Scope
This guideline is aimed at all health care professionals involved in the care of infants within the neonatal service.

Legal Liability (standard UHL statement)
Guidelines issued and approved by the Trust are considered to represent best practice. Staff may only exceptionally depart from any relevant Trust guidelines providing always that such a departure is confined to the specific needs of individual circumstances. In healthcare delivery such departure shall only be undertaken where, in the judgement of the responsible health professional, it is fully appropriate and justifiable – such decision to be fully recorded in the patient's notes.

Aim
This guideline aims to provide a clear and consistent approach to introducing and advancing feeds to very preterm babies of less than 30 weeks gestation admitted to the Leicester Neonatal Service.

Background
Research has demonstrated that it is safe to introduce very small amounts of milk at an early age and this improves gut motility and maturation. This is often referred to as minimal enteral feeding or gut priming. Long term benefits include earlier tolerance of full enteral feeds, improved weight gain and a potentially earlier discharge. There is no increased risk of Necrotising Enterocolitis (NEC) with the introduction of minimal feeds.\(^1,2,3,4,5,6,7,8\) Please see appendix for further information on the incidence of NEC.

Who does this guideline apply to?
All babies who are both \(<30\) weeks gestation and \(<1500\)gms. Therefore a baby of 29 weeks gestation who weighed 1550gms would be exempt from the guideline, likewise a baby of 32 weeks gestation weighing 1450gms*. 

*The risk for NEC is known to be higher in babies who are severely growth retarded and who had AEDF / REDF in utero. Therefore special care should be taken on introducing and advancing feeds in these infants and it may be appropriate to follow this guideline in this instance.
Introducing Feeds

For all babies of <30 weeks GA and <1500gms feeds should be introduced in a controlled and consistent manner. There is little evidence that withholding feeds reduces the risk of NEC. 14

1. Commence minimal feeds at a rate of:
   • 0.5ml 2 hourly <1000gms
   • 1ml 2 hourly 1000gms or more
2. Commence enteral feeding as close to birth as possible following individual clinical assessment.
3. Aspirate stomach contents 6 hourly, however tube position MUST be checked prior to each use
4. If less than 4 hours worth of feed is aspirated (i.e. 1 or 2mls) then feeds should continue
5. If more than 4 hours worth of feed is aspirated OR there are clinical signs of intolerance then discuss with the medical team
6. These feeds should NOT be included in the fluid volume
7. Continue on this regime for at least 48 hours. If waiting for EBM it is acceptable to continue on this regime for up to four days before commencing formula. A delay of longer than this is unacceptable due to the risks associated with Parenteral Nutrition.15

There is no evidence to support withholding feeds in a baby with a UAC16,17,18.

Advancing Feeds

1. Feeds should only be advanced when the baby:
   • Is clinically stable
   • Has no bloody or bilious gastric aspirations
2. Breast milk is highly recommended and mothers should be given enough information to be able to make an informed choice18,19,20,21
3. Continue on a two hourly regime
4. When moving to advancing feeds, include in the total fluid volume
5. Babies should be fed at a rate of no more than 2ml/kg/minute
6. Feeds should be advanced at a maximum rate of 20ml/kg/day – see table 1
7. Feeds should be increased to a maximum of 175ml/kg for formula and up to 200ml/kg for breast milk.

Reducing Feeds

If more than 4 hours of feed is aspirated:
1. Replace, as long as it is not bile or blood-stained
2. Reduce feed volume to the previous amount for the next 24 hours
3. Aspirate after 6 hours. If more than four hours aspirate is obtained and providing the infant is clinically well:
• Continue to reduce until reaching a feed volume the infant can tolerate
• Maintain the tolerated volume for 24 hours before attempting to advance further

**Withholding Feeds**

Starting and stopping feeds can have a negative impact on the production of gastric hormones and can lead to feeding intolerance.\(^{26,27}\) *Large aspirates need to be assessed clinically, but it is not necessary to withhold feeds in every instance.*

1. Aspirates should be checked 6 hourly
2. Feeds should be continued in an infant that is clinically well providing:
   • The aspirate volume is less than 4 hours worth
   • The aspirate is not bile or blood-stained – such aspirates should be reported to a senior doctor immediately
3. Aspirates – excluding bile or blood stained - should be replaced as this has already been through the beginnings of the digestive process
4. Report any abdominal distension or vomiting to a senior doctor
5. Decisions to stop feeds should be taken at a senior medical level and with clear reasons for doing so

**TABLE 1: REGIME FOR INCREASING FEEDS**

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<thead>
<tr>
<th>Birth weight</th>
<th>Increase milk by (two hourly feeds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 600g</td>
<td>0.5 ml every 24 hours</td>
</tr>
<tr>
<td>600 - 899g</td>
<td>1 ml every 24 hours</td>
</tr>
<tr>
<td>900 - 1199g</td>
<td>1 ml every 12 hours</td>
</tr>
<tr>
<td>1200 - 1499g</td>
<td>1 ml every 8 hours</td>
</tr>
</tbody>
</table>

**Also:**

1. Aspirates should be checked 6 hourly
2. Feeds should be continued in an infant that is clinically well providing:
   • The aspirate volume is less than 4 hours worth
   • The aspirate is not bile or blood-stained – such aspirates should be reported to a senior doctor immediately
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**Please Note**

- This regime provides a daily increase in feed volume of between 15 and 20 mls/kg/day
- Please see fluids protocol for total volume of enteral and intravenous fluids recommended for the age of the baby
- Daily increase calculated by working out increase in mls/day and dividing by weight of the baby

\[
e.g. \text{Daily increase in volume of milk} = \frac{4 \times 1 \text{ml}}{8 \text{ hours}} = 0.5 \text{ml/8 hours}
\]

**Calculating increase per kg of weight**

For a 1200g baby this is equivalent to \( \frac{24}{1.2} = 20 \text{mls/kg/day increase in milk intake} \)
There is little evidence regarding how fast feeds should be advanced, but observational studies suggest that faster advancement may increase the risk of NEC.\textsuperscript{18,22,23,24,25}

**Audit Standards**

1. Enteral feeding for gut priming initiated in the first 2-5 days (100%)
2. Feeds increased according to guideline (100%)

**Guideline development**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tr>
<td>Oct 2005</td>
<td>Original guideline (MH)</td>
</tr>
<tr>
<td>Sept 2008</td>
<td>Guidelines meeting ratified</td>
</tr>
<tr>
<td>May 2016</td>
<td>Review by guidelines lead (REM) – Mainly in keeping with current practice (minor amendments)</td>
</tr>
<tr>
<td>May 2016</td>
<td>Guideline circulated to consultants/author (ratified for 1 year) – pending further review</td>
</tr>
<tr>
<td>June 2017</td>
<td>Neonatal governance meeting – approved for further 12 months or until next amendment available (new author assigned to review in light of SIFT trial evidence)</td>
</tr>
<tr>
<td>June 2018</td>
<td>Neonatal governance meeting – to ratify for a further 12 months</td>
</tr>
</tbody>
</table>
References


8. Anderson D., Feeding the ill or preterm infant. Neonatal Network Nov-Dec 2002. 21:(7) 7-14


Further Reading

**1. Schanler, RJ. Approach to enteral nutrition in the premature infant. Ed Abrams SA. UptoDate accessed 10th May 2016 **


6. Cormack B. and Bloomfield F., Audit of feeding practices in babies <1200g or 30 weeks gestation during the first month of life. 2006. 42: 458-463


Appendix 1

NEC is the most common medical and surgical emergency occurring in neonates and evidence shows that a feeding policy can reduce the incidence.\(^9,10,11\) This concurs with the findings of a recent local review of current practice which showed that the incidence of confirmed NEC (Bells stage 2 or 3) has been reduced from 29% to 18% in babies of less than 27 weeks gestation. This is since the introduction of a feeding guideline in October 2005, despite evidence that the guideline was more often than not, not adhered to. This incidence is still higher than international published figures, but is a marked reduction on pre-guideline rates. There was no difference in the rate of line sepsis or episodes of feeding intolerance pre or post guideline introduction.

The incidence of NEC at <1500gms reported on BADGER (for this service) is 11%, compared to around 7% for published figures for the US and Canada, however this includes babies transferred in with NEC.\(^{12,13}\) For those <750gms (using review data) the unit incidence was actually slightly lower at around 10%, compared to 11% for the US. Both unit and published figures show a dramatic decrease in the incidence of NEC after 30 weeks gestation and in those infants with a birth weight of more than 1500gms.

In the recent review of <27 week babies it was found that the incidence of NEC stage 2 or 3 was highest in those <801gms, at 27%, but was still significantly high (20%) for those weighing 801gms or more.

Figures collated from BADGER over a two and a half year period showed the incidence to be highest in those <26 weeks gestation (22%), but a similar incidence in those 26-27+6 weeks GA (14%) and those 28-29+6 weeks GA (15%). After 30 weeks gestation the incidence was 2%.

In light of this the current feeding practice has been extended to all babies of <30 weeks GA AND <1500gms.
Results from the 2008 review of the Gut Priming and Feeding a baby of <27 weeks GA Guidelines

Incidence of NEC stage 2 or 3 in <27/40 babies by weight in grams (n=101)

Incidence of NEC reported on Badger* by gestation

Jan 1st 06-July 16th 08
Incidence of NEC reported on Badger* by weight

1st Jan 06-16th July 08

* When reviewing Badger for the incidence of NEC there often were discrepancies between the information on the discharge letter and the discharge diagnosis. The grade of NEC reported on Badger was reviewed and re-graded as necessary, using Bell’s criteria. In most instances the grade of NEC was under-reported.

Incidence of NEC at <1500gms

Source of data

*Badger data includes babies transferred in with NEC and amended reporting. TNS data excluded as surgical only. Audit data is babies surviving >12hrs (n=116), in line with US and Canadian data

Charts taken from: Feeding babies less than 27 weeks gestation: A review of the policy, introduced October 10th 2005, by M Hubbard