

# **Nutrition support in adults: oral supplements, enteral and parenteral feeding**

**NICE guideline**

**First draft for consultation, May 2005**

If you wish to comment on this version of the guideline, please be aware that all the supporting information and evidence is contained in the full version.

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## Introduction

### **The need for guidelines in nutrition support**

Malnutrition is a state in which a deficiency of energy, protein and/or other nutrients causes measurable adverse effects on tissue/body form, composition, function or clinical outcome (Malnutrition Universal Screening Tool; MUST2003). (In these guidelines we do not use the term to cover excess nutrient provision.)

Malnourishment is both a cause and a consequence of ill-health. It is common and increases a patient's vulnerability. Nutrition support as:

- oral interventions; fortified food, additional snacks and/or sip feeds, and/or
- enteral tube feeding (ETF); the delivery of a nutritionally complete feed directly into the gut via a tube, and/or
- parenteral nutrition (PN); the administration of nutrients by the intravenous route

can improve outcomes but decisions on the most effective and safe means to do so are complex. Currently clinicians' knowledge of the causes, effects and treatment of malnourishment among UK healthcare professionals is poor.

Guidelines are therefore needed to emphasise the following:

- undernutrition is common
- malnourishment increases a patient's vulnerability to disease and further complication
- decisions on providing nutrition support are complex and thus there is a wide variation in nutritional care standards.

The objective of these guidelines is to improve the practice of nutrition support by providing guidance to assist all healthcare professionals to correctly identify patients in community, hospital and care home settings who require nutritional intervention, and to help them choose and deliver the most appropriate form of nutrition support at the appropriate time.

## **Patient-centred care**

This guideline offers best practice advice on the care of people with, or at risk from malnutrition.

Treatment and care should take into account patients' individual needs and preferences. People with, or at risk from malnutrition should have the opportunity to make informed decisions about their care and treatment. Where patients do not have the capacity to make decisions, healthcare professionals should follow Department of Health guidelines – *Reference guide to consent for examination or treatment* (2001) (available from [www.dh.gov.uk](http://www.dh.gov.uk)).

Good communication between healthcare professionals and patients is essential. It should be supported by the provision of evidence-based information offered in a form that is tailored to the needs of the individual patient. The treatment, care and information provided should be culturally appropriate and in a form that is accessible to people who have additional needs, such as people with physical, cognitive or sensory disabilities, and people who do not speak or read English.

Unless specifically excluded by the patient, carers and relatives should have the opportunity to be involved in decisions about the patient's care and treatment.

Carers and relatives should also be provided with the information and support they need.

## Key priorities for implementation

The following recommendations have been identified as priorities for implementation.

### Nutritional assessment and screening

- Ideally all hospital inpatients should be screened for (risk of) under-nutrition on admission using a simple screening tool that includes body mass index (BMI), percentage weight loss and considers the time over which nutrient intake has been reduced (for example, MUST). Screening should be repeated weekly in acute settings. Departments with low risk of under-nutrition may opt out of screening. Opt-out decisions should follow an explicit process via the local clinical governance structure involving experts in nutrition support. **[1.1.1]**
- All hospital 'out-patients' should be screened for (risk of) under-nutrition at the first clinic, using a simple screening tool (for example, MUST). Departments with low risk of under-nutrition may opt out of screening. Opt-out decisions should follow an explicit process via the local clinical governance structure involving experts in nutrition support. **[1.1.2]**
- All residents or patients in care homes should be screened for (risk of) under-nutrition on admission using a simple screening tool (for example, MUST), and whenever there is clinical concern and risk of under-nourishment. **[1.1.3]**

### Indications for nutrition support

Nutrition support should be considered in patients when:

- the patient has not eaten or is very unlikely to be eating for more than 5 days (whatever their current nutritional status and BMI),  
or
- the patient's BMI is <18.5, or
- the patient has unintentionally lost >10% body weight over the previous 3-6 months, or

- the patient has a BMI <20 with unintentional weight loss >5%, or
- when the patient has poor absorptive capacity, is catabolic and/or has high nutrient losses. **[1.2.1]**

### **Prescription of nutrition support**

- In most patients starting enteral or parenteral nutrition support, particularly the very sick, full electrolyte, fluid and micronutrient needs should be provided from the outset but energy and nitrogen should be cautiously introduced according to metabolic and gastrointestinal tolerance over the first 24-48 hours, for example in intensive care patients this may mean commencing 50% of normal energy and nitrogen requirements. **[1.3.2]**

### **Oral nutrition support**

- Interventions to improve oral intake should be offered to hospital patients who can potentially swallow safely but who are either malnourished (unintentional weight loss >10% over the last 3 to 6 months, BMI <18.5, or BMI <20 and unintentional weight loss >5% over the last 3 to 6 months) or who are at risk of malnourishment (not eaten for >5 days or unlikely to eat for >5 days). **[1.5.1]**
- Interventions to improve oral intake such as additional food or supplements should also be considered for appropriate elderly patients in long-term care with unintentional weight loss, who can swallow safely. **[1.5.2]**

### **Enteral nutrition support**

- Enteral tube feeding should be considered in patients who need nutrition support (unintentional weight loss >10% over the last 3 to 6 months; BMI <18.5; BMI <20 and unintentional weight loss >5% over the last 3 to 6 months; not eaten for >5 days or unlikely to eat for >5 days) who have a functional, accessible gastrointestinal tract but an inadequate or unsafe oral intake. **[1.6.1]**

- In the acute setting, for example following dysphagic stroke, patients unable to safely swallow or take sufficient energy and nutrients orally should have an initial 2 week trial of nasogastric tube feeding while assessing the prognosis. **[1.6.6]**

**Parenteral nutrition support**

- Patients prescribed standardised parenteral nutrition need their nutritional requirements to be determined before selection of a particular parenteral nutrition product. The addition of vitamins and trace elements is always required and occasionally electrolytes and other nutrient supplements are needed. Additions must be made under appropriate pharmaceutically controlled environmental conditions before administration. **[1.7.10]**



The following guidance is evidence based. Appendix A shows the grading scheme used for the recommendations: A, B, C, D or good practice point – D(GPP). A summary of the evidence on which the guidance is based is provided in the full guideline (see Section X).

## **1 Guidance**

Where possible systematic reviews have been conducted to appraise the clinical evidence on: nutritional screening, oral, enteral and parenteral nutrition support, prescription of nutrients, monitoring and methods for organising the delivery of nutrition support. In the absence of evidence the guideline development group have agreed by formal and informal consensus on the following recommendations.

## **1.1 Nutritional assessment and screening**

- 1.1.1 Ideally all hospital inpatients should be screened for (risk of) under-nutrition on admission using a simple screening tool that includes BMI, percentage weight loss and considers the time over which nutrient intake has been reduced (for example, MUST). Screening should be repeated weekly in acute settings. Departments with low risk of under-nutrition may opt out of screening. Opt-out decisions should follow an explicit process via the local clinical governance structure involving experts in nutrition support. **[D(GPP)]**
- 1.1.2 All hospital 'out-patients' should be screened for (risk of) under-nutrition at the first clinic, using a simple screening tool (for example, MUST). Departments with low risk of under-nutrition may opt-out of screening. Opt-out decisions should follow an explicit process via the local clinical governance structure involving experts in nutrition support. **[D(GPP)]**
- 1.1.3 All residents or patients in care homes should be screened for (risk of) under-nutrition on admission using a simple screening tool (for example, MUST), and whenever there is clinical concern and risk of under-nourishment. **[D(GPP)]**
- 1.1.4 Nutritional screening for under-nutrition should be undertaken on registering at general practice, and where there is clinical concern of (risk of) under-nutrition, and should be considered at other screening opportunities. **[D(GPP)]**
- 1.1.5 Nutritional assessment and screening should be carried out by healthcare professionals with appropriate training and skills to help generate the confidence of patients and enable accurate data collection. **[D (GPP)]**

## **1.2 Indications for nutrition support**

- 1.2.1 Nutrition support should be considered in patients when:

## DRAFT FOR FIRST CONSULTATION

- the patient has not eaten or is very unlikely to be eating for more than 5 days (whatever their current nutritional status and BMI),  
or
- the patient's BMI is <18.5, or
- the patient has unintentionally lost >10% body weight over the previous 3-6 months, or
- the patient has a BMI <20 with unintentional weight loss >5%, or
- when the patient has poor absorptive capacity, is catabolic and/or has high nutrient losses. **[D(GPP)]**

- 1.2.2 Healthcare professionals should ensure that ethical and legal issues are considered when any decisions regarding the nutrition support of patients are made. **[D(GPP)]**
- 1.2.3 Healthcare professionals should ensure that there is a regular review of the need for and route of nutrition support for all patients. **[D(GPP)]**
- 1.2.4 Patients having treatment for malnutrition should be kept fully informed and have access to appropriate sources of information and/or the opportunity to discuss diagnosis and treatment options. They should also be given contact details for appropriate voluntary organisations, such as support groups and charitable organisations. **[D(GPP)]**
- 1.2.5 Information on nutrition support should be provided in formats, languages and ways that are suited to an individual's requirements. Consideration should be given to the developmental age, gender, physical needs, culture and stage of life of the individual. **[D(GPP)]**
- 1.2.6 Treatment options and plans should be discussed with the patient and decisions on treatment and care should be jointly made with the patient and carers. Treatment plans must be tailored around the patient's needs and wishes and his or her capacity to make decisions. **[D(GPP)]**

### ***1.3 Prescription of nutrition support***

- 1.3.1 Patients receiving nutrition support should have a prescription devised that considers all energy, protein, fluid, electrolytes, minerals and micronutrients needs. **[D(GPP)]**
- 1.3.2 In most patients starting enteral or parenteral nutrition support, particularly the very sick, full electrolyte, fluid and micronutrient needs should be provided from the outset but energy and nitrogen should be cautiously introduced according to metabolic and

gastrointestinal tolerance over the first 24-48 hours, for example in intensive care patients this may mean commencing 50% of normal energy and nitrogen requirements. **[D(GPP)]**

- 1.3.3 In patients at risk of refeeding syndromes, for example BMI <18.5 or recent weight loss >10% and very inadequate nutritional intake for >5 days, nutrition support should be introduced with caution and additional supplementation of potassium, phosphate and magnesium may be required. Close clinical and biochemical monitoring before and during treatment is essential. **[D(GPP)]**

## **1.4 Monitoring**

- 1.4.1 A suggested monitoring protocol for nutritional, anthropometric, clinical and biochemical measures is listed in Appendix F. **[D(GPP)]**
- 1.4.2 Patients receiving different types of nutrition support will require the frequency and extent of this protocol to be adapted appropriately. **[D(GPP)]**
- 1.4.3 Acutely ill and unstable patients should be considered for a more frequent and extensive monitoring protocol. **[D(GPP)]**
- 1.4.4 Patients on home parenteral nutrition should be reviewed at least every 3-6 months, and the full range of tests as outlined in Appendix G should be performed. **[D(GPP)]**
- 1.4.5 Patients receiving home enteral nutrition should be reviewed annually and/or if there is any change in their clinical condition since the last annual review. A limited range of tests from those outlined above should be performed, usually omitting the trace element and vitamin analyses, unless there is cause for concern. **[D(GPP)]**
- 1.4.6 Where long-term nutritional support is required patients should be trained to recognise and respond to adverse changes in both their

well-being and in the management of their nutritional delivery system. **[D(GPP)]**

## **1.5 Oral**

- 1.5.1 Interventions to improve oral intake should be offered to hospital patients who can potentially swallow safely but who are either malnourished (unintentional weight loss >10% over the last 3 to 6 months, BMI <18.5, or BMI <20 and unintentional weight loss >5% over the last 3 to 6 months) or who are at risk of malnourishment (not eaten for >5 days or unlikely to eat for >5 days). **[A]**
- 1.5.2 Interventions to improve oral intake such as additional food or supplements should also be considered for appropriate elderly patients in long-term care with unintentional weight loss, who can swallow safely. **[D]**
- 1.5.3 The snacks or supplements offered to patients should aim to ensure that overall nutrient intake contains a balanced mixture of protein, energy, vitamins and minerals. **[D(GPP)]**
- 1.5.4 A complete multi-vitamin and mineral supplement providing the reference nutrient intake for all vitamins and trace elements should be considered for patients where there is concern about the adequacy of micronutrient intake. **[D (GPP)]**
- 1.5.5 Pre- and post-operative oral nutrition support should be considered for malnourished surgical patients (BMI <18.5 or weight loss >10% usual body weight, or BMI <20 and weight loss >5%). **[B]**
- 1.5.6 Resumption of some oral intake within 24 hours of abdominal surgery is recommended and is likely to reduce lengths of hospital stay. **[A]**
- 1.5.7 Any modification of nutrition and hydration methods should be based on a risk/benefit analysis of clinical indicators relevant to that patient (Appendix H), the results of clinical/instrumental

examinations and consideration of the factors in Appendix I.

**[D(GPP)]**

- 1.5.8 Patients with dysphagia may require medication via a different route from nutrition and hydration and the risks and benefits of any medication should be given separate consideration. Alternative medications and timing may be indicated. **[D(GPP)]**
- 1.5.9 Regular monitoring and reassessing by appropriate specialists is needed to ensure that modified diets are only used for patients who still need them. **[D (GPP)]**

## **1.6 Enteral**

- 1.6.1 Enteral tube feeding should be considered in patients who need nutrition support (unintentional weight loss >10% over the last 3 to 6 months; BMI <18.5; BMI <20 and unintentional weight loss >5% over the last 3 to 6 months; not eaten for >5 days or unlikely to eat for >5 days) who have a functional, accessible gastrointestinal tract but an inadequate or unsafe oral intake. **[D(GPP)]**
- 1.6.2 Elective enteral tube feeding outside of this guideline's general indications for nutrition support is not recommended. **[B]**
- 1.6.3 General medical, surgical and intensive care patients should be fed intragastrically unless there is upper gut dysfunction. **[A]**
- 1.6.4 Patients with impaired upper gastrointestinal function should be considered for post-pyloric feeding. **[D(GPP)]**
- 1.6.5 Gastrostomy/jejunostomy feeding should be considered in patients needing long-term enteral tube feeding. **[D(GPP)]**
- 1.6.6 In the acute setting, for example following dysphagic stroke, patients unable to safely swallow or take sufficient energy and nutrients orally should have an initial 2 week trial of nasogastric tube feeding while assessing the prognosis. **[A]**

- 1.6.7 For most patients on intragastric feeding, either bolus or continuous methods can be used, taking into account patient preference, convenience and drug administration. **[B]**
- 1.6.8 Nasogastric tube feeding should usually be delivered continuously over 16-24 hours daily for acutely ill patients in intensive care. **[D (GPP)]**
- 1.6.9 It is safe to start feeding through a PEG tube four hours after insertion in uncomplicated cases. **[A]**
- 1.6.10 A motility agent should be considered for patients in intensive care with delayed gastric emptying who are not tolerating enteral feeding unless there is suspicion of gastrointestinal obstruction or a pharmacological cause. **[A]**
- 1.6.11 Patients in other acute care settings with delayed gastric emptying not tolerating enteral feeding should also be offered a motility agent unless there is suspicion of gastrointestinal obstruction or a pharmacological cause. **[D (GPP)]**
- 1.6.12 Patients with delayed gastric emptying which severely limits nasogastric feeding despite the use of motility agents should be considered for other methods of nutritional support. **[D (GPP)]**
- 1.6.13 A motility agent should be considered for patients in intensive care with delayed gastric emptying who are not tolerating enteral feeding unless there is suspicion of gastrointestinal obstruction or a pharmacological cause. **[A]**
- 1.6.14 Patients in acute care settings with delayed gastric emptying, not tolerating enteral feeding should also be offered a motility agent unless there is suspicion of gastrointestinal obstruction or a pharmacological cause. **[D (GPP)]**
- 1.6.15 Pre-operative supplementary enteral tube feeding should be considered in malnourished (weight loss >10% usual body weight,



BMI <18.5) surgical patients who are to undergo major abdominal procedures. **[B]**

1.6.16 Early supplementary post-operative enteral tube feeding should not be used routinely in general surgical patients. **[A]**

1.6.17 Enteral tube feeding should be considered for all surgical patients who have not eaten for 5 days or who are unlikely to do so, along with those who have a BMI <18.5 or who have unintentionally lost >10% body weight. **[D]**

## **1.7 Parenteral**

1.7.1 Parenteral nutrition should be considered for patients who need nutrition support and who cannot be fed adequately by oral and/or enteral methods. **[B]**

1.7.2 Whenever possible enteral nutrition should be considered as the first option. In the presence of inadequate intestinal tolerance enteral nutrition should be supported with supplementary parenteral nutrition. **[B]**

1.7.3 Parenteral nutrition should be considered for malnourished patients who have a BMI <18.5 and/or weight loss >10% and/or have not eaten or are not anticipated to eat for > 5 days and who cannot be fed adequately by any other means. **[D(GPP)]**

1.7.4 Supplementary pre- and/or post-operative parenteral nutrition should be offered to surgical patients who have a non-functioning gut and who are already malnourished. **[B]**

1.7.5 Early peri-operative supplementary parenteral nutrition should not be offered to well-nourished or mildly malnourished patients. **[B]**

1.7.6 For hospitalised patients requiring parenteral nutrition, where a centrally placed central venous catheter is not otherwise required or

in situ a peripherally inserted central catheter (PICC) can be a suitable alternative. **[B]**

- 1.7.7 For patients requiring short term, <14 days parenteral nutrition who do not need central access for other reasons, peripheral venous access should be considered. Attention to parenteral nutrition formulation is essential to ensure the absence of complications and length of successful parenteral nutrition. **[B]**
- 1.7.8 Tunneling subcutaneous catheters for long-term use (>14 days) is recommended. **[D(GPP)]**
- 1.7.9 Tunnelling catheters is not recommended for short-term use (<14 days). **[B]**
- 1.7.10 Patients prescribed standardised parenteral nutrition need their nutritional requirements to be determined before selection of a particular parenteral nutrition product. The addition of vitamins and trace elements is always required and occasionally electrolytes and other nutrient supplements are needed. Additions must be made under appropriate pharmaceutically controlled environmental conditions before administration. **[D (GPP)]**
- 1.7.11 Continuous administration of parenteral nutrition should be offered as the preferred method for infusion in most acutely ill intensive care and surgical patients. **[B]**
- 1.7.12 Cyclical delivery of parenteral nutrition should be considered when using peripheral venous catheters with planned routine change. **[B]**
- 1.7.13 Gradual change from continuous to cyclical parenteral nutrition administration should be considered in patients requiring parenteral nutrition support for periods of more than 2 weeks. **[D(GPP)]**

## ***1.8 Organisation of nutrition support***

- 1.8.1 Parenteral nutrition should be provided within a care setting which has multidisciplinary staff who have had specific training in nutritional support, for example a nutrition support team, and with agreed protocols for indications, practice, monitoring and audit. **[C]**
- 1.8.2 All patients receiving enteral tube feeding should also be supported by a team of multidisciplinary staff who have had specific training in nutritional support e.g. a nutrition support team, and with agreed protocols for indications, practice, monitoring and audit. **[D(GPP)]**
- 1.8.3 Prior to discharge patients receiving home nutrition support and their carers should:
- be provided with an instruction manual (and visual aids where appropriate) outlining procedures
  - be provided with both contact and emergency telephone numbers
  - be aware of when and how follow-up will take place. **[D(GPP)]**

## ***1.9 Nutrition support at home***

### **1.9.1 Home enteral nutrition**

Please see sections **1.8.2, 1.8.3, 1.6.5, 1.4.6 and 1.4.5.**

### **1.9.2 Home parenteral nutrition**

Please see sections **1.8.1, 1.8.3, 1.7.8, 1.4.4 and 1.4.6.**

## **2 Notes on the scope of the guidance**

All NICE guidelines are developed in accordance with a scope document that defines what the guideline will and will not cover. The scope of this guideline was established, after a period of consultation, at the start of the guideline development process; it is available from [www.nice.org.uk/page.aspx?o=89460](http://www.nice.org.uk/page.aspx?o=89460).

## **2.1 Remit of the guideline**

The following remit was received from the Department of Health and National Assembly for Wales in as part of NICE's 7<sup>th</sup> wave programme of work:

"To prepare a guideline on appropriate methods of feeding people who

- are still capable of deriving at least some of their nutritional requirements by conventional feeding and/or
- have difficulty in swallowing
- including the use of nutritional supplements and enteral and parenteral feeding methods."

## **2.2 What the guideline covers**

This guideline is relevant to adults (>18 years) in both the hospital and community setting. It provides guidance on the steps required to first identify patients who are potentially at risk of undernutrition, by nutritional screening and then if identified at risk when and how either oral, enteral and/or parenteral nutrition should be initiated, administered and when appropriate, stopped. Guidance on monitoring patients receiving different types of nutrition support is also included. The evidence found has enabled us to produce guidance for patients in general and in some instances, specific guidance related to patients in specific care settings.

## **2.3 What the guideline does not cover**

The guideline does not provide guidance for certain types of patient groups including;

- a) Patients requiring specific specialist therapeutic or maintenance nutrition regimens in the context of diseases such as inborn errors of metabolism, diabetes and chronic renal or liver failure.
- b) Pregnant women, since the nutritional demands on the mother and baby require specialist considerations

c) Patients with eating disorders, because the aims of intervention differ significantly from those with malnutrition related to disease.

d) Primary prevention of malnutrition in healthy individuals in the general population.

e) Children and adolescents under the age of 18 years.

The guideline also provides no recommendations on:

a) The suitability of individually named oral supplements or enteral and parenteral feeding solutions.

b) The use of novel substrates such as glutamine or arginine although we are aware that there is some evidence suggesting potential benefit from the use of these substrates and believe this should perhaps be addressed when this guideline is updated.

c) Types of tubing and receptacles used for enteral and parenteral nutrition support.

d) The management of infections and infection control related to enteral and parenteral nutrition support although reference is made to the existing NICE guidance on Infection Control where appropriate.

### **3 Implementation in the NHS**

*[Please do not add to the wording in this section]*

#### **3.1 Resource implications**

*[Amend the following statement as necessary.]* Local health communities should review their existing practice for nutrition support against this guideline. The review should consider the resources required to implement the recommendations set out in Section 1, the people and processes involved, and the timeline over which full implementation is envisaged. It is in the interests of patients who are at risk of malnutrition that the implementation is as rapid as possible.

Relevant local clinical guidelines, care pathways and protocols should be reviewed in the light of this guidance and revised accordingly.

Information on the cost impact of this guideline in England is available on the NICE website and includes a template that local communities can use ([www.nice.org.uk/CGXXXcosttemplate](http://www.nice.org.uk/CGXXXcosttemplate)). **[Note: the costing information will be available when the guideline is published.]**

### **3.2 General**

*[Include this statement, amended as appropriate:]* The implementation of this guideline will build on the National Service Frameworks for [add] in England and Wales and should form part of the service development plans for each local health community in England and Wales. *[Add further details on Priorities and Planning Framework, health strategies as relevant.]*

This guideline should be used in conjunction with *[insert any related NICE or other national NHS guidance]*

### **3.3 Audit**

*[Please do not add to the wording in this section]*

Suggested audit criteria based on the key priorities for implementation are listed in Appendix D, and can be used to audit practice locally.

## **4 Research recommendations**

The Guideline Development Group has made the following recommendations for research, on the basis of its review of the evidence. The Group regards these recommendations as the most important research areas to improve NICE guidance and patient care in the future. The Guideline Development Group's full set of research recommendations is detailed in the full guideline (see Chapter 1).

- What are the benefits to malnourished surgical patients who have indications for enteral tube feeding being offered enteral tube feeding only compared to enteral tube feeding and parenteral nutrition if they

fail to tolerate >60% of their target nutritional needs 2 days after starting enteral tube feeding in terms of survival, complications and hospital costs?

- What are the benefits of nutritional screening (using a simple tool such as MUST) compared to not screening patients in; a) primary care (attending GP clinics), b) care homes c) hospital inpatients d) hospital outpatients in terms of determining the number of patients at risk of malnutrition, complications, survival, length of stay, quality of life and cost effectiveness?
- What are the benefits of patients (in hospital or community and including the elderly) identified as high risk of malnutrition by a screening tool such as MUST being offered oral sip feeds compared to a) dietary modification and or food fortification, or b) dietary modification and or food fortification and dietary counselling in terms of determining complications, survival, length of hospital stay, quality of life and cost effectiveness?
- What are the benefits to patients in primary care identified as high risk of malnutrition by a screening tool such as MUST being offered oral sip feeds compared to being offered; a) combined micro and macronutrient supplement or b) micronutrient supplementation alone c) standard care (no specific dietary intervention) or d) placebo in terms of survival, hospital admissions, quality of life and cost effectiveness?
- What are the benefits to patients who present with the indications for parenteral nutrition being fed only 50% of estimated nitrogen and energy needs but with full micronutrient and electrolyte provision for first 5 days, followed by feeding at full needs compared to being fed 100% of estimated needs from the first day of feeding in terms of; metabolic complications, infection rates, duration of parenteral feeding, mortality, length of hospital stay, and time to 'medically fit' for discharge?

## 5 Other versions of this guideline

The National Institute for Clinical Excellence commissioned the development of this guidance from the National Collaborating Centre for Acute Care. The Centre established a Guideline Development Group, which reviewed the evidence and developed the recommendations. The members of the Guideline Development Group are listed in Appendix B. Information about the independent Guideline Review Panel is given in Appendix C.

The booklet *The guideline development process – an overview for stakeholders, the public and the NHS* has more information about the Institute's guideline development process. It is available from the Institute's website and copies can also be ordered by telephoning 0870 1555 455 (quote reference N0472).

### 5.1 Full guideline

The full guideline, *Nutrition support in adults: oral supplements, enteral and parenteral feeding*, is published by the National Collaborating Centre for Acute Care; it is available from [website details to be added], the NICE website ([www.nice.org.uk/CGXXXfullguideline](http://www.nice.org.uk/CGXXXfullguideline)) and the website of the National Library for Health ([www.nlh.nhs.uk](http://www.nlh.nhs.uk)). **[Note: these details will apply to the published full guideline.]**

### 5.2 Quick reference guide

A quick reference guide for health professionals is also available from the NICE website ([www.nice.org/CGXXXquickrefguide](http://www.nice.org/CGXXXquickrefguide)) or from the NHS Response Line (telephone 0870 1555 455; quote reference number N0XXX). **[Note: these details will apply when the guideline is published.]**

### 5.3 Information for the public

A version of this guideline for people who are either undernourished or are at risk of undernutrition, their carers, and for the public, is available from the NICE website ([www.nice.org.uk/CGXXXpublicinfo](http://www.nice.org.uk/CGXXXpublicinfo)) or from the NHS Response Line (0870 1555 455); quote reference number N0xxx. **[Note: these details will apply when the guideline is published.]**



## 6 Related NICE guidance

*[If any, add details; if none, state none.]*

[Title of guideline]. *NICE Clinical Guideline* No. [number] ([year]). Available from [www.nice.org/CGXXX](http://www.nice.org/CGXXX)

[Title of appraisal]. *NICE Technology Appraisal* No. [number] ([year]). Available from [www.nice.org/TAXXX](http://www.nice.org/TAXXX)

[Title of interventional procedure]. *NICE Interventional Procedure Guidance* No. [number] ([year]). Available from [www.nice.org/IPGXXX](http://www.nice.org/IPGXXX)

NICE is in the process of developing the following guidance (details available from [www.nice.org.uk](http://www.nice.org.uk)):

- [Title of guideline]. *NICE Clinical Guideline*. (Publication expected [month year].)
- [Title of appraisal]. *NICE Technology Appraisal*. (Publication expected [month year].)
- [Title of interventional procedure]. *NICE Interventional Procedure Guidance*. (Publication expected [month year].)

## 7 Review date

The process of reviewing the evidence is expected to begin 4 years after the date of issue of this guideline. Reviewing may begin before this if significant evidence that affects the guideline recommendations is identified. The updated guideline will be available within 2 years of the start of the review process.

## Appendix A: Grading scheme

The classification of recommendations and the levels of evidence for intervention studies used in this guideline are adapted from the Scottish Intercollegiate Guidelines Network (*SIGN 50: a guideline developers' handbook*), and summarised in the tables below).

### Classification of recommendations on interventions

Recommendation grade	Evidence
A	<ul style="list-style-type: none"> <li>• At least one meta-analysis, systematic review, or randomised controlled trial (RCT) that is rated as 1<sup>++</sup>, and is directly applicable to the target population, <b>or</b></li> <li>• A systematic review of RCTs or a body of evidence that consists principally of studies rated as 1<sup>+</sup>, is directly applicable to the target population and demonstrates overall consistency of results, <b>or</b></li> <li>• Evidence drawn from a NICE technology appraisal</li> </ul>
B	<ul style="list-style-type: none"> <li>• A body of evidence that includes studies rated as 2<sup>++</sup>, is directly applicable to the target population and demonstrates overall consistency of results, <b>or</b></li> <li>• Extrapolated evidence from studies rated as 1<sup>++</sup> or 1<sup>+</sup></li> </ul>
C	<ul style="list-style-type: none"> <li>• A body of evidence that includes studies rated as 2<sup>+</sup>, is directly applicable to the target population and demonstrates overall consistency of results, <b>or</b></li> <li>• Extrapolated evidence from studies rated as 2<sup>++</sup></li> </ul>
D	<ul style="list-style-type: none"> <li>• Evidence level 3 or 4, <b>or</b></li> <li>• Extrapolated evidence from studies rated as 2<sup>+</sup>, <b>or</b></li> <li>• Formal consensus</li> </ul>
D(GPP)	<ul style="list-style-type: none"> <li>• A good practice point (GPP) is a recommendation for best practice based on the experience of the Guideline Development Group</li> </ul>

### Levels of evidence for intervention studies

Level of evidence	Type of evidence
1 <sup>++</sup>	<ul style="list-style-type: none"> <li>• High-quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias</li> </ul>
1 <sup>+</sup>	<ul style="list-style-type: none"> <li>• Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias</li> </ul>
1 <sup>-</sup>	<ul style="list-style-type: none"> <li>• Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias</li> </ul>
2 <sup>++</sup>	<ul style="list-style-type: none"> <li>• High-quality systematic reviews of case-control or cohort studies</li> <li>• High-quality case-control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the</li> </ul>

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	relationship is causal
2 <sup>+</sup>	<ul style="list-style-type: none"><li>• Well-conducted case-control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal</li></ul>
2 <sup>-</sup>	<ul style="list-style-type: none"><li>• Case-control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal</li></ul>
3	<ul style="list-style-type: none"><li>• Non-analytical studies (for example, case reports, case series)</li></ul>
4	<ul style="list-style-type: none"><li>• Expert opinion, formal consensus</li></ul>

## **Appendix B: The Guideline Development Group**

### **Dr Mike Stroud (Chair)**

Institute of Human Nutrition, Southampton General Hospital; British Association of Parenteral and Enteral Nutrition (BAPEN)

### **Ms Christine Baldwin**

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### **Ms Vicky Bradnam**

Chief Pharmacist, Princess Royal University Hospital, Orpington; Royal Pharmaceutical Society

### **Ms Andrea Cartwright**

Nutrition Nurse Specialist, Basildon University Hospital; National Nurses Nutrition Group (NNNG)

### **Ms Gwen Coleman**

Food for Thought Manager, Alzheimer's Society, York; Patient Representative for Samantha Dickson Research Trust

### **Ms Linda Ditchburn**

Community Nutrition Nurse Specialist, Fernbank Medical Centre, Birmingham; National Nurses Nutrition Group (NNNG)

### **Professor Marinos Elia**

Professor of Clinical Nutrition & Metabolism, Institute of Human Nutrition, Southampton General Hospital; Royal College of Physicians/Malnutrition Advisory Group

### **Professor Richard Griffiths**

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### **Ms Judith Jackson**

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### **Mr Bruce McElroy**

Principal Pharmacist, Pharmacy Department, Royal Shrewsbury Hospital; Royal Pharmaceutical Society

### **Dr Jeremy Nightingale**

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### **Ms Joanna Prickett**

Chief Dietitian, North Bristol NHS Trust/Clinical Academic, University of Plymouth; British Dietetic Association

### **Professor Alan Shenkin**

Professor of Clinical Chemistry and Hon Consultant Chemical Pathologist, Department of Clinical Chemistry, University of Liverpool; Intercollegiate Group for Nutrition

### **Ms Carolyn Wheatley**

Chairman, Patients on Intravenous and Nasogastric Nutrition Therapy (PINNT); Patient Representative for PINNT

## **Appendix C: The Guideline Review Panel**

The Guideline Review Panel is an independent panel that oversees the development of the guideline and takes responsibility for monitoring its quality. The Panel includes experts on guideline methodology, health professionals and people with experience of the issues affecting patients and carers. The members of the Guideline Review Panel were as follows.

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### **Peter Robb (Chair)**

Consultant ENT Surgeon, Epsom and St Helier University Hospitals and The Royal Surrey County NHS Trusts

### **Joyce Struthers**

Patient representative, Bedford

### **Peter Duncan**

Consultant in Anaesthetics and Intensive Care Medicine, Royal Preston Hospital, Preston

### **Anne Williams**

Deputy Director of Clinical Governance, Kettering General Hospital NHS Trust

## **Appendix D: Technical detail on the criteria for audit**

### ***Possible objectives for an audit***

The audit criteria highlighted below are based on the recommendations selected as key priority for implementation by the Guideline Development Group.

### ***People that could be included in an audit and time period for selection***

### ***Measures that could be used as a basis for an audit***

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Criterion	Exception	Definition of terms
<p>1. Hospital inpatients are screened for risk of under-nutrition on admission and repeated weekly in acute settings, using a simple screening tool that includes BMI, percentage weight loss and considers the time over which nutrient intake has been reduced (e.g. MUST).</p>	<p>Hospital wards considered to have patients at low risk of under-nutrition. They will have specifically opted out of screening having followed an explicit process to do so via the local clinical governance structure involving experts in nutrition support.</p>	<p>Use of a simple screening tool such as the MUST malnutrition universal screening tool is recommended.</p>
<p>2. Hospital outpatients are screened for risk of under-nutrition when attending their first hospital outpatient clinic using a simple screening tool that includes BMI, percentage weight loss and considers the time over which nutrient intake has been reduced (e.g. MUST).</p>	<p>Departments with low risk of under-nutrition. They will have opted out of screening having followed an explicit process via the local clinical governance structure involving experts in nutrition support.</p>	<p>Use of a simple screening tool such as the MUST malnutrition universal screening tool is recommended.</p>
<p>3. Residents or patients in care homes are screened for risk of under-nutrition on admission to care homes using a simple screening tool that includes BMI, percentage weight loss and considers the time over which nutrient intake has been reduced (e.g.</p>	<p>Subsequent screening of residents or patients in care homes where there is no clinical concern about risk of under-nutrition.</p>	<p>Use of a simple screening tool such as the MUST malnutrition universal screening tool is recommended.</p>



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Criterion	Exception	Definition of terms
MUST).		
<p>4. Documentation in patient records that options of oral, enteral or parenteral nutrition support have been considered for patients who are either: 1) not eating or are unlikely to be eating for more than 5 days or 2) who have a BMI &lt;18.5 or who have unintentionally lost &gt;10% body weight over the previous 3-6 month or 3) who have a BMI &lt;20 and unintentional weight loss &gt;5% or 4) who have poor absorptive capacity are catabolic and/or have high nutrient losses.</p>	<p>Patients who are eating well are well nourished, BMI &gt;20 and do not appear to have high nutrient losses. A record that no action is required with reasons should also be documented.</p>	<p>The documentation should include information about which of the indications criteria listed led the clinician to consider nutritional intervention was required and whether oral, enteral or parenteral nutrition support was instigated after consultation with the patient and/or carer and if not why not.</p>
<p>5. Very sick patients starting enteral or parenteral nutrition support are provided with full electrolyte and micronutrient needs from the outset and then energy and nitrogen requirements introduced gradually according to tolerance over the first 24-48 hours, e.g. in intensive care patients this may mean commencing 50% of normal energy and nitrogen requirements.</p>	<p>The patient who is either not critically ill or who has a BMI &gt;20 and has not had an inadequate nutritional intake for &gt;5 days.</p>	<p>Information on estimating a patient's requirements are detailed in chapter 5 of the main guideline.</p>

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Criterion	Exception	Definition of terms
<p>6. Documentation in patient records that options of oral interventions to improve intake have been considered in patients who can eat safely but who are either: 1) malnourished (unintentional weight loss &gt;10% over the last 3 to 6 months, 2) BMI &lt;18.5, or 3) BMI &lt;20 and unintentional weight loss &gt;5% over the last 3 to 6 months or 4) at risk of malnourishment and have not eaten for &gt;5 days or are unlikely to eat for &gt;5 days)</p>	<p>Patients who are eating well and are not at nutritional risk, e.g. BMI &gt;20.            Patients who are unable to swallow safely.            Patients who present with indications for enteral and parenteral nutrition.</p>	<p>Consider the above criteria with this one also.</p>
<p>7. The elderly person in long-term care who has experienced unintentional weight loss and who is able to eat safely is offered interventions to improve oral intake such as additional food, fortified food or sip feeds.</p>	<p>The patient who is not in a long-term care home for the elderly and is well nourished.            The patient who is not considered to have a safe swallow or adequate absorptive capacity.            The patient who for reasons intervening with nutritional support is not considered ethical.</p>	
<p>8. Documentation in patient records that enteral tube feeding has been considered in patients who either have 1) unintentional weight loss &gt;10%</p>	<p>Patients who are eating well and are not at nutritional risk, e.g. BMI &gt;20.            Patients who are receiving and responding to the</p>	

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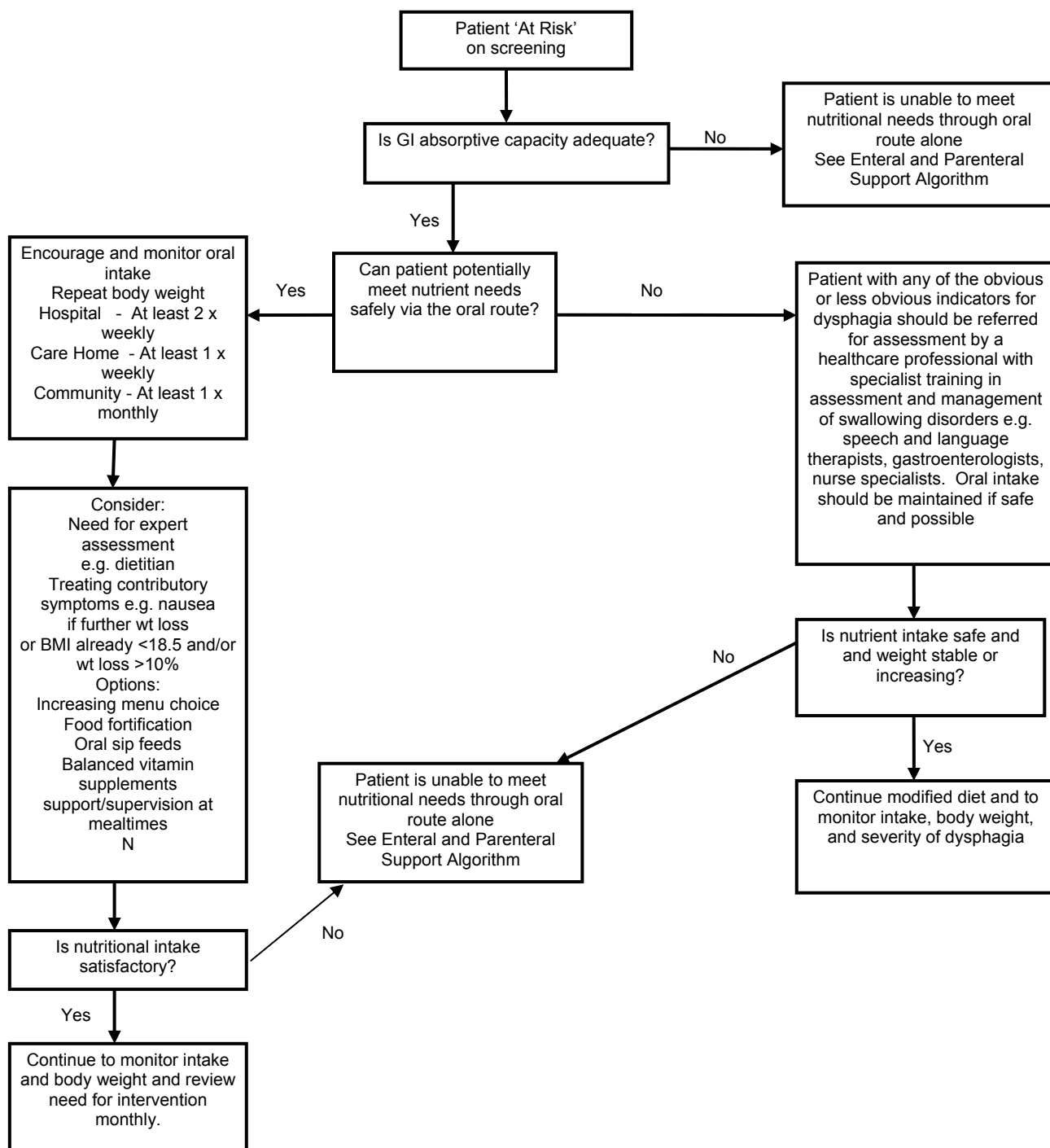
Criterion	Exception	Definition of terms
<p>over the last 3 to 6 months or 2) BMI &lt;18.5 or 3) BMI &lt;20 and unintentional weight loss &gt;5% over the last 3 to 6 months or 4) who have not eaten for &gt;5 days or unlikely to eat for &gt;5 days and who have a functional, accessible gastrointestinal tract but an inadequate or unsafe oral intake and there are no ethical contraindications for ETF.</p>	<p>benefits of oral nutrition support.</p>	
<p>9. Patients unable to safely swallow due to acute dysphagic stroke, who have a functional, accessible gastrointestinal tract with no ethical contraindications to being offered nutrition support should have an initial 2 week trial of nasogastric tube feeding while further assessing the prognosis.</p>	<p>Patients who are eating well and are not at nutritional risk, e.g. BMI &gt;20. Patients who present with indications for parenteral nutrition.</p>	
<p>10. Patients on PN are prescribed a regimen which has been devised to deliver appropriate energy and nitrogen for that individual with the additions from the outset of appropriate</p>	<p>Patients not prescribed PN.</p>	

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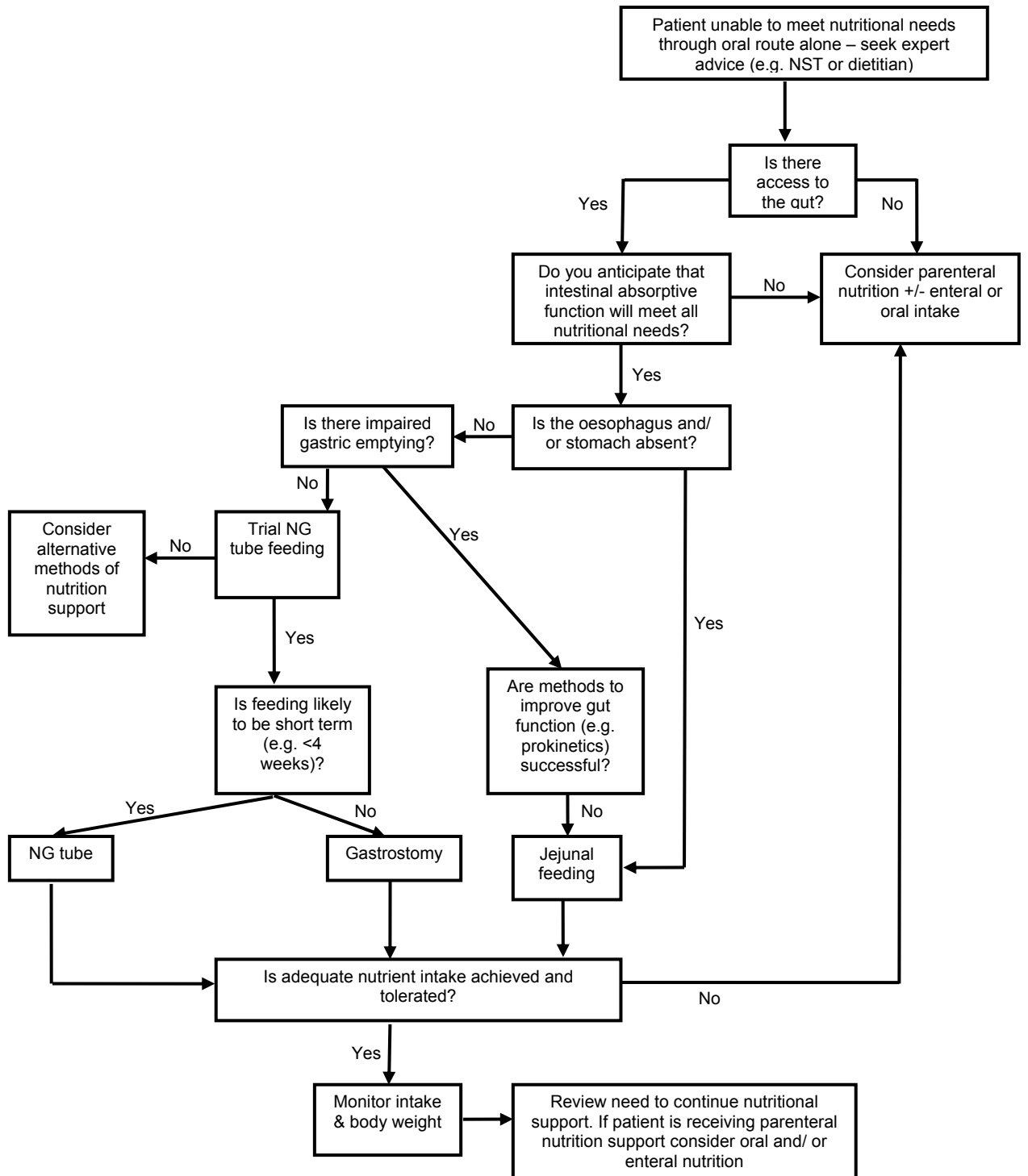
<b>Criterion</b>	<b>Exception</b>	<b>Definition of terms</b>
vitamins, trace elements, electrolytes and other nutrient supplements added under appropriate pharmaceutical controlled environmental conditions.		

## Appendix E: The algorithms

### Algorithm for oral nutrition support



### Algorithm for enteral and parenteral nutrition support



## Appendix F: Nutritional, anthropometric and clinical monitoring for patients receiving oral, enteral and parenteral nutrition support

Parameter	Frequency	Rationale
<b>Nutritional</b>		
Nutrient intake from oral, enteral or parenteral feeding +/- or normal diet (including any change in conditions that are affecting food intake)	Daily initially, reducing to 2x/week when stable, and then monthly for long-term feeding in the community	To ensure that patient is receiving nutrients to meet requirements and that current method of feeding is still the most appropriate. To allow alteration of feed/diet as indicated by monitoring
Actual volume of feed delivered	Daily initially, reducing to 2x/week when stable, and then monthly in long term feeding in the community	To ensure that patient is receiving correct volume of feed. To allow troubleshooting of any problems
Fluid balance charts	Daily initially, reducing to 2x/week when stable	To ensure patient is not becoming over/under hydrated
<b>Anthropometric</b>		
Weight	2x/week initially (may need to be more frequent if there are fluid balance problems) reducing to monthly	To assess ongoing nutritional status, determine whether nutritional goals are being achieved and take into account both body fat and muscle
BMI/	Start of feeding	
Mid arm circumference	Monthly – in patients where weight cannot be obtained or is difficult to interpret	

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Parameter	Frequency	Rationale
Triceps skinfold thickness	Monthly – in patients where weight cannot be obtained or is difficult to interpret	
<b>Gastrointestinal function</b>		
Nausea/vomiting	Daily initially reducing to 2x/week	To ensure tolerance of feed
Diarrhoea	Daily initially reducing to 2x/week	To ensure tolerance of feed. To rule out any other causes of diarrhoea
Constipation	Daily initially reducing to 2x/week	To ensure tolerance of feed
<b>Enteral tube – nasally inserted</b>		
Tube position (length at nose)	Before each feed begins	To ensure tube in correct position
Nasal erosion	Daily	To ensure tolerance of tube
Fixation (is it secure)	Daily	Help prevent tube becoming dislodged
Is tube in working order (all pieces intact, tube blocked/kinked)	Daily	Ensure tube is in working order
<b>Tube – gastrostomy or jejunostomy</b>		
Stoma site	Daily	To ensure site not infected/red
Tube position (length at external fixation)	Daily	To ensure tube has not migrated from/into stomach



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Parameter	Frequency	Rationale
<p>Tube rotation (gastrostomy only)</p> <p><b>Parenteral feeding</b></p> <p>Line site</p> <p>Skin over position of line tip (peripherally fed patients)</p>	<p>Daily</p> <p>Daily</p> <p>Daily</p>	<p>Prevent internal overgranulation</p> <p>Signs of infection/inflammation</p> <p>Signs of thrombophlebitis</p>
<p><b>Clinical condition</b></p> <p>General condition</p> <p>Temperature</p> <p>Drug therapy</p>	<p>Daily</p> <p>Daily initially</p> <p>Daily initially reducing to monthly when stable</p>	<p>To ensure that patient is tolerating feed and that feeding and route continue to be appropriate</p> <p>Sign of infection</p> <p>Appropriate preparation of drug (to reduce incidence of tube blockage). To prevent/reduce drug nutrient interactions</p>
<p><b>Long/short-term goals</b></p> <p>Are goals being met</p> <p>Are goals still appropriate</p>	<p>Daily initially reducing to 2x/week and then monthly?</p>	<p>To ensure that feeding is appropriate to overall care of patient</p>

**Appendix G: Laboratory monitoring for patients on parenteral nutrition support (this could be selectively applied to certain patients receiving enteral or oral nutrition support)**

Parameter	Frequency	Rationale	Interpretation
Sodium, potassium, urea, creatinine	Baseline. Daily till stable. Then 1-2X weekly.	Assessment of renal function, fluid status, and Na and K status	Interpret with knowledge of fluid balance. Urine Na may be helpful in complex cases with gastrointestinal fluid loss.
Glucose	Baseline. 1-2X daily (or more if reqd) till stable. Then weekly.	Glucose intolerance is common	Good glycaemic control is necessary
Magnesium, phosphate	Baseline. Daily if risk of refeeding syndrome. 3X weekly till stable Then weekly.	Depletion is common and under-recognised	Low concentrations indicates poor status
Liver function tests	Baseline. 2X weekly till stable. Then weekly.	Abnormalities common during IVN	Complex. May be due to sepsis, other disease or nutritional intake
Calcium, albumin	Baseline. Then weekly.	Hypocalcaemia or hypercalcaemia may occur	Correct measured serum calcium concentration for albumin.  Hypocalcaemia may be secondary to Mg deficiency.  Low albumin reflects disease not protein status

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<b>Parameter</b>	<b>Frequency</b>	<b>Rationale</b>	<b>Interpretation</b>
Prealbumin	Baseline. Then weekly.	Short half-life marker of protein status	Affected by APR Especially useful in home parenteral nutrition (HPN)
C-reactive protein	Baseline. 2-3X weekly till stable.	Assists interpretation of protein, trace element and vitamin results	Trend of results is important
Zinc, copper	Baseline. Then every 2-4 weeks, depending on results.	Deficiency common, especially when increased losses	Patients most at risk when anabolic. APR causes Zn ↓, and Cu ↑
Selenium	Baseline if risk of depletion. Further results dependent on baseline.	Se deficiency likely in severe illness or long-term nutrition support	APR causes Se↓. Long-term status better assessed by glutathione peroxidase
Manganese	Every 3-6 months	Excess provision to be avoided – more likely if liver disease	Rbc or whole blood better measure of excess than plasma
Full blood count	Baseline. 1-2X weekly till stable. Then weekly.	Anaemia due to iron or folate deficiency is common	Effects of sepsis may be important. Iron status difficult if APR (Fe↓, ferritin↑)
Folate, B12	Baseline. Then every 1-2 weeks.	Folate deficiency is common	Serum folate/B12 sufficient, with full blood count
25-OH vitD	Long-term support	Low if house-bound	Requires normal kidney function for effect
Bone desitometry	On starting HPN Then every 2 years	Metabolic bone disease diagnosis	Together with lab tests for metabolic bone disease

## Appendix H: Obvious and less obvious indicators for dysphagia

<b>Obvious indicators</b>	<b>Less obvious indicators</b>
<ul style="list-style-type: none"><li>• Patient reports difficulty and/or painful chewing and/or swallowing</li></ul>	<ul style="list-style-type: none"><li>• Change in respiration pattern</li></ul>
<ul style="list-style-type: none"><li>• Regurgitation of undigested food stuffs</li></ul>	<ul style="list-style-type: none"><li>• Unexplained temperature spikes</li></ul>
<ul style="list-style-type: none"><li>• Difficulty controlling food and/or liquid in the mouth</li></ul>	<ul style="list-style-type: none"><li>• Wet voice quality</li></ul>
<ul style="list-style-type: none"><li>• Drooling</li></ul>	<ul style="list-style-type: none"><li>• Tongue fasciculation (may be indicative of motor neurone disease)</li></ul>
<ul style="list-style-type: none"><li>• Hoarse voice</li></ul>	<ul style="list-style-type: none"><li>• Xerostomia</li></ul>
<ul style="list-style-type: none"><li>• Coughing and/or choking before, during, or after swallowing</li></ul>	<ul style="list-style-type: none"><li>• Heartburn</li></ul>
<ul style="list-style-type: none"><li>• Globus sensation</li></ul>	<ul style="list-style-type: none"><li>• Change in eating – for example, eating slowly or avoiding social occasions</li></ul>
<ul style="list-style-type: none"><li>• Nasal regurgitation</li></ul>	<ul style="list-style-type: none"><li>• Frequent throat clearing</li></ul>
<ul style="list-style-type: none"><li>• Feeling of obstruction</li></ul>	<ul style="list-style-type: none"><li>• Recurrent chest infections</li></ul>
<ul style="list-style-type: none"><li>• Unexplained/involuntary weight loss</li></ul>	<ul style="list-style-type: none"><li>• Atypical chest pain</li></ul>

## **Appendix I: Factors to be considered before any modification of nutrition and hydration methods**

- Recurrent chest infections
- Mobility
- Dependency on others for feeding
- Perceived palatability for the patient
- Level of alertness
- Compromised physiology
- Poor oral hygiene
- Compromised medical status
- Metabolic and nutritional requirements
- Vulnerability (immuno-compromised)
- Co-morbidities