

Enteral Feeding guidelines for the preterm infant within the neonatal service of the Leeds Teaching Hospitals NHS Trust

Background

The merger of the two neonatal services has seen the development of joint guidelines for the use of parenteral nutrition. Recent changes to obstetric management of the preterm infant, i.e. greater use of antenatal Doppler has necessitated the development of clearer guidelines for milk feeding in the preterm infant.

The major goal of this guideline is an attempt to standardize feeding practices and minimize the development of NEC. There is no clear evidence base for the best method of enteral feeding. Therefore this guideline was developed using published evidence, information from other units and local expertise.

Principles

- The IUGR infant of < 34 weeks gestation is at the greatest risk of NEC
- Significant IUGR is deemed $\leq 2^{\text{nd}}$ centile for gestation
- Early enteral feeding is known to be beneficial (trophic feeding)
- Delayed feeding in the “sick” infant is appropriate. In these infants the decision to start enteral feeding will be determined on the daily ward round
 - “sick infants” will include any infant with significant organ system dysfunction
- The presence of umbilical arterial and/or venous lines are not contraindications to enteral feeding per se
- Birthweight and gestation are important factors in deciding the initiation and progress of enteral feeding

Obstetric care

The increased use of antenatal Doppler as an assessment of fetal well-being has complicated the decision making on enteral feeding in the preterm. These include:

- Reversed end-diastolic flow (REDF)
- Absent end-diastolic flow (AEDF)
- Reduced end-diastolic flow
- Fetal echogenic bowel (persistent)
- Oligohydramnios

In neonatal practice many units do not make the distinction between absent and reversed end-diastolic flow with respect to enteral feeding practices.

Definitions: Feeding Groups

Each baby fits into one of the following Feeding Groups, numbered 1-6. The Feeding Groups are listed here. The flow chart on the next page will help to put each baby in a Feeding Group. The feeding guidelines for each group are then given.

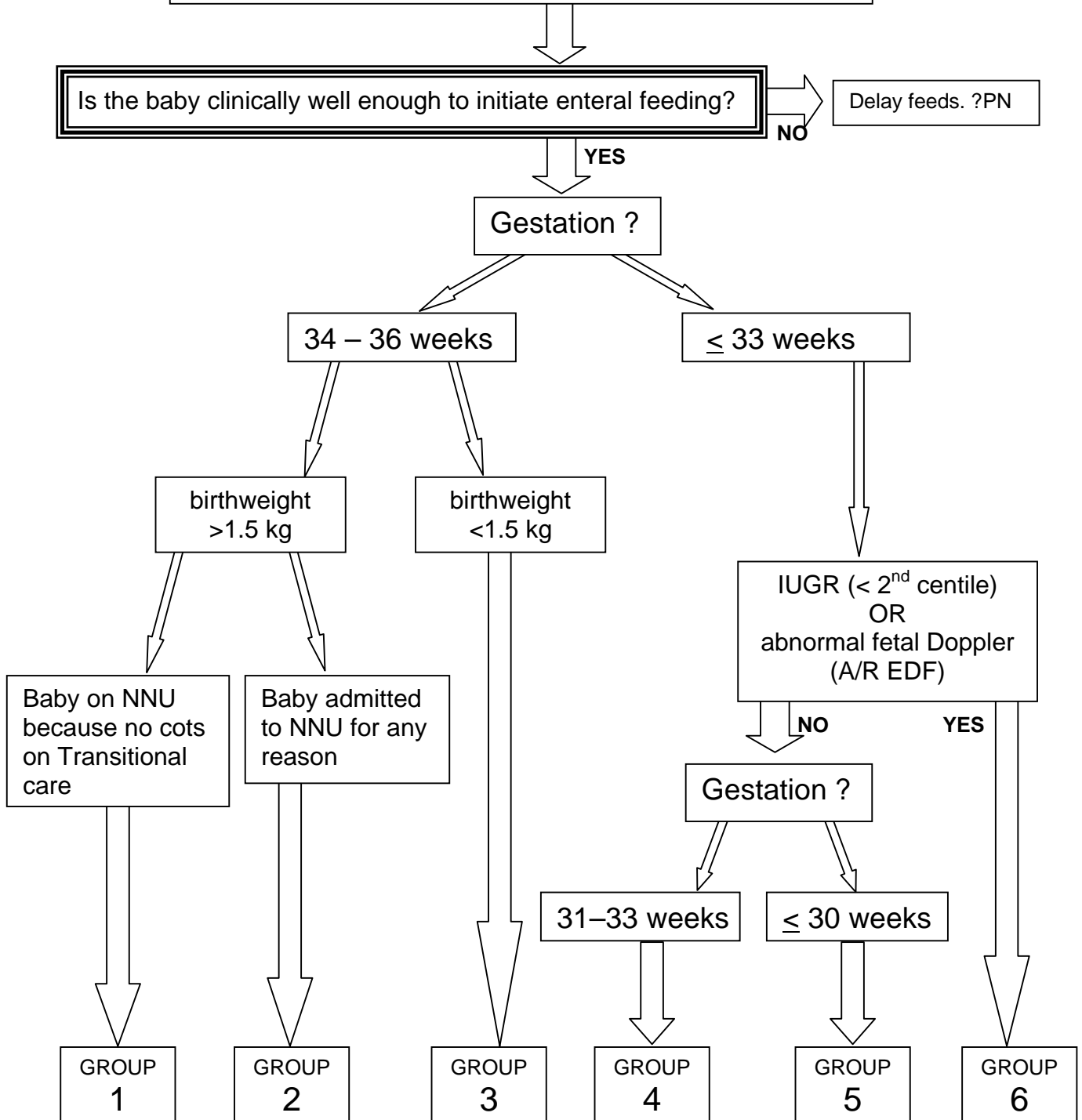
Given the differing risks to babies from developing NEC, 5 groups of infants have been identified **assuming they are considered well enough to initiate enteral feeding.**

1. 34-36 weeks gestational age and birthweight > 1.5Kg (irrespective of IUGR or antenatal Doppler) who either is on the neonatal unit due to a lack of Transitional care capacity.
2. 34-36 weeks gestational age and birthweight > 1.5Kg admitted to Neonatal Unit for whatever reason
3. 34-36 weeks gestational age and Birthweight \leq 1.5Kg
4. 31-33 weeks gestational age, **NO IUGR (> 2nd centile) or A/REDF** on antenatal Doppler
5. \leq 30 weeks gestational age, **NO IUGR (> 2nd centile) or A/R EDF** on antenatal Doppler
6. \leq 33 weeks gestational age, **IUGR (< 2nd centile) or A/R EDF** on antenatal Doppler

Abbreviation: A/R EDF – absent or reversed end diastolic flow.

Baby on NNU

Each baby fits into one of the following Feeding Groups, numbered 1-6. This flow chart will help to put each baby in a Feeding Group. The feeding guidelines for each Feeding Group are then given.



Guidelines

GROUP 1. 34-36 weeks gestational age and birthweight > 1.5Kg who is on the neonatal unit due to a lack of transitional care capacity.

Timing of enteral:	Immediately
Mode of enteral:	NG or oral
Type of milk:	EBM or Nutriprem (as per policy)
Rate of increase:	Full feeds as soon as able

GROUP 2. 34-36 weeks gestational age and birthweight > 1.5Kg admitted to Neonatal Unit for whatever reason

Feeding will depend on primary pathology. If considered ready for feeding, then feed as Feeding Group 1.

GROUP 3. 34-36 weeks gestational age and birthweight < 1.5Kg These infants are under the 2nd centile.

Timing of enteral:	Delay for up to 24 hours in marked IUGR, or make decision to feed immediately
Mode of enteral:	NG or oral
Type of milk:	EBM or Nutriprem 1 (as per policy)
Rate of increase:	60mls/kg increasing at a maximum of 1ml/Kg per day (0.5ml 12 hourly) up to total of 150/ml/kg/day

GROUP 4. 31-33 weeks, **NO** IUGR or A/REDF on antenatal Doppler

Timing of enteral:	Immediately
Mode of enteral:	NG
Type of milk:	EBM or Nutriprem 1(as per policy)
Rate of increase:	60mls/kg, max increase per day < 25ml/kg (0.5ml/h, 8 hourly) as tolerated*

GROUP 5. ≤ 30 weeks, **No IUGR ($> 2^{\text{nd}}$ centile) or A/REDF on antenatal Doppler**

Timing of enteral:	Delay for 24 hours after birth
Mode of enteral:	NG
Type of milk:	EBM or Nutriprem 1(as per policy)
Rate of increase:	1ml/kg, increasing maximum 8 hourly as tolerated* for first 72 hours. Increase to 0.5ml/kg 6 hourly maximum as tolerated* after 72 hours of age.

Note: Slow feeding to 12 hourly if evidence of failure to tolerate*. Maximum daily increase **not** to exceed 25 mls/kg per day.

GROUP 6. ≤ 33 weeks, **IUGR ($\leq 2^{\text{nd}}$ centile) or A/REDF on antenatal Doppler**

Timing of enteral:	Delay at least 24 hours
Mode of enteral:	NG
Type of Milk:	EBM or Donor EBM (see below)
Rate of increase:	$\leq 1\text{kg}$: 0.5ml/hr initially increasing by 0.5 ml/24 hours as tolerated
	$> 1\text{kg}$ 1ml/hr initially increasing by 1ml/24 hours as tolerated

When full feeds established continue, if using Donor EBM, continue on full feeds (maximum 165ml/Kg per day) for at least 5 days. Switch to Nutriprem 1 after this time.

Parenteral Nutrition (PN) will be required for this group (see PN protocol)

***Tolerating enteral feeds**

Babies are considered to be tolerating enteral feeds if

- 4 hourly NG aspirates are $< 25\%$ of total infused in the preceding 4 hours
- No significant abdominal distension
- No significant vomiting
- No bile-stained aspirates

Donor EBM

Consent is required from the mother (or father if married) before ordering. Parents should be given a copy of the information sheet on the final page of this document. If the parents are happy for their baby to be given Donor EBM, a note should be made in the Nursing or Medical record. Written consent is not needed.

Donor EBM is obtained from Huddersfield Royal Infirmary.

References

- Berseth CL, et al. Prolonging small feeding volumes early in life decreases the incidence of necrotizing enterocolitis in very low birth weight infants. *Pediatrics* 2003;111:529-534.
- Kuzma-O'Reilly B, et al. Evaluation, Development, and Implementation of Potentially Better Practices in Neonatal Intensive Care Nutrition. *Pediatrics* 2003; 111:e461-470.
- Mihatsch WA, et al. Early feeding advancement in very low-birth-weight infants with intrauterine growth retardation and increased umbilical artery resistance. *J Pediatr Gastroenterol Nutr.* 2002;35:137-138.
- Williams AF. Early enteral feeding of the preterm infant. *Arch Dis Child Fetal Neonatal Ed* 2000;83:F219 - F220.
- Cooke RJ et al. Feeding issues in preterm infants. *Arch Dis Child Fetal Neonatal Ed* 2000;83:F215 - F218
- Newell SJ. Enteral feeding in the micropremie. *Clin Perinatol* 2000; **27**: 221-234.
- McGuire W., Anthony MY. Donor human milk versus formula for preventing necrotising enterocolitis in preterm infants: systematic review. *Arch. Dis. Child Fetal Neonatal Ed* 2003;**88**:F11-F14.

Donor expressed breast milk

Information sheet for parents

We know that breast milk is generally the best milk for newborn babies. There is a special reasons for giving your baby breast milk. We are recommending breast milk for your baby to prevent a bowel condition called NEC. NEC occurs in about 1 in 20 premature infants and sometimes it is serious and may need surgery. We know that NEC is over 5 times less common in infants who are fed breast milk.

We usually feed preterm babies breast milk from their own mothers. Sometimes this is not possible. Fortunately we have a breast milk bank in Yorkshire. Mothers of healthy babies who have breast milk to spare, donate the milk to the bank. The mothers who donate milk are asked about their health, and tested for HIV, hepatitis B and C, syphilis and a rare condition called HTLV. All the milk is then heat treated and tested to make sure it will not cause infection. We use the milk when we are happy that it is safe. In Leeds, we have never seen a problem in a baby because of donor milk.

Naturally we want you to think about this. We hope that you will be happy us to give donor breast milk to your baby. We usually give the donor milk to a baby who is at risk of NEC when milk is not available from their own mother. We give the donor milk, until the baby is on full feeds when we use formula. If breast milk from the baby's own mother becomes available, we use this.

If you have any questions, please do not hesitate to ask one of our Unit staff. Thank you for reading this. If you are happy for your baby to be given donor breast milk, after we have discussed it with you, we will make a note in your baby's notes, and use the milk. You will of course find out about your baby each time you visit, and if you change your mind about the donor milk, just let us know and we will stop using it.

Preterm babies are at risk of a condition called NEC that is sometimes serious. NEC is less likely if breast milk is given. Sometimes breast milk is not available from a baby's own mother. We recommend that these babies are given donor breast milk. This milk is donated by mothers after careful health checks. We are confident that donor breast milk is safe.