Enteral Nutrition in Neonates

1. **BACKGROUND**

Following operating procedures are based on the combination of the best available evidence and the clinical experience of the senior clinicians of the unit. These guidelines are a tool used to improve patient care and do not replace the central role of clinical expertise and judgement in determining appropriate patient care.

The aims of this operating procedure are:

1. To ensure infants receive the best possible feeding management
2. To promote consistency in the feeding management.
3. To reduce/minimise the risk of NEC

These guidelines apply to infants admitted to Newborn Care Centre at the Royal Hospital for Women.

2. **CLINICAL PRACTICE**

**Infants ≥36 weeks and/or ≥ 2.5 Kg**

1. Review the readiness of infant for feeding at least every 24 hours.

2. **Precautions/Contraindications:** Perinatal asphyxia, PDA, indomethacin, inotropes, post surgery, major congenital anomaly, major congenital heart disease, severe IUGR. Always discuss with a senior clinician for feeding management of these babies.

3. Respiratory support is not a contraindication provided the infant is stable for 24 hours on the respiratory support

4. Presence of umbilical lines is not a contraindication to feed.

5. Surgical Infants – Feeding plan is to be done in consultation with surgical team.

6. Feeding method:

   a. Otherwise well but poor sucking effort: Intermittent 3 hrly gavage feeding at 60 ml/kg/day. Increase by 20-30 ml/kg/day until 150 ml/kg/day. Some infants don’t tolerate 60 ml/kg feed straight away and one can consider giving 30 ml/kg/day aliquots for the first 2-3 feeds before increasing to 60 ml/kg/day (But remember to closely monitor BSLs in such cases).

   b. Infant with illnesses of short duration and resolved or no respiratory distress e.g. TTN – Can go straight onto 3 hrly breast feeds. If mother is on the postnatal wards, infant can be transferred to postnatal wards after 2 consecutive successful breast feeds.

   c. Infants on stable respiratory support and not suitable for sucking feeds - Start 5 mls EBM/term formula q 3 hr and increase by 5 ml every 2nd feed until full feeds (150ml/kg/day).

   d. Establish sucking feeds when the infant is ready.
Infants 34-35 weeks and/or less than 2.5 Kg

1. Review the readiness of infant for feeding at least every 24 hours.

2. Respiratory support is not a contraindication provided the infant is stable for 24 hours on the respiratory support.

3. Presence of umbilical lines is not a contraindication to feed.


5. Surgical Infants – Feeding plan is to be done in consultation with surgical team.

6. Feeding method:
   a. Otherwise well but poor sucking effort: Intermittent 3 hrly gavage feeding at 60 ml/kg/day. Increase by 20-30 ml/kg/day until 150 ml/kg/day. Some infants don’t tolerate 60 ml/kg feed straight away and one can consider giving 30 ml/kg/day aliquots for the first 2-3 feeds before increasing to 60 ml/kg/day (But remember to closely monitor BSLs in such cases).

   b. Infant with illnesses of short duration and resolved or no respiratory distress e.g. TTN – If good sucking efforts - can go straight onto 3 hrly breast feeds. If mother is on the postnatal wards, infant can be transferred to postnatal wards after 2 consecutive successful breast feeds.

   c. Infants on stable respiratory support and not suitable for sucking feeds - Start 5 mls EBM/term formula q 3 hr and increase by 5 ml every 2nd feed until full feeds (150ml/kg/day).

   d. Establish sucking feeds when the infant is ready.

Infants less than 34 weeks:

Precautions/contraindications: Perinatal hypoxia, severe IUGR, major congenital anomaly, complex congenital heart disease,

Surgical Infants – Feeding plan is to be done in consultation with surgical team.

Infants on indomethacin – Trophic feeds can be given and nutritional feeds can be considered after discussing with senior clinician.

Inotropes – NBM.

<table>
<thead>
<tr>
<th>Initiation of feed</th>
<th>&lt;750 g</th>
<th>751-1000 g</th>
<th>1001-1500</th>
<th>1501-1800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 48-72 hrs of age</td>
<td>Within 48-72 hrs of age</td>
<td>Within 48 hrs of age</td>
<td>Within 48 hrs of age</td>
<td></td>
</tr>
<tr>
<td>Method of feeding</td>
<td>Intermittent bolus gavage</td>
<td>Intermittent bolus gavage</td>
<td>Intermittent bolus gavage</td>
<td>Intermittent bolus gavage</td>
</tr>
<tr>
<td>Trophic feeds as the initial feeds</td>
<td>Yes</td>
<td>Yes</td>
<td>Only in special circumstances</td>
<td>Usually not necessary</td>
</tr>
<tr>
<td>Amount of trophic feeds</td>
<td>1 ml q 4 hr</td>
<td>1 ml q 4 hr</td>
<td>1 ml q 2 hr</td>
<td>N/A</td>
</tr>
<tr>
<td>Duration of trophic feeds</td>
<td>48-72 hrs but variable</td>
<td>48-72 hrs but variable</td>
<td>variable</td>
<td>N/A</td>
</tr>
<tr>
<td>Type of trophic feeds</td>
<td>Nutritional feeds</td>
<td>Feed Advancement</td>
<td>Type of nutritional feed</td>
<td>HMF/ preterm formula (24 cal/oz)</td>
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<td>-----------------------</td>
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</tr>
<tr>
<td></td>
<td>EBM</td>
<td>EBM</td>
<td>EBM or term formula</td>
<td>After 24 hrs of 160-170 ml/kg/day of EBM/term formula</td>
</tr>
<tr>
<td>1 ml q2 hr</td>
<td>1 ml q2 hr x 24 hrs, then 1 ml q 1 hr X 24 hrs, then increase by 0.5 ml per feed every 24 hrs until 160-170 ml/kg/day</td>
<td>1 ml q2 hr x 24 hrs, then increase by 1 ml per feed every 24 hrs until 160-170 ml/kg/day</td>
<td>After 24 hrs of 160-170 ml/kg/day of milk</td>
<td>After 24 hrs of 160-170 ml/kg/day of milk</td>
</tr>
</tbody>
</table>

3. SIDE EFFECTS/COMPLICATIONS

Feed intolerance?

Gastric aspirates
1. Check for gastric aspirates before every second feed, but not more than once every 6 hours.
2. If aspirate is <3ml/kg body weight or <30% of the volume of the last feed - Return the aspirate and give the full volume of milk scheduled.
3. If aspirate is 3 – 5 ml/kg body weight and/or between 30-50% of the volume of the last feed - Return the aspirate and give the volume of milk scheduled minus the volume of the aspirate returned.
4. If aspirate is >5 ml/kg body weight and >50% of the volume of the last feed, or (b) if aspirate volumes are markedly increased at one feed, or steadily increasing over several feeds, or (c) if 2 consecutive aspirates are ≥3ml/kg body weight and between 30-50% of the volume of the last feed - Cease feeds and recommence after 6 hrs if clinically otherwise satisfied. Always consult a senior clinician to determine management in these circumstances.
5. If the aspirate is light green with no other sign of feed intolerance e.g. vomiting, large aspirates and abdominal distension or systemic symptoms like temperature instability, apneas or bradycardias, feeds can continue. Check the feeding tube position to make sure it has not migrated through pylorus.
6. If aspirates are lightly stained with blood and no other suspected underlying pathology, no need to stop feeds. If aspirates are heavily blood-stained, consult a senior clinician to determine management.

Vomits
1. Effortless milky vomits, called possets – innocuous. Continue feeds unless other signs of feed intolerance.
2. Persistent or worsening effortless vomiting, with other symptoms suggestive of significant gastro-oesophageal reflux, such as bradycardia or desaturation events - consult a senior clinician.
3. Blood stained vomit: If occasional vomits that are finely streaked with blood and no other symptoms of underlying pathology, - continue feeds but observe closely.
4. Bile stained vomit: Bile-stained vomit is potentially very serious and may suggest bowel obstruction. Stop enteral feeds and consult a senior clinician.
5. Persistent, projectile vomits: Potentially serious and may suggest hypertrophic pyloric stenosis. Stop enteral feeds and consult a senior clinician.

Abdominal Distension
1. Normal Finding: Normal Preterm abdomen can be distended but soft, non-tender and may have visible bowel loops.
2. Routine abdominal girths are not necessary.
3. Any increasing abdominal distension, any firm and/or tender abdomen – consult senior clinician.

Feed Intolerance with HMF or preterm 24 cal per 30 ml formula
Some VLBW infants may develop signs of feed intolerance after adding HMF to EBM or changing over to preterm formula. In these circumstances, stop HMF/preterm formula and continue plain EBM/term formula and reassess after 48 hours.

Feed Intolerance and continuous feeds
In those infants with persistent feed intolerance even after the above measures, we may consider continuous feeds.

Oral medications
Keep in mind that oral sodium chloride increases the osmolality of feeds.

How to re-introduce feeds after feed intolerance/NEC
This is complex and beyond the scope of the guidelines. Always discuss with senior clinician.

Assessing readiness to sucking feed
Suck, swallow, and breathing coordination, is usually not fully developed until 35-36 weeks (and sometimes not until term) although some babies can safely take all their feeds by mouth 35 weeks. There is some evidence that oral feeds can be initiated earlier than was originally thought. Most babies will be 34-35 weeks before bottle feeding can be started, but many babies seem able to ‘go to the breast’ and try and establish feeds as early as 32 weeks. The decision to initiate and increase oral feeds is best taken by an experienced nurse familiar with assessment of preterm babies.

4. RELATED POLICIES/PROCEDURES/CLINICAL PRACTICE GUIDELINES

Parenteral Nutrition in Neonates

5. REFERENCES


