

Wessex Paediatric Oncology Supportive Care Guidelines: Management of Nutrition

Scope

This guideline applies to all paediatric oncology patients in the region. It does not apply to neonates on neonatal units.

Purpose

Children receiving treatment at the Southampton Paediatric Oncology Principal Treatment Centre (PTC) have open access to the designated Paediatric Oncology Ward at either the PTC or their Paediatric Oncology Shared Care Unit (POSCU). Their parents/carers will be in possession of contact details for these wards and have been instructed to contact them for any medical problems that arise while they are receiving treatment. These Guidelines are intended for the use of the medical teams at the PTC or POSCU. If one of the Paediatric Oncology patients presents to a medical service outside of the PTC or POSCU, please contact the medical teams at the PTC or POSCU for advice.

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nutritional support for children with cancer

14.1 Introduction

The promotion and maintenance of good nutritional status is an important part of the supportive care of children undergoing treatment. The consequences of malnutrition are multiple and include a possible influence on outcome (1,2) reduced tolerance to therapy and altered sensitivity to chemotherapy agents (3-7). The relationship between malnutrition and increased risk of infection is well documented (7 -9). As protocols are refined and prognosis improves we also now need to be considering the longer term consequences of treatment such as obesity, bone health and disordered eating patterns.

14.2 Aims of nutritional support

- Reverse any malnutrition seen at diagnosis as soon as possible
- Promote/maintain normal growth and development
- Prevent nutritional depletion associated with treatment
- To meet the needs of an increasing demand for nutrients during treatment

14.3 Factors contributing to nutritional problems

- Loss of appetite
- Nausea/vomiting
- Sore mouth/throat
- Mucositis
- Malabsorption/diarrhoea
- Taste changes/perception
- Pain
- Dry mouth
- Intermittent constipation
- Psychological factors causing food aversion/behavioural issues
- Metabolic disturbances/tubular leak
- Steroid therapy
- Typhilitis/drug induced ileus

14.4 Assessment of nutritional status

Nutritional screening is essential to identify patients who are already malnourished or at risk of becoming so (NICE 2006). The National service framework for children and young people recommends that a nutritional assessment is undertaken on every patient. A height and weight should be documented in the medical notes on the initial medical consultation. This should then be plotted onto the RCPCH UK- WHO electronic growth charts. For inpatients further nutritional screening will be conducted on admission to the ward and weekly thereafter using the Child Health Nutrition screening tool in the admission pack. Those children scored as high risk should be referred to the dietician via eQuest. Children attending day ward will have heights and weights plotted on the electronic growth charts and referred to the dietician where deemed appropriate.

14.5 Nutritional Interventions

Interventions may include any or a combination of

- Food fortification to maximise the nutritional density of foods eaten
- Oral Nutritional Supplements
- Enteral tube feeding
- Parenteral Nutrition (PN)

14.6 Food fortification

Advice can be given on ways of increasing the nutritional quality of any food eaten. Written advice can also be found in the parent/child booklet “Helping your child to eat” (10) which is provided in PHOR (Parent Handheld Oncology Record).

Oral Nutritional Supplements (ONS)

These can be useful in children who are maintaining some oral intake, but do not require enteral tube feeding. There are a range of products available, which the dietician will advise on following assessment.

Where supplements need to be commenced before dietetic review, nutritionally complete supplements should be used as a first line.

Examples of ONS (prescription only)

Types of Supplements	Examples*
Nutritionally complete ONS – milk type	Fortini, Paediasure plus, Frebini For older children: Fortisip, Ensure plus, Fresubin Energy
Nutritionally complete ONS – juice type	Paediasure juce For older children: Fortijuce, Ensure plus juce, Fresubin jucy drink
Energy and protein supplements – NOT nutritionally complete	Scandishake, Calshake, Enshake
Energy Modules – NOT nutritionally complete	Glucose Polymers: Maxijul, Polycal powder Fat Emulsions: Calogen, Liquigen Combined energy sources: Duocal, Procal (these should only be prescribed with instructions for use from the dietician)

*Not an exhaustive list, examples only.

14.7 Enteral Tube Feeding (ETF)

Enteral tube feeding should be considered where

- Weight two centiles below height centile
- Decrease in current centiles for weight (or height) of two centiles
- Total weight loss > 5% since diagnosis
- Reduced oral intake of <70% estimated requirements for > 5 days

Placement of an enteral tube may ultimately reduce stress for both parents and carers, as it not only allows nutritional support but also a route for the administration of medications and additional hydration. One of the main advantages of ETF is that parents can be taught to administer feeds at home. Commercially prepared feeds are available and can meet the requirements of each individual child. Careful consideration needs to be given before discharge home on enteral feeds, to ensure that the parents are competent on the care of feeding tube and the use of the equipment (11). Commencement of feeds and parental education regarding feeding should ideally be done as an inpatient stay.

ETF is usually provided through a nasogastric tube, however, gastrostomy feeding can be used when clinical situation and need dictate. For children who are unable to tolerate nasogastric feeding due to gastric dysmotility, severe vomiting or are at a high risk of aspiration post pyloric feeding can be considered (naso-jejunal tube/gastrostomy with jejunal extension/jejunostomy).

Examples of enteral feeds.

Feed*	Age / weight	Indication
Nutrini Nutrini Energy Frebini Frebini energy Paediasure Paediasure plus	1-6yrs or 8-20kg 1-6yrs or 8-20kg 1-12yrs 1-12yrs 8-30kg 8-30kg	Feeds suitable as a nutritionally complete enteral feed
Tentrini Tentrini Energy	7-12yrs or 21-45kg 7-12yrs or 21-45kg	Feeds suitable as a nutritionally complete enteral feed
Nutrison Nutrison Energy Osmolite Osmolite 1.5 Osmolite plus Fresubin original Fresubin energy	>12yrs +/- >45kg >12yrs +/- >45kg >30kg >30kg >30kg >12yrs >12yrs	Feeds suitable as a nutritionally complete enteral feed

*examples only, not an exhaustive list

In cases of severe diarrhoea or suspected malabsorption, a specialist hydrolysate feed should be considered.

Consult the dietician for guidance on which feed will be best for the patient.

Examples of semi elemental/peptide and elemental feeds

Feed	Age/weight	Nutritional aspects
Infatrini Peptisorb Peptijunior Pregestamil Pepdite 1+ Peptamen Junior Advance Paediasure Peptide Perative	Birth-18mths or <9kg <1 year <1 year >1 year 1-10yrs >1year 8-30kg >30kgs	Semi-elemental/ pepdite based feeds. They are variable in the composition from energy provision, fat type and level of hydrolysis
Neocate Neocate Advance Elemental	<1 year >1 year >1year	Amino acid based "elemental feeds" Pepdite based feeds should be trialled before using these feeds

Different feeding systems are used within different shared care areas, the dietician can advise regarding this. All children discharged on ETF should be discharged with at least 1 weeks supply of feed and equipment.

14.8 Re-feeding syndrome

When commencing nutritional support the possible risk of developing re-feeding syndrome must be considered. Re-feeding can be defined as severe fluid and electrolyte imbalance, most commonly resulting in hypokalaemia, hypomagnesaemia, hypophosphateaemia, in addition to altered glucose metabolism and vitamin deficiencies (12). Any deficiencies of potassium, magnesium and phosphate should be corrected before feeding is started. Feeds should be commenced slowly, with daily biochemical monitoring with appropriate replacement/supplementation. A dietetic feeding plan will help minimise the risks of re-feeding syndrome.

14.9 Healthy Eating

A large proportion of children undergoing treatment for cancer especially haematological malignancies are unlikely to suffer from weight loss. Nutritional advice for these patients should focus on promotion of maintenance of an appropriate weight for height following general healthy eating principles.

14.10 Poor diet and excessive weight gain

Regular steroid use may cause patients to experience excessive weight gain and erratic eating patterns. Dietetic advice should be sought early on for weight maintenance advice and regular monitoring is recommended. Appropriate advice to parents regarding regular food patterns and avoidance of high calorie “snack” foods and confectionary can be helpful.

14.11 Parenteral feeding

- Total Parenteral Nutrition (TPN) should be instituted when enteral intake has been, or is anticipated to be, inadequate for 5-7 days. See also note above re minimal enteral feeding.
- Do not decrease TPN until 25% of the total energy requirement is provided and tolerated from enteral feeds. If feeds are poorly tolerated, with diarrhoea, a low lactose feed should be tried. Lactose deficiency may occur after prolonged gut rest.
- All TPN requests on Child Health should be made using an eQuest referral in addition to any verbal request.
- Children receiving TPN are regularly reviewed by the members of the Nutritional Support Team (Paediatric Gastroenterology Consultant, Specialist Pharmacists, Specialist Dietician and a Specialist Nurse).
- Daily management of TPN prescribing will be in conjunction with the Specialist Pharmacist. Pharmacist contacts are; Bleep 2698 and Bleep 2088.
- All TPN mixtures in UHS NHS FT are aseptically prepared in pharmacy, and prescriptions should be in pharmacy by 13.00 Monday to Friday. TPN requirements for weekends and bank holidays should be prescribed on Fridays. The pharmacy TPN unit can be contacted on extension 8352.
- For those with special gut problems early referral to gastroenterologist is sensible.

14.12 TPN for patients up to 10 years old (or < 30 to 40kg)

- TPN prescribing and preparation for young children in UHS NHS FT uses a computerised system: "AScribe", The Pharmacist will agree the prescription with the Clinician on the Paediatric Haematology/Oncology Ward and then the AScribe system will be used to prepare the TPN required.
- Starting prescriptions will be based upon the nutritional status of the patient, current medication, current fluid and electrolyte inputs, and up to date serum electrolyte and fluid balance data.
- An increase in nutritional content will be made over a few days to optimum nutrition as assessed by the Dietician, if there is a risk of re-feeding then this increase will be slower.
- The Pharmacist needs to be made aware of any 'treatment plans' in relation to the underlying disease (e.g. planned chemotherapy, radiotherapy, scans, etc)
- The carbohydrate should be reduced if there is persistent glycosuria or hyperglycaemia.
- If lipid is not given the carbohydrate should be increased to the maximum tolerated to maintain the calorie content.

- The fluid volume is for guidance only and can be adjusted as necessary.
- Ascribe usually prepared using Peditrace, Solivito & Vitlipid N Infant. Vitlipid N Infant contains phytomenadione 20 microgram/ml.

14.13 TPN for patients aged 10 years and over (or > 30 to 40kg)

- There are a range of standard TPN mixtures in Southampton produced for adult patients that are also suitable for older children. These can be ordered via the Specialist Pharmacist who will also be able to advise you on the most suitable preparation. Remember to add vitamin K (Cernivit does not contain vitamin K) on two days of each week.
- Similar to that for younger children starting prescriptions will be based upon the nutritional status of the patient, current medication, current fluid and electrolyte inputs, and up to date serum electrolyte and fluid balance data.
- An increase in nutritional content will be made over a few days to optimum nutrition as assessed by the Dietician, if there is a risk of re-feeding then this increase will be slower.
- The Pharmacist needs to be made aware of any 'treatment plans' in relation to the underlying disease (e.g. planned chemotherapy, radiotherapy, scans, etc)
- These standard TPN bags contain lipid and if lipid free PN is required it has to be ordered in as a 'special', incurring a delay in delivery to the patient. The Pharmacist will prepare a suitable prescription for these.

14.14 Lipid in TPN

Lipid is contraindicated in sepsis and severe jaundice due to impaired metabolism. There is conflicting evidence about the effect of lipid infusions on immune function, haematological parameters, and Ciclosporin levels. Lipid should be used for paediatric oncology patients as follows: -

- Patients should have lipid in their TPN whenever possible: at least 5% of total energy requirements should be provided as lipid to avoid essential fatty acid deficiency
- Patients who are septic or severely jaundiced should not have lipid
- Patients who are infected or mildly jaundiced should have reduced dose lipid: 0.5 g/kg/day if under 10 years old, or 10% lipid if over 10 years old.
- Patients on Ciclosporin should have lipid unless there are problems with Ciclosporin blood levels or Ciclosporin toxicity, in which case lipid should be stopped.

14.15 References

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