ENTERAL NUTRITION

Statement of best practice

- Feeding with mother's own breastmilk is protective against sepsis, NEC and death
- All mothers should be informed about this and strongly encouraged to express their own milk at first contact (ideally before birth and repeatedly after delivery) irrespective of their potential future choices for milk feeding

Initiating Feeding

Identifying risk of patients for enteral feeding problems:

Low risk:

- Gestation at birth ≥ 35 + 0 weeks
- Birthweight ≥ 2.0 kg
- Minor medical problems (not requiring cardio-respiratory support except LFNC)

Moderate risk:

- Gestation at birth 30 + 0 - < 35 + 0 weeks
- Birthweight ≥ 1.5 - < 2.0 kg
- AEDF
- Respiratory support (except HFOV and LFNC)
- PDA
- Blood transfusion
- Umbilical venous and/or arterial line
- Sepsis
- HIE
- Congenital anomalies (other than the bowel)

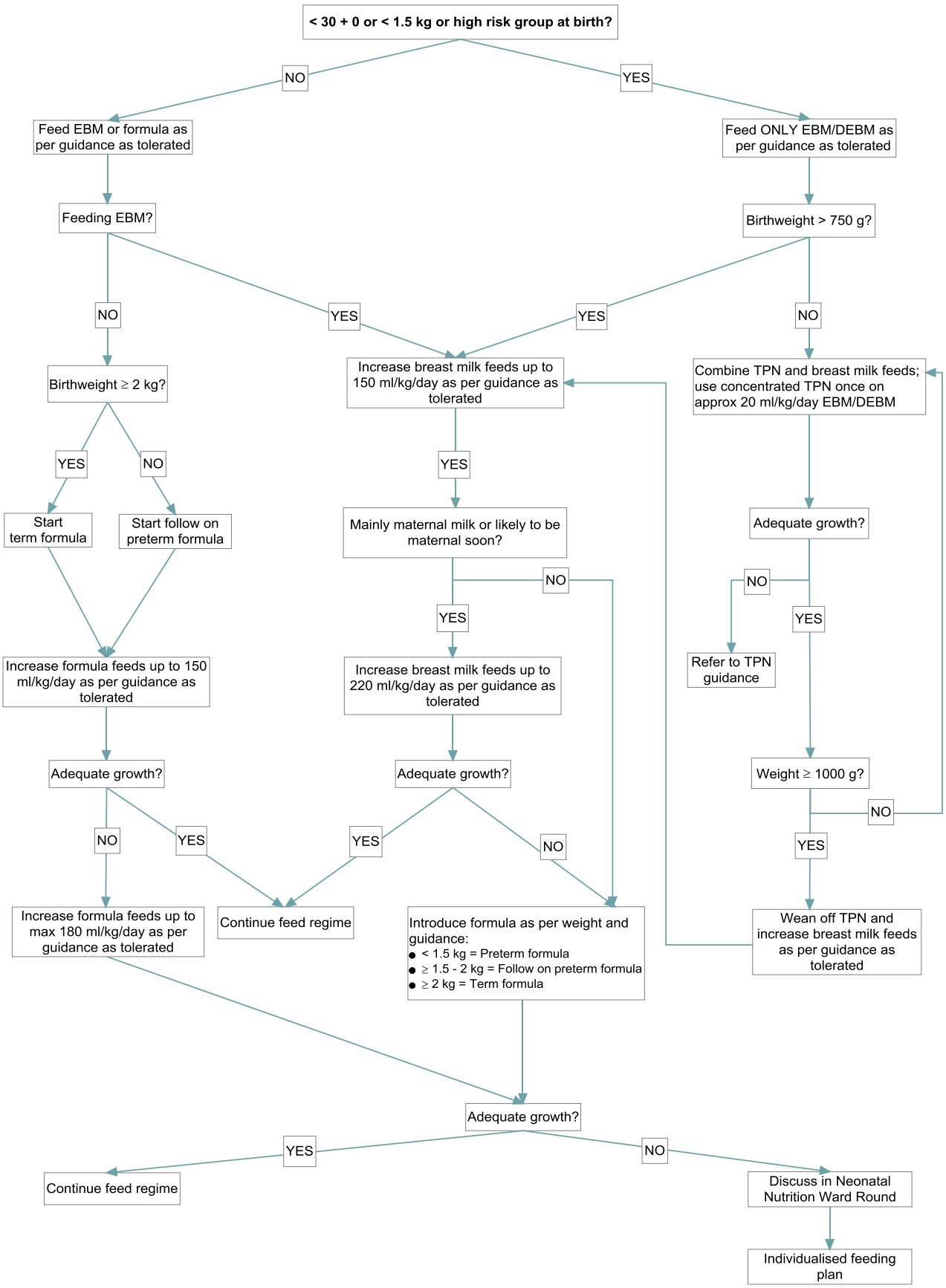
High risk:

- Gestation < 30 + 0 weeks
- Birthweight < 1.5 kg
- Inotropic support for arterial hypotension (except Adrenaline)
- Indomethacin/ibuprofen treatment
- HFOV
- Renal failure
- Short-bowel/stoma/intestinal failure
- Paralysed

Feeding contraindicated or at discretion of Consultant Neonatologist, Consultant Paediatric Surgeon and/or Nutrition Team (individual plan required):

- Combination of several risks from the high risk group
- Shock or inotropic support including Adrenaline
- NEC
- Congenital anomalies of the bowel
- Abdominal surgery
- Critically ill (as defined by attending Consultant)

ENTERAL NUTRITION FLOWCHART



Advancing Feeds

Volume Increase per Day	Volume Increase (ml) per Kilogram per Day on 2 Hourly Feeds							
	< 500 g	< 750 g	< 1.0 kg	< 1.2 kg	< 1.5 kg	< 2.0 kg	< 3.0 kg	< 3.5 kg
1 ml 24 hrly.								
1 ml 12 hrly.								
1 ml 8 hrly.								
1 ml 6 hrly.								
1 ml 4 hrly.								
2 ml 6 hrly.								
2 ml 4 hrly.								
3 ml 6 hrly.								
3 ml 4 hrly.								
2 ml 2 hrly.								
3 ml 2 hrly.								

Zone	Volume Increase per Day
	< 20 ml/kg/day - advisable
	20 – 30 ml/kg/day – with caution
	> 30 ml/kg/day – not recommended

Establishing Growth

- Once full feeds established (150 ml/kg/day) maximise EBM intake as tolerated before considering alternative feeding options
- Introduce formula milk (for poor growth or insufficient EBM supply) as in the table.
- If formula is introduced for poor growth, review weight gain before making the next change
- If formula is introduced for poor EBM supply (DEBM dependency) make changes every 24 hours, if tolerated. Beware that that there is no need to give more than 165 ml/kg/day if they baby is fully formula fed with SMA GP Pro

Use SMA GP Pro if birth weight < 1.5 kg and SMA GP2 if birth weight 1.5 - 2kg
1 formula feed every 24 hours (at 150 ml/kg/day)
↓
1 formula feed every 12 hours (at 150 ml/kg/day)
↓
1 formula feed every 8 hours (at 150 ml/kg/day)
↓
1 formula feed every 6 hours (at 150 ml/kg/day)
↓
1 formula feed every 4 hours (at 150 ml/kg/day)
↓
Increase to maximum of 8 formula feeds in 24 hours

- Aim to keep a minimum of 50 ml/kg/day breast milk in any patient
- Do not use fortifier, unless discussed with Neonatal Dietician or Consultant; if breastmilk is fortified, use medical scales to measure the amount of fortifier required and use table for calculating the total fortification required:

EBM Volume	Fortifier Amount
1 ml	0.04 g
5 ml	0.2 g
10 ml	0.4 g
25 ml	1.0 g
50 ml	2.0 g (1 sachet)

- Aim for linear growth from 28 weeks onwards at > 17 g/kg/d per day up to 2 kg weight and then 30 g per day over a 7 day period
- Aim to keep growth (weight, length and head circumference) between birth centile and centile at 3 weeks of life

Special Considerations

- Aim to start feeds in first 24 hours of life or as soon as cardiorespiratory stable in any group
- Always start feeds at 1 ml (0.5 ml, if birthweight ≤ 750 g) 2 hourly in high risk group; moderate risk group maybe started on higher amounts at 2 - 3 hourly feeds without exceeding 10 - 20 ml/kg/day; low risk group maybe started on full enteral feeds at 60 ml/kg/day on 3 hourly feeds
- Never mix formula and breast milk in one bottle or feed in high risk group; mixing in moderate risk group at Consultant's discretion. Regular mixing only acceptable in low risk group
- Consider in patients with birthweight ≤ 750 g using a combination of concentrated TPN up to a total of 110 ml/kg/day (incl. lipids at max. 17 ml/kg/day) and breast milk/donor EBM of at least 50 to max. 90 ml/kg/day (max. combined total volume 200 ml/kg/day). Change to concentrated TPN once patient on at least 20 ml/kg/day EBM/DEBM (avoid excess breaking of central line)
- Remove central venous line when tolerating 120 ml/kg/day for > 24 h in preterms > 750 g

Supporting Feeding Tolerance

- Ensure gastric tube is correctly placed at all times
- Always use colostrum first (whether fresh or frozen) if available
- Use fresh breast milk rather than frozen milk, but only after the stored milk from the first 2 - 3 weeks of life has been used in order of expressing
- Give all feeds over 30 - 60 minutes once at ≥ 100 ml/kg/day and evidence of feeding intolerance or gastro-oesophageal reflux
- Feed continuously from the outset in newborns with stoma
- Patients should not show signs of feeding related cardio-respiratory compromise or abdominal discomfort, but can have slightly distended soft abdomen (especially if on CPAP)
- Gastric aspirates equivalent to < 1 - 2 ml/kg/h (even if slightly bile stained) are acceptable to progress with feeding
- Patients who do not open their bowels after the first 48 h and/or fail to open their bowels daily thereafter require glycerine suppositories until this has been achieved (even if they are on low volume feeds)

Supplementing Enteral Nutrition

- Start iron and vitamin supplementation in preterm infants (< 35 + 0 weeks or < 2 kg) when > 60 ml/kg/day enteral feeds tolerated irrespective of type of milk or combination with TPN. Do not stop iron for blood transfusions.
- Daily vitamin and iron intake:

Milk Type	Abidec/Dalivit	Folic Acid	Sytron
Unfortified Breastmilk	0.6 ml	50 micrograms	0.9 ml/kg
Breastmilk + BMF	0.3 ml	Nil	
SMA Gold Prem Pro & 2	0.3 ml	Nil	
Term Formula & Specialist Formula	0.6 ml	Nil	

- Minimum EBM volume (ideally higher for formula) requirements for oral supplements - split up doses, if necessary:

Additive	Dosage	Minimum EBM per feed per dosage
Sytron	0.1 ml	1.2 ml
Folic Acid	50 microgram	1.1 ml
Abidec/Dalivit	0.3 ml	3.0 ml
Sodium-Acid-Phosphate	0.1 mmol	1.6 ml
Sodium-Chloride	0.1 mmol	0.7 ml
Caffeine-Citrate	1 mg	0.5 ml
Chloralhydrate	1 mg	0.3 ml

Establishing Demand Breastfeeding/Bottle Feeding

- Try to move to 3 - 4 hourly feeds by gravity once > 32 + 0 weeks gestation, if no medical concerns or on low-flow oxygen
- Mothers who wish to breastfeed should be encouraged to be present for as many consecutive breastfeeds as possible once the baby starts to breastfeed
- Rooming-in facilities should be used as soon as possible to promote establishment of breastfeeding at any time when the rooms are available
- Consider challenge test once > 1.5 kg and > 32 + 0 weeks gestation after some breastfeeds/bottle feeds have taken place - remove NGT, allow demand feeding whilst rooming in, check pre-feed glucose after the first few breastfeeds/bottle feeds

Preparing for Discharge

- Consider discharge at > 1.6 kg and > 34 + 0 weeks gestation, if no medical or social concerns present
- Involve Health Visitor or Neonatal Outreach Team, if feeding concerns present or enhanced care needed at discharge; refer to Community Paediatric Team, if mecial problems including oxygen requirement present at discharge
- Patients on SMA Gold Prem 1 should change over to Gold Prem 2 at 2 kg (current weight) or ideally one week before discharge or earlier when weight gain is excessive or oedema are present
- Change daily vitamin and iron supplements before discharge as follows:

Milk Type	Abidec/Dalivit	Folic Acid	Sytron	Alphacalcidol
Unfortified Breastmilk	0.6 ml	Nil	1 ml	Drops/weight: 1-2kg = 1 drop >2-4kg = 2 drops >4kg = 3 drops
Breastmilk + BMF	0.3 ml	Nil		
SMA Gold Prem Pro & 2	0.3 ml	Nil		
Term Formula & Specialist Formula	0.3 ml	Nil		