Overview

Initiation of feeds:

- Assess within 6hrs post admission if a patient eligible for feeding. (Flowchart 1, 2)
- Trophic feeds to start ASAP to aid with gut priming.
- Basal Metabolic Rate (BMR) to be reached within 5-7 days.
- NJ feeds to be used over TPN if gut is functioning but poor tolerance is observed.
- PN should be considered if target BMR not reached within 5 to 7 days of admission. (See PN guidelines)
- Risk of re-feeding syndrome to be determined prior to commencing enteral feeds.

Feed type:

- Breast milk is preferred first line feed in less than 1yr of age.
- If breast milk not available then standard term infant formula to be used.
- After diagnosis of suspected or confirmed NEC, enteral feeding should be re-established with EBM or a standard formula, if EBM not available. Consider Aptamil Pepti-Junior® if significant GI resection (and risk of malabsorption), and/or high risk of NEC re-occurrence.
- Feeds are not to be fortified or concentrated for the first 10 days of feeding when diagnosed at risk of NEC.
- Suspected and confirmed Chylothorax should be treated using Monogen feed unless diagnosed with cow’s milk allergy. (See UHL Chylothorax guidelines)
Feed method:
• 2 hourly bolus feeds to be initiated as first line feeding regime.
• Initiation of feeds to be based on the recognition of “High Risk Abdomen” and risk of aspiration. (Flowchart 1, 2)
• BMR target can be reached earlier if clinically child is tolerating feeds and not at risk for NEC.
• Once extubated, nutritional requirements are altered.

1. Introduction and Who Guideline applies to

These guidelines are intended to aid qualified nursing staff and medical teams in the appropriate initiation and maintenance of feeding practices for children on intensive care units. These guidelines are solely for the use for children on Intensive Care Units including cardiac intensive care covering ECMO in the “acute phase” of their ITU stay. For guidelines for starting nasogastric enteral tube feeds in children on non-intensive wards please refer to “Guidelines for starting nasogastric tube feeds in children”.

Children with inherited metabolic disorders/disease, acute renal failure not on renal replacement therapy, following a ketogenic diet, or patients with any allergy should be referred to the Dietician prior to initiating these guidelines.

This guideline does not replace a dietetic assessment and referral to the Dietitian is recommended as soon as possible. These are guidelines only. Individual patients may deviate from the guidelines for clinical reasons following discussion with the Consultant.

The purpose of nutritional support on intensive care wards is to ensure adequate nutrition is provided whilst avoiding under or over nutrition. The accurate assessment of energy requirements is vital, as increased metabolic response to injury has a direct effect on nutritional status and can impact on patient outcome [1]. Failure to provide adequate nutritional intake equal to or above predicted basal metabolic rate is associated with higher mortality and morbidity rates with impaired muscle strength, reduced wound healing and increased rates of sepsis [2]. Over nutrition can lead to increased carbon dioxide production resulting in difficulties in weaning from ventilator support as well as inducing lipogenesis causing increased fat deposits in the liver [3].

The type of feed and method of feeding plays a significant role in aiding tolerance. In the population of term babies with cardiac defects the initiation time, rate and feed type has shown to have an impact on the incidence of necrotising enterocolitis (NEC) [4]. The cause of NEC in term congenital heart defect babies is suggested to be the combination of widened pulse pressure and low diastolic pressures [5]. This is thought to result in decreased blood flow to the gut and affects the gut’s ability to absorb [6]. A large percentage of the population of children admitted onto the intensive care wards have known cardiac defects. The associated risk factors with cardiac defects are documented in the table below [4].

Related documents:
UHL Children’s Chylothorax guidelines C91/2016
UHL Nasogastric/Orogastric tube feeds in children B54/2017
UHL Adult ITU Nasogastric Feeding guidelines B42/2016
UHL Adult Parenteral Nutrition guidelines B21/2003
2. Guideline Standards and Procedures

Ensuring that adequate nutrition is provided on intensive care wards has known challenges due to fluid restrictions, digestive intolerances and feeding interruptions for diagnostic and therapeutic procedures [7]. Initiating feeds at appropriate volumes in a timely manner will help to overcome some of these challenges, reduce the risk of other complication such as NEC and will aid in the delivery of adequate estimated energy requirements.

Ideally, the resting energy expenditure (REE) would be established by indirect calorimetry on PICU [8]. In the absence of an Indirect Calorimeter, the Schofield Equation should be used for infants and children, stress factors used with caution [8].

- The predicted REE in infants less than 6 months with congenital heart disease, following cardiac bypass, ranges from 60-70kcal/kg/day [9].
- The predicted REE for ventilated children less than 6 months that have not been on cardiac bypass ranges from 50-60kcal/kg/day [10].
- The recommended minimum protein intake in ventilated infants and children on PICU is 1.5g protein/kg/day [9], in practice, energy and protein are intrinsically linked in paediatric feeds [11] and thus clinical judgement is needed to reach an appropriate compromise between protein and energy provision based on a child / infant’s nutrition risk.

Aim whilst intubated and ventilated [8, 9]:
- Under 6 months: non cardiac bypass 55-65 kcal/kg/d
- Under 6 months: following cardiac bypass 65-75 kcal/kg/d
- Under 6 months: target requirement by 7 days: 80-90 kcal/kg/d
- Over 1: BMR by 5-7 days and 80% EAR by 7-14 days

Once extubated, nutritional requirements are altered. For adolescents > 45kg please follow adult UHL ITU Feeding guidelines.

2.1 BOLUS FEEDS

- Feed Tolerance:
  There is inconclusive evidence to indicate if bolus or continuous feeds aid in better feed tolerance [13] [14]. However, the use of bolus feeds are more physiological, eliciting cyclical surges of hormones aiding with gut maturation, which is not found in continuous feeds [14].

- Feed Performance:
  Bolus feeds achieve full enteral requirements significantly faster than continuous feeds and risk of infection is less [13] [14].

- Gastric Aspirates:
  No trials are reported for gastric emptying times for children in intensive care. The use of continuous feeding with adults on critical care wards has reported to delay gastric emptying time [14].

- NEC:
  A recent Cochrane review indicated there have been no recorded cases of NEC in infants given bolus feeds. For continuous feeds there was one proven NEC and one probable case. Bolus feeds are associated with patient having better safety, sedation and no risk of aspiration [16].

2.2 GASTRO INTESTINAL INTOLERANCES

- Feed type:
  Breast milk is the preferred feed for infants. It is nutritionally complete providing increased benefits in nutrition, neurodevelopment, immune defence and gastrointestinal function compare with formula milks. The use of breast milk is also associated with significantly reduced incidences of NEC [12]. Standard formula feeds are tailored to copy the composition of breast milk and can be used as an alternative if breast milk is not available.
• Osmolality:
Lower osmolality feeds may improve feeding tolerances [17]. Caution is needed when using higher osmolality feeds, as an association between hyperosmolar preparations (> 425 mOsm/kg H2O) and NEC has been reported [18]. However, since this became known, formulas are now made to be of lower osmolality, and thus the commonly used PICU infant formulae are not considered to be hyperosmolar feeds.

Breast milk fortifiers are associated with short term benefits of improved growth in preterm infants (born at <37/40 gestation) and do not appear to be associated with adverse effect or any long-term benefits [19]. Although by adding fortifier to breast milk, the osmolality of the feed increases, the use of fortified breast milk rather than preterm formula milk (when feeding preterm infants) is also associated with significantly reduced incidences of NEC as well as other forms of sepsis [20].

Breast milk fortifier is designed for inpatient use only, for preterm infants. These fortifiers are designed specifically to replete the low stores of infants born before term gestation [21], and therefore are not usually appropriate for use in term infants.

2.3 INITIATION RATES

• Timing:
The implementation of early nutritional support (consider starting feeding within 6 hours of admission to ITU) including trophic feeds within 24 - 48hrs of admission can improve clinical outcomes, shorter length of stay, decreased infection rates and enhanced immune function [22].

Additional benefits of early nutrition include maintaining gut integrity with higher production of gastrointestinal hormones and advanced maturation of motor responses enabling better absorption of nutrients [23][24].

• High Risk Abdomen:
Premature babies and term cardiac new born infants have increased risk of NEC due to gut immaturity and gut integrity [4]. Early trophic feeds provide greater energy intake, more rapid weight gain and head growth. There is no increased risk of NEC and the development of sepsis is less likely [25].

2.4 GASTRIC RESIDUAL VOLUME

Gastric residual volume (GRV) is considered a marker of GI dysfunction and delayed gastric emptying. Elevated GRV are associated with sedation/paralysis and catecholamine use [26]. There are suggestions that GRV > 5ml/kg or > 200ml can be considered to be an indicator of poor feed tolerance and delayed gastric emptying with accompanying potential risks (vomiting, aspiration, pneumonia) in ventilated patients [27,28]. Gastric aspirate contains digestive enzymes, electrolytes, medication and fluids and should be re-feed, unless frank blood, frank bile or faecal fluid is aspirated. In that case DO NOT return aspirate via NG tube and inform medical staff. All other aspirate types (e.g. milky, partially digested, bile stained) should be returned via NG tube. The value of periodic GRV measurement with regard to the risk reduction of VAP (ventilator associated pneumonia) incidence as a major risk of enteral nutrition, has been questioned in the past years. There is increasing consensus that the routine checking of gastric residual volumes is unnecessary in asymptomatic patients receiving tube feeding. GRV should be measured if there is a change in patients condition noted as abdominal distension, vomiting, deterioration in haemodynamics or overall status [29].

2.5 NASO-JEJUNAL (NJ) FEEDS

Enteral nutrition within the first 5 days of life promotes endocrine adaption and the maturation of motility patterns, luminal nutrient and increased immune function [30].

Nasojejunal feeding should be considered in patients with a history of recurrent aspiration of gastric contents, oesophageal dysmotility with regurgitation, or severe gastroesophageal reflux disease. There is some evidence that NJ feeding can reduce the frequency of pneumonia [32,33]. In terms of increased energy delivery, there is no advantage in early nasojejunal nutrition compare to nasogastric feeding. There was observed an increased frequency of minor gastrointestinal haemorrhage in patients with nasojejunal feeding so gastric prophylaxis should be considered [34]. NJ feeds are preferred over Parenteral Nutrition (PN) with lower associated risks of sepsis and complications. If feed tolerance is poor with noted vomiting and/or absorption is repeatedly poor, consider whether it is appropriate to use prokinetic medications, then trial NJ feeds prior to PN being used. (Please refer to UHL NG and NJ placement policy).
2.6 PARENTERAL NUTRITION (PN)

The risks of sepsis and other complications during PN is high and takes between 3 to 4 days to provide full nutritional requirements. If no enteral nutrition is likely to be started within 3 days of admission, the use of PN needs to be instigated. A recent randomised control trial investigating early versus late PN in PICU patients found that later PN was associated with reduced infection incidence and shorter length of stay\textsuperscript{[35]}. Nevertheless, the patients enrolled in this study were given IV micronutrients to meet their RNI until 80% enteral nutrition was achieved, thus these patients experienced only macronutrient deficit during this time \textsuperscript{[35]}, and therefore the results should be interpreted with caution as not directly applicable to UK PICU settings who don’t routinely administer IV micronutrients. Current nutritional guidelines for starting PN must be followed.

2.7 REFEEDING SYNDROME

Re-feeding syndrome can occur in malnourished patients or those who have not had any significant nutrition for more than 5 days. This syndrome is recognised with there introduction of feeding resulting in severe fluid and electrolyte shifts, and metabolic complications resulting in decreased plasma levels of phosphate, potassium and magnesium. Guidance for the identification and treatment of refeeding syndrome is found in UHL Guideline for the Use of Parenteral Nutrition in Term neonates, children and adolescents (excludes patients on NNU) Monitoring Troubleshooting and Weaning C43/2018

3. Education and Training

None

4. Monitoring Compliance

<table>
<thead>
<tr>
<th>What will be measured to monitor compliance</th>
<th>How will compliance be monitored</th>
<th>Monitoring Lead</th>
<th>Frequency</th>
<th>Reporting arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caloric intake, weight gain</td>
<td>Audit</td>
<td>Julia Vujcikova</td>
<td>As required</td>
<td>Local audit group</td>
</tr>
</tbody>
</table>

5. Supporting References

6. Necrotizing enterocolitis in infants with congenital heart disease: To feed or not to feed? J Am Coll Cardiol (2011); 57: E413.
16. Continuous nasogastric milk feeding versus intermittent bolus milk feeding for premature infants less than 1500grams. Cochrane Database of Systematic Reviews (2008); Issue 2.
22. Use of a feeding protocol to improve nutritional support through early aggressive enteral nutrition in the paediatric intensive care unit. Paediatric Critical Care Medicine (2006); 7:340-344.

6. Key Words
Feeding, Intensive Care, Nasogastric, Naso-Jejunal, Parenteral, Re-feeding syndrome.
The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs. As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

<table>
<thead>
<tr>
<th>CONTACT AND REVIEW DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guideline Lead (Name and Title)</td>
</tr>
<tr>
<td>J Vujcikova - Consultant Paediatrician</td>
</tr>
</tbody>
</table>
Details of Changes made during review: Reformatted throughout

Overview:

Added - Suspected and confirmed Chylothorax should be treated using Monogen feed unless diagnosed with cow's milk allergy.

Consider Aptamil Pepti-Junior® if significant GI resection (and risk of malabsorption), and/or high risk of NEC re-occurrence.

Removed brand names of standard formula infant feeds unless medical indication dictates specific formulas

Added to guideline standards & procedures pg. 3:

Ideally, REE would be established by indirect calorimetry on PICU [8]. In the absence of an Indirect Calorimeter, the Schofield Equation should be used for infants and children, stress factors used with caution [8].

The predicted resting energy expenditure in infants under 6 months with congenital heart disease, following cardiac bypass, ranges from 60-70kcal/kg/day [9]. The predicted resting energy expenditure for ventilated children under 6 months that have not been on cardiac bypass ranges from 50-60kcal/kg/day [10].

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Changed values p.g 3:

Aim whilst intubated and ventilated [8,9]:

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- Under 6 months: following cardiac bypass 65-75 (was 60-70) kcal/kg/d
- Under 6 months: target requirement by 7 days (was 5-7 days): 80-90 kcal/kg/d
- Over 1: BMR by 5-7 days and 80% EAR by 7-14 days

Page 4 added information:

- Osmolality

Lower osmolality feeds may improve feeding tolerances [17]. Caution is needed when using higher osmolarity feeds, as an association between hyperosmolar preparations (> 425 mOsm/kg H2O) and NEC has been reported [18]. However, since this became known, formulas are now made to be of lower osmolality, and thus the commonly used PICU infant formulae are not considered to be hyperosmolar feeds.

Breast milk fortifier is designed for inpatient use only, for preterm infants. These fortifiers are designed specifically to replete the low stores of infants born before term gestation [21], and therefore are not usually appropriate for use in term infants.

Added to pg 5:

If feed tolerance is poor with noted vomiting and/or absorption is repeatedly poor, consider whether it is appropriate to use prokinetic medications, then trial NJ feeds prior to PN being used.

Added & Amended pg 6

If no enteral nutrition is likely to be started within 3 days of admission, the use of PN needs to be instigated. A recent randomised control trial investigating early versus late PN in PICU patients found that later PN was associated with reduced infection incidence and shorter length of stay [35]. Nevertheless, the patients enrolled in this study were given IV micronutrients to meet their RNI until 80% enteral nutrition was achieved, thus these patients experienced only macronutrient deficit during this time [35], and therefore the results should be interpreted with caution as not directly applicable to UK PICU settings who don’t routinely administer IV micronutrients.

Amended 12/09/19 Flow chart 2: HIGH RISK ABDOMEN

High risk NJ feeding was D1: start 0.5ml/kg every 2 hours Corrected: D1: Start at 0.5ml/kg/h
### APPENDIX 1: AVAILABLE PAEDIATRIC FEEDS

#### < 1 year
- Expressed Breast Milk (EBM)
- Standard Infant Formula (e.g. SMA 1, C&G 1)
- High Energy Infant Formula (e.g. Infatrini, SMA High Energy, Infatrini Peptisorb)
- Preterm Infant Formula (e.g. Nutriprem 1 and 2, hydrolysed Nutriprem)
- Specialist Infant Formula (e.g. Pepti Junior, Althera, Nutramigen LGG, Neocate LCP, Alfamino, Monogen, Renastart)

#### 1- 6 years (and 8-20kg)
- 1kcal/ml feed +/- fibre (e.g. Nutrini, Nutrini Multifibre)
- 1.5kcal/ml feed +/- fibre (e.g. Nutrini Energy, Nutrini Multifibre)
- 1kcal/ml hydrolysed feeds (e.g. Nutrini Peptisorb, Peptamen Junior)
- 1.5kcal/ml hydrolysed feeds (e.g Nutrini Peptisorb Energy, Peptamen Junior Advance)
- Specialist feeds (e.g. Neocate Advance, Neocate Junior, Monogen, Renastart)

#### From 6 years (and over 20kg)
- 1kcal/ml feed +/- fibre (e.g. Nutrison 1.0, Nutrison Multifibre)
- 1.5kcal/ml feed +/- fibre (e.g. Nutrison Energy, Nutrison Energy Multifibre)
- Hydrolysed feeds (e.g. Nutrison Peptisorb)
- Protein enriched feeds (Nutrison Protein Plus, Nutrison Protein Plus Multifibre)
- Specialist feeds (e.g. Nutrison Low Sodium, Nutrison MCT, Modulen IBD)

### ALLERGY
ALWAYS CONSULT WITH DIETICIAN

#### Milk Allergy
- <1 year:
  - Extensively Hydrolysed Formulae (1st line): Althera, Nutramigen LGG, Pepti-Junior, Similac Alimentum
  - Amino Acid formula: Alfamino, Neocate LCP, Puramino
- >1 year & >8kg: Neocate Junior, Neocate Advance
- >6 years & >20kg: Nutrison Soya

#### Fish Allergy
- >1 year & >8kg: Paediasure
- >6 years & >20kg: Nutrison Soya

#### Vegetarian
- >1 year & >8kg: Paediasure
- >6 years & > 20kg: Nutrison Soya
### APPENDIX 2: MONITORING FEED TOLERANCE

<table>
<thead>
<tr>
<th>Complication</th>
<th>Significance</th>
<th>Causes</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vomiting</td>
<td>&gt;2 times/ 24h</td>
<td>Constipation, Large aspirates / poor absorption, Being moved, Having physio / cares medications</td>
<td>Consider prokinetics, Reduce feed bolus by ½ for next 2 feeds, Consider NJ feeding, Consider changing feed type</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>Type 7 on Bristol stool chart with every stool movement &amp; &gt;3 times/24h (&gt;3 stool/day can be normal for breastfed infant)</td>
<td>Assess medication, Assess antibiotics, Check stool sample for bacterial growth, High osmolar feeds or correct feed type administered</td>
<td>Consider stool for C.Diff, Evaluate medications, Consider overflow diarrhoea, Consider changing feed type</td>
</tr>
<tr>
<td>High aspirates</td>
<td>Measure gastric aspirates 4 hrly: &gt;5ml/kg or &gt;200ml (in those &gt;40kg)</td>
<td>Check for constipation, Assess medication</td>
<td>1. Halt feeds at the current rate, 2. Reassess after 1 hour, 3. Replace gastric residual volume up to 5ml/kg (or 200ml) unless contraindicated, 4. If feeding intolerance still present stop feeding for 4 hrs and reassess, 5. If feeding intolerance still present, consider promotility agents, NJ feeding or review for PN</td>
</tr>
<tr>
<td>Constipation</td>
<td>Bristol stool type 1 or 2 and low frequency</td>
<td>Lack of fluids, Assess medication (opiates), Reduced mobility</td>
<td>Commence stool softeners and or laxatives, Review fluid intake, Change feed type</td>
</tr>
</tbody>
</table>
**Flow chart 1: Enteral Nutrition – Gastric feeding**

**ENTERAL NUTRITION**

**GASTRIC FEEDING PICU GUIDELINE**

**ASSESS 6h POST ADMISSION/ POSTOP FOR FEEDING**

**CONFIRM POSITION OF NG TUBE**

**APR**

**ASPIRATION RISK?**

- **HIGH RISK ABDOMEN**
  - Absolute risk:
    - Mechanical bowel obstruction
    - Confirmed NEC, ischaemic bowel
    - Significant GI bleed
    - HLHS/CoA/IAA/Critical AS
  - Relative risk:
    - Suspected NEC, post complex GI surgery
    - Truncus arteriosus/ AP window, BT shunt, Prostin dependent lesions
    - Prematurity 30/40 < 6 weeks CGA, UAC
    - Low cardiac output state, central cooling, open chest, <24h post resus
    - Malnutrition or NBM > 1 week (risk of refeeding sy)

- **CONSIDER NJ FEEDS**
  - IF:
    - History of aspiration
    - Witnessed regurgitation
    - Delayed gastric emptying
    - Significant GORD
    - Depressed gag reflex
    - Persistent vomiting
    - Altered intestinal motility

**STANDARD BOLUS FEEDS**

- Start by 0.5 - 1ml/kg 2 hourly (max 50ml)
- >44kg see adult ITU feeding guideline
- After 4 hours check gastric aspirate.
  - Is it > 5ml/kg or > 200ml?

  - If not, return aspirate* and increase by 0.5 - 1ml/kg max 50ml

  - Continue to check aspirate every 4 hours and increase feed to maximum fluid allowance
  - Titrate iv fluids to enteral volume

**Monitor for feeding intolerance**

- 4 hourly: gastric residual volume, vomiting, abdominal distention, diarrhea - 3 or more episodes in 24 hours, rule out constipation

- If aspirate >5ml/kg or 200ml, return 5ml/kg or 200ml back (unless contraindicated)* and discard the rest. Hold next feed and re-check

- If gastric aspirate still >5ml/kg or 200ml, return 5ml/kg or 200ml back (unless contraindicated)* and discard the rest.
  - Hold next feed and consider: **
    - promotibility agents
    - transpyloric feeding (NJ)
    - if PN is indicated

**HIGH RISK ABDOMEN**

- D1: Start at 0.5ml/kg 2 hourly (max 25ml)
- Check gastric residual volume 4 hourly
- Is it > 5ml/kg or > 200ml?
  - If not increase by 0.5ml/kg every 12 hours

- D2: increase by 0.5ml/kg every 8 hours; consider starting PN

- D3-5: increased by 0.5 - 1ml/kg every 4 - 6 hours; reduce PN when enteral volume is 25% of target set by Dietician; wean PN as per dietician/picu consultant plan.

**STOPPING FEEDS**: NG feeds to be stopped 4 h prior to extubation and recommenced 2 - 4 hours post extubation.

NJ feeds to be stopped 1 h before extubation and recommenced 1 hour after extubation (once position is verified).

NBM pre-op:
- 6 hours: Food, Cow’s milk, formula
- 4 hours: EBM
- 2 hours: Clear fluids

* If frank blood, frank bile or faecal fluid is aspirated DO NOT return via NG and inform medical staff. Replace all other aspirate (milky, bile stained, partially digested. Gastric aspirate contains digestive enzymes, electrolytes, medication and should be re-fed (unless contraindicated *). If 2 consecutive aspirates >5ml/kg (or >200ml) further action is required (see**); rule out constipation.
Flow chart 2: Enteral Nutrition – Jejunal feeding

ENTERAL NUTRITION
JEJUNAL FEEDING PICU GUIDELINE

ASSESS 6h POST ADMISSION/ POSTOP FOR FEEDING
CONFIRM POSITION OF NJ TUBE

HIGH RISK ABDOMEN
Absolute risk:
* Mechanical bowel obstruction
* Confirmed NEC, ischaemic bowel
* Significant GI bleed
* HLHS/CoA/IAA/Critical AS

Relative risk:
* Suspected NEC, post complex GI surgery
* Truncus arteriosus/AP window, BT shunt, Prostin dependent lesions
* Prematurity 30/40+<6weeks CGA, UAC
* Low cardiac output state, central cooling, open chest, <24h post resus
* Malnutrition or NBM > 1 week (risk of refeeding sy)

STANDARD CONTINUOUS FEEDS
Start by 0.5 ml/kg/h (max 25ml/h)
>44kg see adult ITU feeding guideline
After 4 hours check gastric aspirate

Monitor for feeding intolerance; abdominal distention, discomfort, diarrhoea - 3 or more episodes in 24hours; rule out constipation.

Aspirate NASOGASTRIC (NG) tube 4 hourly.
Is it milky? If yes, stop feeds and check position of NJ tube - likely migrated to stomach.
If no replace gastric aspirate via NG.
Continue checking gastric aspirate every 4 h.

CONSIDER PN if unable to advance feeds:
> 2 days in neonates
> 3 days in infants
> 5 days in older children
Weight loss of >10% with poorly functioning GI tract
Anticipated need for PN for min 3 - 5 days

ALWAYS feed continuously via jejunal feeding tube. DO NOT aspirate NJ tube.
Take sample from NG tube every 4 hours to monitor the position of NJ tube. It is not necessary to aspirate full volume via NG (unless clinically indicated). All NG aspirates should be replaced via NG. Patients on NJ feeds usually require gastric protection with Ranitidine (or Omeprazole). Encourage non-nutritive sucking on dummy or finger.

STOPPING FEEDS: NG feeds to be stopped 4 h prior to extubation and recommenced 2 - 4 hours post extubation.
NJ feeds to be stopped 1 h before extubation and recommenced 1 hour after extubation (once position is verified).

NBM pre-op:
6 hours: Food, Cow’s milk, formula
4 hours: EBM
2 hours: Clear fluids

HIGH RISK ABDOMEN
D1: Start at 0.5ml/kg/h (max 25ml/h)
Check gastric residual volume 4 hourly
Is it > 5ml/kg or > 200ml?
If not increase by 0.5ml/kg every 12 hours

D2: increase by 0.5ml/kg every 8 hours; consider starting PN

D3-S: increased by 0.5 - 1ml/kg every 4-6 hours; reduce PN when enteral volume is 25% of target set by Dietician; wean PN as per dietician/picu consultant plan.