

Malnutrition: the spectre at the feast

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ABSTRACT It seems impossible that malnutrition could be a problem in a modern Western country, particularly when obesity has been identified as the major public health challenge of the twenty-first century. Despite this, hospital malnutrition remains a major problem in the UK's National Health Service, and there have been repeated calls for this to be addressed as a matter of urgency. In this article Dr Alastair McKinlay provides a detailed analysis of the problem of hospital malnutrition and how it should be tackled.

KEYWORDS Malnutrition, Malnutrition Universal Screening Tool (MUST), nutritional care in hospitals, undernutrition

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In 2005 the British Association for Parenteral and Enteral Nutrition (BAPEN) published an economic analysis of the cost of disease-related malnutrition in the UK. The total figure was estimated to be £7.3 billion, with approximately £3.8 billion (52%) of the cost occurring in hospitals and £2.8 billion in long-term care facilities.¹ GP visits accounted for £490 million and hospital patients £360 million. The figures are remarkable but are derived from a carefully developed model. Even if the estimate were twice or ten times too high, the sums involved would still be formidable.

It seems impossible that malnutrition could be a problem in a modern Western country, particularly when obesity has been identified as the major public health challenge of the twenty-first century. Many doctors remain sceptical because they do not see malnourished patients in their clinical practice. On the contrary, they see an increasing number of patients who want to lose weight, not thin people wanting to be fattened up. To understand the problem it is first necessary to define what malnutrition is, why it occurs and why a common problem can apparently remain hidden from the medical profession.

DEFINING MALNUTRITION

Malnutrition is a state of nutrition in which a deficiency or excess (or imbalance) of energy, protein and other nutrients causes measurable adverse effects on tissue/body form, body function and clinical outcome.²

In common with many 'catch all' definitions, the description is very broad and includes both undernutrition and overnutrition. Humans are sensitive to a wide range of nutritional problems that have different detrimental effects and operate over different time frames. For the purpose of this paper, the term 'malnutrition' will be used synonymously with 'undernutrition' to refer to an inadequate intake of protein and energy. Micronutrient deficiency is also common, but usually goes hand in hand with the underprovision of protein and energy.

Recognising that undernutrition is a problem does not detract from the importance of overnutrition. The prevalence of obesity in England and Wales tripled between 1980 and 2001, with 21% of women and 17% of men being clinically obese, and there is no evidence that this trend has slowed.³ Nutritional status is not, however, fixed during an individual's life, and obese people can move from overnutrition to undernutrition, particularly if they become ill and lose their appetite. Indeed 'undernourished' obese patients can be notoriously difficult to identify because they do not conform to the usual 'thin' stereotype.

To identify undernutrition, it is therefore necessary to define a series of measurable criteria. The body mass index (BMI) (weight in kg, divided by height² in m²) is a simple but robust measurement. Defining limits for a healthy BMI have to take account of age, sex and ethnic origin, particularly when considering what constitutes being 'overweight'. The value of BMI in children is also controversial.

In adults, a BMI of less than 18 kg/m² is usually associated with significant loss of muscle and functional impairment. A BMI of less than 20 kg/m² may still occur in health but often suggests loss of functional reserve; 20 is, therefore, usually accepted as the lower limit of normality.

Body mass index on its own, however, will not identify all patients at risk of malnutrition. Obese patients whose nutritional intake falls below their requirements will lose weight and, while this might be beneficial as part of a planned dietary change, it is not desirable when it is unintentional and due to disease. An unintentional loss of 10% of body weight is usually associated with poorer clinical outcomes, even in the obese. A definition of malnutrition must, therefore, include a provision for unintentional weight loss. A review of the evidence suggests that unintentional loss of 5–10% of body weight over three to six months is associated with poorer outcomes.⁴

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Finally, it is necessary to identify undernutrition at an early stage rather than allow patients to undergo significant weight loss, or develop a low BMI, before action is taken. Malnutrition is better prevented and correction may be easier if identified early in the course of the condition.⁵ Identifying patients with a poor oral intake before they develop problems is, therefore, helpful.

These considerations form the basis of the case for routine screening for malnutrition. The Malnutrition Universal Screening Tool (MUST),⁶ developed by BAPEN, is a simple assessment score that allows care workers to identify patients at risk of malnutrition by following three simple steps:

1. The measurement of height and weight and calculation of the BMI. This will identify patients with a BMI below 20 as well as those who are obese. It is surprising that doctors have traditionally accepted the importance of measuring weight but not of correlating it against height. BMI is simply the logical extension of the most basic clinical parameter and arguably should be a routine part of good clinical practice. The Malnutrition Universal Screening Tool also supplies a range of surrogate measures for height, although surrogate measures for weight are more problematic, particularly in the acutely ill where oedema and injuries may make any measurement difficult.
2. The patient is then asked about unintentional weight loss of 5 or 10% over the preceding three to six months.
3. Finally, patients are asked whether they have eaten anything over the past five days.

A score greater than two indicates a significant risk of malnutrition.

The Malnutrition Universal Screening Tool is not perfect and will not pick up subtle nutritional deficiency states, but it will identify many patients at risk of malnutrition. Scores can also be used as part of care plans, and MUST can be used by non-medical staff working in care homes and sheltered housing. It is free and can be used by any organisation, provided that BAPEN's copyright is acknowledged.⁷

THE PREVALENCE OF MALNUTRITION

Using the criteria defined by MUST, what is the prevalence of malnutrition in the UK today? Regrettably, it appears to have changed little over the past 20 years.

An independent UK health think-tank, the King's Fund, first drew attention to the high prevalence of malnutrition in 1992.⁸ The report of the working party, chaired by Prof. John Lennard-Jones, is out of print but remains relevant. The King's Fund estimated that 50% of surgical and 44% of medical inpatients were malnourished, and

that 10% of inpatients could have their stay reduced by five days with proper use of nutritional support. The working party concluded that responsibility for nutrition was fragmented among different professions; that education in nutrition was superficial, particularly among doctors; and that the organisation of complex nutritional support was poor, due mainly to a lack of clinical nutrition support teams.

A prospective survey of inpatients at Ninewells Hospital, Dundee, found that 40% of acute admissions in five specialties were undernourished and that 75% of patients actually lost weight during their hospital admission.⁹ The nutritional status of 78% of patients who were already nutritionally depleted on admission actually deteriorated during their stay. Similar results have been found in many studies published subsequently.⁴ A study from Glasgow Royal Infirmary, using different criteria to define malnutrition, identified 13% of patients as undernourished, but this was not identified by staff in 75% of cases and those patients' nutritional condition, therefore, deteriorated during the admission.¹⁰

In November 2007 BAPEN announced the results of the UK National Nutritional Screening Week.¹¹ Participation was voluntary, so there are potential problems with selection bias, but the sample size of 9,762 hospital inpatients, 1,610 care home residents and 293 long-term mental health patients is the largest reported from the UK. A total of 28% of hospital inpatients, 28% of care home residents, 42% of patients with gastrointestinal disease, 34% with central nervous system disease and 33% of patients with respiratory conditions were considered to be at risk of malnutrition. The rates among oncology, general medical, care of the elderly and general surgical wards were 41%, 31%, 33% and 27% respectively. The prevalence of malnutrition seems to have changed very little over the past decade and a half.

The high prevalence of malnutrition in hospitals often surprises doctors, and there is an understandable tendency to believe that it must apply to someone else's specialty or wards. A brief walk around a ward, ignoring the underlying disease processes and simply considering the nutritional status of patients, can be very illuminating. Hospitals develop nutritional problems because malnutrition is strongly associated with both acute and chronic disease. It has been recognised for many years that acutely ill patients become catabolic and that their nutritional requirements can be very high, particularly in those with sepsis, trauma or burns. In the majority of inpatients, however, the most important single factor leading to malnutrition is probably loss of appetite and failure of intake. An audit conducted by the Clinical Resource and Audit Group (CRAG), now part of NHS Quality Improvement Scotland (NHS QIS), examined the nutritional status of elderly people in long-stay settings and showed that, while the energy content of meals in

most cases met the dietary recommended value (DRV), the actual dietary intake for energy was below the DRV for the majority of subjects, and this was more apparent in the group aged 88 years or more.¹² Nutrients where the intake was below the DRV were potassium, non-starch carbohydrate (fibre), vitamin D, folate and zinc.

Community studies suggest that approximately 5% of the general population is malnourished, but that there is a strong association with age. Secondary analysis of data collected prospectively by the National Diet and Nutrition Survey, using MUST criteria for a medium or high risk of malnutrition, has shown a linear increase in the prevalence of malnutrition in the community from 10.7% in 65- to 75-year-olds, to 17.7% of those aged 85 years or more. There were also strong geographical trends, with the prevalence of those at medium to high risk of malnutrition using MUST being higher in the north of England (19.4%) than central England (12.3%) and southern England (11.2%).¹³

In summary, therefore, malnutrition is associated with illness and is more common in the elderly and socially deprived. Social isolation, poor mobility and bereavement, particularly if the spouse did most of the cooking, also contribute. Closure of shops, the trend towards out-of-town supermarkets and poor town planning can lead to what have been termed 'food deserts', where choice of diet can become limited.¹⁴ Malnutrition is associated with more consultations with general practitioners and a higher rate of admission to hospital. Once in hospital the priority becomes diagnosis of the underlying illness, and the associated malnutrition is not recognised in 75% of patients, whose nutritional status often deteriorates on discharge back to the community where their chance of readmission is significantly higher. The result has been described as the 'malnutrition carousel' of multiple admissions.¹⁵

WHAT MEASURES CAN BE TAKEN TO BREAK THE MALNUTRITION CYCLE?

The first step is to accept that there is a problem with malnourished patients.

The Royal College of Physicians of London has drawn attention to the lack of importance given to nutrition in medical education at both undergraduate and postgraduate level.¹⁶ Nutrition is the bedrock on which most other medical treatments rest, and in a sense should be the responsibility of every doctor.

The Council of Europe's Committee of Ministers has published an extensive series of recommendations on the provision of food and nutritional care in hospitals,¹⁷ to which the UK is a signatory. Unfortunately, compliance with Council of Europe resolutions is not mandatory. The declaration is an acceptance by member states that there is a problem with malnutrition in hospitals in Europe, but it is not a guarantee that any action will result.

In 2006 the National Institute for Health and Clinical Excellence (NICE) published specific guidance on nutritional support in adults.¹⁸ The NICE working party considered a large number of studies, many of which were fragmentary and based on small sample sizes. Randomised controlled trials are difficult to carry out in nutritional research, as a 'starvation limb' is not ethical and any design that knowingly restricts patients' access to food or drink probably breaches human rights legislation. The consequence of failing to meet the basic requirement for energy is, however, determined by the first law of thermodynamics and the outcome is inevitable. A person whose energy intake does not meet their requirements will lose weight and ultimately die. Dr Mike Stroud, a distinguished nutritional expert, polar explorer and the chairman of the NICE working party, has coined the term 'parachute evidence'. To date no randomised controlled trial of 'parachutes' has been carried out, because the consequence of the freefall, 'placebo' arm of the study has not proved attractive to volunteers. The NICE guidance supported screening for undernutrition and artificial nutritional support, but many of the recommendations had to be classed as expert opinion, or good practice points. The NICE guidance is voluntary and applies predominantly to England. While health authorities are expected to be cognisant of the recommendations, they are not compelled to follow them and formal inspections are not carried out by NICE.

More recently, BAPEN and the International Longevity Centre have drawn attention to the high prevalence of malnutrition among elderly people living in the community.¹⁴ There is no shortage of publications that highlight malnutrition. The problem has always been converting reports into action.

The management of malnutrition does not require high technology or expensive intervention. The vast majority of patients would be helped by ensuring that they received adequate quantities of food while in hospital. Contrary to popular belief, hospital catering usually does provide the dietary recommended values for most nutrients, but its presentation is not always optimal. In April 2007, however, the Department of Health suddenly terminated its Better Hospital Food initiative, a high-profile campaign chaired by TV personality Loyd Grossman. The project had been controversial and its recommendations and recipes had provoked a lively debate, particularly in NHS catering circles. Its demise may not be mourned, but it does leave a vacuum and it may not send the right message to a public that consistently puts NHS food as one of its main hospital concerns.

The main problem with hospital food is that it is not effective unless it physically gets into the patient and, unfortunately, many of the most vulnerable patients require assistance with eating. Treating malnutrition in hospital is, therefore, not only concerned with the

mechanics of catering and providing food, but also about ensuring that there are adequate persons on the ward to assist patients. When patients have difficulties with their intake, food can be backed up by oral nutritional supplements and by more complex techniques such as enteral tube feeding via nasogastric tube or gastrostomy. Finally, it is perfectly possible to support people intravenously if no other route exists. All the evidence suggests that complex nutritional support is best delivered by multidisciplinary clinical nutrition teams, but findings from the British Artificial Nutrition Survey indicate that these are present in only half of the UK's hospitals.¹⁹

In reality, reducing the incidence of malnutrition in hospital is more a question of logistics than technology. It is about the organisation of catering and clinical nutritional support teams. Mandatory screening for undernutrition would, for example, identify patients with nutritional problems earlier and allow referral for treatment. We need to ensure that there are enough staff to help patients, and this in turn means examining the way that staff work and how they are deployed. In many hospitals, for example, the only time that staff can eat in the canteen is when the meal trolleys arrive on the wards.

One of the few countries that has introduced mandatory national standards, rather than simply guidelines, is Scotland. NHS Quality Improvement Scotland published a standard for Food, Fluid and Nutritional Care in Hospitals (FFNC) in 2003.²⁰ The document is not large and appears deceptively simple. It embodies six standards: policy and strategy at health board level; assessment and screening for undernutrition; the organisation of catering services and the planning of menus; delivery of food at ward level; communication between staff, patients and carers; and training. In 2006 NHS QIS completed the first peer review of the standard, concentrating particularly on policy, screening for undernutrition and training. The national overview and individual health board reports were published in August of that year.²¹

NHS QIS found that Scotland has made a start to improving nutritional care in its hospitals, but the process is taking time to implement. By 2006, all Scottish health boards had nutritional care groups to develop policy and strategic plans, but only a minority had actually approved a policy document and none had developed a financial framework to implement the FFNC standards. Most boards had started to introduce screening for undernutrition, and some, such as NHS Grampian and, more recently, NHS Greater Glasgow and Clyde, have decided to implement a single screening tool across their entire region. No board had developed comprehensive discharge planning to include nutrition. Basic training in nutrition was fragmented. Many examples of good local initiatives were found, but training was not comprehensive and varied, even within individual boards. No attempt was being made to share learning resources

or experience between different areas in Scotland. As most of the training needs are similar across the country, there would seem to be an obvious role for NHS Education Scotland. The NHS QIS standards are compulsory and health boards are obliged to meet their requirements, but the process is complex and involves a 'hearts and minds' change among large numbers of staff belonging to different professions. Even with compulsory standards it is likely to take Scotland many years to produce widespread change. In England, the advice of NICE remains voluntary.

There has been less progress in the community. Undernutrition does not resonate with primary care services, although most of the patient journey through malnutrition occurs in the community and it affects some of the most vulnerable people in society. Nutrition is a Cinderella subject and requires champions. Doctors are not the most important people in the treatment of patients with undernutrition, but they can provide important leadership. Sadly, there seems to be virtually no interest in this issue in primary care at present.

Two initiatives give cause for some hope. The Department of Health responded to concern about undernutrition among elderly people by convening a working party, drawn from most of the relevant stakeholders, to produce an action plan, which was published in October 2007.²² The plan places nutritional care in a wider context of dignity in care and patient safety. It also includes community care settings such as nursing homes and sheltered housing, and was given personal backing by Ivan Lewis MP, the Parliamentary Under Secretary of State for Care Services. Gordon Lishman, the Director General of Age Concern, chairs the Nutrition Action Plan Delivery Board that oversees the delivery of the action plan. The group is made up of leading stakeholders, and monitors the various commitments made in the nutrition action plan to ensure that they are completed on time and that any issues around their implementation are identified.²³ The experience from Scotland is that change takes time and may require several years. The danger is that the action plan will take longer to implement than the current parliamentary term and may founder in spite of the best intentions of the politicians concerned.

In Scotland the Chief Nursing Officer has initiated a project to improve nutritional care for elderly and vulnerable patients. The initiative is very welcome, but it is too early to comment on the likely outcome. The Scottish government appears to be addressing the issue seriously and for the first time has promised funding to support the process. A draft nutritional specification for hospital food has also been published. This includes extensive guidance for hospital catering departments. The Scottish initiatives are less politically driven than their English equivalents. Whether this will be an advantage or a disadvantage remains to be seen.

CONCLUSION

It is easy to become discouraged by the size of the nutritional problems facing the UK and other developed societies. Doctors, let alone the general public, find it difficult to accept that both obesity and malnutrition can

exist side by side. The King's Fund was a lone voice in 1992. There has been significant progress, particularly in developing tools to screen for undernutrition. The NHS QIS FFNC standards and NICE guidance define clearly what needs to be done, but the challenge, as always, is to turn good intentions into sustained action.

KEY POINTS

- The strict scientific definition of malnutrition includes both the deficiency or excess (or imbalance) of energy, protein and other nutrients. In practice most people associate malnutrition with undernutrition as an inadequate intake of protein and energy.
- The body mass index (BMI) (weight in kg, divided by height² in m²) is a simple and robust measurement of nutritional status. In adults a BMI <18 kg/m² is associated with significant loss of muscle and functional impairment.
- Unintentional loss of 5–10% of body weight over three to six months is associated with worse outcomes and should be included in the definition of malnutrition.
- More than 40% of acute admissions patients are undernourished, and 75% of patients lose weight during their hospital admission.
- The Malnutrition Universal Screening Tool (MUST) is a simple assessment score that allows identification of patients at risk of malnutrition.
- Malnutrition is associated with illness and is more common in the elderly and socially deprived. It is also associated with more consultations with general practitioners and a higher rate of admission to hospital.
- The management of malnutrition does not require particularly high technology or expensive intervention. Treating malnutrition in hospital is not only about catering and providing food, but also about ensuring that there are adequate numbers of staff on the ward to provide assistance with meals.
- Complex nutritional support is best delivered by multidisciplinary clinical nutrition teams, but these are present in only half of the UK's hospitals.

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