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Clinical Guideline: Oral feeding infants on neonatal units

Authors: Laura Baird (Lead SLT EoE Neonatal ODN), Lynsey Gooch (Highly Specialist SLT NNUH), Linzi Green (Advanced Specialist SLT CUH)

For use in: EoE Neonatal Units

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Scope:

There is wide ranging practise and evidence regarding establishing and supporting oral feeding of infants on neonatal units.

This document will outline best practise described in the evidence with regards to supporting the attainment of oral feeding for infants admitted to the neonatal unit.

1 Introduction:

Pleasurable, sustainable and safe oral feeding of infants should be the goal of all units. There is an increased risk of long-term feeding problems and repeated hospital admissions among infants admitted to neonatal units^{1,2}. This is influenced by everyone who cares for these infants, including neonatal nurses, doctors, Allied Health Professionals (AHPs) and caregivers.

Support and preparation for oral feeding should commence as soon as the infant is admitted to the neonatal unit, and neurodevelopment needs to be considered throughout. Emphasis on early positive oral experiences commencing with buccal colostrum, non-nutritive sucking and skin to skin can improve the transition from tube to oral feeding.

Staff should be familiar with the following principles and standards, which are supportive of feeding:

Trauma Informed Care
Neurodevelopmental Care
Family Integrated Care (FICare)
Baby Friendly Initiative (BFI)

This document aims to meet the diverse needs of our service, population and workforce, ensuring that none are placed at a disadvantage over others. It takes into account the provisions of the Equality Act 2010 and promotes equal opportunities for all. This document ensures that no one receives less favourable treatment on the protected characteristics of their age, disability, sex, gender reassignment, sexual orientation, marriage and civil partnership, race, religion or belief, pregnancy and maternity. The East of England Neonatal ODN advocates due regard to the various needs of different protected equality groups in our network. The East of England Neonatal ODN acknowledges the additional challenges that gender identity can have. We are aware that there is not yet universal language that addresses all families accessing maternity and neonatal care. We will always use the individual's preferred language, name, pronouns or terminology that they are most comfortable with, as we recognise the importance of providing inclusive and respectful perinatal information and support to all pregnant women, pregnant people, mothers, parents and families. Within this document, the terms woman/ mother is used to reflect all choices.

1.1 Purpose:

The purpose of this guideline is to provide evidence to support a consistent approach to supporting oral feeding of infants on neonatal units within the East of England Neonatal Operational Delivery Network. It is designed to be used in conjunction with individual clinical assessments by skilled staff.

This guideline should also be used in conjunction with other national, network and local guidelines and frameworks, including but not limited to:

- Enteral Feeding Guideline
<https://eooneonatalpccsicnetwork.nhs.uk/neonatal/downloads/enteral-feeding-guideline/>
- Mouthcare Guideline
<https://eooneonatalpccsicnetwork.nhs.uk/neonatal/downloads/mouthcare-guideline/>
- Developmental Care Guideline
<https://eooneonatalpccsicnetwork.nhs.uk/neonatal/downloads/developmental-care-guideline/>
- Neonatal Feeding Policy
<https://eooneonatalpccsicnetwork.nhs.uk/neonatal/downloads/neonatal-feeding-policy/>

- Family Integrated Care e.g. <https://www.bapm.org/resources/ficare-framework-for-practice>
- BFI Neonatal Standards <https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/implementing-standards-resources/neonatal-guide-to-the-standards/>
- BAPM Maternal Breastmilk Toolkit <https://www.bapm.org/pages/196-maternal-breast-milk-toolkit>
- Feeding and non-invasive respiratory support in neonatal care, Royal College of Speech and Language Therapists (RCSLT) Position Paper, 2023 <https://www.rcslt.org/wp-content/uploads/2023/03/Neonatal-care-position-paper-2023.pdf>

1.2 Parents as Partners in Care/ Family Integrated Care:

Families are core to the infant's neurodevelopmental and feeding outcomes on the neonatal unit and beyond. It is recognised that implementation of Family Integrated Care can improve feeding outcomes, reduce length of time to full oral feeding, increase rates of breastfeeding and reduce length of stay³. The principles of Family Integrated Care underpin all activities related to feeding. Parents should be supported and encouraged to be involved in all feeding related tasks, where it is safe and possible for them to do so.

1.2 Multi-Disciplinary Team (MDT)

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

- Infant feeding leads
- Speech and Language Therapist (SLT)
- Lactation Specialist
- Dietitian
- Nursing staff
- Medical team
- Occupational Therapist
- Physiotherapist
- Psychological professionals

An MDT Nutrition Ward round is recommended to monitor feeding and growth. Frequency should be determined by the team according to the needs of the unit.

2 Preparation for Oral Feeding (Early pre-feeding experiences):

The aim of early pre-feeding intervention is to provide early, positive oral experiences and support development of feeding skills.

This includes

- Skin to skin: supports physiological stability/ homeostasis, which is essential for successful feeding⁴ (including heart rate, breathing and temperature control). Promotes lactation and early initiation of breastfeeding^{5,6}
- Mouthcares with freshly expressed colostrum and expressed human milk (EHM) (including buccal colostrum): provides infants with the taste of their parent's milk, associated with reduced rates of ventilator-associated pneumonia (VAP) and increased human milk feeding⁷
- Non-nutritive sucking (on a dummy, finger or expressed breast): promotes regulation, pain management and offers sucking practice^{8,9}
- Handling and positioning: being held or having skin to skin during nasogastric tube (NGT) feeds promotes improved tolerance¹⁰

3 Initiation of oral feeding

In order to feed orally, babies are required to co-ordinate sucking, swallowing and breathing. This co-ordination matures with increasing gestational age^{11,12}. Initiation of oral feeding

should be led by a baby's developmental readiness rather than their recorded gestational age. High-quality oral feeding attempts (such as tastes, time at the breast, breastfeeding or bottle feeding) with family should begin as soon as the infant demonstrates readiness.³

The success of oral feeding should be measured by the quality of the feed, where feeding is nurturing and developmentally appropriate to baby's cues, rather than measured by volumes and quantity of feeds consumed¹³.

Baby's oral skills mature over time and therefore oral feeds should not be rushed, coerced or 'forced' as this may result in negative experiences, increased need for medical interventions and potential for baby to aspirate during oral feeds which may prolong length of stay. Early introduction of oral feeding has not been shown to be effective in improving time to full oral feeding^{3, 12, 14}

3.1 Responsive / Cue-based Feeding Approach

Evidence suggests preterm babies fed in response to hunger and satiation cues achieve full oral feeding earlier than babies fed prescribed volumes at scheduled intervals (e.g. 3 or 4 hourly feeding, 1 oral feed to 2 NGT feeds).^{15, 16, 17} Responsive / cue-based feeding is used to describe a feeding relationship which is sensitive, reciprocal, about more than nutrition and applies to both bottle and breast feeding. "The feeder maintains a goal to optimise the feeding through assessment of infant cues".¹⁸

Cue-based feeding, as opposed to volume- driven feeding, has been shown to lead to increased weight gain, shorter hospitalisation, fewer adverse events, and contrary to opinions, does not increase staff workload while improving parenting skills with regard to feeding.^{16, 17, 19, 20}

Cue-based feeding, infant or baby led feeding, infant driven feeding, co-regulated, attuned or responsive feeding are all systems that promote the infant-led approach to initiating oral feeding. Each defines oral feeding readiness not by weight or gestational age but a combination of neurodevelopmental maturity, behavioural state organisation and physiological stability.¹⁸

3.2 Oral Feeding Readiness

Babies are considered ready for oral feeding trials when they have:

1. Neurodevelopmental maturity:
 - a. Established non-nutritive sucking
 - b. Managing oral secretions
2. Behavioural state organisation:
 - a. Has periods of being in a calm, active awake state
 - b. Able to maintain this for more than a few minutes
3. Physiological stability:
 - a. Self-ventilating in air (SVIA) or stable on a low level of low flow oxygen via nasal cannula (LFNC).
 - b. If on high flow nasal cannula oxygen (HFNC) then specialist, individual assessment by SLT is recommended to determine safety and readiness to commence oral feeding²¹.
 - c. Oral feeding on continuous positive airway pressure (CPAP) is contraindicated in the evidence as it is associated with higher rates of aspiration²² and does not improve time to full oral feeding²³
 - d. Tolerating bolus feeds
 - e. Stable during handling, cares and cuddles
 - f. Stable with non-nutritive sucking (no autonomic changes – heart rate (HR), respiratory rate (RR), oxygen saturations, work of breathing)
4. Showing active feeding cues.

3.3 Neurodevelopment and Environment

Sensory stimulation can overwhelm preterm infants and increase physiological signs of stress. Reducing noise and light where possible supports the transition from passive to active feeding, supports increases in weight, and shows improvement of sleep-wake cycles.

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3.4 Positioning and Handling

Optimal positioning maintains preterm infants in symmetrical, flexed posture and is important for behavioural state stability, stress reduction and impacting neurological or musculoskeletal development. Symmetrical movement and responses are crucial for early development. Therefore, supporting the baby to achieve a midline position with their hands to face is essential.²⁵

Using swaddling can provide increased postural stability and support behavioural regulation during transfers and feeding for some infants. Swaddling a pre-term baby for bottle feeding has been shown to support better quality feeding, reduced stress cues and improved alertness and engagement during feeding, however, may not improve efficiency.²⁶

There is little evidence to support swaddling infants for breastfeeding, and some suggestion that swaddling term infants for initial breastfeeding attempts may negatively impact feeding by impeding close positioning, affecting the latch²⁷. Therefore, any decision to swaddle infants for breastfeeding should be supported by individualised assessment and clear rationale.²⁷

3.4 State Regulation

Infants have different states of alertness.

Deep Sleep/ Quiet sleep	Body is still, may occasionally startle but will not rouse. Regular breathing. Eyes are closed.
Light sleep/ Active sleep	Eyes are closed but may see rapid eye movements. May have some face or body movements and irregular breathing. Facial movements include frowns, grimaces, smiles, twitches, mouth movements and sucking
Drowsy	Eyes may open and close. Smooth movements. May suck. Will react to stimulation.
Quiet Alert	Eyes are open. Body is relaxed and still. Shows interest in stimuli and may interact.
Fussing/ Active alert	More movement. May make more sounds. More sensitive to stimuli.
Crying	Cries, may be grimacing. Lots of body movement.

(Adapted from Humphreys et al 2015²⁸ and 'The Earliest Relationship', by T. B. Brazelton & B. G. Cramer²⁹)

Infants will feed best when in a quiet alert state but may also feed effectively in drowsy or fussy/active alert states as well. Oral feeds should not be commenced if the infant is sleeping. If the infant falls asleep during the feed, then the feed should be stopped. They may have difficulty engaging in oral feeding if crying however may also respond to strategies that allow them to transition back to quiet alert.

Preterm infants have more difficulty with state regulation in the first 6 months and associated feeding difficulties at 3 and 6 months³⁰. Signs of dysregulation may include:

- Rapid, abrupt movement through states of arousal, unable to wake or quickly falling asleep (shutting down)
- Yawning, hiccoughing, sneezing, vomiting

- Twitches, tremors, hyper/hypotonia, asymmetric and non-optimal reflexes
- Changes to colour (red, mottled, pale), heart rate (rapid or slow), breathing (i.e. irregular, rapid, noisy, breath holding)
- Widespread/ splayed fingers and toes

Infants should be able to reach and maintain an appropriate state for feeding before and during the feed. If the infant is unable to do so, then feeding is unlikely to be successful at that time. Infants may feed more successfully when allowed to wake independently for feeds. Infants that are woken for feeds may have greater difficulty reaching and maintaining an awake and alert state throughout the feed. Also consider the impact on neurodevelopment and the importance of protecting sleep. Placing babies in skin to skin in anticipation of an oral feed may allow them to demonstrate early feeding cues and support parents to respond to these.

If the infant presents with difficulties in this area, consider referral to Occupational Therapy.

3.5 Feeding cues

Feeding cues are how babies communicate hunger and readiness to feed. The cues escalate as drive increases. *See appendix 1*

Early feeding cues: - "I'm Hungry"

- Stirring
- Turning head
- Opening and closing their mouth, puckering lips
- Sucking on hands, fingers, clothing, etc

Mid feeding cues: - "I'm really hungry"

- Stretching
- Turning head towards the chest of whoever is holding them
- Seeking/rooting
- Squirming
- Fussing noises

Late feeding cues: - "Calm me, then feed me"

- Agitated body movements and crying
- Clenched fists
- Moving head from side to side
- Colour change

Babies who have escalated to a late feeding cues phase, require support to become calm and settled before attempting oral feeding. Methods vary but can include non-nutritive sucking, cuddling, gentle rocking or supporting the infant into a flexed position. The infant's cues and communication should always be monitored to ensure comfort and tolerance.

During the first few weeks of life, babies may be sleepy for a variety of reasons and unable to reliably give feeding cues. Each oral feeding attempt should be individually assessed by parent or staff ¹⁴.

Baby's readiness cues can be measured in several ways, but a consistent tool used by all staff is advantageous.

5 Supporting breastfeeding/ chest feeding

Breastfeeding or chest feeding is primarily infant led and supports co-regulation, improving physiological stability of preterm infants during feeding. Infants are able to breathe more

frequently during sucking bursts and experience fewer episodes of oxygen desaturation compared with infants who bottle feed.³¹

- Parents should be encouraged and supported to have skin to skin regularly with their infant.
- If the infant shows signs of readiness to feed and it has been agreed between the MDT that oral feeding can commence, then they should be supported to be put to the breast.
- Skilled support for positioning and attachment should be provided for those babies making active attempts to latch.
- Even if there is no milk transfer occurring, time at the breast should be encouraged.
- NGT feeds can be offered during, after and between breastfeeding attempts as required.
- Use of tools, such as the UNICEF BFI Breastfeeding neonatal assessment tool (appendix), should be used to guide decision making about additional nutritional support using the NGT.

BFI recommends that where a family have decided to breast/ chest feed, bottles should not be introduced until breast/ chest feeding is established (i.e. when parent and baby are confident with latching and positioning, when managing some full feeds at the breast with effective milk transfer) as this may disrupt the establishment of breastfeeding.

6 Supporting bottle feeding

Preterm infants who bottle feed tend to show higher levels of stress cues during oral feeds.³² It is harder to achieve co-regulation with bottle feeding and easy to override cues to stop, therefore careful assessment of the infant throughout the feed is required to ensure the feed remains positive and safe.

Families should make an informed decision regarding whether or not to offer bottles. Families should be provided with information from credible sources to aid their decision making.

- First bottle feeds should be given by the parents or caregivers, with support from staff. They should also be supported and encouraged to continue to offer the majority of bottle feeds moving forward.³ Where parents or caregivers choose not to offer the first bottle feed staff should be supportive of this decision.
- Infants should be positioned in a manner which supports physiological stability, postural stability and alignment (see appendix for positioning)^{33, 34}
- A slow flow teat should be used for all initial feeding attempts. Commercial bottle systems consistently test as having more consistent and slower flows than disposable, single use teats and bottles.³⁵ Parents should be encouraged to bring in their own bottles if they have these.
- Responsive, supported external pacing should be used to support suck, swallow breathe co-ordination³⁶
- Recognise the infants' cues to stop and provide NG top ups to meet nutritional requirements when required.

Infants who are bottle feeding on the unit should be given adequate opportunity to establish feeding on the bottle system which will be used at home. Infants should not be sent home feeding from disposable, single use bottles and teats. These are unsustainable for most families in terms of access and cost.

The UNICEF Bottle Feeding Assessment tool can be used to support assessment of bottle feeding (*see Appendix 2& 3*).

7 Supporting transition to oral feeding

As with commencing oral feeds, a developmental care approach should be taken towards progressing oral feeds. Each infant develops their feeding skills in their own time, depending on individual morbidities, growth and development patterns.

There is little evidence to support the idea that bottle feeding instead of breastfeeding/chest feeding facilitates faster discharge.³⁷ For those infants where parents have expressed a desire to breast / chest feed, this should be offered first.

An infant's behavioural cues before and during an oral feed contribute to the assessment of feeding competency and success. Each oral feeding effort should be independently assessed with the understanding that one competent feed does not automatically mean that all subsequent feeds will be the same.⁴

The quality of each oral feed is determined by:

- How developmentally appropriate the feed is
- How safe the feed is
- How effective the feed is
- How responsive and co-regulated the feed is
- Parental feedback i.e. pain, comfort, position, perception

As the focus is on the quality of oral feeding rather than the volumes consumed, it is recommended that each feed be assessed using a standardised tool, for example the BFI breast or bottle feeding assessment tool (*see appendix 2 & 3*)

Currently there is no clear evidence about the best feeding regimen for preterm infants. Shorter feeding schedules (e.g., two hourly feeds) theoretically allow for regular, smaller volumes of milk to be delivered. Longer feeding intervals (e.g., 3 hourly feeds) theoretically allow for more gastric emptying between feeds, and potentially increase hunger drive for oral feeding.

8 Referral to Speech Language Therapy (SLT)

Speech Language Therapists on Neonatal Units are specialists in:

- Identifying infants who are at risk of feeding and/or swallowing and communication difficulties.
- Providing developmentally appropriate clinical assessment of the infant and family for these difficulties; including postural control, state regulation, pre-feeding skills, feeding reflexes, signs of stress associated with feeding, and oral feeding and swallowing behaviours.
 - *Neonatal Care – Guidance* (2023) RCSLT. Available at: <https://www.rcslt.org/speech-and-language-therapy/clinical-information/neonatal-care/> (Accessed: 20 June 2024).

Recommended staffing levels of SLT for units have been developed with the aim of ensuring SLT provision is adequate to meet the needs of the families and infants. This is available on <https://www.rcslt.org/wp-content/uploads/2023/03/Neonatal-staffing-levels-2023.pdf> and [Neonatal Staffing Level Calculator | Review 360 \(articulate.com\)](#)

Referral to SLT should be made before commencing oral feeding for:

- Any baby at risk of developing feeding or swallowing difficulties as a result of prematurity, genetic/ chromosomal, craniofacial, airway, TOF-OA, complex cardiac, neuromuscular or neurological conditions.
- Any baby requiring high flow oxygen or CPAP where there are plans to orally feed or babies with chronic lung disease requiring prolonged respiratory support.
- Babies required to be nil by mouth long term (e.g. long term TPN)

For babies where oral feeding has commenced, referral should be made for:

- Babies now 35/36 weeks showing limited wakefulness or readiness to begin breast/bottle feeding
- Babies identified as not feeding well by parents/carers, nursing or medical team
- Any baby with a history of coughing/desaturations/bradycardia associated with feeding
- Any baby with chest changes who has commenced oral feeding and where there are concerns about changes in respiratory health or possible aspiration

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Baby Feeding Cues (signs)

EARLY CUES - "I'm hungry"



• Stirring



• Mouth opening



• Turning head
• Seeking/rooting

MID CUES - "I'm really hungry"



• Stretching

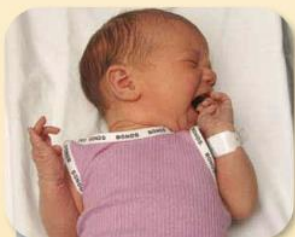


• Increasing physical movement



• Hand to mouth

LATE CUES - "Calm me, then feed me"



• Crying



• Agitated body movements



• Colour turning red

Time to calm crying baby

- Cuddling
- Skin to Skin on chest
- Talking
- Stroking



Appendix 2 BFI breastfeeding assessment tool

https://www.unicef.org.uk/babyfriendly/wp-content/uploads/sites/2/2018/03/breastfeeding_assessment_tool_neonatal.pdf

Breastfeeding assessment tool: Neonatal

How you and your nurse/midwife can recognise that your baby is feeding well								*please see reverse of form for guidance on top-ups post-breastfeed
What to look for/ask about	✓	✓	✓	✓	✓	✓	✓	Wet nappies: Day 1-2 = 1-2 or more in 24 hours Day 3-4 = 3-4 or more in 24 hours, heavier Day 6 plus = 6 or more in 24 hours, heavy
Your baby:								
Is not interested, when offered breast, sleepy (*A)								
Is showing feeding cues but not attaching (*B)								
Attaches at the breast but quickly falls asleep (*C)								
Attaches for short bursts with long pauses (*D)								
Attaches well with long rhythmical sucking and swallowing for a short feed (requiring stimulation) (*E)								Stools/dirty nappies: Day 1-2 = 1 or more in 24 hours, meconium Day 3-4 = 2 (preferably more) in 24 hours changing stools By day 10-14 babies should pass frequent soft, runny stools everyday; 2 dirty nappies in 24 hours being the minimum you would expect.
Attaches well for a sustained period with long rhythmical sucking and swallowing (*F)								
Normal skin colour and tone								
Gaining weight appropriately								
Your baby's nappies:								
At least 5-6 heavy, wet nappies in 24 hours								
At least 2 dirty nappies in 24hrs, at least £2 coin size, yellow and runny								Exclusively breastfed babies should not have a day when they do not pass stool within the first 4-6 weeks. If they do then a full breastfeed should be observed to check for effective feeding. However, it is recognised that very preterm babies who transition to breastfeeding later may have developed their individual stooling pattern before beginning to breastfeed, and therefore this may be used as a guide to what is normal for each baby.
Your breasts:								
Breasts and nipples are comfortable								
Nipples are the same shape at the end of the feed as at the start								
Referred for additional breastfeeding support								
Date								
Midwife/nurse initials								
Midwife/nurse: If any responses not ticked: watch a full breastfeed, develop a care plan including revisiting positioning and attachment and/or refer for additional support. Consider specialist support if needed.								Being responsive to your baby's need to breastfeed for food, drink, comfort and security will ensure you have a good milk supply and a secure, happy baby.

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Breastfeeding assessment score to determine tube top ups

adapted from Imperial College Hospitals NHS Trust

To be used in conjunction with the assessment of maternal lactation, attachment and signs of effective milk transfer

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

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Appendix 4 Elevated side lying (with permission from West Midlands ODN)



Elevated side lying position for bottle feeding your baby



West Midlands
Neonatal Operational Delivery Network

WMN ODN Allied Health Professionals 2020

Katyparnell@nhs.net (SLT) sara.clarke1@nhs.net (Dietitian) Emmafoulerton@nhs.net (PT)

Elevated side lying feeding (ESL) is a good position to introduce and support babies born sick or preterm who are learning to bottle feed.

Equipment needed: Footstool, pillow, blanket

Advantages to ESL

- Baby can manage milk flow from the bottle
- Baby feels safe and comfortable
- Helps baby coordinate sucking, swallowing and breathing
- Helps support a stable feeding position



Method

- Wrap the baby's shoulders in a lightweight sheet or towel bringing arms and hands into the middle
- Sit with feet up on footstool with pillow on knee
- Lie baby on the pillow on their side ensuring their bottom and legs lie across the your stomach
- Baby's back should be straight and their cheek on the pillow – think of an "L" shape
- Baby's head should be higher than their feet

Making changes to this position makes baby work harder and will reduce their concentration on their suck-swallow-breathe skills

No pillow and / or footstool	Less stable feeding position
Carers legs crossed	Baby has to work harder to bring their arms into the middle of their body
Baby's head not placed higher than their feet	Increased risk of milk going down the wrong way
Holding baby up off the pillow	Restricts baby's ability to pace themselves Less support for baby to maintain a safe and comfortable position



<https://www.wmnodn.org.uk/wp-content/uploads/2020/05/ESL-032019-poster.pdf>

Appendix 5 Cradle Hold *(with permission from Just One Norfolk)*

Available at <https://www.justonenorfolk.nhs.uk/healthy-lifestyles/infant-feeding/formula-feeding/>



Exceptional Circumstances Form

Form to be completed in the **exceptional** circumstances that the Trust is not able to follow ODN approved guidelines.

Details of person completing the form:	
Title:	Organisation:
First name:	Email contact address:
Surname:	Telephone contact number:
Title of document to be excepted from:	
Rationale why Trust is unable to adhere to the document:	
Signature of speciality Clinical Lead:	Signature of Trust Nursing / Medical Director:
Date:	Date:
Hard Copy Received by ODN (date and sign):	Date acknowledgement receipt sent out:

Please email form to: kelly.hart5@nhs.net requesting receipt.

Send hard signed copy to: Kelly Hart

EOE ODN Office Manager
Box 402
Rosie Hospital
Robinson Way
Cambridge University Hospital
Hills Road
Cambridge CB2 0SW