



BAPEN

*Putting patients at the centre
of good nutritional care*

Managing malnutrition to improve lives and save money

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British Association for Parenteral and Enteral Nutrition (BAPEN)

BAPEN is a multi-professional association and registered charity established in 1992. Its membership is drawn from doctors, dietitians, nurses, patients, pharmacists and the health policy, industry, public health and research sectors.

- BAPEN works to achieve its mission by raising awareness of the prevalence and impact of malnutrition, raising standards in nutritional care and developing appropriate pathways to prevent malnutrition
- BAPEN researches and publishes the evidence on malnutrition, and provides tools, guidance, educational resources and events for all health and social care professionals to support the implementation of nutritional care across all care settings and according to individual need.
- BAPEN works in partnership with its membership, its core specialist groups and external stakeholders to embed excellent nutritional care into the policy processes and practices of all health and care settings.

Malnutrition Action Group (MAG) of BAPEN

- The Malnutrition Action Group of BAPEN aims to facilitate many of the key objectives of BAPEN, particularly the detection and management of malnutrition in the UK, including providing tools for screening ('MUST') and assessing nutritional care (Nutritional Care Tool), raising the profile of malnutrition among health and social care professionals and the public, and promoting high quality, evidence-based nutritional care.

British Artificial Nutrition Survey (BANS) of BAPEN

- The aims of BANS are: To monitor trends in artificial nutrition support, track treatment outcomes, establish structure of artificial nutrition support services, identify problems associated with the use/lack artificial nutrition support and assess standards of care

The definition of malnutrition used here is 'a state of nutrition in which a deficiency of energy, protein and other nutrients causes adverse effects on the body's size, composition and function resulting in poorer clinical outcomes'. In this report the term malnutrition is used to refer to undernutrition only (and not overnutrition and obesity).

Key points

Malnutrition is a public health problem, estimated to cost at least £19.6 billion in England (£23.5 billion in the UK), which is about 15% of the total expenditure on health and social care. Most of the costs of malnutrition are in health care (£15.2bn), mostly secondary care, with £4bn from social care. The costs of malnutrition are likely to rise in the future as the population ages.

Older adults (aged 65 years and over) account for 52% of the total costs of malnutrition, with the remainder from younger adults (<65 years) and children. The annual health and social costs are estimated to be 3x greater for a malnourished patient (£7408) than a non-malnourished patient (£2155).

The costs of malnutrition are high as:

1. Malnutrition is common across health and social care settings in those with disease, and in older people.
2. Malnutrition continues to be under-identified and under-treated.
3. Malnutrition has adverse effects if unidentified and untreated. The consequences of untreated malnutrition include physical and functional decline and poorer clinical outcomes (e.g. increased infections, wounds, complications, mortality), leading to greater health care use (hospital (re)admissions, longer hospital stays, more GP visits, increased prescription costs).

The expenditure on treatments and strategies to identify and manage malnutrition is a very small proportion of the overall costs of malnutrition (<2.5%).

Research, national NICE guidance and clinical pathways highlight the importance of:

1. Malnutrition screening with a validated tool (e.g. Malnutrition Universal Screening Tool 'MUST') to identify malnutrition and initiate a treatment plan, whilst identifying and managing the underlying cause.
2. Managing malnutrition in a timely and evidence-based way with nutritional support, such as the appropriate prescription of oral nutritional supplements for those patients at high risk of malnutrition who can be managed orally, and use of enteral tube feeding and/or parenteral nutrition where indicated. Dietitians can provide expert dietary advice and guidance on all strategies for managing malnutrition.

Identifying malnutrition (with screening) and effectively managing this condition can improve lives and save money. Research confirms the benefits of managing malnutrition with nutritional support, such as the use of oral nutritional supplements alongside the diet, resulting in improvements in patients' function (e.g. strength), quality of life and clinical outcomes, and reductions in health care use (e.g. hospital stays, admissions).

Economic analysis shows that identifying and treating malnutrition can save at least ~£123,530 per 100,000 people, a ~£65m net saving for England. A large proportion of these estimated savings arises from the clinical and cost effectiveness of oral nutritional supplements, reducing health care use. The economic analyses of both NICE and BAPEN show that managing malnutrition with nutritional support according to NICE CG32/QS24 is highly cost effective, and compares favourably with other interventions in clinical practice.

Costs of malnutrition

The UK was the first country to publish a report on the estimated costs of malnutrition in 2005(1), which was subsequently updated in 2009(2). Both of these earlier reports highlighted the scale and economic burden of this condition to society. With the rise in the population of older people, disease prevalence and health and social care budgets, it is not surprising that the most recent analysis published in 2015(3) confirmed that malnutrition is still an extremely costly public health problem in our society.

Malnutrition is estimated to cost at least £19.6 billion in England (£23.5 billion in the UK), which is about 15% of the total expenditure on health and social care. This corresponds to ~£370 per capita of population.

Most of the costs of malnutrition are in health care (£15.27bn), mostly secondary care, with £4.36bn from social care. The health and social care costs are estimated to be 3x greater for a malnourished patient (£7408) than a non-malnourished patient (£2155).

Costs of malnutrition are likely to rise in the future as the population ages. Older adults (aged 65 years and over) already account for 52% of the total costs of malnutrition, with the remainder from younger adults (< 65 years) and children.

The costs of malnutrition are estimated wherever possible from age-specific and location-specific (e.g. health or social care settings) data on the prevalence of malnutrition, mostly using 'MUST' in adults (medium plus high risk, www.bapen.org.uk/MUST), associated resource use and the public expenditure on health and social care (2011-12)(see (3) for more details). It is anticipated that malnutrition is mostly disease-related, although there are other causes (e.g. such as social deprivation).

In addition to malnutrition, estimates suggest that in the United Kingdom, the government currently spends >£4.2 bn a year on the direct medical costs of conditions related to being overweight or obese, a figure also predicted to rise significantly in the future (to £10bn by 2050) ((4)Foresight report, 2007). The huge costs of both conditions highlight the importance of tackling nutritional problems in our society.

Why is malnutrition so costly?

The costs of malnutrition are high for a number of reasons described below

1. Malnutrition is common across health and social care settings in those with disease, and in older people.

Malnutrition is common and has long been established as a public health problem for the UK(5-7). National estimates suggest that around 29% of adult patients admitted to hospitals in the UK are at risk of malnutrition, most (21%) at high risk of malnutrition using ‘MUST’(8). The prevalence is higher in older than younger (<65y) adults (33% vs. 25%) and in emergency (33%) than elective (20%) admissions. The prevalence of malnutrition varies only slightly across the 4 countries. A high prevalence of malnutrition is also found in older adults in care homes across the UK and in each of the constituent countries(9). The prevalence is lower in residential care homes (27%) than in nursing homes (41%).

Country	Hospitals (% patients malnourished)*	Care homes (% residents malnourished)*~
UK	29 (21% are high risk)	35 (23% are high risk)
England	30	35
Scotland	24	39
Wales	28	27
N Ireland	29	33

* Medium and high risk of malnutrition using ‘MUST’ ~admitted within the past 6 months

Table 1. Malnutrition is common in hospitals and care homes in the UK

Around 15% of adult outpatients are estimated to be at risk of malnutrition, 14% of those living in sheltered housing, 18% of those in mental health units and 7-10% of adults in primary care. Estimates in children also suggest malnutrition is common, although with a lower prevalence than in adults (inpatients 15%, outpatients 7.5%, primary care 4%)(3).

At any given point in time, most (93%) people at risk of malnutrition are living in the community, 5% are in care homes and 2% are in hospital. The most vulnerable groups are those with acute and chronic diseases (e.g. cancer, respiratory diseases such as COPD, gastrointestinal conditions, neurological diseases, musculoskeletal conditions, renal and liver diseases), those recently discharged from hospital (including those post-surgery), older people (including those with frailty) and those who are poor or socially isolated(3, 7, 10).

2. Malnutrition continues to be under-identified and under-treated.

Latest data from the Nutritional Care Tool annual report(11) indicates that whilst many patients in health care, mostly hospitals, are screened, many (>40%) do not receive any form of nutritional support. Similar findings in care homes and general practice suggest that a large proportion of patients with malnutrition go unrecognised and untreated(12-15). With lack of investment in nutrition support services, it is likely that the proportion of patients with malnutrition going without nutritional support will increase, with adverse clinical effects for patients and economic consequences for our health and social care system.

3. Malnutrition has adverse effects if unidentified and untreated.

The consequences of untreated malnutrition are many(7). They include physical decline (loss of muscle mass, impaired growth in infants and children), impaired psychosocial function, functional decline with reduced muscle strength, fatigue and inactivity, reduced quality of life, poorer clinical outcomes (e.g. increased infections, poor wound healing, mortality), and greater health care use (more hospital (re)admissions, longer hospital stays, more GP and HCP visits, increased prescription costs). Poorer outcomes leading to greater health care use by malnourished patients when untreated is the main driver of the large costs of this condition(3). The high costs are not because of expenditure on strategies to manage malnutrition, estimated to be a very small proportion of the overall costs of malnutrition (<2.5%)(16).

How to tackle the problem of malnutrition?

Identifying malnutrition and effectively managing this condition can improve lives and save money. Research, regulation/legislation, national NICE guidance and clinical pathways highlight the importance of promptly identifying malnutrition with screening and optimally managing malnutrition with nutritional support.

Screening for malnutrition

Malnutrition screening to identify malnutrition is key as recommended by BAPEN(6, 17), NICE CG32 and QS24(18, 19), the Department of Health and Social Care and the Care Quality Commission (CQC)(20, 21), NHS Quality Improvement Scotland (22), the Welsh Assembly Government(23) and the Department of Health Social Services and Public Safety (Northern Ireland)(24). The Malnutrition pathway (Endorsed by nine professional organisations and the patients association) also recommends screening for malnutrition (www.malnutritionpathway.co.uk). As part of the screening process, the underlying cause should be identified and managed, where feasible and ethical.

The Malnutrition Universal Screening Tool 'MUST' can be used by health care professionals to screen for malnutrition in all settings in adults. There are extensive resources for HCPs to freely use on the BAPEN website and an online 'MUST' calculator (www.bapen.org.uk/screening-and-must/must-calculator). A self-screening version of 'MUST' has also been developed for patients and carers to use to screen themselves (www.malnutritionselfscreening.org). Other screening tools are available for HCPs to use to screen infants and children and adults (see (25) for more information). Screening may need to be repeated regularly as a persons' clinical condition and nutritional problems can change. Re-screening is also important when a person moves between different health and social care settings.

The results of screening must be linked to an action plan. In some cases, a more detailed nutritional assessment will be needed, especially where there are special dietary needs/complex conditions, typically undertaken by a dietitian. Those identified with malnutrition will mostly require some form of nutritional support.

Regulations exist in the UK to make sure that people who use health and social care services have adequate nutritional care to sustain life and good health and reduce the risks of malnutrition and dehydration while they receive care and treatment. For example, The Health and Social Care Act 2008 (England) Regulation 14 states that where relevant, providers must make sure that people have enough to eat and drink to meet their nutrition and hydration needs and receive the support they need to do so. People must have their nutritional needs assessed and food must be provided to meet those needs. This includes where people are prescribed nutritional supplements and/or parenteral nutrition(20).

Managing malnutrition with nutritional support

Malnutrition should be managed in a timely and evidence-based way with an optimal diet, nutritional support, such as prescription of oral nutritional supplements (ONS) for those patients at high risk of malnutrition who can be managed orally, and with the use of enteral tube feeding and/or parenteral nutrition where indicated. Dietitians can provide expert dietary advice and guidance on all strategies for managing patients with malnutrition.

In patients at risk of malnutrition, dietary intake should be maximised as much as is feasible and in patients at medium risk of malnutrition, this maybe sufficient. When it is not possible to meet nutritional requirements from food and drink alone, multi-nutrient oral nutritional supplements should be prescribed, typically 1-3 ONS per day (300-900kcal, 12-48g protein), the quantity and duration of which will depend on the patients' clinical condition, nutritional needs and goals of treatment. It is recommended that oral nutritional supplements are used for a high-risk patient (particularly where there is acute illness, chronic conditions affecting appetite and food intake (e.g. chronic obstructive pulmonary disease (COPD), cancer, neurological disease), complex nutritional and clinical needs, severe anorexia, short periods in which to intervene e.g. in hospital, pre- or post-surgery). The reasons for this recommendation are multiple and include:

1. ONS are specially formulated and prescribable for the dietary management of disease-related malnutrition and other conditions where it is difficult to meet nutritional requirements from diet alone (e.g. dysphagia, inflammatory bowel disease etc.). Most formulations are energy and protein-dense, with a range of micronutrients, in small volumes (125-200ml) and these formulations are well tested for tolerance, compliance and acceptability (see British National Formulary, www.bnf.org).
2. ONS are the most effective way of improving total energy, protein and micronutrient intakes, when used alongside of the diet. ONS are more effective than other oral nutritional support methods as they tend not to suppress appetite and food intake. This is vital in the management of patients with disease-related malnutrition, many of whom suffer from anorexia and struggle to eat and drink enough to meet their nutritional requirements.
3. Malnourished patients in all settings (inpatients, outpatients, in care homes, in the community/ at home) have been shown to benefit from ONS, particularly those that are ready-made liquids. There are a range of benefits of liquid ONS (3, 7, 18, 26-31):
 - Improve functional outcomes e.g. muscle strength, quality of life (including mobility, ability to self care and to undertake usual activities, pain or discomfort, anxiety or depression).
 - Reduce complications (such as poor wound healing, infections)
 - Reduce health care use (e.g. admissions, hospital stays, prescriptions (e.g. for antibiotics), GP and HCP visits).
 - Use is highly cost effective as shown by NICE and BAPEN.

NICE review of the evidence for proprietary ONS
• Significantly reduce mortality
• Significantly reduce complications
• Significantly improve weight
• Functional benefits
• Better energy and protein intakes in supplemented patients in all trials
• Acceptable to patients

Table 2. NICE summary of the evidence for oral nutritional supplements (18)

NICE recommendations for oral nutritional support
• Healthcare professionals should consider oral nutritional support to improve nutritional intake for people who can swallow safely and are malnourished or at risk of malnutrition (A grade)
• Oral nutritional support includes ONS, support for people unable to feed themselves, advice from a dietitian, altered meal patterns and fortified food (with all nutrients)
• Nutritional support should contain a balanced mixture of nutrients,
• Nutritional support should continue until the patient is established on adequate oral intake from normal food
• Care is needed when using food fortification as this tends to supplement energy and not other nutrients

Table 3. NICE recommendations for oral nutritional support (18, 19)

As with any treatment, it is important to set goals, and to monitor compliance and progress. For more information about managing malnutrition in the community setting, see the malnutrition pathway (www.malnutritionpathway.co.uk). For some patients, other methods of nutritional support may be needed, such as enteral tube feeding and/or parenteral nutrition, used as a sole source of nutrition or alongside of the diet and oral nutritional supplements. Both these forms of nutritional support can be life-saving and life-sustaining (for more information refer to www.bapen.org.uk).

In summary, research confirms the benefits of managing malnutrition with nutritional support, especially the use of multi-nutrient, ready-made, liquid oral nutritional supplements alongside of the diet, resulting in improvements in function and clinical outcomes, and reductions in health care use. NICE have given the use of oral nutritional support to manage malnutrition an A grade recommendation and highlighted the cost-effectiveness.

A number of clinical pathways for the management of malnutrition in community settings exist that are endorsed by many professional organisations (including the Royal College of General Practitioners, Royal College of Nursing, Primary Care Pharmacy Association, British Dietetic Association, BAPEN etc.) and by the Patients Association (see www.malnutritionpathway.co.uk).

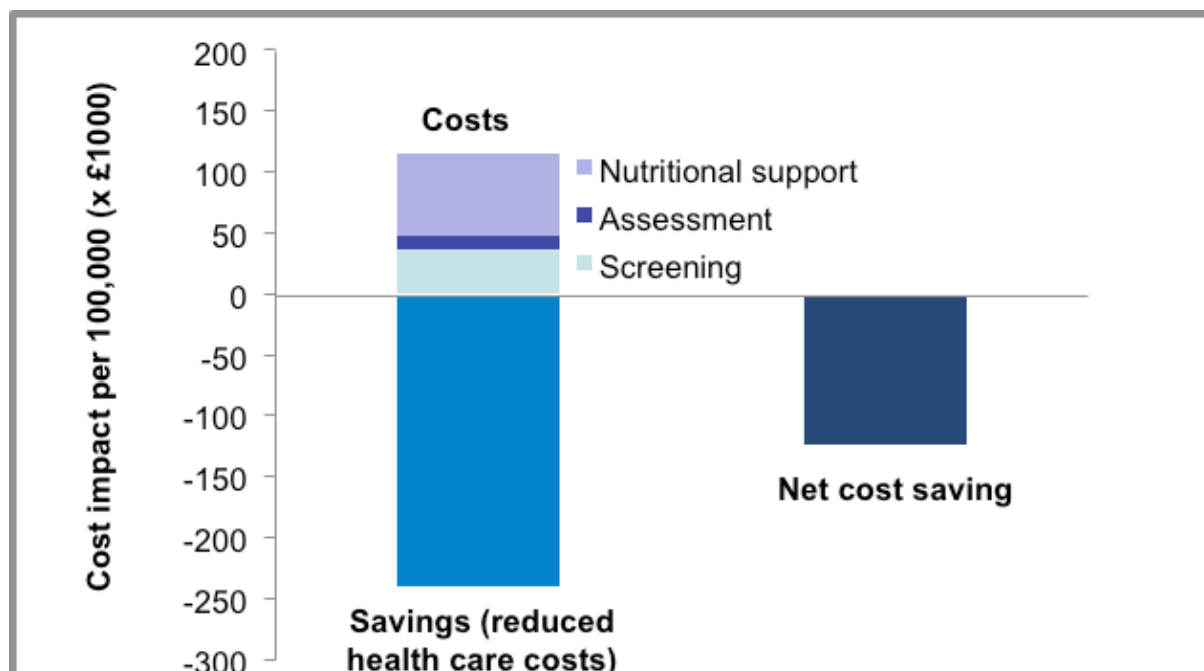
The implementation of the NICE guidance and/or malnutrition pathways in different health care settings (e.g. hospitals, care homes, general practice) to manage malnutrition (including screening and use of ONS to manage patients at high risk of malnutrition) has shown benefits including(13, 16, 32, 33):

- improved rates of screening
- weight gain
- reductions in health care use (e.g. fewer GP visits, hospital admissions, antibiotic prescriptions, shorter hospital stays)
- reduced health care costs.

Saving money by managing malnutrition

In addition to cost savings demonstrated in local areas where the implementation of the malnutrition pathway has improved outcomes and reduced health care use and costs, a health economic analysis by NIHR and BAPEN(3) shows that identifying and treating malnutrition according to the NICE guidance (CG32/QS24) can save at least ~£123,530 per 100,000 people (see Figure 2) or £308,820 per 250,000 people (approximate size of a CCG in England)(3).

Figure 2. Annual estimated costs and cost savings of managing malnutrition with nutritional support (per 100,000)



This is almost double the earlier estimate from NICE of £71,800 per 100,000 people, which had already been highlighted as one of the highest estimated cost savings to be achieved by implementing NICE guidance (see Table 4).

NICE Clinical Guidance	Saving per 100,000 population*
CG30 Long acting reversible contraception	£214,681
CG32 / QS24 Nutrition support in adults	£71,800 (updated to £123,530)(3)
CG127 Hypertension	£20,464
CG108 Chronic heart failure	£19,000
CG115 Alcohol dependence	£18,600

*As of May 5th 2016, www.nice.org.uk/about/what-we-do/into-practice/cost-saving-guidance (Note the cost savings figures are regularly updated on the NICE website)

Table 4. Examples of potential cost savings per 100,000 people from NICE clinical guidance

For the population of England, the NIHR/BAPEN report estimates that the annual costs of screening (£19.7m), assessment (£5.7m) and nutritional support (including ONS, tube feeding and parenteral nutrition, £35.7m) would be more than offset by the decrease in health care use and costs (saving of £126.6m), with a ~£65m net saving for England. Most of the reduction in health care use and associated costs (savings of £~100m in England) is a result of the impact of ONS reducing hospital stays and hospital admissions (with a saving of at least £119,200 per 100,000 people)(3).

All of these estimates are based on a model of managing 85% of those at high risk of malnutrition and estimates are far greater (£324,800-£432,300 per 100,000) if more malnourished patients are treated (e.g. 85% of medium and high risk patients) (See the full report for complete details of assumptions, and sensitivity analyses(3)).

In summary, the economic models available show that managing malnutrition with nutritional support according to the NICE CG32/QS24 guidance is highly cost effective, and compares favourably with intervention with other NICE guidance/standards in clinical practice(34, 35), as illustrated by the quotes below.

'Improving the identification and treatment of malnutrition is estimated to have the third highest potential to deliver cost savings to the NHS' NHS England, 2015(35)

'If this guidance (CG32) was fully implemented and resulted in better nourished patients then this would lead to reduced complications such as secondary chest infections, pressure ulcers, wound abscesses and cardiac failure. Conservative estimates of reduced admissions and reduced length of stay for admitted patients, as well as reduced demand for General Practitioner and outpatient appointments indicate that significant savings are possible'(36)

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