Paediatric Intensive Care Unit

Feeding Guidelines for Children on Intensive Care Units

Staff relevant to:	Qualified nursing staff and medical teams working in the Children intensive care units
Approval date:	June 2022
Version:	3
Revision due:	June 2025
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Trust Ref:	C90/2016

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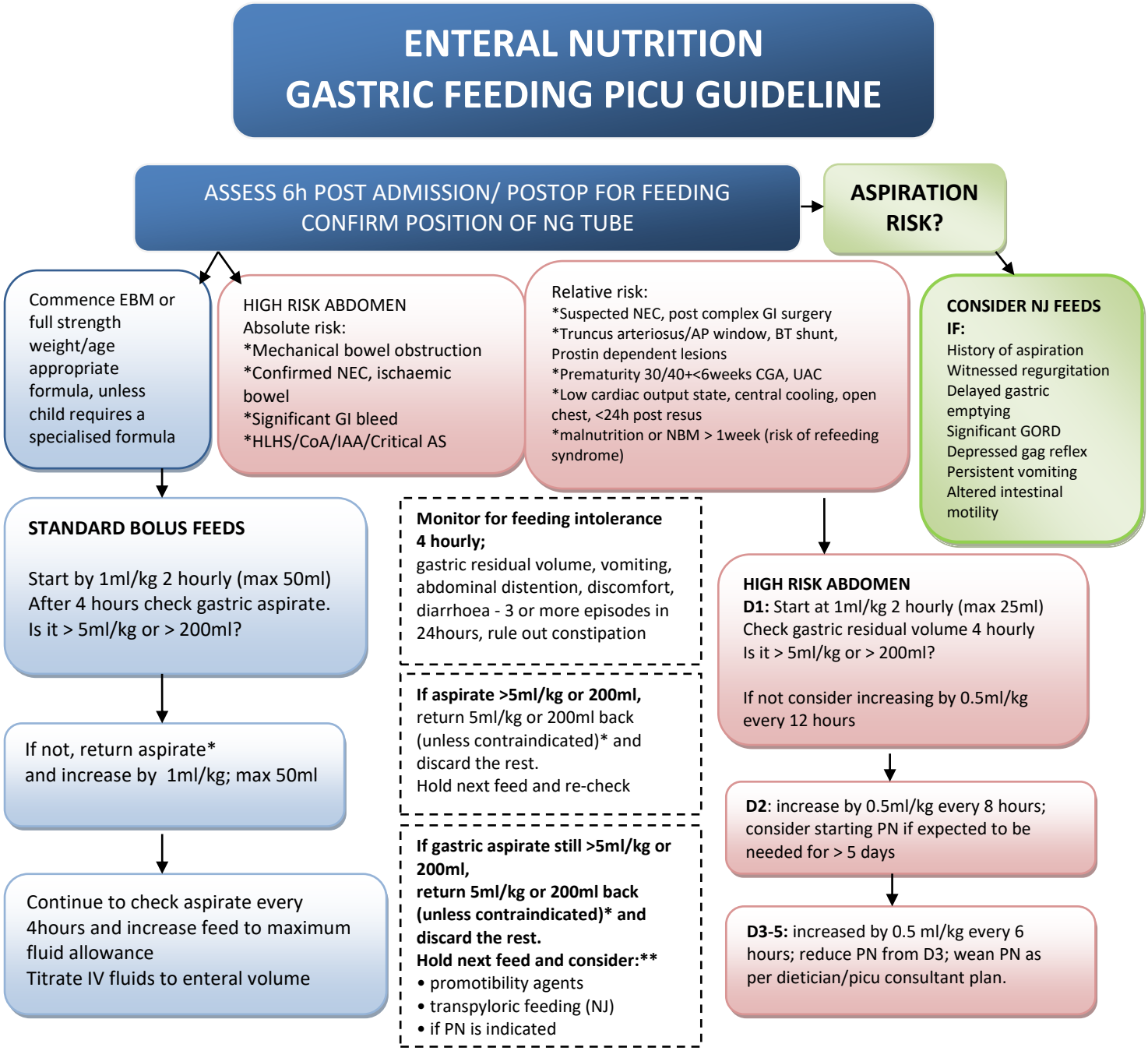
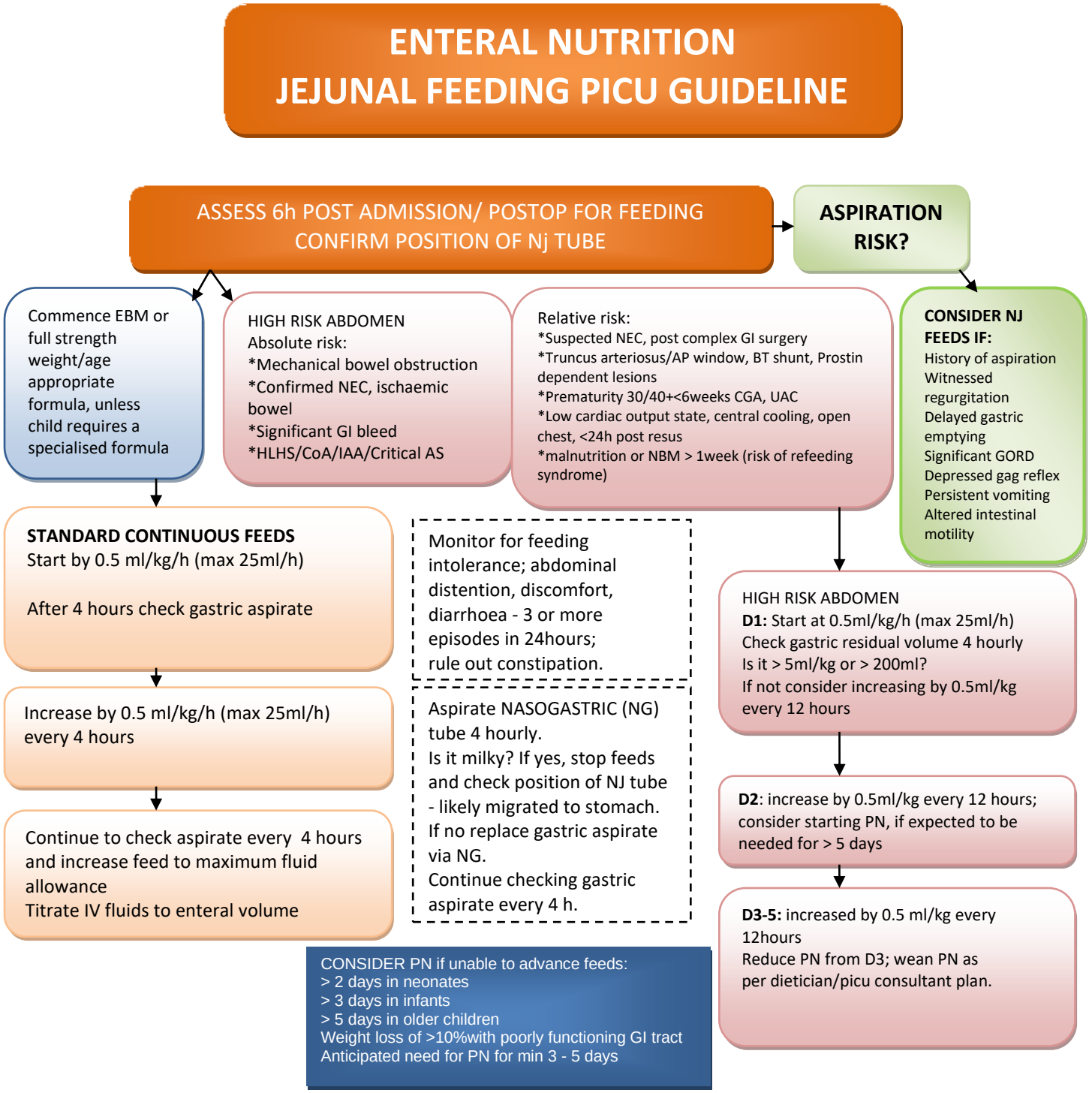
Flow chart 1: Enteral Nutrition – Gastric feeding
(>44kg see adult ITU feeding guideline)



Monitor NG position prior feeding. Feeding rate can be overridden by a consultant if required.
*** 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.**
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

Flow chart 2: Enteral Nutrition – Jejunal feeding
(>44kg see adult ITU feeding guideline)



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 Omeprazole – dose as per BNFc. 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
1 hours: Clear fluids

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. The evidence suggests that children with congenital heart defect require additional 30% on the top of BMR [Tume, DeWitt].
- 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 hydrolysed formula (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, in children with complex congenital heart disease, including their postoperative period.
- Suspected and confirmed chylothorax should be treated using Monogen feed unless diagnosed with cow's milk allergy. (See UHL Chylothorax Post Cardiac Surgery UHL Paediatric Intensive Care Guideline)

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)
- 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.

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 Specialist 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. 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.

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.

Specific attention has been required to nutritional needs of children with congenital heart disease (CHD) (accounts for one third of all major congenital anomalies). Whilst most infants with CHD have a normal weight at birth, many experience growth failure with a decline in weight and height for age z scores during the first year of life that is associated with an increased risk of morbidity and mortality. Long term consequences of poor growth include neurodevelopmental disability leading poorer scholastic outcomes and reduced life-long earnings and an increased risk of cardiovascular-disease. Young children with CHD who are underweight at the time of surgery spend significantly longer in hospital and neonates with a low weight-for-age at the time of surgery are more likely to die at 12-months of age, irrespective of the severity of the cardiac defect, suggesting being underweight increases morbidity and mortality.

Related documents:

- Parenteral Nutrition – Supporting Information UHL Childrens Hospital Guideline UHL Trust ref: C44/2018
- Parenteral Nutrition – Administration by Nurses UHL Childrens Hospital Guideline UHL Trust ref: C45/2018
- Parenteral Nutrition - Monitoring and Weaning UHL Childrens Hospital Guideline UHL Trust ref: C43/2018
- Parenteral Nutrition - Initiation and Administration UHL Childrens Hospital Guideline UHL Trust ref: C42/2018
- Chylothorax Post Cardiac Surgery UHL Paediatric Intensive Care Guideline UHL Trust ref: C91/2016
- Nasogastric and Orogastric Tube Insertion in Children and Neonates UHL Childrens Hospital Policy UHL Trust ref:B54/2017

- Nasogastric Tube Nasojejunal Tube insertion(s) Standard Operating Procedure UHL Paediatric Intensive Care LocSSIP UHL Trust ref:C37/2021
- Nasogastric Feeding in Critical Care UHL Nutrition and Dietetics Guideline UHL Trust ref:C24/2020
- Enteral Feeding Tube (EFT) UHL Policy UHL Trust ref:B30/2019

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 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. In the absence of an Indirect Calorimeter, the Schofield Equation should be used for infants and children, stress factors used with caution.

- The predicted REE in infants less than 12 months with congenital heart disease, following cardiac bypass in the **acute stage, ranges from 55-70kcal/kg/day depending on infant's weight**.
- The predicted REE for ventilated children less than **12** months that have not been on cardiac bypass ranges **from 45-55kcal/kg/day depending on infant's weight**.
- 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 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:
- Acute phase by 5 – 7 days:

<12 months non cardiac bypass (REE) Kcal/kg

1kg	2kg	3kg	4kg	5kg	6kg	7kg	8kg	9kg	10kg
30	45	50	52	55	55	55	55	55	55

< 12 months post cardiac bypass (REE+30%)

1kg	2kg	3kg	4kg	5kg	6kg	7kg	8kg	9kg	10kg
35	55	65	70	70	70	70	70	70	75

Stable phase:

< 12 months of age 80% EAR by 7 – 14 days

> 12 months of age 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 However, the use of bolus feeds is more physiological, eliciting cyclical surges of hormones aiding with gut maturation, which is not found in continuous feeds

• Feed Performance:
Bolus feeds achieve full enteral requirements significantly faster than continuous feeds and risk of infection is less

• 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

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 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 Caution is needed when using higher osmolarity feeds, as an association between hyperosmolar preparations (> 425 mOsm/kg H_2O) and NEC has been reported. 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. 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 .

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, 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 .
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.

• High Risk Abdomen:
Most of NEC occur in premature babies, however, an estimated 10% of cases occur in term born neonates. Congenital heart disease is major risk factor.

Early trophic feeds (preferably EBM) prevent intestinal villus atrophy, derangement of the intestinal microflora, which may contribute to risk of NEC.

Preoperative enteral feeding in term neonates children with congenital cardiac disease should be provided as minimal enteral feeding, with a 10–20 mL/kg/day milk intake for a few days, aiming to increase enteral intakes by 20 to 30 mL/kg daily until reaching the volume goal.

Trophic feeding has been associated with a faster achievement of full enteral and oral feed, more stable hemodynamics, and a shorter need for respiratory support. Although specific data on the benefits of a human milk diet in infants with CHD are scarce, human milk appears to be the preferred option for the initiation of enteral feeds. **Combination of the protective factors of human milk, and lower volume feeds which is associated with decreased risk of NEC might serve as a protective mechanism in the population of cardiac babies with unstable splanchnic perfusion.**

To better support growth and development prior to surgery many of these infants require a higher calorific intake, however in the first few weeks and months of life the amount and density of feeds is balanced with the increased risk necrotising enterocolitis (NEC). It has been estimated that 1.5 – 11% of infants with CHD develop NEC during the neonatal period. The greatest risk of NEC in infants with CHD is seen amongst those with ductal dependent lesions, due to diastolic steal from the patent ductus arteriosus leading to mucosal damage from decreased intestinal perfusion, predisposing the infant to NEC. Cognata et al. reported the prevalence of NEC as being 3.3% (Bell stage I-III) in a single centre retrospective cohort, with feed volumes exceeding 100ml/kg/day associated with significant increase in the risk of preoperative NEC.

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.

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.

Gastric aspirate contains digestive enzymes, electrolytes, medication and fluids and should be re-fed, 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.

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.

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. 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.

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.

2.6 PARENTERAL NUTRITION (PN)

There are risks of sepsis and other complications during PN and it takes between 3 to 4 days to provide full nutritional requirements. If the estimated nutritional requirements are unlikely to be reached within 5 - 7 days then PN should be considered. 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. 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, 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.

Indication of PN (see the PN guidelines):

Any neonate less than 36+6 CGA
• where established enteral feeds have to be stopped and are unlikely to restart within 48 hours
OR
• where established enteral feeds have stopped for over 24 hours and there is unlikely to be sufficient progress with feeding within a further 48 hours

Any neonate born over 37+0
• where established enteral feeds have to be stopped and are unlikely to restart within 72 hours
OR
• where established enteral feeds have stopped for over 48 hours and there is unlikely to be sufficient progress with feeding within a further 48 hours

Any neonate unlikely to establish sufficient enteral feeding due to e.g. congenital gut disorder, critical illness

Older children (> 1 months of age):
- Non-functioning GI tract

and/or
- Inadequate oral intake for greater than up to 5 days (except neonates) in a patient with sub-optimal nutritional status (There is no clinical or nutritional justification for PN, which lasts less than 3 days. Anticipated need for parenteral nutrition should be for at least 3 to 5 days)

and/or
- Increased nutrient requirements or losses, which cannot be met by enteral nutrition

The hazards of therapy include line complications and infection, cholestatic jaundice and metabolic disturbance. The benefits require PN to be used for at least 5 to7 days and so PN should not be used unless full enteral feeding is unlikely to be achieved within 5-7 days.
The intention to start PN and indication should be documented in the clinical notes.

2.7 RE-FEEDING 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 the 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

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Calorific intake, weight gain	Audit	Julia Vujcikova	As required	Local audit group

5. Supporting References

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6. Key Words

Feeding, Intensive Care, Nasogastric, NEC, 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.

CONTACT AND REVIEW DETAILS	
Guideline Lead (Name and Title) **J Vujcikova - Consultant Paediatrician**	**Executive Lead** **Chief Nurse**

Details of Changes made during review:

CHD infants the evidence recommends addition 30% on top of BMR
Enteral feeding –
Gastric feeding;
Start standard bolus feeds at 1ml rather than 0.5-1ml and increase at same rate.
High risk abdomen - Consider PN if expected to be needed for > 5 days. D3-5 increase by 0.5 ml/kg every 6 hours rather than 0.5-1ml/kg every 4-6 hrs
Jejunal feeding;
High risk abdomen- D2 increase by 0.5ml/kg every 12 hours rather than every 8 hours and consider PN if needed >5 days. D3-5 increase by 0.5ml/kg every 12 hours rather than 0.5-1ml/kg every 4-6 hrs
Ranitidine removed
Added information regards to CHD in the intro
Amended predicted REE values in <6 months CHD from 60-70kcal/kg/day to 55-70, ventilated <6 months from 50-60kcal/kg/day to 45-55
Target value tables for <12 months & >12 months added
Indications for commencing PN and hazards associated with PN added
Signpost to adult guidance if >44kg
Added medications suitable/not suitable for administration via NJ

APPENDIX 1: AVAILABLE PAEDIATRIC FEEDS

< 1year

• 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

Complication	Significance	Causes	Treatment
Vomiting	>2 times/ 24h	Constipation Large aspirates / poor absorption Being moved Having physio / cares medications	Consider prokinetics Reduce feed bolus by ½ for next 2 feeds Consider NJ feeding Consider changing feed type
Diarrhoea	Type 7 on Bristol stool chart with every stool movement&>3 times/24h (>3 stool/day can be normal for breastfed infant)	Assess medication Assess antibiotics Check stool sample for bacterial growth High osmolar feeds or correct feed type administered	Consider stool for C.Diff Evaluate medications Consider overflow diarrhoea Consider changing feed type
High aspirates	Measure gastric aspirates 4 hrly: >5ml/kg or >200ml (in those >40kg)	Check for constipation Assess medication	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
Constipation	Bristol stool type 1 or 2 and low frequency	Lack of fluids Assess medication (opiates) Reduced mobility	Commence stool softeners and or laxatives Review fluid intake Change feed type

APPENDIX 3: Administration of drugs via NJ:

Drug	Action for NJ administration
Alimemazine	No specific information but likely to be ok; monitor for effect
Aspirin	Ok to give NJ
Azithromycin	**Unknown site of absorption so effect unknown, interaction with feeds likely if given within 2 hours of a dose**
Baclofen	Crush and disperse tablets: liquid will cause diarrhoea
Caffeine	No specific information but likely to be ok; monitor for effect
Chlorphenamine	No specific information but likely to be ok; monitor for effect
Clonidine	No specific information but likely to be ok; monitor for effect
Clopidogrel	No specific information but likely to be ok
Co-amoxiclav	Avoid giving NJ as mostly absorbed in duodenum
Dexamethasone	**Avoid if possible; use parenteral route**
Diazepam	No specific information found but absorption likely to be reduced due to adsorption to PVC
Digoxin	**Absorption will be erratic as NJ bypasses some sites of absorption. Changing formulation will also affect bioavailability. Avoid NJ if possible**
Domperidone	No specific information available, consider alternate route (PR)
Erythromycin	**Avoid giving NJ as mostly absorbed in duodenum**
Flucloxacillin	Syrup is hyperosmolar and may cause diarrhoea if not diluted before administration
Fluconazole	**Major site of absorption higher up GI tract so may need a 20-25% dose increase for therapeutic effect**
Folic acid	Liquid is hyperosmolar and may cause diarrhoea if not diluted before administration
Furosemide	Liquid is hyperosmolar and may cause diarrhoea if not diluted before administration
Ibuprofen	Ok to give NJ
Lactulose	Ok to give NJ
Lansoprazole	Ok to give but consider dispersing tablets in 8.4% bicarbonate solution rather than sterile water
Morphine	No specific information but likely to be ok; monitor for effect

Nystatin	Not absorbed: continue to apply to buccal cavity directly to treat/prevent oral thrush. Do not give via enteral feeding tube
Omeprazole	Ok to give but consider dispersing tablets in 8.4% bicarbonate solution rather than sterile water
Ondansetron	Acidic solution so needs flushing well but ok to give NJ
Paracetamol	Liquid is hyperosmolar and may cause diarrhoea if not diluted before administration
Penicillin	Ok to give but leave two hours either side of dose before giving feeds, flush well
Phenobarbitone	**Absorption likely to be erratic, avoid NJ if possible**
Phenytoin	**Absorption likely to be erratic, avoid NJ if possible**
Potassium	Use SandoK because KayCeeL likely to cause osmotic diarrhoea
Sildenafil	Ok to give NJ
Sotalol	Ok to give NJ
Spironolactone	No specific information found, consider using iv potassium or canrenoate instead to prevent hyperkalaemia
Sytron	**Absorption likely to be reduced as absorption occurs higher up GI tract, also is hyperosmolar so may cause diarrhoea. Avoid NJ if possible**
Ursodeoxycholic acid	Dilute syrup if needed as high viscosity may block the tube
Warfarin	**Jejunum is beyond site of absorption so levels likely to be lower than expected. Titrate to effect but exercise caution when changing route as dose may need changing too.**