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## **Nutrition support in adults**

Nutrition support in adults: oral nutrition support, enteral tube feeding and parenteral nutrition

## **Clinical Guideline 32**

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

#### **Ordering information**

You can download the following documents from [www.nice.org.uk/CG032](http://www.nice.org.uk/CG032)

- The NICE guideline (this document) – all the recommendations.
- A quick reference guide, which has been distributed to healthcare professionals working in the NHS in England.
- Information for people who need nutrition support, their families and carers, and the public.
- The full guideline – all the recommendations, details of how they were developed, and summaries of the evidence on which they were based.

For printed copies of the quick reference guide or information for the public, phone the NHS Response Line on 0870 1555 455 and quote:

- N0977 (quick reference guide)
- N0978 (information for the public).

#### **This guidance is written in the following context**

This guidance represents the view of the Institute, which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. The guidance does not, however, override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

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## **Introduction**

Malnutrition is a state in which a deficiency of nutrients such as energy, protein, vitamins and minerals causes measurable adverse effects on body composition, function or clinical outcome. In this guideline we do not use the term to cover excess nutrient provision.

Malnutrition is both a cause and a consequence of ill health. It is common and increases a patient's vulnerability to disease. Methods to improve or maintain nutritional intake are known as nutrition support. These include:

- oral nutrition support – for example, fortified food, additional snacks and/or sip feeds
- enteral tube feeding – the delivery of a nutritionally complete feed directly into the gut via a tube
- parenteral nutrition – the delivery of nutrition intravenously.

These methods can improve outcomes, but decisions on the most effective and safe methods are complex.

Currently, knowledge of the causes, effects and treatment of malnutrition among healthcare professionals in the UK is poor. This guideline aims to help healthcare professionals correctly identify people in hospital and the community who need nutrition support, and enable them to choose and deliver the most appropriate nutrition support at the most appropriate time.

## **Developing this guideline**

The recommendations in this guideline were systematically developed and based on trial evidence when possible. However, the guideline development group met many difficulties including: the breadth of the remit; limited time and resources; and an evidence base that was difficult to interpret. There were three main reasons for this difficulty in interpretation.

- Most of the evidence consisted of small trials, applying different interventions and outcome measures to variable populations in different

settings. This not only made individual trials statistically underpowered, but also limited the possibilities for meta-analyses.

- It was difficult to make recommendations for people in the community when most research was conducted in hospitals.
- Most randomised trials of enteral tube feeding or parenteral nutrition support have excluded, on ethical grounds, patients who were either already malnourished or were likely to eat little or nothing for several days (since those allocated to control groups might have had feeding withheld for significant periods). The trials therefore examined 'elective' supplementary use of enteral tube feeding or parenteral nutrition support rather than their use for any of the usual clinical indications.

## Patient-centred care

This guideline offers best practice advice on the care of adults who are malnourished or at risk of malnutrition.

Treatment and care should take into account patients' needs and preferences. People with malnutrition should have the opportunity to make informed decisions about their care and treatment, in partnership with their health professionals. When patients do not have the capacity to make decisions, healthcare professionals should follow the 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 evidence-based written information tailored to the patient's needs. Treatment and care, and the information patients are given about it, should be culturally appropriate. It should also be accessible to people with additional needs such as physical, sensory or learning disabilities, and to people who do not speak or read English.

Carers and relatives should have the opportunity to be involved in decisions about the patient's care and treatment, if the patient agrees to this. Carers and relatives should also be given the information and support they need.

Recommendations in this guideline apply to all patients with malnutrition or at risk of malnutrition, whether they are in hospital or at home. Good coordination between the hospital and the home or community is needed when patients are transferred between settings.

# Key priorities for implementation

## Key clinical priorities

- Screening for malnutrition and the risk of malnutrition should be carried out by healthcare professionals with appropriate skills and training.
- All hospital inpatients on admission and all outpatients at their first clinic appointment should be screened. Screening should be repeated weekly for inpatients and when there is clinical concern for outpatients. People in care homes should be screened on admission and when there is clinical concern.
- Hospital departments who identify groups of patients with low risk of malnutrition may opt out of screening these groups. Opt-out decisions should follow an explicit process via the local clinical governance structure involving experts in nutrition support.
- Nutrition support should be considered in people who are malnourished, as defined by any of the following:
  - a body mass index (BMI) of less than 18.5 kg/m<sup>2</sup>
  - unintentional weight loss greater than 10% within the last 3–6 months
  - a BMI of less than 20 kg/m<sup>2</sup> and unintentional weight loss greater than 5% within the last 3–6 months.
- Nutrition support should be considered in people at risk of malnutrition, defined as those who have:
  - eaten little or nothing for more than 5 days and/or are likely to eat little or nothing for 5 days or longer
  - a poor absorptive capacity and/or high nutrient losses and/or increased nutritional needs from causes such as catabolism.
- Healthcare professionals should consider using oral, enteral or parenteral nutrition support, alone or in combination, for people who

are either malnourished or at risk of malnutrition, as defined above. Potential swallowing problems should be taken into account.

### **Key organisational priorities**

- All healthcare professionals who are directly involved in patient care should receive education and training, relevant to their post, on the importance of providing adequate nutrition.
- Healthcare professionals should ensure that all people who need nutrition support receive coordinated care from a multidisciplinary team.<sup>1</sup>
- All acute hospital trusts should employ at least one specialist nutrition support nurse.
- All hospital trusts should have a nutrition steering committee working within the clinical governance framework.

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<sup>1</sup> The composition of this team may differ according to setting and local arrangements.



# 1 Guidance

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 5).

## ***1.1 Organisation of nutrition support in hospital and the community***

- 1.1.1 All healthcare professionals who are directly involved in patient care should receive education and training, relevant to their post, on the importance of providing adequate nutrition. **D(GPP)**
- 1.1.2 Education and training should cover: **D(GPP)**
- nutritional needs and indications for nutrition support
  - options for nutrition support (oral, enteral and parenteral)
  - ethical and legal concepts
  - potential risks and benefits
  - when and where to seek expert advice.
- 1.1.3 Healthcare professionals should ensure that care provides: **D(GPP)**
- food and fluid of adequate quantity and quality in an environment conducive to eating
  - appropriate support, for example, modified eating aids, for people who can potentially chew and swallow but are unable to feed themselves.

- 1.1.4 Healthcare professionals should ensure that all people who need nutrition support receive coordinated care from a multidisciplinary team.<sup>2</sup> **D(GPP)**
- 1.1.5 All acute hospital trusts should have a multidisciplinary nutrition support team which may include: doctors (for example gastroenterologists, gastrointestinal surgeons, intensivists or others with a specific interest in nutrition support), dietitians, a specialist nutrition nurse, other nurses, pharmacists, biochemistry and microbiology laboratory support staff, and other allied healthcare professionals (for example, speech and language therapists). **D(GPP)**
- 1.1.6 All hospital trusts should have a nutrition steering committee working within the clinical governance framework. **D(GPP)**
- 1.1.7 Members of the nutrition steering committee should be drawn from trust management, and include senior representation from medical staff, catering, nursing, dietetics, pharmacy and other healthcare professionals as appropriate, for example, speech and language therapists. **D(GPP)**
- 1.1.8 All acute hospital trusts should employ at least one specialist nutrition support nurse. **D(GPP)**
- 1.1.9 The specialist nutrition support nurse should work alongside nursing staff, as well as dietitians and other experts in nutrition support, to: **D(GPP)**
- minimise complications related to enteral tube feeding and parenteral nutrition
  - ensure optimal ward-based training of nurses
  - ensure adherence to nutrition support protocols

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<sup>2</sup> The composition of this team may differ according to setting and local arrangements.

- support coordination of care between the hospital and the community.

## **1.2 Screening for malnutrition and the risk of malnutrition in hospital and the community**

- 1.2.1 Screening for malnutrition and the risk of malnutrition should be carried out by healthcare professionals with appropriate skills and training. **D(GPP)**
- 1.2.2 All hospital inpatients on admission and all outpatients at their first clinic appointment should be screened. Screening should be repeated weekly for inpatients and when there is clinical concern for outpatients. **D(GPP)**
- 1.2.3 Hospital departments who identify groups of patients with low risk of malnutrition may opt out of screening these groups. Opt-out decisions should follow an explicit process via the local clinical governance structure involving experts in nutrition support. **D(GPP)**
- 1.2.4 People in care homes should be screened on admission and when there is clinical concern.<sup>3</sup> **D(GPP)**
- 1.2.5 Screening should take place on initial registration at general practice surgeries and when there is clinical concern.<sup>1</sup> Screening should also be considered at other opportunities (for example, health checks, flu injections). **D(GPP)**
- 1.2.6 Screening should assess body mass index (BMI)<sup>4</sup> and percentage unintentional weight loss and should also consider the time over which nutrient intake has been unintentionally reduced and/or the likelihood of future impaired nutrient intake. The Malnutrition Universal Screening Tool (MUST), for example, may be used to do this. **D(GPP)**

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<sup>3</sup> Clinical concern includes, for example, unintentional weight loss, fragile skin, poor wound healing, apathy, wasted muscles, poor appetite, altered taste sensation, impaired swallowing, altered bowel habit, loose fitting clothes or prolonged intercurrent illness.

<sup>4</sup> BMI is weight (kg)/height (m<sup>2</sup>) (weight in kilograms divided by height in metres squared).

### **1.3 Indications for nutrition support in hospital and the community**

- 1.3.1 Nutrition support should be considered in people who are malnourished, as defined by any of the following: **D(GPP)**
- a BMI of less than 18.5 kg/m<sup>2</sup>
  - unintentional weight loss greater than 10% within the last 3–6 months
  - a BMI of less than 20 kg/m<sup>2</sup> and unintentional weight loss greater than 5% within the last 3–6 months.
- 1.3.2 Nutrition support should be considered in people at risk of malnutrition who, as defined by any of the following: **D(GPP)**
- have eaten little or nothing for more than 5 days and/or are likely to eat little or nothing for the next 5 days or longer
  - have a poor absorptive capacity, and/or have high nutrient losses and/or have increased nutritional needs from causes such as catabolism.
- 1.3.3 Healthcare professionals should consider using oral, enteral or parenteral nutrition support, alone or in combination, for people who are either malnourished or at risk of malnutrition, as defined in 1.3.1 and 1.3.2. Potential swallowing problems should be taken into account. **D(GPP)**
- 1.3.4 Healthcare professionals involved in starting or stopping nutrition support should: **D(GPP)**
- obtain consent from the patient if he or she is competent
  - act in the patient's best interest if he or she is not competent to give consent

- be aware that the provision of nutrition support is not always appropriate. Decisions on withholding or withdrawing of nutrition support require a consideration of both ethical and legal principles (both at common law and statute including the Human Rights Act 1998).

When such decisions are being made guidance issued by the General Medical Council<sup>5</sup> and the Department of Health<sup>6</sup> should be followed.

- 1.3.5 Healthcare professionals should ensure that people having nutrition support, and their carers, are kept fully informed about their treatment. They should also have access to appropriate information and be given the opportunity to discuss diagnosis and treatment options. **D(GPP)**

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<sup>5</sup> Withholding and withdrawing life prolonging treatments: good practice in decision making. General Medical Council. Available from [www.gmc-uk.org](http://www.gmc-uk.org)

<sup>6</sup> Reference guide to consent for examination or treatment (2001) Department of Health. Available from [www.dh.gov.uk](http://www.dh.gov.uk)

## **1.4 What to give in hospital and the community**

1.4.1 Healthcare professionals who are skilled and trained in nutritional requirements and methods of nutrition support should ensure that the total nutrient intake<sup>7</sup> of people prescribed nutrition support accounts for: **D(GPP)**

- energy, protein, fluid, electrolyte, mineral, micronutrients<sup>8</sup> and fibre needs
- activity levels and the underlying clinical condition – for example, catabolism, pyrexia
- gastrointestinal tolerance, potential metabolic instability and risk of refeeding problems
- the likely duration of nutrition support.

1.4.2 For people who are not severely ill or injured, nor at risk of refeeding syndrome, the suggested nutritional prescription for total intake<sup>4</sup> should provide all of the following: **D(GPP)**

- 25–35 kcal/kg/day total energy (including that derived from protein<sup>9,10</sup>)
- 0.8–1.5 g protein (0.13–0.24 g nitrogen)/kg/day
- 30–35 ml fluid/kg (with allowance for extra losses from drains and fistulae, for example, and extra input from other sources – for example, intravenous drugs)

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<sup>7</sup> Total intake includes intake from any food, oral fluid, oral nutritional supplements, enteral and/or parenteral nutrition support and intravenous fluid.

<sup>8</sup> The term 'micronutrient' is used throughout to include all essential vitamins and trace elements.

<sup>9</sup> This level may need to be lower in people who are overweight, BMI >25.

<sup>10</sup> When using parenteral nutrition it is often necessary to adjust total energy values listed on the manufacturer's information which may not include protein energy values.

- adequate electrolytes, minerals, micronutrients (allowing for any pre-existing deficits, excessive losses or increased demands) and fibre if appropriate.

1.4.3 The prescription should be reviewed according to the person's progress, and care should be taken when: **D(GPP)**

- using food fortification which tends to supplement energy and/or protein without adequate micronutrients and minerals
- using feeds and supplements that meet full energy and nitrogen needs, as they may not provide adequate micronutrients and minerals when only used in a supplementary role
- using pre-mixed parenteral nutrition bags that have not had tailored additions from pharmacy.



- 1.4.4 Nutrition support should be cautiously introduced in seriously ill or injured people requiring enteral tube feeding or parenteral nutrition. It should be started at no more than 50% of the estimated target energy and protein needs. It should be built up to meet full needs over the first 24–48 hours according to metabolic and gastrointestinal tolerance. Full requirements of fluid, electrolytes, vitamins and minerals should be provided from the outset of feeding. **D(GPP)**
- 1.4.5 People who have eaten little or nothing for more than 5 days should have nutrition support introduced at no more than 50% of requirements for the first 2 days, before increasing feed rates to meet full needs if clinical and biochemical monitoring reveals no refeeding problems. **D(GPP)**
- 1.4.6 People who meet the criteria in Box 1 should be considered to be at high risk of developing refeeding problems. **D(GPP)**

**Box 1 Criteria for determining people at high risk of developing refeeding problems**

**Patient has one or more of the following:**

- BMI less than 16 kg/m<sup>2</sup>
- unintentional weight loss greater than 15% within the last 3–6 months
- little or no nutritional intake for more than 10 days
- low levels of potassium, phosphate or magnesium prior to feeding.

**Or patient has two or more of the following:**

- BMI less than 18.5 kg/m<sup>2</sup>
- unintentional weight loss greater than 10% within the last 3–6 months
- little or no nutritional intake for more than 5 days
- a history of alcohol abuse or drugs including insulin, chemotherapy, antacids or diuretics.

- 1.4.7 People at high risk of developing refeeding problems (Box 1) should be cared for by healthcare professionals who are appropriately

skilled and trained and have expert knowledge of nutritional requirements and nutrition support. **D(GPP)**

1.4.8 The prescription for people at high risk of developing refeeding problems should consider: **D(GPP)**

- starting nutrition support at a maximum of 10 kcal/kg/day, increasing levels slowly to meet or exceed full needs by 4–7 days
- using only 5 kcal/kg/day in extreme cases (for example, BMI less than 14 kg/m<sup>2</sup> or negligible intake for more than 15 days) and monitoring cardiac rhythm continually in these people and any others who already have or develop any cardiac arrhythmias
- restoring circulatory volume and monitoring fluid balance and overall clinical status closely
- providing immediately before and during the first 10 days of feeding: oral thiamin 200–300 mg daily, vitamin B co strong 1 or 2 tablets, three times a day (or full dose daily intravenous vitamin B preparation, if necessary) and a balanced multivitamin/trace element supplement once daily
- providing oral, enteral or intravenous supplements of potassium (likely requirement 2–4 mmol/kg/day), phosphate (likely requirement 0.3–0.6 mmol/kg/day) and magnesium (likely requirement 0.2 mmol/kg/day intravenous, 0.4 mmol/kg/day oral) unless pre-feeding plasma levels are high. Pre-feeding correction of low plasma levels is unnecessary.

## ***1.5 Monitoring of nutrition support in hospital and the community***

1.5.1 Healthcare professionals should review the indications, route, risks, benefits and goals of nutrition support at regular intervals. The time between reviews depends on the patient, care setting and duration

of nutrition support. Intervals may increase as the patient is stabilised on nutrition support. **D(GPP)**

- 1.5.2 People having nutrition support in hospital should be monitored by healthcare professionals with the relevant skills and training in nutritional monitoring. **D(GPP)**
- 1.5.3 Healthcare professionals should refer to the protocols for nutritional, anthropometric and clinical monitoring, shown in Table 1, when monitoring people having nutrition support in hospital. **D(GPP)**
- 1.5.4 Healthcare professionals should refer to the protocols for laboratory monitoring, shown in Table 2, when monitoring people having nutrition support in hospital. Table 2 is particularly relevant to parenteral nutrition. It could also be selectively applied when enteral or oral nutrition support is used, particularly for people who are metabolically unstable or at risk of refeeding syndrome. The frequency and extent of the observations given may need to be adapted in acutely ill or metabolically unstable people. **D(GPP)**
- 1.5.5 People having parenteral nutrition in the community need regular assessment and monitoring. This should be carried out by home care specialists and by experienced hospital teams (initially at least weekly), using observations marked \* in Table 1. In addition, they should be reviewed at a specialist hospital clinic every 3–6 months. Monitoring should be more frequent during the early months of home parenteral nutrition, or if there is a change in clinical condition, when the full range of tests in Tables 1 and 2 should be performed. Some of the clinical observations may be checked by patients or carers. **D(GPP)**
- 1.5.6 People having oral nutrition support and/or enteral tube feeding in the community should be monitored by healthcare professionals with the relevant skills and training in nutritional monitoring. This group of people should be monitored every 3–6 months or more frequently if there is any change in their clinical condition. A limited

number of observations and tests from Table 1 should be performed. Some of the clinical observations may be checked by patients or carers. If clinical progress is satisfactory, laboratory tests are rarely needed. **D(GPP)**

- 1.5.7 If long-term nutrition support is needed patients and carers 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)**

**Table 1 Protocol for nutritional, anthropometric and clinical monitoring of nutrition support**

<b>Parameter</b>	<b>Frequency</b>	<b>Rationale</b>
<b>Nutritional</b>		
Nutrient intake from oral, enteral or parenteral nutrition (including any change in conditions that are affecting food intake)	Daily initially, reducing to twice weekly when stable	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 intake as indicated
Actual volume of feed delivered*	Daily initially, reducing to twice weekly when stable	To ensure that patient is receiving correct volume of feed. To allow troubleshooting
Fluid balance charts (enteral and parenteral)	Daily initially, reducing to twice weekly when stable	To ensure patient is not becoming over/under hydrated
<b>Anthropometric</b>		
Weight*	Daily if concerns regarding fluid balance, otherwise weekly 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 and then monthly	
Mid-arm circumference*	Monthly, if weight cannot be obtained or is difficult to interpret	
Triceps skinfold thickness	Monthly, if weight cannot be obtained or is difficult to interpret	
<b>GI function</b>		
Nausea/vomiting*	Daily initially, reducing to twice weekly	To ensure tolerance of feed

<b>Parameter</b>	<b>Frequency</b>	<b>Rationale</b>
Diarrhoea*	Daily initially, reducing to twice weekly	To rule out any other causes of diarrhoea and then assess tolerance of feeds
Constipation*	Daily initially, reducing to twice weekly	To rule out other causes of constipation and then assess tolerance of feeds
Abdominal distension	As necessary	Assess tolerance of feed
<b>Enteral tube – nasally inserted</b>		
Gastric tube position (pH less than or equal to 5.5 using pH paper – or noting position of markers on tube once initial position has been confirmed)	Before each feed begins	To ensure tube in correct position
Nasal erosion	Daily	To ensure tolerance of tube
Fixation (is it secure?)	Daily	To help prevent tube becoming dislodged
Is tube in working order (all pieces intact, tube not blocked/kinked)?	Daily	To ensure tube is in working order
<b>Gastrostomy or jejunostomy</b>		
Stoma site	Daily	To ensure site not infected/red, no signs of gastric leakage
Tube position (length at external fixation)	Daily	To ensure tube has not migrated from/into stomach and external over granulation
Tube insertion and rotation (gastrostomy without jejunal extension only)	Weekly	Prevent internal overgranulation/prevention of buried bumper syndrome
Balloon water volume (balloon retained gastrostomies only)	Weekly	To prevent tube falling out

<b>Parameter</b>	<b>Frequency</b>	<b>Rationale</b>
Jejunostomy tube position by noting position of external markers	Daily	Confirmation of position
<b>Parenteral nutrition</b>		
Catheter entry site*	Daily	Signs of infection/inflammation
Skin over position of catheter tip (peripherally fed people)*	Daily	Signs of thrombophlebitis
<b>Clinical condition</b>		
General condition*	Daily	To ensure that patient is tolerating feed and that feeding and route continue to be appropriate
Temperature/blood pressure	Daily initially, then as needed	Sign of infection/fluid balance
Drug therapy*	Daily initially, reducing to monthly when stable	Appropriate preparation of drug (to reduce incidence of tube blockage). To prevent/reduce drug nutrient interactions
<b>Long-/short-term goals</b>		
Are goals being met?*	Daily initially, reducing to twice weekly and then progressively to 3–6 monthly, unless clinical condition changes	To ensure that feeding is appropriate to overall care of patient
Are goals still appropriate?*	Daily initially, reducing to twice weekly and then progressively to 3–6 monthly, unless clinical condition changes	To ensure that feeding is appropriate to overall care of patient

People at home having parenteral nutrition should be monitored using observations marked \*.

**Table 2 Protocol for laboratory monitoring of nutrition support**

<b>Parameter</b>	<b>Frequency</b>	<b>Rationale</b>	<b>Interpretation</b>
Sodium, potassium, urea, creatinine	Baseline Daily until stable Then 1 or 2 times a week	Assessment of renal function, fluid status, and Na and K status	Interpret with knowledge of fluid balance and medication  Urinary sodium may be helpful in complex cases with gastrointestinal fluid loss
Glucose	Baseline 1 or 2 times a day (or more if needed) until stable Then weekly	Glucose intolerance is common	Good glycaemic control is necessary
Magnesium, phosphate	Baseline Daily if risk of refeeding syndrome Three times a week until stable Then weekly	Depletion is common and under recognised	Low concentrations indicate poor status
Liver function tests including International Normalised Ratio (INR)	Baseline Twice weekly until stable Then weekly	Abnormalities common during parenteral nutrition	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



C-reactive protein	Baseline Then 2 or 3 times a week until stable	Assists interpretation of protein, trace element and vitamin results	To assess the presence of an acute phase reaction (APR). The trend of results is important
Zinc, copper	Baseline Then every 2–4 weeks, depending on results	Deficiency common, especially when increased losses	People most at risk when anabolic APR causes Zn ↓ and Cu ↑
Selenium <sup>a</sup>	Baseline if risk of depletion Further testing dependent on baseline	Se deficiency likely in severe illness and sepsis, or long-term nutrition support	APR causes Se ↓ Long-term status better assessed by glutathione peroxidase
Full blood count and MCV	Baseline 1 or 2 times a week until stable Then weekly	Anaemia due to iron or folate deficiency is common	Effects of sepsis may be important
Iron, ferritin	Baseline Then every 3–6 months	Iron deficiency common in long-term parenteral nutrition	Iron status difficult if APR (Fe ↓, ferritin ↑)
Folate, B12	Baseline Then every 2–4 weeks	Iron deficiency is common	Serum folate/B12 sufficient, with full blood count
Manganese <sup>b</sup>	Every 3–6 months if on home parenteral nutrition	Excess provision to be avoided, more likely if liver disease	Red blood cell or whole blood better measure of excess than plasma
25-OH Vit D <sup>b</sup>	6 monthly if on long-term support	Low if housebound	Requires normal kidney function for effect
Bone densitometry <sup>b</sup>	On starting home parenteral nutrition Then every 2 years	Metabolic bone disease diagnosis	Together with lab tests for metabolic bone disease

<sup>a</sup> These tests are needed primarily for people having parenteral nutrition in the community.

<sup>b</sup> These tests are rarely needed for people having enteral tube feeding (in hospital or in the community), unless there is cause for concern.

## 1.6 Oral nutrition support in hospital and the community

### People with dysphagia

- 1.6.1 People who present with any obvious or less obvious indicators of dysphagia listed in Box 2 should be referred to healthcare professionals with relevant skills and training in the diagnosis, assessment and management of swallowing disorders. **D(GPP)**

### Box 2 Indicators of dysphagia

Obvious indicators of dysphagia	Less obvious indicators of dysphagia
Difficult, painful chewing or swallowing	Change in respiration pattern
Regurgitation of undigested food	Unexplained temperature spikes
Difficulty controlling food or liquid in the mouth	Wet voice quality
Drooling	Tongue fasciculation (may be indicative of motor neurone disease)
Hoarse voice	Xerostomia
Coughing or choking before, during or after swallowing	Heartburn
Globus sensation	Change in eating habits – for example, eating slowly or avoiding social occasions
Nasal regurgitation	Frequent throat clearing
Feeling of obstruction	Recurrent chest infections
Unintentional weight loss – for example, in people with dementia	Atypical chest pain

- 1.6.2 Healthcare professionals should recognise that people with acute and chronic neurological conditions and those who have undergone surgery or radiotherapy to the upper aero-digestive tract are at high risk of developing dysphagia. **D(GPP)**

- 1.6.3 When managing people with dysphagia, healthcare professionals with relevant skills and training in the diagnosis, assessment and management of swallowing disorders should consider: **D(GPP)**

- the risks and benefits of modified oral nutrition support and/or enteral tube feeding
- the factors listed in Box 3.

### **Box 3 Factors to be considered before modification of nutrition support and hydration in people with dysphagia**

Recurrent chest infections

Mobility

Dependency on others for assistance to eat

Perceived palatability and appearance of food or drink

Level of alertness

Compromised physiology

Poor oral hygiene

Compromised medical status

Metabolic and nutritional requirements

Vulnerability (for example, immunocompromised)

Comorbidities

1.6.4 People with dysphagia should have a drug review to ascertain if the current drug formulation, route and timing of administration remains appropriate and is without contraindications for the feeding regimen or swallowing process. **D(GPP)**

1.6.5 Healthcare professionals with relevant skills and training in the diagnosis, assessment and management of swallowing disorders should regularly monitor and reassess people with dysphagia who are having modified food and liquid until they are stable. **D(GPP)**

#### **Indications**

1.6.6 Healthcare professionals should consider oral nutrition support to improve nutritional intake for people who can swallow safely and are malnourished or at risk of malnutrition as defined in 1.3.1 and 1.3.2, respectively.<sup>11</sup> **A**

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<sup>11</sup> Oral nutrition support includes any of the following methods to improve nutritional intake: fortified food with protein, carbohydrate and/or fat, plus minerals and vitamins; snacks; oral nutritional supplements; altered meal patterns; the provision of dietary advice.

- 1.6.7 Healthcare professionals should ensure that the overall nutrient intake of oral nutrition support offered contains a balanced mixture of protein, energy, fibre, electrolytes, vitamins and minerals. **D(GPP)**
- 1.6.8 If there is concern about the adequacy of micronutrient intake, a complete oral multivitamin and mineral supplement providing the reference nutrient intake for all vitamins and trace elements should be considered by healthcare professionals with the relevant skills and training in nutrition support who are able to determine the nutritional adequacy of a patient's dietary intake. **D(GPP)**
- 1.6.9 Oral nutrition support should be stopped when the patient is established on adequate oral intake from normal food. **D(GPP)**

### **Surgical patients**

- 1.6.10 Peri-operative oral nutrition support should be considered for surgical patients who can swallow safely and are malnourished as defined in 1.3.1. **B**
- 1.6.11 Healthcare professionals should consider giving post-caesarean or gynaecological surgical patients who can swallow safely, some oral intake within 24 hours of surgery. **A**
- 1.6.12 Healthcare professionals should consider giving post-abdominal surgery patients who can swallow safely, and in whom there are no specific concerns about gut function or integrity, some oral intake within 24 hours of surgery. The patient should be monitored carefully for any signs of nausea or vomiting. **A**

### **1.7 Enteral tube feeding in hospital and the community**

In this guideline, enteral tube feeding refers to the delivery of a nutritionally complete feed (as specified in section 1.4) via a tube into the stomach, duodenum or jejunum.

## Indications

- 1.7.1 Healthcare professionals should consider enteral tube feeding in people who are malnourished or at risk of malnutrition as defined in 1.3.1 and 1.3.2, respectively, and have: **D(GPP)**
- inadequate or unsafe oral intake, and
  - a functional, accessible gastrointestinal tract.
- 1.7.2 Enteral tube feeding should not be given to people unless they meet the criteria in 1.7.1, or they are taking part in a clinical trial. **A**
- 1.7.3 Enteral tube feeding should be stopped when the patient is established on adequate oral intake. **D(GPP)**

## Surgical patients

- 1.7.4 Surgical patients who are: malnourished, as defined in 1.3.1, and meet the criteria in 1.7.1, and are due to undergo major abdominal procedures, should be considered for pre-operative enteral tube feeding. **B**
- 1.7.5 General surgical patients should not have enteral tube feeding within 48 hours post-surgery unless they meet the criteria in 1.7.1. **A**

## Route of access

- 1.7.6 People in general medical, surgical and intensive care wards who meet the criteria in 1.7.1 should be fed via a tube into the stomach unless there is upper gastrointestinal dysfunction. **A**
- 1.7.7 People who meet the criteria in 1.7.1, with upper gastrointestinal dysfunction (or an inaccessible upper gastrointestinal tract) should be considered for post-pyloric (duodenal or jejunal) feeding. **D(GPP)**

- 1.7.8 Gastrostomy feeding should be considered in people likely to need long-term (4 weeks or more) enteral tube feeding. **D(GPP)**
- 1.7.9 Percutaneous endoscopic gastrostomy (PEG) tubes which have been placed without apparent complications can be used for enteral tube feeding 4 hours after insertion. **A**

### **People with dysphagia**

- 1.7.10 In the acute setting, for example following stroke, people unable to swallow safely or take sufficient energy and nutrients orally should have an initial 2–4 week trial of nasogastric enteral tube feeding. Healthcare professionals with relevant skills and training in the diagnosis, assessment and management of swallowing disorders should assess the prognosis and options for future nutrition support. **A**

### **Mode of delivery**

- 1.7.11 For people being fed into the stomach, bolus or continuous methods should be considered, taking into account patient preference, convenience and drug administration. **B**
- 1.7.12 For people in intensive care, nasogastric tube feeding should usually be delivered continuously over 16–24 hours daily. If insulin administration is needed it is safe and more practical to administer feeding continuously over 24 hours. **D(GPP)**

### **Motility agents**

- 1.7.13 For people in intensive care with delayed gastric emptying who are not tolerating enteral tube feeding, a motility agent should be considered, unless there is a pharmacological cause that can be rectified or suspicion of gastrointestinal obstruction. **A**
- 1.7.14 People in other acute care settings who have delayed gastric emptying and are not tolerating enteral tube feeding should also be

offered a motility agent unless there is a pharmacological cause that can be rectified or suspicion of gastrointestinal obstruction. **D(GPP)**

- 1.7.15 If delayed gastric emptying is severely limiting feeding into the stomach, despite the use of motility agents, post-pyloric enteral tube feeding and/or parenteral nutrition should be considered. **D(GPP)**

### **Management of tubes**

- 1.7.16 People requiring enteral tube feeding should have their tube inserted by healthcare professionals with the relevant skills and training. **D(GPP)**
- 1.7.17 The position of all nasogastric tubes should be confirmed after placement and before each use by aspiration and pH graded paper (with X-ray if necessary) as per the advice from the National Patient Safety Agency (NPSA 2005). Local protocols should address the clinical criteria that permit enteral tube feeding. These criteria include how to proceed when the ability to make repeat checks of the tube position is limited by the inability to aspirate the tube, or the checking of pH is invalid because of gastric acid suppression. **D(GPP)**
- 1.7.18 The initial placement of post-pyloric tubes should be confirmed with an abdominal X-ray (unless placed radiologically). Agreed protocols setting out the necessary clinical checks need to be in place before this procedure is carried out. **D(GPP)**

## ***1.8 Parenteral nutrition in hospital and the community***

### **Indications**

- 1.8.1 Healthcare professionals should consider parenteral nutrition in people who are malnourished or at risk of malnutrition as defined in



1.3.1 and 1.3.2, respectively, and meet either of the following criteria: **D(GPP)**

- inadequate or unsafe oral and/or enteral nutritional intake
- a non-functional, inaccessible or perforated (leaking) gastrointestinal tract.

## **Prescription**

1.8.2 Parenteral nutrition should be introduced progressively and closely monitored, usually starting at no more than 50% of estimated needs for the first 24–48 hours. Parenteral nutrition can be withdrawn once adequate oral or enteral nutrition is tolerated and nutritional status is stable. Withdrawal should be planned and stepwise with a daily review of the patient's progress. **D(GPP)**

1.8.3 Patients who need parenteral nutrition should have their nutritional requirements determined by healthcare professionals with the relevant skills and training in the prescription of nutrition support. Before using most parenteral nutrition products, micronutrients and trace elements should be added and additional electrolytes and other nutrients may also be needed. Additions should be made under appropriate pharmaceutically controlled environmental conditions before administration. **D(GPP)**

1.8.4 Parenteral nutrition should be stopped when the patient is established on adequate oral and/or enteral support. There is no minimum length of time for the duration of parenteral nutrition. **D(GPP)**

## **Surgical patients**

1.8.5 Healthcare professionals should consider supplementary peri-operative parenteral nutrition in malnourished surgical patients who meet the criteria in 1.8.1. **B**

- 1.8.6 Peri-operative supplementary parenteral nutrition should not be given to surgical patients unless they meet the criteria set out in 1.8.1. **B**
- 1.8.7 If intestinal tolerance persistently limits enteral tube feeding in surgical or critical care patients, parenteral nutrition should be used to supplement or replace enteral tube feeding. **B**

### **Route of access**

- 1.8.8 In hospital, parenteral nutrition can be given via a dedicated peripherally inserted central catheter as an alternative to a dedicated centrally placed central venous catheter. A free dedicated lumen in a multi-lumen centrally placed catheter may also be used. **B**
- 1.8.9 Administration of parenteral nutrition via a peripheral venous catheter should be considered for patients who are likely to need short-term parenteral nutrition (less than 14 days) who have no need for central access for other reasons. Care should be taken in catheter choice, and in attention to pH, tonicity and long-term compatibility of the parenteral nutrition formulations in order to avoid administration or stability problems. **B**
- 1.8.10 Tunnelling subclavian lines is recommended for long-term use (more than 30 days). **D(GPP)**
- 1.8.11 Catheters do not have to be tunnelled for short-term use (less than 30 days). **B**

### **Mode of delivery**

- 1.8.12 Continuous administration of parenteral nutrition should be offered as the preferred method of infusion in severely ill people who require parenteral nutrition. **B**

- 1.8.13 Cyclical delivery of parenteral nutrition should be considered when using peripheral venous cannulae with planned routine catheter change. **B**
- 1.8.14 A gradual change from continuous to cyclical delivery should be considered in patients requiring parenteral nutrition for more than 2 weeks. **D(GPP)**

### **Management of catheters**

- 1.8.15 Only healthcare professionals competent in catheter placement should be responsible for the placement of catheters and they should be aware of the importance of monitoring and managing these safely.<sup>12</sup> **D(GPP)**

## **1.9 Supporting patients in the community**

- 1.9.1 Healthcare professionals should ensure that patients having enteral or parenteral nutrition in the community and their carers: **D(GPP)**
- are kept fully informed and have access to appropriate sources of information in formats, languages and ways that are suited to an individual's requirements. Consideration should be given to cognition, gender, physical needs, culture and stage of life of the individual
  - have the opportunity to discuss diagnosis, treatment options and relevant physical, psychological and social issues
  - are given contact details for relevant support groups, charities and voluntary organisations.

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<sup>12</sup> Infection control: prevention of healthcare-associated infection in primary and community care. *NICE Clinical Guideline* No. 2 (2003). Available from [www.nice.org.uk/CG002](http://www.nice.org.uk/CG002)

## Enteral tube feeding

- 1.9.2 All people in the community having enteral tube feeding should be supported by a coordinated multidisciplinary team, which includes dietitians, district, care home or homecare company nurses, GPs, community pharmacists and other allied healthcare professionals (for example, speech and language therapists) as appropriate. Close liaison between the multidisciplinary team and patients and carers regarding diagnoses, prescription, arrangements and potential problems is essential. **D(GPP)**
- 1.9.3 Patients in the community having enteral tube feeding and their carers should receive an individualised care plan which includes overall aims and a monitoring plan. **D(GPP)**
- 1.9.4 Patients in the community having enteral tube feeding and their carers, should receive training and information from members of the multidisciplinary team on: **D(GPP)**
- the management of the tubes, delivery systems and the regimen, outlining all procedures related to setting up feeds, using feed pumps, the likely risks and methods for troubleshooting common problems and be provided with an instruction manual (and visual aids if appropriate)
  - both routine and emergency telephone numbers to contact a healthcare professional who understands the needs and potential problems of people on home enteral tube feeding
  - the delivery of equipment, ancillaries and feed with appropriate contact details for any homecare company involved.

## Parenteral nutrition

- 1.9.5 All people in the community having parenteral nutrition should be supported by a co-ordinated multidisciplinary team, which includes input from specialist nutrition nurses, dietitians, GPs, pharmacists

and district and/or homecare company nurses. Close liaison between the multidisciplinary team and patients and carers regarding diagnoses, prescription, arrangements and potential problems is essential. **D(GPP)**

1.9.6 People in the community having parenteral nutrition and their carers should receive an individualised care plan which includes overall aims and a monitoring plan. **D(GPP)**

1.9.7 People in the community having parenteral nutrition and their carers should receive training and information from members of the multidisciplinary team on: **D(GPP)**

- the management of the delivery systems and the regimen, outlining all procedures related to setting up feeds, using feed pumps, the likely risks and methods for troubleshooting common problems and be provided with an instruction manual (and visual aids if appropriate)
- routine and emergency telephone numbers to contact a healthcare professional with the relevant competencies (specialist nutrition nurse, pharmacist)
- the arrangements for the delivery of equipment, ancillaries and feed with appropriate contact details for any homecare company involved.

## **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 Groups that will be covered***

- Adults (aged 18 years or older) in hospital and the community, with a disease, disorder or other condition, who are at risk of malnutrition or who have become malnourished.
- As far as is possible, recommendations for the general adult population will be made and specific recommendations may be made for certain clinical situations, conditions or groups (such as elderly people), although it will not be possible to do this for a large number of situations, conditions or groups.
- Patients receiving home enteral and parenteral nutrition.

### ***2.2 Groups that will not be covered***

- Patients requiring specific long-term therapeutic regimens for the treatment of diseases such as inborn errors of metabolism and chronic renal, liver or cardiac disease.
- Pregnant women, because the nutritional demands on the mother and baby need specialist considerations.
- Patients with eating disorders. This is covered in the NICE guideline on eating disorders.
- People who are obese. This will be covered by the NICE obesity guidelines expected to be published in 2007.

- Primary prevention of malnutrition in healthy individuals in the general population.
- Children and adolescents under the age of 18 years.

### 3 Implementation in the NHS

The Healthcare Commission will assess the performance of NHS organisations in meeting core and developmental standards set by the Department of Health in *Standards for better health* issued in July 2004.

Implementation of clinical guidelines forms part of the developmental standard D2. Core standard C5 says that national agreed guidance should be taken into account when NHS organisations are planning and delivering care.

This guideline is supported by the following implementation tools available on our website [www.nice.org.uk/CG032](http://www.nice.org.uk/CG032)

- A slide set; key messages for local discussion.
- Costing tools:
  - a national costing report, which estimates the overall resource impact associated with implementation
  - a local costing template: a simple spreadsheet that can be used to estimate the local cost of implementation.
- Implementation advice; practical suggestions on how to address potential barriers to implementation.

Suggested audit criteria based on the key priorities for implementation are listed in Appendix D of this document (see page 52), 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 section 5).

### **4.1 Research question**

Further research is needed to ascertain whether an educational intervention (for example, three 1-week modular courses, over 6 months) for all healthcare professionals, in particular medical and nursing staff including those who work with people with dementia, would have an affect on patient care (that is, affect on nutritional status, length of hospital stay, frequency of GP visits, complications and quality of life) compared with no formal education?

#### **Why this is important**

It is known that healthcare professionals in both the hospital and community setting have a poor knowledge of nutrition. This is partly due to receiving a minimal amount of education in nutrition during their undergraduate or basic training. It is therefore essential to determine whether an organised nutrition support education programme to healthcare professionals would improve the choice made about nutrition support and the consequent care of patients prescribed nutrition support.

### **4.2 Research question**

What are the benefits to patients of a nutritional screening programme (using a simple tool such as the 'Malnutrition Universal Screening Tool' [MUST]) compared with not screening people in: a) primary care (attending GP clinics); b) care homes; c) hospital inpatients; d) hospital outpatients; e) patients with dementia in terms of determining the number of people at risk of malnutrition, complications, survival, hospital admission rates, length of stay, quality of life and cost effectiveness?

### **Why this is important**

There is no clear evidence available as to whether screening is really beneficial or how it should be carried out. With the lack of evidence the GDG have considered in detail this problem and have instead carefully developed consensus statements to support recommendations for screening. As a priority it is important that we determine the need for screening and intervention – in particular, primary care and the wider community.

### **4.3 Research question**

Further research is needed to identify which components of nutrition monitoring are clinically and cost effective.

### **Why this is important**

There is no clear evidence available regarding the long- and short-term benefits of clinical monitoring in terms of prevention of complications and survival. With the lack of evidence the GDG have considered in detail this problem and have instead carefully developed the guidance for monitoring by expert clinical practice and consensus opinion.

### **4.4 Research question**

What are the benefits of patients (in hospital or the community, including older people) identified as at high risk of malnutrition by a screening tool such as MUST being offered either oral nutritional supplements compared with: a) dietary modification and/or food fortification; or b) dietary modification and/or food fortification together with dietary counselling, in terms of determining complications, survival, length of hospital stay, quality of life and cost effectiveness?

### **Why this is important**

This is an essential recommendation for research since there is insufficient evidence on the benefits of intervention used for oral nutrition support – in particular, the benefits of often first line treatment, for example food fortification and/or dietary counselling. It is essential to know this so that the indications on how to treat can be further supported.

#### **4.5 Research question**

What are the benefits of enteral tube feeding to patients compared with no enteral tube feeding in people with dysphagia and early to mid-stage dementia in terms of reduced complications associated with swallowing, improved nutritional status, delayed onset of advanced stage dementia, hospital admissions, cost effectiveness and survival?

#### **Why this is important**

Much of the research tends to focus or concentrate on tube feeding people with advanced dementia or those who may be in terminal stages of the disease. Depending on the type of dementia, swallowing disorders may occur at an earlier stage in the disease, for example vascular dementia. The benefits and complications of tube feeding may be quite different in people in the earlier stages than those who are in the advanced stage of dementia.

## **5 Other versions of this guideline**

The National Institute for Health and 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 [www.nice.org.uk/guidelinesprocess](http://www.nice.org.uk/guidelinesprocess) 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 nutrition support, enteral tube feeding and parenteral nutrition, is published by the National Collaborating Centre for Acute Care; it is available from [www.rcseng.ac.uk/research/nccac](http://www.rcseng.ac.uk/research/nccac), the NICE website ([www.nice.org.uk/CG032fullguideline](http://www.nice.org.uk/CG032fullguideline)) and the website of the National Library for Health ([www.nlh.nhs.uk](http://www.nlh.nhs.uk)).

### **5.2 Quick reference guide**

A quick reference guide for health professionals is also available from the NICE website ([www.nice.org.uk/CG032quickrefguide](http://www.nice.org.uk/CG032quickrefguide)) or from the NHS Response Line (telephone 0870 1555 455; quote reference number N0977).

### **5.3 Information for the public**

A version of this guideline for people who need nutrition support, their families and carers, and for the public, is available from the NICE website ([www.nice.org.uk/CG032publicinfo](http://www.nice.org.uk/CG032publicinfo)) or from the NHS Response Line (0870 1555 455); quote reference number N0978).

## 6 Related NICE guidance

Chronic obstructive pulmonary disease: management of chronic obstructive pulmonary disease in adults in primary and secondary care. *NICE Clinical Guideline* No. 12 (2004). Available from [www.nice.org.uk/CG012](http://www.nice.org.uk/CG012)

Eating disorders: core interventions in the treatment and management of anorexia nervosa, bulimia nervosa and related eating disorders. *NICE Clinical Guideline* No. 9 (2004). Available from [www.nice.org.uk/CG009](http://www.nice.org.uk/CG009)

Pressure ulcer risk assessment and prevention. *NICE Inherited Clinical Guideline* No. B (2001). Available from [www.nice.org.uk/guidelineb](http://www.nice.org.uk/guidelineb)

Infection control: prevention of healthcare-associated infection in primary and community care. *NICE Clinical Guideline* No. 2 (2003). Available from [www.nice.org.uk/CG002](http://www.nice.org.uk/CG002)

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

Dementia: the treatment and care of people with dementia in health and social care. *NICE Clinical Guideline*. (Publication expected November 2006.)

Obesity: the prevention, identification, assessment and management of overweight and obesity in adults and children. *NICE Clinical Guideline*. (Publication expected February 2007.)

## 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 relationship is causal</li> </ul>
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**

### **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**

Dietitian, Department of Medicine and Therapeutics, Imperial College, London; British Dietetic Association (BDA)

#### **Mrs Vicky Bradnam**

Chief Pharmacist, Bromley Hospitals NHS Trust, Bromley. Royal Pharmaceutical Society of Great Britain

#### **Mrs Andrea Cartwright**

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

#### **Miss Gwen Coleman**

Manager, Food for Thought, Patient representative for Alzheimer's Society

#### **Mrs 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 Action Group (BAPEN)



**Professor Richard Griffiths**

Professor of Medicine (Intensive Care), Division of Metabolic and Cellular Medicine, School of Clinical Science, University of Liverpool, and the Intensive Care Society (UK)

**Ms Judith Jackson**

Principal Speech and Language Therapist, Islington PCT based at Whittington Hospital; Royal College of Speech and Language Therapists Advisor in dysphagia

**Professor Paul Little**

Professor of Primary Care Research, University of Southampton; Royal College of General Practitioners

**Mr Bruce McElroy**

Associate Director of Pharmacy, University Hospital Birmingham Foundation Trust, Birmingham, Royal Pharmaceutical Society of Great Britain

**Dr Jeremy Nightingale**

Consultant Gastroenterologist, Digestive Disease Centre, Leicester Royal Infirmary; British Society of Gastroenterology

**Miss Joanna Prickett**

Chief Dietitian, Department Nutrition and Dietetics, North Bristol NHS Trust, 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

**Mrs Carolyn Wheatley**

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

### **NCC-AC staff on the Guideline Development Group**

Ms Susan Murray	Project Manager
Ms Louise Thomas	Research Associate/Assistant Project Manager
Dr Funsho Akinluyi	Research Associate
Ms Rifna Aktar	Research Associate
Ms Leticia Barcena	Research Associate
Dr John Browne	Advisor on methodological issues
Mr Peter B Katz	Information Specialist
Ms Veena Mazarello Paes	Research Associate
Ms Guldem Okem	Health Economist
Dr Arash Rashidian	Advisor on methodological issues
Mr Carlos Sharpin	Information Specialist and Reviewer
Ms Rachel Southon	Information Specialist
Mr David Wonderling	Health Economist

## **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 people and carers. The members of the Guideline Review Panel were as follows.

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

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

### **Mrs Joyce Struthers**

Patient Representative, Bedford

### **Dr Peter Duncan (Deputy Chair)**

Consultant in Anaesthetics and Intensive Care Medicine, Royal Preston Hospital

### **Mr Mike Baldwin**

Head of Health Technology Appraisals, Sanofi-Aventis

### **Mrs Anne Williams**

Deputy Director of Clinical Governance, Kettering General Hospital NHS Trust, Northamptonshire

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

Criterion	Exception	Definition of terms
<p>To determine the risk of malnutrition:</p> <ul style="list-style-type: none"> <li>• hospital inpatients are screened on admission and this is repeated weekly</li> <li>• hospital outpatients are screened at their first clinic appointment and at subsequent appointments where there is clinical concern</li> <li>• people in care homes should be screened on admission and when there is clinical concern</li> </ul> <p>A clear process should be established for documenting the outcomes of screening (that is, 'nutritional risk score') and the subsequent actions (that is, 'nutritional care plan') taken if the patient is recognised as malnourished or at risk of malnutrition.</p>	<p>Hospital departments considered to have people at low risk of malnutrition. They will have specifically opted out of screening having followed an explicit process to do so via the local clinical governance structure and involving experts in nutrition support.</p> <p>Subsequent screening of people in care homes if there is no clinical concern about risk of under nutrition.</p>	<p>A simple screening tool should be used that includes BMI (or other estimate, for example mid-arm circumference when weight cannot be measured), percentage weight loss, and considers the time over which nutrient intake has been reduced (for example, the malnutrition universal screening tool ('MUST')).</p> <p>Examples for clinical concern; people with fragile skin, poor wound healing, apathy, wasted muscles, poor appetite, altered taste sensation, impaired swallowing, altered bowel habit, loose fitting clothes or prolonged intercurrent illness).</p>
<p>Documentation in patient records that consideration has been given as to whether the patient presents with any indications for malnutrition or risk of malnutrition and a record of whether options of nutrition support have been considered for people who present with:</p> <ul style="list-style-type: none"> <li>• a BMI less than 18.5 kg/m<sup>2</sup>,</li> <li>• unintentional loss of greater than 10% body weight within the previous 3–6 months,</li> <li>• a BMI less than 20 kg/m<sup>2</sup> and more than 5% unintentional</li> </ul>		

Criterion	Exception	Definition of terms
<p>body weight loss within the previous 3–6 months,</p> <ul style="list-style-type: none"> <li>• the patient has eaten little or nothing for more than 5 days and/or is likely to eat little or nothing for the next 5 days or longer</li> <li>• the patient has poor absorptive capacity, is catabolic and/or has high nutrient losses and/or has increased nutritional needs.</li> </ul>		
<p>There should be clear documentation in patient records that patients who present with the indications for nutrition support (1.3.1 and 1.3.2) are considered for oral nutrition support as indicated in 1.6.6 and/or enteral tube feeding as indicated in 1.7.1 or parenteral nutrition as indicated in 1.8.1.</p>		
<p>There should be documentation that healthcare workers directly involved in patient care in the hospital and community settings have received training in nutrition support (relevant to their post) on:</p> <ol style="list-style-type: none"> <li>1) the nutritional needs and indications for nutrition support</li> <li>2) the options available for providing nutrition support (oral, enteral and parenteral, routes, mode of access, prescription)</li> <li>3) ethical and legal concepts relating to nutrition support</li> <li>4) the potential risks and benefits of the different methods of nutrition support – for example, refeeding syndrome</li> <li>5) when and where to seek expert advice</li> </ol>	<p>Healthcare professionals who are recognised experts in the field of nutrition support as recognised within the local clinical governance structure.</p> <p>Healthcare workers who are not directly involved in patient care.</p>	<p>This should take place at the start of their employment and thereafter biannually.</p>

<b>Criterion</b>	<b>Exception</b>	<b>Definition of terms</b>
<p>In patients who receive nutrition support there should be clear documentation of which healthcare professionals have been involved in the prescription, administration and monitoring. Records should be kept of important outcome measures such as frequency of GP visits, hospital duration, complications – for example, infections.</p>	<p>People not prescribed nutrition support</p>	
<p>In acute hospitals trusts the nutrition steering committee should support at least one hospital specialist nutrition support nurse who should work alongside nursing staff, dietitians and other experts in nutrition support to facilitate ongoing training of ward staff who care for people on nutrition support. A system of documenting hospital staff adherence to nutrition support protocols should be established for each patient prescribed nutrition support, along with data collection on complications related to the use of nutrition support – for example, poor tolerance of feeds or tubes, infections rate, site of infection.</p>	<p>GP practice</p>	<p>Nutrition Steering Committee working within the clinical Governance framework may include representatives from medical staff, dietetics, nursing, pharmacy, catering and management.</p>
<p>Senior managers of hospitals should maintain clear documentation of the outcomes of nutrition steering committees meetings. They should attempt to record the benefits of their work such as clinicians' adherence to nutrition support protocols that have been developed and agreed by the nutrition steering committee.</p>		