

Feeding babies in NNU

Feeding: Less than 30 weeks gestation

Use feed increment chart. Feeds/Colostrum can be given from birth in clinically well infants.

Feeding: \geq 30 weeks gestation

Key points

- Mother's feeding intention should be clarified at admission.
- If more \geq 32 weeks inform parents, we would need to use formula if there is any shortfall in breastmilk supply until this can be supplied. (Infants $<$ 32 weeks would be eligible for donor EBM)
- Consider if an IV line is needed on admission.
- Babies not initially given milk need to be reassessed every 6 hours as to whether they are ready to start.

Well babies

- There is no automatic need to place an IV line.
- Start full enteral feeds @ 60-90 mL/kg/day as 2 to 3 hourly boluses as soon as possible (within the hour) -this will usually be formula after informing parents.
- Introduce buccal colostrum as soon as possible after birth.
- Advance feeds as tolerated @ 20-30 mL/kg/day.
- Continue to monitor feed tolerance regularly with cares.

Not completely well (Tachypnoea $>$ 70-80, grunting, recession, requirement for oxygen, apnoea, poor colour or perfusion-at clinician discretion)

- Place an IV line and start IV fluids as per guidance.
- Reassess every 6 hours to decide if feeds can be started.
- Once felt to be clinically well enough for feeds try quarter/half feeds weaning the drip by similar volume if tolerated and weaning up a similar feed volume each 4-6 hours until on full feeds.
- 2 to 3 hourly bolus feeds is the usual feeding pattern.

Infants with significant risk factors:

- Small for gestational age ($<$ 2nd percentile) especially if associated with absent or reversed end diastolic flow
- MCDA twins with either TTTS
- Perinatal hypoxic-ischaemic insult with evidence of end organ injury
- Hypotensive / unstable ventilated babies /critical cardiorespiratory care
- Additional risk factors for gut hypoperfusion
- Once felt ready for feeds, consider trophic feeds for 24 hours then build up feeds slowly eg quarter/half feeds weaning the drip by similar volume if tolerated, and weaning a similar volume each 4-6 hours until on full feeds.
- 2 to 3 hourly bolus feeds is the usual feeding pattern.

General guidelines for feeding in NNU

a. **Speaking to parents about feeding and supporting expressing breast milk.** When any baby is admitted to the neonatal unit, the parents should be spoken to about feeding.

(a) Ask about the parents preferred method of feeding.

(b) Ask if mother is prepared to express.

(c) Check if they have received a Golden basin with Golden Drops leaflet and had support for expressing. If not, a Golden basin should be procured from labour ward and support provided in the neonatal unit.

(d) Discuss expressing breast milk with the mother as early as possible, if possible, during discussions before delivery of the baby. The attending midwife should be included in this discussion if at all possible.

(e) Tell them what the likely method of fluid/feed administration will be following admission and possible need to use formula/DEBM temporarily while in NNU, iv fluids, NG feeding, etc.

(f) Document this discussion in Badger.

(g) Postnatal ward rounds should include consideration of mothers whose babies are in NNU. Find out:

- Whether they have been given written information about breast milk.
- How often they are expressing and how much milk they are producing from their breast milk diary.
- Speak to the midwife concerned about help and supervision.

(h) The target is for mother to be shown how to double pump express within 1 hour of delivery and be helped to express 8-10 times in 24 hours, including once between 12:00 and 05:00. Colostrum may be given directly into the mouth if only a very small amount is available. Colostrum should be given fresh, not frozen.

(i) Check if expressing assessment tool has been used in the last 24 hours

b. **Starting and progressing enteral feeds**

(a) There are 3 distinct aspects to enteral feeding: (1) “immunisation” of the baby - colostrum provides many immune factors and an inoculation of maternal flora, and early colostrum feeding can counteract some of threats to abnormal colonisation (caesarean section, separation from Mum, empirical antibiotics) (2) to prime the gut –very small amounts of milk, as little as 0.1ml/kg/hr are trophic to the gut mucosa and (3) to provide nutrition.

(b) **Trophic Feeds** All infants <30 weeks should receive trophic feed volumes from where available at 12-24 ml/kg/day for 24 hours unless there is a contraindication.

(b) It is not necessary to wait for sufficient amounts of breast milk for regular hourly volumes in order to start feeding. However, the amount of mother's EBM available and comparing that to how much milk will be needed in the next 24 hours will allow guidance to be given to the mother and, where there is a shortfall, for the use of available EBM to be spread out.

(c) Currently donor breast milk is available and recommended for all infants less than 32 weeks gestation or less than 1500g, if expressed donor breast milk is declined the decision to use formula feeds instead of mother's milk should be made by the consultant depending on the likelihood of obtaining sufficient quantities of breast milk and the balance of risks in an individual case.

(d) In all cases start milk "extra to fluid requirements" until the baby is on more than 1ml/kg/hr; then include milk in the total calculated fluid volumes.

(e) When infants <30 weeks gestation are initially weaning up on feeds, and at any other time when the baby is not on full milk feeds (i.e. when some of the maintenance fluids are given iv), a Feed Increment Chart should be completed on a daily basis.

c. **No feeds** There are a few clinical situations in which there is reason to believe that gut perfusion might be acutely impaired. These are:

(a) Likelihood of tissue hypoxia (current hypotension, acidosis, poor skin perfusion)

(b) Severe Polycythaemia until treated (uncommon)

In both these situations, colostrum should still be provided as mouthcare

d. **Review of Feeding Regimen**

(a) The provision of information to parents about EBM, rate of feed increase, the use of Parenteral Nutrition and the continued use of a long line needs to be reviewed daily on the consultant ward round and decisions recorded on ward round note.

(b) There may be situations in which continued progress according to a *Highest risk Regimen* is either impractical or poses a higher risk than faster increase. This may include babies in whom there is major difficulty with vascular access, and those who have recently had serious blood stream infection. A faster increment is easier to justify if there has been prior good toleration of feeds and passage of changing stools (i.e. there are signs the gut has adapted to some extent in terms of motility).

(c) When there has been a pause in feeding, an individual decision has to be made on the increment step at which feeds are restarted, and the increment regimen to be used.

(d) If no MEBM is available after 24 hours consider starting DEBM see DEBM guideline.

e. **Insufficient supply of mother's EBM** Check the following:

- (a) Have the parents been given information and support?
- (b) What is mother's feeding intention and motivation to express?
- (c) Has she got an up-to-date breast feeding diary?
- (d) Does she have equipment for expressing
- (e) Has expressing assessment tool been used in the last 24 hours

Then:

- (a) Speak to the midwife on postnatal ward about providing help and support
- (b) Phone Mum if at home
- (c) Check Mum's technique and stress frequency of expressing

Consider Domperidone – contact obstetrics if Mum an inpatient; contact GP if outpatient.

f. **Choice of milk other than mother's expressed breast milk**

- (a) If donor EBM is to be used (see DEBM guideline), obtain written consent, and stop DEBM either when there is sufficient mother's milk or when the baby reaches 34 weeks CGA.
- (b) The decision to start giving formula milk should be explained to the family. It is not appropriate to seek approval or consent for this as it is a medical decision.
- (c) If formula milk is indicated use **preterm** formula throughout in all babies <32 weeks or <1.5kg birthweight (there is no need to start with term formula).
- (d) Convert to term formula when the baby reaches 2kg, unless there are specific reasons to continue preterm formula.

g. **Use of iv lines.** Intravenous glucose should only be started if:

- (a) the baby is hypoglycaemic and the other steps in the hypoglycaemia guidelines have been followed
- (b) there are acute concerns about the risks of respiratory or airway compromise with milk feeds or
- (c) the infant is < 30 weeks gestation.
- (d) do not automatically measure blood sugar on admission unless it is felt that the symptoms leading to admission might be the result of hypoglycaemia.

h. Nutritional supplementation

(a) Nutritional supplements (vitamins, etc) should be started once the infant is receiving 75 ml/Kg/day enteral feeds.

(b) Breast milk fortifier is standard practice from 100 ml/kg/day if tolerating full feeds see Nutritional principles.

i. Use of nasogastric tubes. This should be restricted to:

(a) babies too immature to suck and swallow efficiently (less than 35 weeks)

(b) babies with respiratory distress either as a route for feeding (mild distress), or to decompress the stomach to diminish splinting of the diaphragm (moderate or severe distress)

In babies 35 weeks or over who are able to suck feed, nasogastric tubes should not be used as an alternative to cup or bottle feeding, regardless of the mother's intended feeding method.

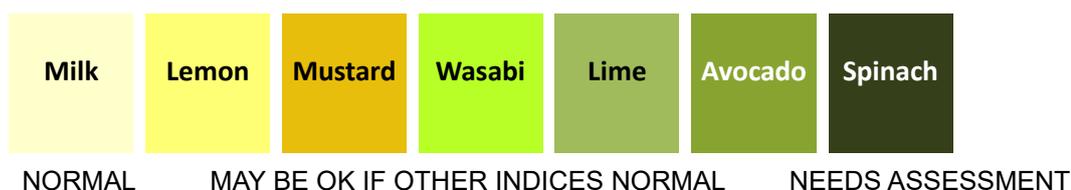
j. Assessing feed toleration

(a) Gastric residual volumes/aspirates alone should not be used to determine whether milk feeding is stopped.

(b) In general, if feeds are continuing it is best re-feeding any aspirates obtained

(c) Colour of Gastric residuals

Indicative chart for assessing the colour of gastric residual volumes / aspirates



k. Signs of feed intolerance to suggest possibility of significant gut pathology-consider **stopping feeds** or stopping feed increase. The definition of feed intolerance includes not only the volume and colour of gastric RV, but also assessment for some or all of the following:

1. Any concern that gastric residual volumes resemble or smell like faeces (so called faeculent aspirates)
2. Large aspirates > ½ 6 hourly feed volume (not routinely measured)
3. Vomiting
4. Abdominal distension / visible bowel loops / discolouration / tenderness
5. Presence of abnormal or bloody stool
6. Clinical instability e.g. apnoea, temperature instability, tachycardia

7. Blood results e.g. metabolic acidosis, rising inflammatory markers, change platelets or WBC
8. Abdominal x-ray

Dependent on these findings an informed decision to continue milk feeding, reduce milk volumes and review, or stop milk feeding can be made.

- I. **The use of abdominal X-rays.** Abdominal X-rays are generally a very poor way of diagnosing necrotising enterocolitis in a baby with equivocal signs, and often lead to the stopping of feeds because pathology (in particular pneumatosis) cannot be excluded.
 - (a) Abdominal X-rays should only be done in babies in whom there is a combination of symptoms and signs which strongly point to the likelihood of gut pathology (similar to the indications for stopping feeds, see above).
 - (b) A lateral shoot through X-ray is indicated when there are concerns about the possibility of gut perforation.

m. **Stooling**

- (a) The lack of much stooling in the first few days might just be related to little milk being given, and immaturity of gut motility. In this situation, persisting with milk feeding, rather than treatment with glycerine suppositories, is usually appropriate (with the exception of extreme preterm infants where consultants may advise a regimen of regular suppositories).
 - (b) If there has been little or no stool for the first 4 days despite milk feeding, consideration needs to be given to the possibility of either inspissation of meconium or a structural cause of distal bowel obstruction, and such a baby should be discussed with the consultant.
- n. **Other factors** Several other clinical factors might influence the commencement or rate of increase of feeds, and need to be considered on an individual basis.
 - (a) The presence of an umbilical catheter should not on its own either delay commencement or rate of advance of feeds.
 - (b) A history of significant perinatal asphyxia or other cause of significant systemic illness will often lead to a decision to delay commencement of feeds until signs of poor tissue perfusion and poor cellular function have disappeared.
 - (c) In the presence of significant respiratory disease, commencement, and rate of increase of feeds will usually be determined by a judgement of the effect of feeding on the baby's respiratory status, and a decision should be made on an individual basis.
 - (d) When a baby is receiving muscle relaxants or is receiving an inotrope and has good blood pressure and skin perfusion, a small *Trophic Feed Volume* may be fed provided there are no other contraindications.