Chapter 1

National and European Initiatives to Improve Standards of Nutritional Care

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Introduction

In 1859, Florence Nightingale made the statement that ‘thousands of patients are annually starved in the midst of plenty’ (Tierney, 1996). Disturbingly, in the twenty-first century similar observations of patients in hospital are still being made.

Despite the clear indication that poor nutrition in hospital is not a new problem, little importance was attached to this aspect of healthcare until the 1970s, when Butterworth (1974) in the United States of America discussed the issue of poor nutrition, and Bistrian et al. (1976) highlighted levels of poor nutrition of 44% or more. In 1977, Hill et al. examined surgical patients in Leeds, reporting that malnutrition and vitamin deficiency often went unrecognised and untreated by hospital staff and that few patients had even had their body weight measured. In spite of these research findings, 17 years later McWhirter and Pennington (1994) revealed that 200 out of 500 patients admitted to a hospital in Scotland were malnourished and that 75% of those patients followed lost further weight during their hospital stay.

In response to the recognition of the effect of poor nutrition on health, a number of policies, guidelines and resolutions were published towards the end of the twentieth and into this century in an attempt to address the problem.

To understand how these initiatives affect our daily working practice, and to set the scene for this book, it is important that we gain an insight into what each says. This chapter aims to give a brief outline of the aims of a number of UK and European initiatives to improve the nutritional care of patients. The list discussed is by no means exhaustive, so apologies for any we have missed.
Where a report concerned discusses wider issues in relation to healthcare, we have highlighted those parts of it that refer to nutrition.

National and European initiatives 1990–2007

1990


Although the incidence of malnutrition in hospital patients had been recognised as a problem since the mid-1970s, until 1990 only two surveys had been undertaken in the United Kingdom that looked at the provision of nutrition support (Tredger et al., 1981; Green et al., 1987). Unfortunately, both of these studies only looked at nasogastric tube feeding.

The 1988 survey (Payne-James et al., 1990) was undertaken to ascertain the level and type of nutrition support provided to the nutritionally compromised hospital patient in 206 districts in the United Kingdom. It looked at all the methods of nutrition support provided to patients. As dietitians were the only healthcare professionals solely working with patients with nutritional needs at the time, questionnaires were targeted at them. The survey reveals a wide variation in the provision of nutrition support throughout the country.

Its recommendations for the future of clinical nutrition support include:

- Each district (hospital) should have a group of people with an interest in clinical nutrition to monitor and advise on the care provided.
- The development of a national multidisciplinary group to advise, educate and promote the appropriate use of nutrition support and to encourage research into the field. This led to the development of the British Association for Parenteral and Enteral Nutrition (BAPEN).

1992

*A Positive Approach to Nutrition as Treatment* (Lennard-Jones, 1992)

This report was published to raise the awareness of healthcare professionals of the effects of poor nutrition and to improve the
treatment of clinical malnutrition in hospital and at home through the development of local and national standards. This was the first document that set standards for nutrition in practice in the United Kingdom and stemmed from the results of the *Nutritional support in hospitals in the United Kingdom: National survey 1988* (Payne-James et al., 1990).

**1996**

*Standards and Guidelines for Nutritional Support of Patients in Hospital (Sizer, 1996)*

This booklet, compiled by BAPEN, agreed national standards for the organisation and provision of nutrition support for patients in hospital.

The standards stipulate that there should be:

- a management policy within healthcare organisations stating that all patients receive adequate and appropriate nutrition support
- a functioning catering liaison group with representation from caterers, dietitians, nurses and doctors
- the development of a Nutrition Support Team to advise on all aspects of nutrition support
- the need to have organisation-wide policies in place for the provision of enteral and parenteral nutrition
- the provision of a continuing education programme addressing issues surrounding general nutrition and techniques of nutrition support for all staff involved in the clinical care of patients
- details on what care the patient can expect
- that there is a robust audit process in place.

**1997**

*Hungry in Hospital? (Community Health Councils, 1997)*

This briefing explores the issues around why some patients do not eat and drink enough when they are in hospital and who should be responsible for ensuring that patients’ nutritional needs are met. It also makes recommendations to address the issues identified. It is based upon the experiences of a number of community health councils and the concerns relayed to them by families regarding the care their elderly relatives received in hospital. Much of the criticism for patients’ poor food and fluid intake was aimed at nursing staff.
Eating Matters (Centre for Health Services Research, 1997)

Following the criticism aimed at nurses in the Hungry in Hospital? report, the Department of Health commissioned an education pack aimed at addressing nurses’ understanding of the importance of nutrition and tackling practical issues to improve nutritional intake.

Eating Matters is the resource pack developed.

Its aims were to:

- help hospital staff meet patients’ nutritional needs whilst they are in hospital
- offer practical solutions on how to audit and improve clinical practice
- provide a number of teaching aids and case studies.

Its chapters include:

- an overview of nutritional issues relating to the care of the patient in hospital
- educating ward staff
- issues around swallowing and the presentation of food
- fortifying foods
- auditing dietary care.

1998

Ethical and Legal Aspects of Clinical Hydration and Nutritional Support (Lennard-Jones, 1998)

This report highlights the ethical issues that surround any decision made for patients requiring nutrition support and offers guidance on appropriate action.

The report explores important issues, including:

- the impact of physical death and loss of personality
- defining the differences between withholding or withdrawing hydration or nutrition given through a feeding tube
- the difference between an act and an omission to act
- the rights of the competent patient
- protecting the rights of, and decision-making for, incompetent patients
- decision-making in infants, children and adolescents
- the right of the patient or family to demand fluid or nutrition via a tube.
1999

Current Perspectives on Enteral Nutrition in Adults (McAtear, 1999)

This document was released to provide up-to-date information on current practice in enteral feeding with the aim of assisting the development of local policies and procedures.

It addresses issues such as:

- why patients should be fed enterally
- which groups of patients should be fed enterally
- how a patient’s nutritional requirements should be estimated
- route and tube options for enteral feeding
- the types of feed available for enteral feeding and when each should be used
- what monitoring should be undertaken
- possible complications that may arise and recommendations for management.

Managing Nutrition in Hospital: A Recipe for Quality (Davis and Bristow, 1999)

This report focuses on the key organisational and management issues relating to food and feeding in hospital, from ward level upwards. The findings confirm the need for clear definitions of roles and responsibilities together with closer coordination of food provision and nutritional care at all levels within hospital Trusts.

Hospital Food as Treatment (Allison, 1999)

This report looks at inadequacies in the provision of hospital food and makes recommendations on how these issues could be addressed.

It addresses:

- the consequences of malnutrition
- common reasons why people don’t eat in hospital
- the cost and prevalence of food wastage
- the level of nutrient consumption
- the screening, assessment and monitoring of patients
- improving the distribution and service of meals
- the nutritional requirements of patients
- staffing, staff training and education.
The report concludes that there is room for improvement in all aspects of care, from the nutrition screening of patients on admission to the development of appropriate menus and methods of serving food.

**2000**

*Guidelines for Detection and Management of Malnutrition (British Association for Parenteral and Enteral Nutrition, 2000)*

These guidelines discuss the development of a new screening tool for use in the detection and management of malnutrition in the community – the MAG tool. It includes explanations on how to use the tool and makes recommendations on areas for future audit/research.

*Reducing Food Waste in the NHS (Department of Health, 2000a)*

This publication promotes good practice in NHS hospitals to minimise food wastage.

It:

- considers who is responsible for controlling food waste
- identifies stages in the hospital food cycle
- makes recommendations for best practice.

It provides hospital managers and other professionals involved in the provision of food within hospitals with a guide highlighting where food waste occurs and how to control it. It also provides a tool for hospital caterers that encourages a multidisciplinary approach to monitoring and tackling food waste.

*NHS Plan (Department of Health, 2000b)*

The *NHS Plan* outlines the Department of Health vision of the future health service: a service ‘designed around the patient’.

In relation to nutrition and food service, the *NHS Plan* states that by 2001 there would be a:

- 24-hour catering service available with a new NHS menu
- national franchise for NHS catering.

It also states that:
- housekeepers will be present on half of all wards by 2004
- dietitians will advise and check on the nutritional values of hospital food as part of the Performance Assessment Framework
- there will be a regular programme of unannounced inspections of the nutritional quality and presentation of hospital food.

2001

*Essence of Care (Department of Health, 2001a)*

This document arose from a commitment made in *Making a Difference: Strengthening the nursing, midwifery and health visiting contribution to health and healthcare* (Department of Health, 1999) to explore the benefits of benchmarking to help improve the quality of fundamental and essential aspects of care. It was designed to support the measures to improve quality set out in *A First-Class Service* (Department of Health, 1998) and help practitioners to take a structured approach to sharing and comparing practice, to identify best practice and to develop action plans to remedy poor practice.

Eight standards were agreed upon, of which the Food and Nutrition standard was the third. The Food and Nutrition standard was then broken down into 10 factors, each of which was to be audited and its performance measured:

1. screening and assessment to identify patients’ nutritional needs
2. planning, implementation and evaluation of care assessments for those patients who require a nutrition assessment
3. a conducive environment (acceptable sights, smells and sounds)
4. assistance to eat and drink
5. obtaining food
6. food provided
7. food availability
8. food presentation
9. monitoring of food
10. eating to promote health

*National Service Framework for Older People* (Department of Health, 2001b)

In relation to nutrition, this framework states that ‘nutritional risk screening should take place to identify those with characteristics of nutritional concern. For those at particular risk, a nutrition plan needs
to be developed, appropriate food provided, food intake monitored and action taken if nutritional needs are not being met.’

Better Hospital Food Programme (NHS Estates, 2001)

The Better Hospital Food programme was designed to raise the profile of the quality of food offered to patients in NHS hospitals in England and to make effective changes to hospital food services nationwide. It followed the recommendations made in the NHS Plan (Department of Health, 2000b).

The Better Hospital Food programme’s initial aims were to:

- produce a comprehensive range of tasty, nutritious and interesting recipes that every NHS hospital could use
- redesign hospital printed menus to make them more accessible and easier for the patient to understand
- introduce a 24-hour catering service to ensure food was available night and day
- ensure hot food was available in hospitals at lunchtimes and early-evening meals.

As a result of the work undertaken during this project, a number of initiatives were piloted and implemented, including:

- the National Dish Selector, containing over 300 recipes developed by a team of leading chefs for use in healthcare facilities
- the Flexi Menu, aimed at providing patients with a greater choice of meals
- protected mealtimes
- the provision of food 24 hours a day using:
  - light-bite hot meals, with dishes such as cottage pie and cod in parsley sauce
  - light refreshments provided through ward kitchens, such as tea or coffee with biscuits, cake or fresh fruit
  - snack boxes, containing sandwiches or cheese and crackers, a piece of cake or a biscuit, fruit and a drink.

Acute Hospital Portfolio: Review of National Findings – Catering (Audit Commission, 2001)

This review records the national results of an investigation of hospital catering carried out by the Audit Commission as part of its Acute Hospital Portfolio. It is based on data collected during 1999/2000 and
involves the participation of most of the NHS hospitals in England and Wales.

The main areas reviewed in this report are:

- how patients’ nutritional needs are identified and met
- the quality of the catering service provided and the relationship between quality and costs
- the actual expenditure on catering and the variation in spending between Trusts
- the management and control of costs
- the potential savings available from reducing food waste on wards.

In conclusion, the report states that:

1. There is scope for many Trusts to improve the quality of their catering service.
2. Patients’ nutritional needs are not always identified or are not fulfilled, owing to limited menu choice, poor timeliness of meals or lack of assistance provided to eat.
3. More effective communication is required between the catering department and other staff to raise and then maintain the quality of the service delivered to patients.
4. Cost savings could be made through better pricing policies for non-patient services, reducing the waste of unserved meals.
5. Trusts need better information for decision-making and need effective mechanisms for ensuring that funds set aside for improving patient services are spent in this area and not redirected into subsidising non-patient services.
6. Patient satisfaction must be closely monitored to ensure that a tighter control of costs does not bring about a decline in service quality.

2002

*Improving Health in Wales: Nutrition and Catering Framework (Welsh Assembly Government, 2002)*

This document sets a number of standards that Trusts in Wales are expected to meet, including that:

- All Trusts have nominated a single board member responsible for hospital nutrition and catering.
• Patients should expect:
  o a choice of meals  
  o to be given assistance with eating their food if required 
  o an uninterrupted period to eat their meal 
  o meals and snacks to be available when mealtimes are missed.
• Trusts should develop a nutrition policy that clearly indicates the roles and responsibilities of staff regarding patient nutrition.
• Relevant procedures and protocols should be in place to cover issues such as:
  o screening/assessment of patients 
  o ongoing nutrition assessments 
  o measuring the intake of food and fluid 
  o pre- and post-operative care and restriction of food and fluid intake.

**Nutrition and Patients: A doctor’s responsibility**  
*(Royal College of Physicians, 2002)*

This report aims to highlight the role of a doctor in providing nutritional care for their patients in both a hospital and community setting and makes the following recommendations for medical staff.

All doctors should be aware:

• of a patient’s nutrition problems and how to manage them  
• that proper nutritional care is fundamental to good clinical practice.

Doctors should be responsible for ensuring that:

• adequate information concerning a patient’s nutritional status is documented in the patient’s clinical record  
• appropriate action has been taken to deal with nutritional problems.

Doctors should play a role in:

• the multidisciplinary support required for patients with complicated malnutrition  
• patients requiring long-term artificial enteral or parenteral nutrition.
Patient Environment Action Teams (PEAT) inspections
(Patient Environment Action Teams, 2002)

The PEAT programme was set up in 2000 to assess NHS hospitals. In 2002, its scope was extended to include assessments on the quality of food and food service. Under the programme, every in-patient healthcare facility in England with more than 10 beds is assessed annually.

During a PEAT visit, meals and meals service are assessed and the organisation is given a rating based on a traffic-light system:

- **Green:** those organisations found to be providing high standards of food and food service that always, or almost always, met patients’ needs and generally exceeds expectations. These organisations met the requirements of the Better Hospital Food programme.
- **Yellow:** those organisations found to be providing standards of food and food service that generally met patients’ needs. However, these facilities had room for improvement in some areas.
- **Red:** those organisations found to be providing generally poor standards of food and food service that did not meet patients’ needs and required urgent improvement.

PEAT results are given to the Healthcare Commission and results relating to food and food service are published on the Better Hospital Food website. Each year, the PEAT programme is adapted to reflect changing expectations within the NHS and to ensure that the results provide an accurate picture.

Promoting Nutrition for Older Adult In-patients in NHS Hospitals in Scotland (Scottish Executive, 2002)

This paper aims to provide a practical guide to clinical staff in implementing standards for nutritional care and focuses on:

- undertaking pre-admission assessments and nutrition screening for patients aged 65 years and over
- the importance of recognising the signs and symptoms of malnutrition
- menu design
- patient choice
the roles of healthcare professionals in maintaining nutritional standards
developing and undertaking training programmes.

Best Practice Statement: Nutrition Assessment and Referral in the Care of Adults in Hospital (Nursing and Midwifery Practice Development Unit, 2002)

The Nursing and Midwifery Practice Development Unit (NMPDU) is an organisation that identifies and disseminates best practice across Scotland. This paper highlights what actions constitute best practice in relation to:

- patients receiving appropriate nutritional care on admission to hospital
- nursing management of nutritional care
- screening and documentation
- criteria for nutritional referrals
- education and training.

2003

Care Homes for Older People: National Minimum Standards and the Care Homes Regulations 2001 (Department of Health, 2003)

This document, although dated 2001, was released in February 2003 and replaced earlier editions. It contains a statement of national minimum standards for older people in care homes. It covers all aspects of care, but Standard 15 relates specifically to nutrition, stating that: ‘the registered person ensures that service users receive a varied, appealing, wholesome and nutritious diet, which is suited to assessed and recorded requirements, and that meals are taken in a congenial setting and at flexible times’.

In addition, it recommends that nursing homes should ensure that:

- care staff monitor the individual resident’s food intake
- the availability, quality and style of presentation of food should be monitored
- residents should receive appropriate assistance at mealtimes
- the social aspects of food (its preparation, presentation and consumption) remain an important aspect of a resident’s life whenever possible
• alternative ways of maintaining residents’ involvement in food preparation and delivery are explored
• individuals’ food preferences (personal and cultural/religious) are observed
• they do not make false claims that they can provide specialised diets (e.g. kosher or halal if they cannot observe all the requirements associated with those diets in terms of purchase, storage, preparation and cooking of the food).

Guidelines for Nutrition Screening (Kondrup et al., 2003)

This document sets out guidelines for hospitals and other healthcare organisations in the use of nutrition screening tools by proposing a set of standards for their use. It discusses what it calls ‘the lack of a widely accepted screening system’ and makes recommendations for practice.

It states how the effectiveness of a screening tool should be evaluated (Box 1.1) and that hospitals and healthcare organisations should have a policy and a specific set of protocols for identifying patients at nutritional risk, leading to the development of appropriate nutritional care plans.

Its suggested course of action includes:

• **Screening:** All patients should be screened on admission to hospital or other institutions. The outcome of screening must be linked to a defined course of action.

**Box 1.1 Assessing the effectiveness of a screening tool**
(European Society for Parenteral and Enteral Nutrition)

- That the individual identified to be at risk is likely to obtain a health benefit from the intervention arising from the results of the screening (i.e. the predictive validity of the tool).
- The screening tool should have a high degree of content validity (i.e. it includes all relevant components of the problem it is meant to solve).
- It must have a high reliability (i.e. little interobserver variation).
- It must be a practical document that is simple to use.
- It should not contain irrelevant information.
- It should be linked to specified protocols for action, e.g.:
  - referral to a dietitian for those patients screened at risk
  - development of nutrition care plans.

Adapted from Kondrup et al., 2003
• **Assessment**: A detailed examination of metabolic, nutritional or functional variables should be undertaken by an expert clinician, dietitian or nutrition nurse.

• **Monitoring and outcome**: The effectiveness of the care plan should be monitored by defined measurements and observations that will direct the nutritional care provided to the patient.

• **Communication**: Results of screening, assessment and nutritional care plans should be communicated to other healthcare professionals if the patient is transferred from one clinical area to another or from secondary to primary care (and vice versa).

• **Audit**: The need to develop a programme of audit to inform future policy decisions should be recognised.

*Essence of Care: Patient-focused benchmarks for clinical governance (NHS Modernisation Agency, 2003)*

This document updates the information released in 2001 and contains a toolkit for benchmarking the fundamentals of care.

It includes information on:

• the background to the *Essence of Care*
• a description of the benchmarking tool
• instructions on how to use the benchmarks
• the record forms for developing action and business plans
• the information to be measured to benchmark each standard.

*The MUST report: Nutritional screening of adults: a multidisciplinary responsibility (Elia, 2003)*

The MUST report provides evidence regarding the extent and effects of malnutrition in the United Kingdom, stating that:

• malnourished patients when discharged from hospital are two and a half times more likely to require healthcare at home
• underweight patients visit their GP more frequently and require more prescriptions
• malnourished individuals are more likely to need a longer stay in hospital.

It highlights the issue that the management and treatment of malnutrition often goes unrecognised and untreated in the United Kingdom and that £226 million could be saved each year in UK hospitals if malnourished patients were identified and treated appropria-
ately. This report was used to launch the ‘MUST’ (Malnutrition Universal Screening Tool) as the first universal nutrition screening tool for adults to detect whether individuals have a low, medium or high risk of malnutrition, or are obese. It was the first nutrition screening tool designed for use in all healthcare settings and with all adult patients.

*Standard for Hospital Food, Fluid and Nutritional Care in Hospitals (NHS Quality Improvement Scotland, 2003)*

This report provides standards for the provision of food and the nutritional care of patients in hospital in Scotland and makes nutrition screening mandatory for every person admitted to hospital, acknowledging that the MUST screening tool is appropriate for this purpose.


This resolution makes a number of recommendations that all governments of the member states, which includes the United Kingdom, should put into practice, including the need to draw up and implement national recommendations on food and nutritional care in hospitals.

2004


In 2004, a new system was used to represent the overall quality of food and food services in individual healthcare facilities. The assessment comprised a review of nine components relating to meals and their service and six Better Hospital Food requirements.

2005

*Managing Food Waste in the NHS (NHS Estates, 2005)*

This document aims to provide best practice guidance for modern matrons, doctors, dietitians, catering managers, ward housekeepers and ward-based teams and identifies reasons why food waste occurs in the ordering, distribution and service of food at ward
level. It makes recommendations on how food waste can be managed in a cost-effective way. It was produced in response to the Audit Commission’s *Acute Hospital Portfolio: Review of National Findings – Catering* (2001) and updates *Reducing Food Waste in the NHS* (Department of Health, 2000a) and provides guidance on:

- identifying the reasons for food wastage and definitions of food waste
- developing universally accepted tools to identify levels of food waste in order to enable effective comparisons between Trusts
- reducing the volume of food supplied or cooked but not served
- explaining why patients do not eat food served to them and developing appropriate action in response
- identifying the responsibilities for reducing food waste amongst members of the wider healthcare team.

*The Cost of Disease-related Malnutrition in the UK and Economic Considerations for the Use of Oral Nutritional Supplements in Adults* (British Association for Parenteral and Enteral Nutrition, 2005)

This report discusses the cost of malnutrition in the United Kingdom and details findings from a number of studies relating to the cost of using nutritional supplements in both the primary and secondary care settings and makes recommendations for future research.

2006


These guidelines provide information to improve the practice of nutrition support in both hospital and community settings. The recommendations or guidelines are backed by evidence (where possible) or ‘best practice’ standards. Relevant information is provided to equip healthcare practitioners with the necessary information to recognise and treat poor nutrition using the most appropriate form of nutrition support for patients.

The guidelines cover information on:

- the prevalence of malnutrition
- the benefits of good nutrition
- who should be screened for malnutrition and when
indications for nutrition support
monitoring required for patients receiving nutrition support
the administration of oral, enteral and parenteral nutrition
appropriate access for enteral and parenteral nutrition
supporting patients receiving enteral and parenteral nutrition
support in the community.

Hungry to be Heard: The scandal of malnourished older people in hospital (Age Concern, 2006)

Age Concern uses this report to highlight the continuing problem of poor nutritional care for older people in hospital and calls for action from the NHS, Healthcare Commission and Department of Health.

It documents what it considers to be seven vital steps that need to be taken to end malnutrition in hospital:

1. Listening to older people, their relatives and carers.
2. Ensuring that all ward staff are ‘food aware’.
3. Hospital staff must follow professional codes.
4. Patients are assessed for signs of malnourishment.
5. Protected mealtimes are introduced.
6. The ‘red tray’ system is implemented.
7. Volunteers are used to assist eating where appropriate.

Guidelines on Adult Enteral Nutrition (Lochs et al., 2006)

These are evidence-based guidelines on enteral nutrition. They discuss a wide range of issues, including:

- the patient journey
- ethical and legal aspects
- cardiology and pulmonology
- gastroenterology
- geriatrics
- hepatology
- wasting in HIV
- intensive care
- non-surgical oncology
- pancreas
- renal failure
- surgery and transplantation.
2007

Nutrition Now (Royal College of Nursing, 2007)

The Royal College of Nursing (RCN) developed this list of principles to guide nurses in their thinking regarding what can be done to improve the experience of the patient in relation to nutrition and hydration.

This initiative provides a framework and resources to educate nurses linking into relevant literature, as appropriate.

Subject areas covered include:

- malnutrition
- nutrition assessment
- nutrition in hospitals
- nutrition in the community
- older people
- patient information
- protected mealtimes
- case studies: to provide ideas on how nurses can improve nutrition in the area in which they work.

Improving Nutritional Care (Department of Health, 2007)

In response to the continuing concerns regarding patients/residents not receiving optimal nutritional care in the health and care systems, the Department of Health together with a number of other organisations, including the Food Standards Agency, BAPEN, the RCN and National Patient Safety Agency (NPSA), collaborated to make a number of recommendations for how, collectively, they and the government will tackle the issue.

The paper sets out the key priorities for action:

- To raise awareness of the link between nutrition and good health and that malnutrition can be prevented.
- To ensure that accessible guidance is available.
- To ensure that the most relevant guidance is appropriate and user-friendly.
- To encourage nutrition screening for all people using health and social care services, in particular those groups that are known to be vulnerable.
- To encourage provision and access to relevant training for frontline staff and managers on the importance of nutrition.
- To clarify standards and strengthen inspection and regulation.
Conclusion

A number of common threads can be seen running through the reports discussed.

You may recognise some that have filtered down to become accepted into everyday practice, for example protected mealtimes and the ‘red tray’ initiative. Other aspects, such as nutrition screening, continue to be an issue. There are no magic answers to these issues. The same problems are being addressed in hospitals throughout the United Kingdom.

It will be interesting to see what changes the future will bring and whether we are any better at caring for malnourished patients admitted to hospital.

References


Centre for Health Services Research (1997) Eating Matters, Centre for Health Services Research, University of Newcastle, Newcastle-upon-Tyne.


