Royal Cornwall Hospitals NHS Trust

Policy Under Review

Please note that this policy is under review. It does, however, remain current Trust policy subject to any recent legislative changes, national policy instruction (NHS or Department of Health), or Trust Board decision. For guidance, please contact the Author/Owner.

Information Category	Detailed Information
Document Title:	Enteral Feeding Infants Neonatal Clinical Guideline V3.4
This document replaces (exact title of previous version):	Enteral Feeding Infants - Neonatal Clinical Guideline V3.3
Date Issued / Approved:	June 2023
Date Valid From:	June 2023
Date Valid To:	September 2025
Author / Owner:	Georgia Kirwin; Neonatal Dietician
Contact details:	01872 252667
Brief summary of contents:	This guideline is designed to provide guidance to neonatal staff on the feeding of infants.
Suggested Keywords:	Enteral, feeding, neonates
Target Audience:	**RCHT:** Yes **CFT:** No **CIOS ICB:** No
Executive Director responsible for Policy:	Chief Medical Officer.
Approval route for consultation and ratification:	Neonatal Health Audit and Guidelines Group.
Manager confirming approval processes:	Caroline Chappell.
Name of Governance Lead confirming consultation and ratification:	Michael Cross.
Links to key external standards:	None required

Related Documents:	1. Agostoni, C., Buonocore, G., Carnielli, V.P., De Curtis, M., Darmaun, D., Decsi, T., Domellöf, M., Embleton, N.D., Fusch, C., Genzel-Boroviczeny, O. and Goulet, O., 2010. Enteral nutrient supply for preterm infants: commentary from the European Society of Paediatric Gastroenterology, Hepatology and Nutrition Committee on Nutrition. Journal of pediatric gastroenterology and nutrition, 50(1), pp.85-91. 2. British Association of Perinatal Medicine (2020): Maternal Breast Milk Toolkit 3. Gephart, S.M., Underwood, M.A., Rosito, S., Kim, J.H. and Caplan, M.S., 2020. Grading the evidence to identify strategies to modify risk for necrotizing enterocolitis. Pediatric research, 88(1), pp.41-47. 4. Koletzko, B., Uauy, R. and Poindexter, B., 2014. Nutritional care of preterm infants: scientific basis and practical guidelines. Nutritional Care of Preterm Infants, pp.1-314. 5. Morgan, J., Bombell, S. and McGuire, W., 2013. Early trophic feeding versus enteral fasting for very preterm or very low birth weight infants. Cochrane database of systematic reviews, (3). 6. Morley, R., Fewtrell, M.S., A. Abbott, R., Stephenson, T., MacFadyen, U. and Lucas, A., 2004. Neurodevelopment in children born small for gestational age: a randomized trial of nutrient-enriched versus standard formula and comparison with a reference breastfed group. Pediatrics, 113(3), pp.515-521. 7. Samuels, N., van de Graaf, R.A., de Jonge, R.C., Reiss, I.K. and Vermeulen, M.J., 2017. Risk factors for necrotizing enterocolitis in neonates: a systematic review of prognostic studies. BMC pediatrics, 17(1), pp.1-9. 8. Singhal, A., Cole, T.J., Fewtrell, M., Kennedy, K., Stephenson, T., Elias-Jones, A. and Lucas, A., 2007. Promotion of faster weight gain in infants born small for gestational age: is there an adverse effect on later blood pressure?. Circulation, 115(2), pp.213-220. 9. Tyson J. E., Kennedy K. A. (2005) Trophic Feeding for parenterally fed infants. Cochrane Database Syst Rev.Jul20;(3).

Information Category	Detailed Information
	10. UNICEF UK (2022) Baby Friendly Initiative: Guidance for Neonatal Units.
Training Need Identified:	No.
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet and Intranet
Document Library Folder/Sub Folder:	Clinical/ Neonatal

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 on Document Production. It should not be altered in any way without the express permission of the author or their Line Manager.

Enteral Feeding Infants Neonatal Clinical Guideline

V3.4

June 2023

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. 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 [1,4].
- Preventing feeding-related morbidities, especially necrotising enterocolitis (NEC).
- Optimising long-term outcomes.

1.2. This version supersedes any previous versions of this document.

Data Protection Act 2018 (General Data Protection Regulation – GDPR) Legislation

The Trust has a duty under the Data Protection Act 2018 and General Data Protection Regulations 2016/679 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 cannot rely on opt out, it must be opt in.

Data Protection Act 2018 and General Data Protection Regulations 2016/679 is applicable to all staff; this includes those working as contractors and providers of services.

For more information about your obligations under the Data Protection Act 2018 and General Data Protection Regulations 2016/679 please see the Information Use Framework Policy or contact the Information Governance Team

Royal Cornwall Hospital Trust rch-tr.infogov@nhs.net

2. The Guidance

Abbreviations	
PN	Parenteral Nutrition
BMF	Breast milk fortifier
EBM	Expressed breast milk
MEBM	Maternal expressed breast milk
DEBM	Donor expressed breast milk
NEC	Necrotizing enterocolitis
SWNN	South west neonatal network
NEPDF	Nutrient enriched post-discharge formula
NG	Nasogastric tube
SGA	Small for gestational age
OFC	Occipito-frontal circumference

2.1. Babies should be risk assessed on admission to the neonatal unit and started on the high/standard risk feeding protocol as appropriate.

2.2. Refer to appendices 3 and 4 for feeding protocols and criteria.

2.3. Babies of ≥34 weeks gestation with transient respiratory distress, who do not meet any high risk feeding criteria, should have their feeding normalized as soon as they are safe to feed. They do not need to follow the feeding protocols for gradual feed introduction.

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.
The maximum volume classed as a “trophic feed” is **1ml/kg/hour or 24ml/kg/day**[5].

Trophic feeds should commence as soon as possible, within 6 hours after birth[2].
If trophic feeds are not clinically appropriate, this should be clearly documented in the notes by the medical team.

Available MEBM should be used for all mouth care[10].

2.5. **Goal feeding rates.**

Feeds should be advanced to 165ml/kg as standard using the appropriate feeding protocol. Feeds may be increased to 180-200ml/kg/day, on advice of the Neonatal Dietitian or Neonatal Consultant.

2.6. **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 infants at risk for NEC, gastric residual volumes and bloody residuals in combination represent an early relevant marker.

2.6.3. If there is clinical suspicion of NEC, please consult a member of the Neonatal Team and refer to the NEC guideline.

2.6.4. Routine measurement of gastric volumes is not recommended.

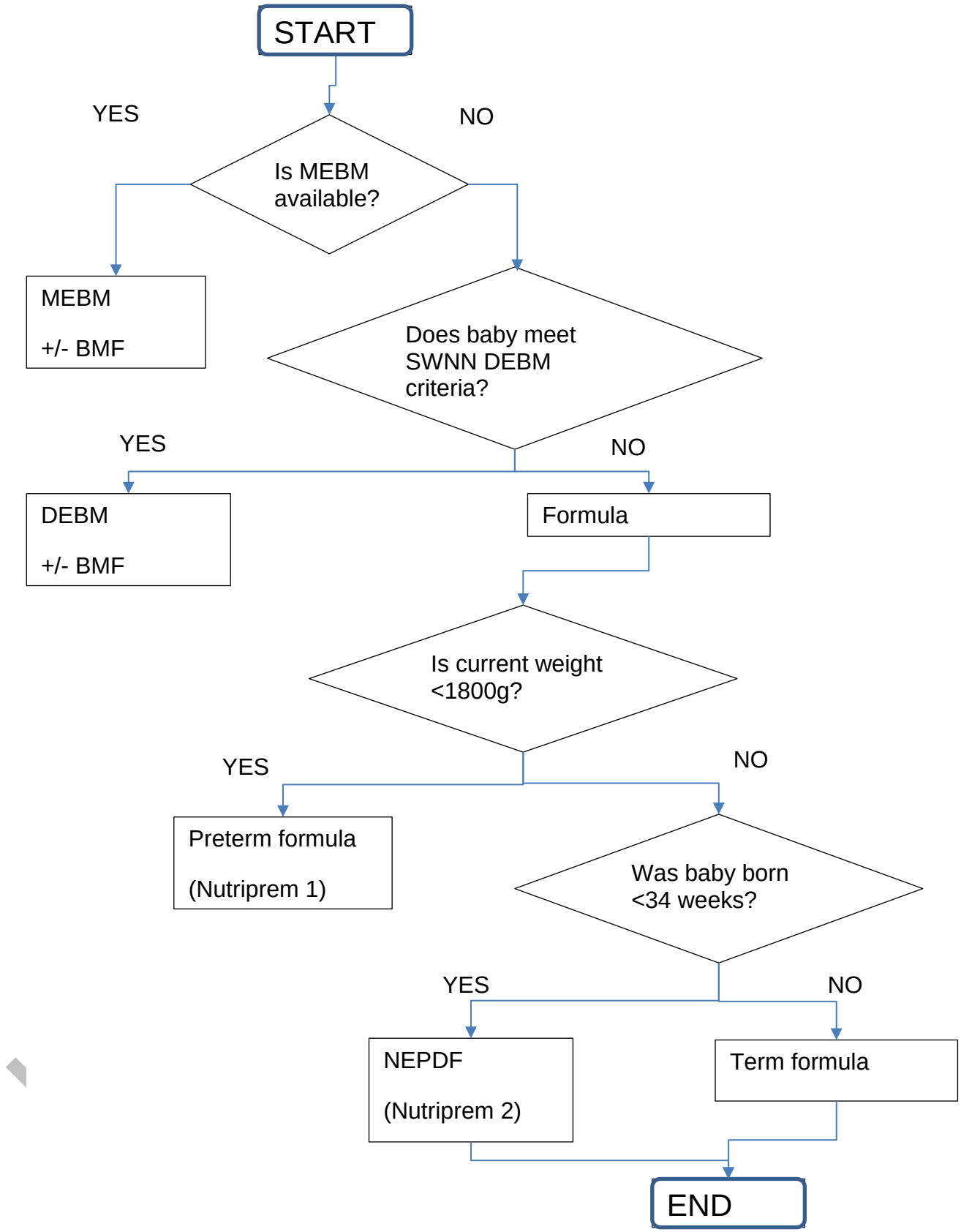
2.6.5. Use of diluted feeds is not recommended.

2.6.6. 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.

2.7. **Choice of milk type.**

2.7.1. Figure 2: Milk choice flowchart for preterm infants- see next page.


START
YES
NO
Is MEBM available?
MEBM
+/- BMF
Does baby meet SWNN DEBM criteria?
YES
NO
DEBM
+/- BMF
Formula
Is current weight <1800g?
YES
NO
Preterm formula
(Nutriprem 1)
Was baby born <34 weeks?
YES
NO
NEPDF
(Nutriprem 2)
Term formula
END

2.7.2. **Breast Milk.**

Maternal breast milk is the first choice for all preterm infants[1,4].

Mothers/feeding parents should be counselled and encouraged to breastfeed or express milk even if their long-term intention is not to breastfeed. This should happen before delivery ideally, or as soon after birth as possible. 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[2,10].

2.7.3. **Donor Breast Milk (DBM).**

If maternal EBM is insufficient, give DEBM if the infant is eligible; SWNN eligibility criteria for DEBM are included in Appendix 8. Parental consent for DEBM is required.

2.7.4. **Breast Milk Fortification (BMF).**

Routine introduction of BMF is recommended if an infant meets both criteria:

- Infants with birth weight <1800g OR <34 weeks gestation.
- Receiving >50% enteral intake as MEBM/DEBM.

Infants who do not meet criteria for routine use of BMF may be recommended to commence BMF at the discretion of the neonatal dietitians if there are other indicators of suboptimal nutritional status.

Breastmilk fortifier should be commenced when the infant is tolerating ≥100ml/kg/d enteral MEBM/DEBM. BMF should be introduced at ½ strength, then increased to full strength after 48 hours unless there are tolerance issues.

Infants receiving BMF will usually be gradually weaned off BMF during the transition to oral breastfeeds. However, natural weaning of BMF will not occur for infants transitioning to MEBM bottle feeds, or those expected to have substantial NG top ups post-discharge. The neonatal dietitians will therefore advise on the gradual withdrawal of BMF on an individual basis. BMF may be used post-discharge in occasional cases, this will be under the supervision of the neonatal dietitians.

2.7.5. **Mixed breastmilk and formula feeding.**

Where a mixed feed is required, it can be given with either:

- EBM +/- BMF followed by unfortified formula.

OR

- 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.

BMF must never be added to formula.

BMF can be stopped if an infant is having >50% enteral intake as formula. However, it may be pragmatic to continue BMF if the proportions of EBM and formula given vary widely on a day-to-day basis.

2.7.6. **Formula.**

Formula should only be used if MEBM/DEBM are unavailable OR parents state a preference for their baby to be formula-fed.

See **Error! Reference source not found.** to determine appropriate formula choice when infants are newly starting formula.

When an infant receiving preterm formula reaches 1800g they should be transitioned onto a first infant formula or NEPDF. This decision should be based on individual nutritional assessment by a neonatal consultant or neonatal dietitian. Infants discharged on NEPDF will be followed up by the neonatal dietitian to support the transition to first infant formula by 6 months corrected age at the latest.

Small for gestational age term infants should not routinely receive preterm formula or NEPDF. They should be commenced on term formula if breastmilk is unavailable[6,8].

2.7.7. **Micronutrient supplementation.**

Infants born prior to 34 weeks gestation and/or below 1800g birth weight will require micronutrient supplementation in addition to milk feeds. Refer to RCHT clinical guideline “Micronutrient Supplementation in Preterm Infants” for guidance.

2.7.8. **Specialist products.**

Preterm-specific protein supplements and hydrolysed preterm formula may be used occasionally on the advice of the Neonatal Dietitian. Appendix 5 lists available products at RCHT.

Specialist term formulas should only be used on the advice of a Neonatal Dietitian or Neonatal Consultant.

2.8. **Assessing Growth.**

All babies should be weighed twice weekly. All babies should have their length and OFC measured weekly, unless too clinically unstable.

Measurements should be plotted on the appropriate growth chart to aid nutritional assessment.

3. Monitoring compliance and effectiveness

Information Category	Detail of process and methodology for monitoring compliance
Element to be monitored	Key changes in practice.
Lead	Neonatal Guidelines Lead - Dr Charlotte Lea.
Tool	Audit. To be included in the Neonatal Clinical Audit Programme. Findings reported to the Directorate Audit / Governance meetings.
Frequency	As dictated by audit findings.
Reporting arrangements	Child Health Directorate Audit and Neonatal Clinical Guideline meetings.
Acting on recommendations and Lead(s)	Chris Warren Consultant Paediatrician and Neonatologist.
Change in practice and lessons to be shared	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.

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 and 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

Information Category	Detailed Information
Document Title:	Enteral Feeding Infants Neonatal Clinical Guideline V3.4
This document replaces (exact title of previous version):	Enteral Feeding Infants - Neonatal Clinical Guideline V3.3
Date Issued/Approved:	June 2023
Date Valid From:	June 2023
Date Valid To:	June 2025
Directorate / Department responsible (author/owner):	Georgia Kirwin; Neonatal Dietician
Contact details:	01872 252667
Brief summary of contents:	This guideline is designed to provide guidance to neonatal staff on the feeding of infants.
Suggested Keywords:	Enteral, feeding, neonates
Target Audience:	**RCHT:** Yes **CFT:** No **CIOS ICB:** No
Executive Director responsible for Policy:	Chief Medical Officer
Approval route for consultation and ratification:	Neonatal Audit and Guidelines Group
Manager confirming approval processes:	Caroline Chappell
Name of Governance Lead confirming consultation and ratification:	Caroline Amukusana
Links to key external standards:	None required
Related Documents:	11. Agostoni, C., Buonocore, G., Carnielli, V.P., De Curtis, M., Darmaun, D., Decsi, T., Domellöf, M., Embleton, N.D., Fusch, C., Genzel-Boroviczeny, O. and Goulet, O., 2010. Enteral nutrient supply for preterm infants: commentary from the European Society of Paediatric Gastroenterology,

Information Category	Detailed Information
	Hepatology and Nutrition Committee on Nutrition. Journal of pediatric gastroenterology and nutrition, 50(1), pp.85-91. 12. British Association of Perinatal Medicine (2020): Maternal Breast Milk Toolkit 13. Gephart, S.M., Underwood, M.A., Rosito, S., Kim, J.H. and Caplan, M.S., 2020. Grading the evidence to identify strategies to modify risk for necrotizing enterocolitis. Pediatric research, 88(1), pp.41-47. 14. Koletzko, B., Uauy, R. and Poindexter, B., 2014. Nutritional care of preterm infants: scientific basis and practical guidelines. Nutritional Care of Preterm Infants, pp.1-314. 15. Morgan, J., Bombell, S. and McGuire, W., 2013. Early trophic feeding versus enteral fasting for very preterm or very low birth weight infants. Cochrane database of systematic reviews, (3). 16. Morley, R., Fewtrell, M.S., A. Abbott, R., Stephenson, T., MacFadyen, U. and Lucas, A., 2004. Neurodevelopment in children born small for gestational age: a randomized trial of nutrient-enriched versus standard formula and comparison with a reference breastfed group. Pediatrics, 113(3), pp.515-521. 17. Samuels, N., van de Graaf, R.A., de Jonge, R.C., Reiss, I.K. and Vermeulen, M.J., 2017. Risk factors for necrotizing enterocolitis in neonates: a systematic review of prognostic studies. BMC pediatrics, 17(1), pp.1-9. 18. Singhal, A., Cole, T.J., Fewtrell, M., Kennedy, K., Stephenson, T., Elias-Jones, A. and Lucas, A., 2007. Promotion of faster weight gain in infants born small for gestational age: is there an adverse effect on later blood pressure?. Circulation, 115(2), pp.213-220. 19. Tyson J. E., Kennedy K. A. (2005) Trophic Feeding for parenterally fed infants. Cochrane Database Syst Rev.Jul20;(3) 20. UNICEF UK (2022) Baby Friendly Initiative: Guidance for Neonatal Units
Training Need Identified?	No

Information Category	Detailed Information
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet and Intranet
Document Library Folder/Sub Folder:	Clinical/ Neonatal

Version Control Table

Date	Version Number	Summary of Changes	Changes Made by
30 Sept 14	V1.0	Initial Issue	Andrew Collinson. Consultant Paediatrician and Neonatologist
April 2019	V2.0	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	Lesley George, ANNP
June 2022	V3.0	Goal feeding rate reduced to 165mlkg/d Breast milk fortifier commenced at 100ml/kg/d and titrated up over 2 days Change from preterm formula at 1.8kg New flowchart added for milk choice High risk feeding protocol reformatted	Georgia Kirwin Neonatal Dietitian
August 2022	V3.1	Breast milk fortification protocol amended due to stock issues and reformulation of product	Georgia Kirwin Neonatal Dietitian
November 2022	V3.2	Changes made to clarify that not all babies on high-risk regime will be receiving TPN. Also noted BMF was not increased to full strength after 48h as per policy.	Georgia Kirwin Neonatal Dietitian

Date	Version Number	Summary of Changes	Changes Made by
March 2023	V3.3	Changed high risk criteria to reflected PN guideline – 31 weeks and < 1.25kg	Lel George (ANNP)
June 2023	V 3.4	Removed <0.4th centile (any gestation) from indication for high risk feeding, and added in 'consultant discretion' as an indication for high risk regimen	Charlotte Lea; Consultant Paediatrician

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

All Policies, Strategies and Operating Procedures, including Business Plans, are to be kept for the lifetime of the organisation plus 6 years.

This document is only valid on the day of printing.

Controlled Document

This document has been created following the Royal Cornwall Hospitals NHS Trust The Policy on Policies (Development and Management of Knowledge Procedural and Web Documents Policy). It should not be altered in any way without the express permission of the author or their Line Manager.

Appendix 2. Equality Impact Assessment

Section 1: Equality Impact Assessment (EIA) Form

The EIA process allows the Trust to identify where a policy or service may have a negative impact on an individual or particular group of people.

For guidance please refer to the Equality Impact Assessment Policy (available from the document library) or contact the Equality, Diversity and Inclusion Team rcht.inclusion@nhs.net

Information Category	Detailed Information
Name of the strategy / policy / proposal / service function to be assessed:	Enteral Feeding Infants Neonatal Clinical Guideline V3.4
Directorate and service area:	Neonatal
Is this a new or existing Policy?	Existing
Name of individual completing EIA (Should be completed by an individual with a good understanding of the Service/Policy):	Neonatal Audit and Guidelines Group
Contact details:	01872 252667

Information Category	Detailed Information
1. Policy Aim - Who is the Policy aimed at? (The Policy is the Strategy, Policy, Proposal or Service Change to be assessed)	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	To provide optimal nutritional care to meet the needs of infants requiring neonatal care.
4. How will you measure each outcome?	See section 3.
5. Who is intended to benefit from the policy?	Medical, nursing and midwifery staff responsible for the care of infants. Neonatal patients.

Information Category	Detailed Information
6a. Who did you consult with? (Please select Yes or No for each category)	• Workforce: Yes • Patients/ visitors: No • Local groups/ system partners: No • External organisations: No • Other: No
6b. Please list the individuals/groups who have been consulted about this policy.	**Please record specific names of individuals/ groups:** Neonatal Audit and Guidelines Group
6c. What was the outcome of the consultation?	Approved- 07 June 2023
6d. Have you used any of the following to assist your assessment?	**National or local statistics, audits, activity reports, process maps, complaints, staff or patient surveys:** No

7. The Impact

Following consultation with key groups, has a negative impact been identified for any protected characteristic? Please note that a rationale is required for each one.

Where a negative impact is identified without rationale, the key groups will need to be consulted again.

Protected Characteristic	(Yes or No)	Rationale
Age	No	
Sex (male or female)	No	
Gender reassignment (Transgender, non-binary, gender fluid etc.)	No	
Race	No	Any information provided should be in an accessible format for the parent/ carer needs- i.e., available in different languages if required/access to an interpreter if required

Protected Characteristic	(Yes or No)	Rationale
Disability (e.g. physical or cognitive impairment, mental health, long term conditions etc.)	No	Those parent/ carer 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.
Religion or belief	No	All staff should be aware of any beliefs that may impact on the decision to treat and should respond accordingly
Marriage and civil partnership	No	All staff should be aware of any marital arrangements that may have an impact on care (for example: separated parents, domestic abuse).
Pregnancy and maternity	No	
Sexual orientation (e.g. gay, straight, bisexual, lesbian etc.)	No	

A robust rationale must be in place for all protected characteristics. If a negative impact has been identified, please complete section 2. If no negative impact has been identified and if this is not a major service change, you can end the assessment here.

I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.

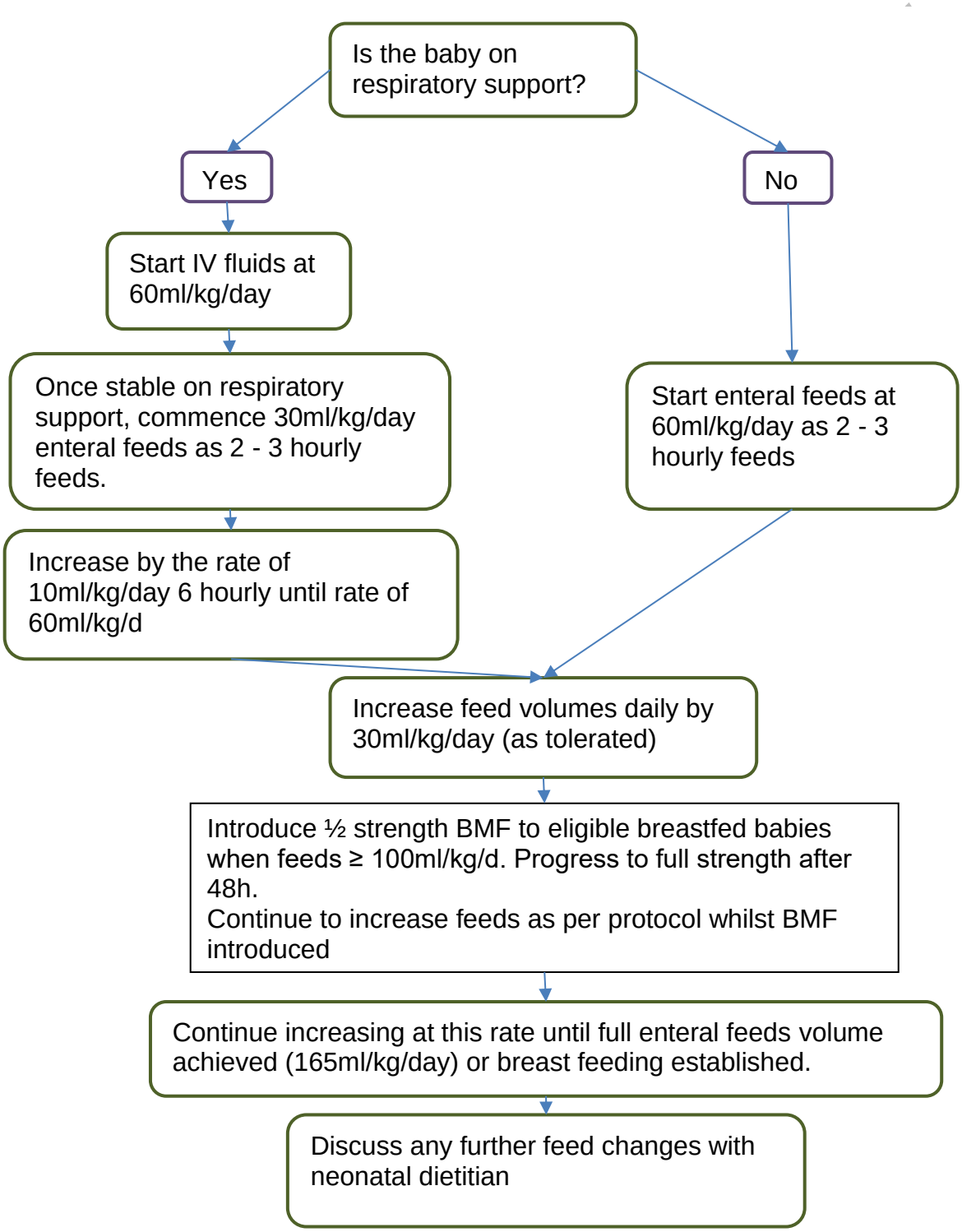
Name of person confirming result of initial impact assessment: Neonatal Audit and Guidelines Group

If a negative impact has been identified above OR this is a major service change, you will need to complete section 2 of the EIA form available here:
Section 2. Full Equality Analysis

Appendix 3. Enteral Feeding STANDARD Risk Criteria Algorithm

Late preterm (34-37) and Term infants requiring non-invasive respiratory support ONLY, who do not have any high-risk feeding criteria, can be enteral fed starting at 30-60ml/kg/day. They can have feeds increased as tolerated each feed.

For all **other** babies > 31 weeks or > 1.25kg with no high-risk risk factors use the below algorithm



Appendix 4. Enteral Feeding High Risk Criteria and Algorithm

HIGH Risk

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

- Less than 31 weeks' gestation.
- Less than 1250kg birth weight.
- Preterm Small for Gestational Age infant (less than 2nd 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.
- Polycythaemia infants (Symptomatic with Venous HCT>70%).
- Consultant Discretion.

Feeding progression guide for the high-risk regime using 15ml/kg/day 12 hourly

Start baby on **6ml/kg/day** 2 hourly feeds EXTRA TO VOLUME
After 6 hours
Increase to **12ml/kg/day** 2 hourly feeds EXTRA TO VOLUME
After 6 hours
Increase to **18ml/kg/day** 2 hourly feeds EXTRA TO VOLUME
After 6 hours
Increase to **24ml/kg/day** 2 hourly feeds EXTRA TO VOLUME
After 6 hours
Increase to **30ml/kg/day** 2 hourly feeds INCLUDE IN VOLUME * If on TPN titrate Lipids to 15ml/kg/day*
After 6 hours
Now increase by 15ml/kg/day every 12 hours
Increase to **45ml/kg/day** 2 hourly feeds
After 12 hours
Increase to **60ml/kg/day** every 2 hourly feeds * If on TPN titrate Lipids to 10ml/kg/day*
After 12 hours
Increase to **75ml/kg/day** every 2 hourly feeds
After 12 hours
Increase to **90ml/kg/day** every 2 hourly feeds * If on TPN stop Lipids*
After 12 hours
Increase to **105ml/kg/day** every 2 hourly feeds *NB Consider introducing BMF ½ strength*
After 12 hours
Increase to **120ml/kg/day** every 2 hourly feeds *NB Consider switching to clear fluids if on TPN *
After 12 hours
Increase to **135ml/kg/day** every 2 hourly feeds
After 12 hours
Increase to **150ml/kg/day** every 2 hourly feeds
After 12 hours
Increase to **165ml/kg/day** every 2 hourly feeds *Consider increasing BMF to full strength*

Feeding progression guide for the high-risk regime using 10ml/kg/day 8 hourly.

Start baby on **6ml/kg/day** 2 hourly feeds EXTRA TO VOLUME
After 6 hours
Increase to **12ml/kg/day** 2 hourly feeds EXTRA TO VOLUME
After 6 hours
Increase to **18ml/kg/day** 2 hourly feeds EXTRA TO VOLUME
After 6 hours
Increase to **24ml/kg/day** 2 hourly feeds EXTRA TO VOLUME
After 6 hours
Increase to **30ml/kg/day** 2 hourly feeds INCLUDE IN VOLUME * If on TPN titrate Lipids to 15ml/kg/day*
After 6 hours
Now increase by 10ml/kg/day every 8 hours
Increase to **40ml/kg/day** 2 hourly feeds
After 8 hours
Increase to **50ml/kg/day** 2 hourly feeds
After 8 hours
Increase to **60ml/kg/day** every 2 hourly feeds * If on TPN titrate Lipids to 10ml/kg/day*
After 8 hours
Increase to **70ml/kg/day** every 2 hourly feeds
After 8 hours
Increase to **80ml/kg/day** 2 hourly feeds
After 8 hours
Increase to **90ml/kg/day** every 2 hourly feeds * If on TPN stop Lipids*
After 8 hours
Increase to **100ml/kg/day** every 2 hourly feeds *Consider introducing BMF ½ strength*
After 8 hours
Increase to **110ml/kg/day** every 2 hourly feeds
After 8 hours
Increase to **120ml/kg/day** every 2 hourly feeds *NB Consider switching to clear fluids if on TPN*
After 8 hours
Increase to **130ml/kg/day** every 2 hourly feeds
After 8 hours
Increase to **140ml/kg/day** every 2 hourly feeds
After 12 hours
Increase to **150ml/kg/day** every 2 hourly feeds *Increase to full strength BMF*
After 24 hours
Increase to **165ml/kg/day** every 2 hourly feeds
After 24 hours

Appendix 5: List of Nutritional Products

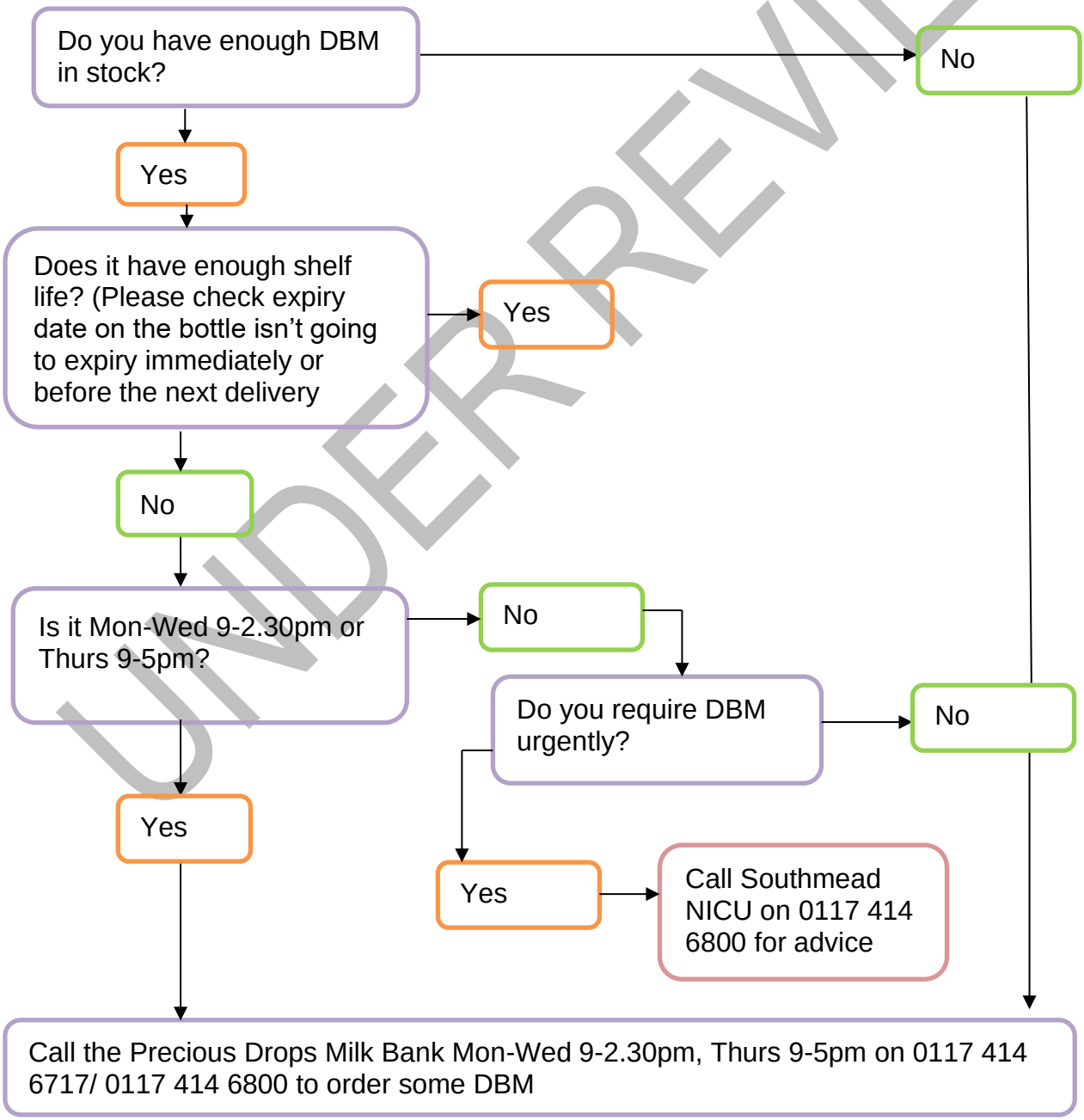
First line product	Alternatives available
Nutriprem human milk fortifier	SMA Breast milk fortifier
Nutriprem 1 preterm formula	SMA Gold Prem 1
Nutriprem 2 post-discharge formula	SMA Gold Prem 2
The below products are available for use at RCHT but are unlikely to be required routinely	
Similac high energy (term nutrient-enriched formula)	Infatrini; SMA high energy
Hydrolysed nutriprem (extensively hydrolysed preterm formula)	N/A
Similac Alimentum (extensively hydrolysed term formula)	Nutramigen 1; Aptamil Pepti 1; SMA Althera
Elecare (amino acid formula)	Neocate LCP; SMA Alfamino
Nutriprem protein supplement	N/A

Appendix 6. 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. See Donor EBM guideline for further information http://swneonatalnetwork.co.uk/media/111960/swnn-guideline-use-of-donor-breastmilk-formatted.pdf



Appendix 7. Fortifier Concentration to 50mls of Expressed Breast Milk

Making fortified EBM concentrate USING 2.2g SACHETS of Nutriprem BMF:

Mix 1 x 2.2g sachet of breast milk fortifier with 6mls expressed breast milk (referred to as fortified EBM concentrate from this point forward) **Shake vigorously.**

Making fortified EBM concentrate USING 1g SACHETS of SMA/Nutriprem BMF:

Mix 2 x 1g sachets of breast milk fortifier with 6mls expressed breast milk (referred to as fortified EBM concentrate from this point forward) **Shake vigorously.**

Using fortified EBM concentrate:

Once fortified, concentrate is added to EBM - swirl to mix.

For half strength Fortifier:

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

For full strength Fortifier:

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

Fortified EBM concentrate (i.e., 6mls EBM with added fortifier) can be safely stored in the refrigerator for 24hours as per the manufacturers guidelines but will expire if the EBM is due to expire earlier. (e.g., after 24hours 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 concentrate be added to the remaining EBM volume as close to a feed as possible to avoid this.

Appendix 8: SWNN DEBM Eligibility Criteria

Recommendations for the use of DEBM:

- ≤ 32weeks gestation and/or ≤ 1500g (including multiples).
- ≤ 35weeks and absent/reverse end diastolic flow.
- Post NEC (medically and surgically treated).
- Infants transferred on DEBM from another unit.

Other circumstances where DEBM may be used.

- Babies ≤35 weeks with growth restriction below 2nd centile.
- Following circulatory collapse requiring complex resuscitation.
- Haemodynamically unstable babies, for example, requiring or have required inotropic support.
- Preterm infants receiving medical treatment or awaiting surgical treatment for PDA.
- Cardiac defects with left to right shunt.
- Severe HIE.
- Post GI surgery.

Duration of Use of DEBM:

Once the baby has tolerated 150ml/kg/day DEBM for 72 hours and reaches 33+0 weeks CGA, introduction of formula should be considered. (SWNN).
Method of grading onto formula from DEBM is suggested as giving DEBM followed by formula each feed rather than mixing. The formula can increase ¼ then, ½ then, ¾ strength volumes of feed until full strength is tolerated. (SWNN).