/ HIV positive, Cocaine use)
- If the mother is unwell and is unable to breastfeed,
- If the mother has stopped lactating

Cup feeding - may be used in practice on the postnatal ward and possibly in transitional care

Discharge Planning

Mothers who wish to continue breast feeding on discharge will benefit from good planning to ensure a smooth transition and adequate support in the community.

Hospital stay does not need to be prolonged because of tube feeding. Some babies can be discharged home on NG feeds either as full feeds (e.g. babies with neurodevelopmental problems) or as top ups to compliment breast or bottle feeds. Close liaison with the community neonatal nurses will be required

Prior to discharge the nursing staff will organise for the mother to room in as required, to support the transition to full feeding on demand or prepare for tube feeding at home

Post Discharge Management

Infants discharged home on preterm post discharge formula may continue with this formula until 6 months corrected age

Refer to the named consultant or the paediatric dietitian if weight gain is not as expected:

For poor weight gain,

- consider breast milk fortifier for breast fed infants
- consider infantrini in formula fed infants

For excessive weight gain in a preterm formula fed infant consider changing to a term formula

For excessive weight gain, consider a term formula

Vitamin and iron supplements can be stopped at 6 months or when fully weaned, although currently there are concerns about the levels of Vitamin D in the diet of infants.

See appendix 6 for other recommendations

Appendix 1 Feeds for use on the Neonatal Unit (mean value per 100ml). See also Nutritional Calculator

Product name	Feed Description	Kcals	Protein (g)	CHO (g)	Fat (g) (%LCT: %MCT)	Na (mmol)	K (mmol)	Na (mg)	K (mg)
Pre-term Infants (<36 /40)									
EBM	Breast Milk	70	1.8	7	4	0.48	0.80	29	60
EBM + Nutriprem BMF	BM + fortifier	86	2.6	10	4		0.90	43	68
Nutriprem 1	Pre-term formula	80	2.4	7.9	4.4	0.68	1.06	41	80
Nutriprem 2	Pre-term formula	75	2	7.4	4.1	0.43	1.02	26	77
SMA Gold Prem 1	Pre-term formula								
SMA Gold Prem 2	Pre-term formula								
Infants < 1 year (up to 8kg)									
C&G Stage 1	Whole protein whey based	67	1.4	7.5	3.5	0.32	0.85	19	64
Milupa Aptamil	Whole protein whey based	67	1.4	7.5	3.5	0.32	0.85	19	64
Infatrini (Nutricia)	High energy infant formula	100	2.6	10.3	5.4	0.42	1.33	25	100
Pregestimil	Hydrolysed Casein	68	1.9	6.8	3.8	0.53	0.98	32	74
Enfamil AR	For reflux	68	1.7	7.6	3.5	0.40	1.13	24	85
Pepti- Junior	Hydrolysed Whey	67	1.8	6.8	3.6	0.33	0.88	20	66
C&G Pepti	Hydrolysed Whey	66	1.6	6.8	3.6	0.32	0.94	19	71
Neocate	Free Amino Acids	71	1.95	8.1	3.5	0.30	0.84	18	63
Monogen	Whole protein whey + MCT fat	74	2	12	2.1	0.58	0.84	35	63

Appendix 2: Nasogastric / Orogastric Tubes - Measurement, Checks and Flushing

Measurement

NGT: Xiphisternum to nose + Nose to Ear

OGT: Xiphisternum to nose

- Changed every 7 days
- <1500g use size 5
- >1500g use size 6

Secured to either chin or side of face

Checks

On 2 hourly feeds:

- the orogastric/nasogastric tube is tested for pH before every feed and documented on the feed chart
- aspirates are performed routinely every 6 hours, prior to handling

Flushing

Flush the nasogastric /orogastric tube after every three hourly or four hourly feed with 1ml of sterile water

Appendix 3: Use of Domperidone to Enhance Lactation

Letter can be photocopied and given to the mother

Any member of the neonatal medical team can sign the letter (doctors and nurses). The name should be printed after the signature at the bottom of the letter along with his /her title

Neonatal Intensive Care Unit

Dear Dr

Re:

This mother currently has an infant on the Neonatal Unit at St. Peter's Hospital, Chertsey. She has received advice and information about how to maximise her breast milk production but is finding it difficult to increase the volumes of milk she expresses.

Evidence suggests that Domperidone has been successfully and safely used to enhance breast milk production. As you are probably aware, it is not licensed for use in breastfeeding. However oral Domperidone appears to be safe and effective when used as advised.

Please would you therefore consider prescribing Domperidone for this mother? We recommend a dose of 10mg tds for 7 days, increasing to 20mg tds for the next 7 days if there has not been an increase in milk supply, or continuing at 10mg tds for the next 7 days if the milk supply is good. A course of 14 days is usually sufficient but can be repeated if necessary.

If you have any further questions about the prescription please contact us on the Neonatal Unit at St. Peter's Hospital, Chertsey.

Yours sincerely

.....

(Title).....

Appendix 4: Breast Milk Additives

Breast Milk Fortifier

Useful in infants who

- are growth faltering on just MEBM at a maximum tolerated volume
- have low urea levels (<2.0mmol/l)
- have low blood sugars

This product should be prescribed on ACBS and so need to be weaned off prior to discharge

This product should be prescribed; starting dose is 1% (see appendix 5)

Duocal

Useful for infants who are on MEBM and growth faltering prior to discharge

This product should be prescribed; starting dose of 1% (see appendix 5)

Maxijul

Useful for infants who are on MEBM and who have problems managing their blood sugars but continue to grow well. 3% will increase their total CHO amount from 7% to 10.0%

This product should be prescribed; starting dose 1% (see appendix 5)

Carobel

Can be used in a dietary management of infants who are

- vomiting and possetting more than usual
- have recurrent vomiting as in gastro oesophageal reflux

Carobel needs to be stirred well and not shaken when made up and left to thicken for 3-4 minutes. It will continue to thicken for 10-15 minutes after being made up

This product should be prescribed; starting dose is 1% (see below)

Gaviscon Infant Sachets

Can be used in a dietary management of infants who are

- vomiting and possetting more than usual
- have recurrent vomiting as in gastro oesophageal reflux

Other Products Available

Infatrini

Useful in infants who are on formula milk and who are:

- growth faltering
- have low blood sugars

Infatrini

The protein intake should not exceed 4g/kg/day

MI/kg/day	Protein (g/kg/d)	Fat	Carbohydrate	Glucose (mg/kg/m)
100	2.6	5.4	10.3	7.2
120	3.1	6.5	12.4	8.6
140	3.6	7.6	14.4	10.0
150	3.9	8.1	15.5	10.7

Appendix 5: Breast milk fortifier

The paediatric dietician should be contacted in the first instance to make a prescription for Breast Milk Fortifier in breast milk. This emergency regime can be used if the dietician is not available.

	1%	2%	3%
10mls Breast Milk	0.1g	0.2g	0.3g
15mls	0.15g	0.3g	0.45g
20mls	0.20g	0.4g	0.6g
25mls	0.25g	0.5g	0.75g
30mls	0.3g	0.6g	0.9g
35mls	0.35g	0.7g	1.05g
40mls	0.4g	0.8g	1.20g
50mls	0.5g	1.0g	1.5g

Contraindications to BMF:

- ◆ Never make up more than 50mls fortified milk at a time, unless feed boluses are more than 50mls.
- ◆ Never store fortified milk for more than 4hours (can increase the osmolality of the breast milk and reduce its function and effectiveness)
- ◆ Never mix fortifier with formula milk (studies have shown an increase risk of gastrointestinal calcium bolus obstruction –

Appendix 6: Guidelines for the use of NP1, NP2, SMA Gold Prem 1 (SGP1), SMA Gold Prem 2 (SGP2) and Term formula

<i>Age</i>	<i>Weight</i>	<i>Formula</i>		<i>Breast milk</i>	
		Type	Vitamins/Fe	With BMF	Vitamins/Fe
<36weeks	<1.8kg	Preterm formula	*Iron	1-2%BMF	Vitamins *Iron
<36weeks	>1.8kg	Preterm follow on formula	None	1-2% BMF	Vitamins *Iron
36-37weeks	<1.8kg	Preterm formula	*Iron	1-2% BMF	Vitamins *Iron
36-37 weeks	>1.8kg	Term	None	1-2%BMF	Vitamins *Iron
>37weeks	<1.8kg	Term	None	1-2% BMF	None
>37weeks	>1.8kg	Term	None		None

* Iron is started on day 21

Breast Fed Infants:

- All preterm infants on breast milk only will require vitamins and iron. Breast fed infants should continue vitamins until fully weaned.
- Vitamins should be started when the infant is taking up to 150ml/k/d of enteral feeds. Iron supplements should be started at 21 days
- For breast fed infants receiving Breast Milk Fortier (BMF), vitamins should be continued unless the infant is receiving 3% fortifier. Iron supplements should be started at 21 days and continued until fully weaned
- Babies on >50% feeds (and <50% formula) of EBM need vitamins

Preterm Formula

- Infants on preterm formula do not require vitamin supplements. Iron supplements should be started at 21 days
- Infants on preterm formula should be changed to Preterm follow on formula when their weight is $\geq 1.8\text{kg}$
- Infants on follow on preterm formula do not require vitamins or iron supplements
- Preterm infants should not be given term formula. They can be discharged home on the follow on preterm formula

All Infants

- It is recommended by the Department of Health that all infants should receive vitamin drops until they are 4 years old if they are still breast fed or taking less than 500ml of formula milk per day at the age of 6 months

Neonatal Intensive Care Unit
Tel:

Dear Parents/Guardians

Congratulations on taking your infant home

This letter is aimed at giving you better understanding of what your infant requires to supplement the milk your infant is on

If you are breast feeding, you will be discharged home with Vitamins for your baby. Iron supplements will be added once your infant is over 21 days. It is recommended that vitamins and iron should still be given till 6 months corrected age

If your infant is discharged home on a pre-term post discharge formula, iron supplements will be prescribed. These should be continued till you infant is 6 months corrected age

If your infant is discharged home on a term formula, a 2 week supply of vitamins and iron will be given to you on discharge. These can be bought over the counter if you wish to continue them

It is recommended by the Department of Health that your infant receives vitamin drops until they are 4 years old if you are still breast feeding or if he/she is taking less than 500ml of formula milk per day at the age of 6 months

Yours Sincerely

.....

(Title).....

Neonatal Intensive Care Unit
Tel:

Dear Dr

Re:(Mother of)

Name:
DOB.....
Address.....
.....

This infant has been prescribed Nutriprem 2/ SMA 2, a post discharge formula suitable for infants from discharge to 6 months corrected age. It is a specialised nutrient dense formula for preterm infants and has been recommended by

Dr.....
(Consultant Paediatrician at St Peter's Hospital Neonatal Unit)

We would be very grateful if you would prescribe this formula for the above infant until they are 6 months corrected age

Yours Sincerely

.....

(Title).....