Enteral Feeding Infants - Neonatal Clinical Guideline

V2.0

June 2019
Summary

Baby admitted to the neonatal unit
Assess criteria for appropriate feeding pathway

**STANDARD RISK**
(Appendix 4)

If appropriate, obtain IV access and commence 10% dextrose.

Start enteral feeds at 60ml/kg/day or 30ml/kg/day (with IV fluids @ 30ml/kg/day) dependent on respiratory status and increase by 10ml/kg 6hrly

Increase feeds daily by 30ml/kg/day (unless clinically contraindicated) to 160ml/kg/day - 180ml/kg/day

Consider starting breast milk fortifier when tolerating 120ml/kg/day

Continue to increase feeds daily by 10ml/kg/day up to 180ml/kg/day

**HIGHER RISK**
(Appendix 3)

Obtain central access and commence TPN <6 hours following admission.

Commence trophic feeds at 0.5ml/kg every 2 hours, increasing the 2-hourly volume by 0.5ml/kg every 6 hours, to aim for 2ml/kg every 2 hours by 24 hours, unless not appropriate – GI malformation, hypoxia, shock and severe medical instability

Increase feeds by 15 ml/kg 12 hourly (30ml/kg/day)

Stop lipids when tolerating ≥ 90ml/kg/day
1. **Aim/Purpose of this Guideline**

1.1 This guideline aims to provide optimal nutritional care to meet the needs of infants requiring neonatal care.

1.2. **Data Protection Act 2018 (General Data Protection Regulation – GDPR) Legislation**

The Trust has a duty under the DPA18 to ensure that there is a valid legal basis to process personal and sensitive data. The legal basis for processing must be identified and documented before the processing begins. In many cases we may need consent; this must be explicit, informed and documented. We can’t rely on Opt out, it must be Opt in.

DPA18 is applicable to all staff; this includes those working as contractors and providers of services.

For more information about your obligations under the DPA18 please see the ‘information use framework policy’, or contact the Information Governance Team rch-tr.infogov@nhs.net

2. **The Guidance**

2.1. **Introduction**

The goals of nutritional support in the preterm include:

- Achieving an acceptable standard of short-term growth.
- Meeting the recognised nutritional requirements of the preterm infant.
- Preventing feeding-related morbidities, especially necrotising enterocolitis (NEC)
- Optimising long-term outcomes.

2.2. **Nutritional requirements of the preterm infant.**

2.2.1. **Pre- Term Infants Nutritional Daily Requirement**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Term</th>
<th>Pre-Term Infant (Tsang 2005) ELBW</th>
<th>VLBW</th>
<th>Pre-Term Infant 1000kg – 1800kg (ESPGHAN 2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy (Kcal / kg)</strong></td>
<td>95 - 115</td>
<td>130 - 150</td>
<td>110 - 130</td>
<td>110 - 135</td>
</tr>
<tr>
<td><strong>Protein (g/kg)</strong></td>
<td>2</td>
<td>3.8 - 4.4</td>
<td>3.4 – 4.2</td>
<td>4.0 - 4.5 (≤1.0 kg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.5 - 4.0 (1.0 -1.8kg)</td>
</tr>
<tr>
<td><strong>Sodium (mmol/kg)</strong></td>
<td>1.5</td>
<td>3.0 - 5.0</td>
<td>3.0 – 5.0</td>
<td>3.0 - 5.0</td>
</tr>
<tr>
<td><strong>Potassium (mmol/kg)</strong></td>
<td>3.4</td>
<td>2.0 - 3.0</td>
<td>2.0 – 3.0</td>
<td>2.0 - 3.5</td>
</tr>
<tr>
<td><strong>Calcium (mmol/ml)</strong></td>
<td>3.8</td>
<td>2.5 - 5.5</td>
<td>2.5 – 5.5</td>
<td>3.0 - 3.5</td>
</tr>
<tr>
<td><strong>Phosphate (mmol/kg)</strong></td>
<td>2.1</td>
<td>2.0 - 4.5</td>
<td>2.5 – 4.5</td>
<td>1.9 – 2.9</td>
</tr>
</tbody>
</table>
2.3. **When to start feeding**

Stable non high-risk infants should commence feeding as close to birth as possible. There is growing evidence to support a move to earlier enteral feeding in the higher risk infant. (Infants considered HIGHER risk Appendix 3)

Caution should be taken when initiating feeding in the HIGHER risk subgroups. Treatment should be at individual clinical assessment.

2.4. **Trophic feeding**

Trophic feeds are small volumes of milk given to stimulate the bowel which are maintained for up to 7 days and not intended to contribute to nutrition.

2.4.1. The maximum volume classed as a “trophic feed” is **1ml/kg/hour or 24ml/kg/day**.

2.4.2. Trophic feeds should be given to very premature or high-risk infants in order to utilise maternal colostrum and stimulate gut trophic hormones. There is no recognised consensus on duration or method of delivery. However, there is general clinical consensus that:

2.4.2.1. Trophic feeds should commence as soon as possible.

2.4.2.2. Trophic feeds can be initiated and advanced during Ibuprofen treatment.

2.4.2.3. Trophic feeding of preterm infants with intrauterine growth restriction (IUGR) and abnormal antenatal Doppler results may not have a significant impact on incidence of NEC or feed intolerance.

2.4.2.4. Individual infants should be assessed daily for tolerance and decisions made with regard to continuation of trophic feeding or standard advancement of feeds.

2.4.2.5. In line with Baby Friendly Initiative (BFI) standards, available EBM should be used for all mouth care.

2.4.2.6. Probiotics should be commenced **as soon as possible in eligible infants (<32 weeks/<1500g)**.

2.5. **Rate of advance of feeding**

Available trial data do not provide evidence that advancing enteral feed volumes at slow rates (15 to 20 mL/kg/d) compared with faster rates (30 to 40 mL/kg/d) reduces the risk of necrotising enterocolitis (NEC) in very low birth weight (VLBW) infants.

The trials did not show an effect on all-cause mortality, and there was no statistical significant effect on risk of NEC or death among extremely low birth weight (ELBW), extremely preterm infants or infants with growth restriction or
evidence of absent or reversed end-diastolic flow velocity (AREDFV). However, some trials showed a higher risk of late-onset infection among infants who had slow advancement of enteral feeds\textsuperscript{25}.

2.5.1. Introduction of trophic feeds; Commence 0.5ml/kg every 2 hours, increasing the 2-hourly volume by 0.5ml/kg every 6 hours, to aim for 2ml/kg every 2 hours by 24 hours of age.

2.5.2. In standard risk infants a rate of increase of 40 ml/kg/day is reported as safe.

2.5.3. In higher risk infant evidence points towards a period of trophic feeds followed by a rate of increase of 30ml/kg/day.

2.5.4. \textbf{There should be a low threshold for withholding stepped increases secondary to intolerance in the high-risk infant.}

2.5.5. Infants <32 weeks should receive 2 hourly feeds moving to 3 hourly as they grow.

2.5.6. BFI supports the transition to responsive feeding from 3 hourly feeding if waking earlier for feeds +/- consistently completing calculated volumes.

2.5.7. The use of set 4 hourly feeding patterns should not be used.

2.6. \textbf{Assessing feed tolerance}

2.6.1. Careful clinical assessment is essential to prevent unnecessary limitations of enteral feeds or reliance on parenteral nutrition.

2.6.2. Gastric residual volume and colour of aspirate may indicate level of gut maturity rather than gut dysfunction and as volumes vary in the early stages of feeding significant increases should not be used in isolation when deciding to limit advancement of feeds. For the early detection of VLBW infants at risk for NEC, gastric residual volumes and bloody residuals in combination represent an early relevant marker.

2.6.3. Routine measurement of gastric volumes is not recommended\textsuperscript{26}.

2.6.4. \textit{Use of diluted feeds is not recommended.}

2.6.5. \textbf{Signs of intolerance:}

- Frequent Vomiting
- Abdominal distension
• Suspected NEC (signs can include: - bilious/bloody aspirates, visual bowel loops/abdominal discolouration, grossly bloody/watery or abnormal stools, clinically unstable or acute deterioration)

Modified Bell staging criteria for necrotizing enterocolitis (NEC).²⁷

<table>
<thead>
<tr>
<th>Stage</th>
<th>Classification of NEC</th>
<th>Systemic signs</th>
<th>Abdominal signs</th>
<th>Radiographic signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>Suspected</td>
<td>Temperature instability, apnoea, bradycardia, lethargy</td>
<td>Gastric retention, abdominal distention, emesis, haem-positive stool</td>
<td>Normal or mild intestinal dilation, mild ileus</td>
</tr>
<tr>
<td>IB</td>
<td>Suspected</td>
<td>Same as above</td>
<td>Grossly bloody stool</td>
<td>Same as above</td>
</tr>
<tr>
<td>IIA</td>
<td>Definite, mildly ill</td>
<td>Same as above</td>
<td>Same as above, plus absent bowel sounds with or without abdominal tenderness</td>
<td>Intestinal dilation, ileus, pneumatosis intestinalis</td>
</tr>
<tr>
<td>IIB</td>
<td>Definite, moderately ill</td>
<td>Same as above, plus mild metabolic acidosis and thrombocytopenia</td>
<td>Same as above, plus absent bowel sounds, definite tenderness, with or without abdominal cellulitis or right lower quadrant mass</td>
<td>Same as IIA, plus ascites</td>
</tr>
<tr>
<td>IIIA</td>
<td>Advanced, severely ill, intact bowel</td>
<td>Same as IIB, plus hypotension, bradycardia, severe apnoea, combined respiratory and metabolic acidosis, DIC, and neutropenia</td>
<td>Same as above, plus signs of peritonitis, marked tenderness, and abdominal distention</td>
<td>Same as IIA, plus ascites</td>
</tr>
<tr>
<td>IIIB</td>
<td>Advanced, severely ill, perforated bowel</td>
<td>Same as IIIA</td>
<td>Same as IIIA</td>
<td>Same as above, plus pneumoperitoneum</td>
</tr>
</tbody>
</table>

• Bilious Aspirates
Colour of aspirates should not be used in isolation when deciding whether to advance, continue or stop feeds. Infants with bilious aspirates should be medically assessed urgently.

2.6.6. Suggested interventions if signs of intolerance present:

• Medical review.
• Consider continuing with trophic feeds rather than nil enterally (not if signs of NEC).
• Consider partial septic screen, IV antibiotics and/or abdominal x-ray.
2.7. Milks and Indications for use

2.7.1. Breast Milk

2.7.1.1. Breast milk expressed by the infant's mother is the standard of care for all preterm infants.

2.7.1.2. Mothers should be counselled and encouraged to breastfeed or express milk as soon after birth as possible, even if their long-term intention is not to breastfeed. They should be encouraged to express 8-10 times in a 24-hour period, or as frequently as possible, as a minimum daily volume of 750 – 900ml by day 10-14 after birth is required in order to sustain exclusive breastfeeding. Preterm breast milk contains higher concentrations of protein, fat, energy and sodium in the first few weeks of lactation, but these drop to the same levels as mature term milk within 2-3 weeks of birth. Eventually more protein may be required in the form of multi-nutrient fortifiers, especially in those infants <1500g birth weight and/or <34weeks gestation.

2.7.1.3. Initiate feeding as per appropriate feeding risk category, increasing to maximum feed volume, as indicated by weight gain and volume tolerance.

2.7.1.4. Infants born <1000g will require 200ml/kg EBM to meet energy requirements; however, this will not meet their higher requirement for protein without breast milk fortification. Fortification should be considered in order to maintain lower feed volumes.

2.7.2. Donor Breast Milk (DBM)

2.7.2.1. If maternal EBM is insufficient, if appropriate, DBM should be offered. Advance until they are tolerating 180mls/kg/day and then transition to preterm formula.

2.7.2.2. Recommendations for the use of DBM

- ≤ 32weeks gestation and/or ≤ 1500g (including multiples)
- ≤ 35weeks and absent/reverse end diastolic flow
- Post NEC (medically and surgically treated)
- Post GI surgery
- Congenital heart disease with potential gut hypoperfusion e.g. hypoplastic left heart syndrome
- Infants transferred on DBM from another unit

Please refer to South West Neonatal Network Guideline for additional information on the giving of DBM.
http://swneonatalnetwork.co.uk/media/111960/swnn-guideline-use-of-donor-breastmilk-formatted.pdf
For advice on how to order DBM, if additional stock is required, please refer to Appendix 7.

2.7.3. Fore and Hind milk
- Prior to the introduction of fortifier to improve weight gain and depending on parental choice (plus maternal milk supply), the use of hind milk can be used. Please refer to Appendix 8 for further guidance.

2.7.4. Breast Milk Fortification (BMF)

2.7.4.1. Enteral feeding should be routinely advanced to 180mls/kg/day in infants <34weeks.

2.7.4.2. Infants born at <34weeks who are exclusively breastmilk feeding and tolerating 180mls/kg/day for at least 24hours are recommended to start fortifier or incrementally to 200mls/kg/day if there are significant concerns regarding the use of fortifier.

2.7.4.3. Fortifier is recommended if:
   1. Infants BW <1500g
   2. Infants BW >1500g but <2000g where:
      - Transitioning from Parenteral Nutrition (PN) to EBM once 150ml/kg/day is tolerated
      - Volumes of 180-200ml/kg EBM are not likely to be tolerated or
      - Weight gain is <18g/kg/day on maximum volumes tolerated or serum urea <2mmol/l (Appendix 5)
      - IUGR

2.7.4.4. If >50% of the feed requirement is provided by preterm formula, BMF need not be added. However, it should be considered if there is associated poor growth and tolerance of volume. In practice this would depend on having adequate volumes of milk to fortify accurately.

2.7.4.5. Where a combination feed is required, it can be given with either
   - EBM followed by unfortified formula
   - as alternate feeds of EBM+BMF and then formula.

There is no evidence to support one practice over the other, but the method that is easiest in practice and that involves the least amount of milk handling is likely to be the best for individual infants.

2.7.4.6. BMF should never be added as a supplement to preterm formula.
2.7.4.7. If infants are on full strength BMF only additional Iron supplements are required.

*Please refer to Appendix 9 for stepped approach to introducing fortifier.*

2.7.5. Preterm Infants and formulas

2.7.5.1. Where maternal EBM is not available (and parents do not wish to use DBM/infant does not fit DBM criteria) preterm formula should be used.

2.7.5.2. Recommendations for use of preterm formulas

- Infants born <34 weeks with a birth weight <2000g where EBM unavailable
- Feed to initial volume of 180ml/kg increasing as indicated by weight gain and volume tolerance.
- Infants born >1000g will have their protein requirements met by ~165ml/kg
- Infants born <1000g will have their protein requirements met by ~180ml/kg
- Volumes >180ml/kg are not usually necessary and other reasons for poor growth should be sought before further volume increases are introduced

2.7.6. Nutrient Enriched Post Discharge Formulas (NEPDF)

2.7.6.1. Infants born prior to 34 weeks who are >2kg and later preterm infants <2kg at birth who are not breastfed/EBM or who will require supplementary feeding at discharge should be changed NEPDF once appropriate to use a term formula.

2.7.6.2. There are currently two NEPDFs available in the UK, Nutriprem 2 and SMA Gold Prem 2.

2.7.6.3. These should be prescribed on EPMA (and as TTO)

2.7.6.4. NEPDF should be prescribed for preterm infants until 6 months corrected age (unless excessive growth at outpatient follow up):

- Infants on NEPDF do not require multivitamin supplements or folic acid but do require iron supplements.

2.7.7. Specialised term formulas

2.7.7.1. Specialised formulas should only be used under the direction of a Paediatric or Neonatal Dietitian or Paediatric Consultant.

2.7.7.2. Soya formulas are not recommended for infants under 6 months of age.
2.8. **Assessing Growth**

2.8.1. To monitor overall growth weekly assessment of weight, head circumference and length (Every Wednesday ward round).

2.8.1.1. Weigh every 4 days with calculation of g/kg/day (optimal weight gain 18g/kg/day) To calculate g/kg/day – (Latest weight – previous weight (in grams)) ÷ number of days since previous weight ÷ Previous weight (in kg)

2.8.1.2. OFC on admission and then every Wednesday

2.8.1.3. Length weekly (special care baby’s in cots)

3. **Monitoring compliance and effectiveness**

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>Key changes in practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Chris Bell, Acting Guidelines Lead</td>
</tr>
<tr>
<td>Tool</td>
<td>Audit</td>
</tr>
<tr>
<td></td>
<td>To be included in the Neonatal Clinical Audit Programme.</td>
</tr>
<tr>
<td></td>
<td>Findings reported to the Directorate Audit / Governance meetings.</td>
</tr>
<tr>
<td>Frequency</td>
<td>As dictated by audit findings</td>
</tr>
<tr>
<td>Reporting arrangements</td>
<td>Child Health Directorate Audit and Neonatal Clinical Guideline meetings.</td>
</tr>
<tr>
<td>Acting on recommendations and Lead(s)</td>
<td>Chris Warren Consultant Paediatrician and Neonatologist</td>
</tr>
<tr>
<td>Change in practice and lessons to be shared</td>
<td>Required changes to practice will be identified and actioned within 3 months of audit. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders</td>
</tr>
</tbody>
</table>

4. **Equality and Diversity**

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Inclusion & Human Rights Policy' or the Equality and Diversity website.

4.2. **Equality Impact Assessment**

The Initial Equality Impact Assessment Screening Form is at Appendix 2.
Appendix 1. Governance Information

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Enteral Feeding Infants on the Neonatal Unit Neonatal Clinical Guideline V2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>19 June 2019</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>26 June 2019</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>26 June 2022</td>
</tr>
<tr>
<td>Directorate / Department responsible (author/owner):</td>
<td>Neonatal - Lesley George, ANNP</td>
</tr>
<tr>
<td>Contact details:</td>
<td>(01872) 252667</td>
</tr>
<tr>
<td>Brief summary of contents</td>
<td>This guideline is designed to provide guidance to neonatal staff on the feeding of infants.</td>
</tr>
<tr>
<td>Suggested Keywords:</td>
<td>Enteral, feeding, neonates</td>
</tr>
<tr>
<td>Target Audience</td>
<td>RCHT</td>
</tr>
<tr>
<td>Executive Director responsible for Policy:</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Date revised:</td>
<td>May 2019</td>
</tr>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Enteral Feeding Infants - Neonatal Clinical Guideline V1.0</td>
</tr>
<tr>
<td>Care Group General Manager confirming approval processes</td>
<td>Debra Shields, Care Group General Manager</td>
</tr>
<tr>
<td>Name and Post Title of additional signatories</td>
<td>Not Required</td>
</tr>
<tr>
<td>Name and Signature of Care Group/Directorate Governance Lead confirming approval by specialty and care group management meetings</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Name: Caroline Amukusana</td>
<td></td>
</tr>
<tr>
<td>Signature of Executive Director giving approval</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Publication Location (refer to Policy on Policies – Approvals and Ratification):</td>
<td>Internet &amp; Intranet</td>
</tr>
<tr>
<td>Related Documents:</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Training Need Identified?</th>
<th>No</th>
</tr>
</thead>
</table>

Enteral Feeding of Preterm Infants on the Neonatal Unit. Clinical Guideline. Lynne Rathborne (2013)


Version Control Table

<table>
<thead>
<tr>
<th>Date</th>
<th>Version No</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job Title)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 Sept 14</td>
<td>V1.0</td>
<td>Initial Issue</td>
<td>Andrew Collinson. Consultant Paediatrician and Neonatologist</td>
</tr>
<tr>
<td>April 2019</td>
<td>V2.0</td>
<td>High and moderate risk regimes now higher risk Introduce trophic feeds on 1st day of life Introduce DEBM (if appropriate) if EBM not available to commence trophic feeds from day 1 Change in rates of increasing feeds higher risk 30ml/kg/day and standard risk 40ml/kg/day Escalation of feeds to 180ml/kg/day as standard Routine assessment of gastric residual volumes has been discontinued Change from preterm formula to standard formula when baby’s weight is over 2Kgs Increase breast milk fortifier daily (as tolerated) Perform weekly lengths on special care baby’s in cots</td>
<td>Lesley George, ANNP</td>
</tr>
</tbody>
</table>

All or part of this document can be released under the Freedom of Information Act 2000

This document is to be retained for 10 years from the date of expiry.
This document is only valid on the day of printing

Controlled Document
This document has been created following the Royal Cornwall Hospitals NHS Trust Policy for the Development and Management of Knowledge, Procedural and Web Documents (The Policy on Policies). It should not be altered in any way without the express permission of the author or their Line Manager.
### Appendix 2. Initial Equality Impact Assessment Form

*This assessment will need to be completed in stages to allow for adequate consultation with the relevant groups.*

<table>
<thead>
<tr>
<th>Name of the strategy / policy / proposal / service function to be assessed</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral Feeding Infants on the Neonatal Unit Neonatal Clinical Guideline V2.0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Directorate and service area:</th>
<th>Directorate and service area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Health Directorate. Neonatal</td>
<td>Existing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of individual completing assessment:</th>
<th>Name of individual completing assessment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chris Warren</td>
<td>Telephone: (01872) 252667</td>
</tr>
</tbody>
</table>

1. Policy Aim*

*Who is the strategy / policy / proposal / service function aimed at?*

The guideline is aimed at hospital staff responsible for the nutritional care of infants in a hospital setting.

2. Policy Objectives*

As above

3. Policy – intended Outcomes*

Audit

4. *How will you measure the outcome?*

Audit

5. Who is intended to benefit from the policy?

Medical, nursing and midwifery staff responsible for the care of infants. Neonatal patients

6a Who did you consult with

<table>
<thead>
<tr>
<th>Workforce</th>
<th>Patients</th>
<th>Local groups</th>
<th>External organisations</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b). Please identify the groups who have been consulted about this procedure.

Please record specific names of groups


What was the outcome of the consultation?

Guideline agreed (19/6/19)
7. The Impact
Please complete the following table. If you are unsure/don’t know if there is a negative impact you need to repeat the consultation step.

Are there concerns that the policy could have differential impact on:

<table>
<thead>
<tr>
<th>Equality Strands:</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
<th>Rationale for Assessment / Existing Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Sex (male, female, trans-gender / gender reassignment)</td>
<td></td>
<td></td>
<td>x</td>
<td>Any information provided should be in an accessible format for the parent/carer’s needs – i.e. available in different languages if required/access to an interpreter if required</td>
</tr>
<tr>
<td>Race / Ethnic communities /groups</td>
<td></td>
<td></td>
<td>x</td>
<td>Those parent/carers with any identified additional needs will be referred for additional support as appropriate - i.e. to the Liaison team or for specialised equipment. Written information will be provided in a format to meet the family’s needs e.g. easy read, audio etc.</td>
</tr>
<tr>
<td>Disability - Learning disability, physical impairment, sensory impairment, mental health conditions and some long-term health conditions.</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Religion / other beliefs</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Marriage and Civil partnership</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Pregnancy and maternity</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:
- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation- this excludes any policies which have been identified as not requiring consultation. or
- Major this relates to service redesign or development

8. Please indicate if a full equality analysis is recommended. 
   Yes | No | x

9. If you are not recommending a Full Impact assessment please explain why.

No areas identified

Enteral Feeding Infants - Neonatal Clinical Guideline V2.0
Page 17 of 26
| Date of completion and submission | 19 June 2019 | Members approving screening assessment | Policy Review Group (PRG) APPROVED |

**This EIA will not be uploaded to the Trust website without the approval of the Policy Review Group.**

A summary of the results will be published on the Trust’s web site.
Appendix 3. Enteral Feeding High Risk Criteria and Algorithm.

**HIGHER Risk**

High risk can be defined by **any** of the following:

- Less than 32 weeks’ gestation
- Less than 1000g birth weight or less than 0.4\textsuperscript{th} centile (any gestation)
- Preterm Small for Gestational Age infant (less than 2\textsuperscript{nd} percentile and less than 34 weeks’ gestation)
- Absent or reversed end diastolic flow in infants less than 34 weeks’ gestation
- Unstable ventilated neonates
- Hypotensive ventilated neonates
- Re-establishment of feeds following NEC
- Perinatal hypoxia-ischaemia with significant organ dysfunction
- Congenital gut malformations (e.g. gastroschisis)
- Dexamethasone treatment
- Indomethacin or ibuprofen treatment for PDA
- Complex congenital cardiac disease
- Polycythaemic infants (HCT≥65%)

**Enteral feeding HIGHER Risk Algorithm**

1. **Start TPN < 6 hours** of admission via central access

2. When clinically indicated start feeds at 0.5ml/kg every 2 hours, increasing the 2-hourly volume by 0.5ml/kg every 6 hours, aim for 2ml/kg every 2 hours by 24 hours of age.

3. Increase by 15ml/kg 12hourly as 2 hourly feeds. (30ml/kg/day) up to 180 ml/kg/day
   - Titrate feed volumes against IV fluids
   - Adjust PN as per guideline

4. If weight gain unsatisfactory refer to Appendix 5
Appendix 4. Enteral Feeding STANDARD Risk Criteria and Algorithm.

Standard risk can be defined by

- Babies > 32 weeks with no risk factors in any of the other groups.

**STANDARD Risk Algorithm**

![Diagram of STANDARD Risk Algorithm]

- **Is the baby on respiratory support?**
  - **Yes**
    - Start IV fluids at 60ml/kg/day
    - Once stable on respiratory support, commence 30ml/kg/day enteral feeds as 2-3 hourly feeds.
    - Increase by the rate of 10ml/kg 6 hourly (40ml/kg/day) as 2-3 hourly feeds.
    - Continue increasing at this rate until full enteral feeds volume achieved 180ml/kg/day or breast feeding established.
  - **No**
    - Start 60ml/kg/day as 2-3 hourly feeds
    - Increase feed volumes daily by 30ml/kg/day (as tolerated)
    - If weight gain is unsatisfactory refer to Appendix 5
Appendix 5. Response to feeding if weight gain unsatisfactory

- Serum urea <2mmol/l OR weight gain <18g/kg/day

- When tolerating 180mls/kg/day for at least 4 days

- Receiving EBM/DBM?

  - YES
    - Start Fortifier / Consider Fore/hind milk (see appendix 8)

  - NO
    - Ensure receiving preterm formula ↑200mls/kg/day. If not tolerated, consider high energy formula.
Appendix 6. Choice of Milk Algorithm

Expressed breast milk is the first milk of choice for these infants unless clearly contraindicated.
Use this algorithm to select which milk should be used if maternal EBM supply is not yet fully established to meet the babies feed volumes or if the baby is formula feeding.

Birth Weight

< 2kg

<1.5kg

Establish feeds on maternal EBM. If not sufficient volume available use Donor EBM with parental consent from birth. If declined, escalate to senior medical staff member to discuss with family and then consider Pregestimil.

1.5kg – 2kg

Establish feeds on maternal EBM. If not sufficient volume available use Donor EBM with parental consent from birth. If declined, consider preterm formula.

> 2kg

Establish feeds on maternal EBM. Supplement with term formula as required/ parental choice

See Donor EBM guideline for further information
http://swneonatalnetwork.co.uk/media/111960/swnn-guideline-use-of-donor-breastmilk-formatted.pdf
Appendix 7. Ordering of Donor Breast Milk

There is a monthly delivery of DBM, which aims to keep a constant 6 week supply in our freezer.

Deliveries are scheduled for the first Friday of each month. The Wednesday prior to this delivery, the unit will receive a telephone call to check stock levels so that a sufficient volume of milk is delivered.

Should you require additional DBM, or the shelf life of current stock is due to run out, please use the ordering process below:

If it is an urgent request you will need to arrange transport via freewheelers on 0300 800 1907. Non-urgent transport can usually be arranged via the milk bank and bloodbikes on 07831 470 870.

Do you have enough DBM in stock?

Yes

Does it have enough shelf life? (Please check expiry date on the bottle isn't going to expiry immediately or before the next delivery)

Yes

No

Is it Mon-Wed 9-2.30pm or Thurs 9-5pm?

No

Do you require DBM urgently?

Yes

Call the Precious Drops Milk Bank Mon-Wed 9-2.30pm, Thurs 9-5pm on 0117 414 6717/ 0117 414 6800 to order some DBM

No

Call Southmead NICU on 0117 414 6800 for advice
Appendix 8 Fore/Hind milk

Baby has inadequate weight gain, is receiving EBM but has not tolerated a ml/kg/day increase

Does mother have a good milk supply? E.g. if this were to be halved would it still cover the baby’s 24 hour requirements? Would this be sustainable?

Yes

Review information regarding Fore/Hind milk expressing. See requirement information. Does family fit criteria?

Yes

Begin fore/hind milk expressing and giving hind milk. Give alternate feeds whole milk and hind milk. Review weight after 2-4 days. Ensure the baby has had a minimum of 48 hours after receiving the hind milk before the weight is reviewed. Freeze foremilk.

No

Consider starting Breast milk fortifier as per Enteral feeding guidelines. Reweigh in 2-4 days

No

Does baby now have an adequate weight gain?

Yes

No

Continue
Information on Fore and Hind milk expressing

The theory behind fore and hind milk expressing is that the first part of the feed has the voluminous liquid part of the feed. As the expression (or feed) continues, the fat content rises.

Therefore, if you split the expression in half, the second half of the expression should contain more fat and calories than the first.

Requirements:

- Mums must have a good supply of breastmilk (near to 750mls/day) so that, if this is halved, there will be enough milk to feed the baby on just hind milk alone.
- Mums need to be happy to do this; as it involves estimating the length of expression and changing bottles half way through. Bottles should then be labelled 1 and 2. The FIRST bottle (fore milk) can then be frozen for use when the baby needs fewer calories, e.g. with weaning. Parents should be encouraged to freeze and store this bottle at home.
- Mum intends to continue expressing for a while. The initial benefit of using hind milk will be reduced if we will then need to give the foremilk with fewer calories in the following weeks, or that we would then need to move to formula/ start fortifier sooner than planned due to there being only foremilk left in stock.
- Hind milk must always be given fresh; hind milk should not be frozen unless absolutely necessary as freezing reduces the fat content of the milk.
Appendix 9. Fortifier Concentration to 50mls of Expressed Breast Milk

**Breast Milk Fortifier Concentrations**

Mix 1 sachet of breast milk fortifier with 6mls expressed breast milk (referred to as fortified EBM solution from this point forward) **Shake vigorously. Once fortified, solution is added to EBM - swirl to mix**

**For ¼ Strength Fortifier**

To make a 50ml volume add 1.5mls of fortified EBM solution to 48.5mls EBM

**For ½ Strength Fortifier**

To make 50mls of milk up add 3mls of fortified EBM solution to 47mls EBM

**For ¾ Strength Fortifier**

To make 50mls of milk up, add 4.5mls of fortified EBM solution to 45.5mls EBM.

**For full Strength Fortifier**

To make 50mls of milk up, **add the full 6mls of fortified EBM solution to 44mls of EBM**

*Fortifier should be commenced at ¼ strength and then increased by ¼ strength every 24 hours, as tolerated*

Fortified EBM solution (i.e. 6mls EBM with added fortifier) can be safely stored in the refrigerator for 24 hours as per the manufacturers guidelines but will expire if the EBM is due to expire earlier. (e.g. after 24 hours if using defrosted EBM). There is some evidence (although not yet quantified) to suggest that prolonged storage of fortified EBM in large volumes may impact immunological components (Shaw, 2015). It is therefore advised that fortified EBM solution be added to the remaining EBM volume as close to a feed as possible to avoid this.

Breast milk fortifier can be introduced when tolerating 150ml/kg/day in situations of poor weight gain (Consultant decision).