FOOD AND NUTRITIONAL CARE IN HOSPITALS: HOW TO PREVENT UNDERNUTRITION

Report and recommendations of the Committee of Experts on Nutrition, Food Safety and Consumer Protection

Health protection of the consumer

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DEFINITIONS

Administrative dietician
A dietician with an education focused on food service management with responsibility for feeding of groups of people in health and disease.

Anthropometrical measurements
The assessment of the nutritional state and body composition of a person. It may consist of measurements of body height, body weight, skin fold thickness, arm and calf circumference.

Artificial nutritional support
Administration of specially formulated liquid nutrients through a tube directly into the gut (enteral nutrition) or into a vein (parenteral nutrition).

Body mass index (BMI)
Weight (in kg) divided by height$^2$ (m$^2$). Used to define underweight, normal weight, overweight and obesity of adult patients. However, patients with low BMI can be undernourished and edema always falsely increases weight.

Clinical dietician
A dietician with an education in clinical nutrition and dietetics. Clinical dieticians are responsible for dietary prevention and treatment of individuals in institutions or the community.

Clinical nutrition
The application of scientifically based nutritional methods in medical practice. This includes nutritional prophylactics (disease prevention) as well as the treatment of nutritional disorders.

Clinical nutritionist
A physician specialised in clinical nutrition.

Cook-chill
Food is cooked, immediately chilled to 0-5°C, and regenerated at the point of service.

Cook-freeze
Food is cooked, then frozen and stored at –18°C, and reheated at the point of service.

Cook-serve
This is the traditional food service method in which food is produced and (immediately) served.
Cost-benefit
The analysis extends the cost-effectiveness analysis by placing a money value on the outcomes.

Cost-effectiveness
Compares two or more different ways to achieve the same object.

Diet (on medical indications)
A prescribed allowance of food or nutrients provided via the oral route and used in the treatment of specific diseases, e.g. lipid lowering diet, diabetic diet, energy reduced diet etc.

Disease-related undernutrition
A state of insufficient intake, utilisation, or absorption of energy and nutrients due to individual or systemic factors, which results in recent or rapid weight loss and change in organ function, and is likely to be associated with a worse outcome from the disease or the treatment. Undernourished patients can be overweight or obese according to their BMI.

Drug-nutrient interactions
An event that occurs when nutrient availability is altered by a medication or when a drug effect is altered or adverse reaction caused by concurrent nutrient intake.

Energy and protein dense menu
A menu with a high nutrient density, due to use of food products with a high fat and protein content.

Enteral nutrition
Nutrition provided through a tube or catheter or stoma that delivers nutrients distal to the oral cavity.

Food service
A system in which meals are produced and served for hospital patients, in a professional context. The system includes the food service premises, the production and distribution technology, and human resources involved in management, production, distribution and serving.

General dietician
A dietician with an education in clinical nutrition and dietetics, and food service management with overall responsibilities for both aspects in an institution or a community.

General menu
The menu most frequently served in European hospitals.
Hospital food
The meals served at hospitals, including diets on a medical indication.

Macronutrients
Energy-supplying nutrients (carbohydrates, proteins, and lipids).

Micronutrients
Essential nutrients present and required in the body in small quantities (vitamins, minerals and oligoelements).

Nutritional assessment
A comprehensive evaluation of nutritional status, including one or more of these: medical history, dietary history, physical examination, anthropometrical measurements and laboratory data.

Nutritional care
The basic duty of providing adequate and appropriate food and drinks, and/or artificial nutrition to the patient.

Nutritional counselling
The activity of giving nutritional advice to patients.

Nutritional risk
The risk for nutrition-related complications to the disease or the treatment.

Nutritional risk screening
The process of identifying characteristics known to be associated with nutrition-related complications. Its purpose is to detect patients at risk who may experience an improved clinical outcome when given nutritional support.

Nutritional steering committee (NSC)
An advisory committee consisting of staff from all disciplines, including managers, involved in the nutritional care of the patient.

Nutritional support
Assessment of current nutritional status, estimation of nutritional requirements, prescription and delivery of appropriate energy, macro- and micro-nutrients, electrolytes and fluids (in the form of ordinary hospital food (first choice), sip feedings and/or artificial nutrition), monitoring the former in the context of clinical status and ensuring that the most optimal feeding route is used at all times. Nutritional support is part of the medical treatment and its purpose is to improve or maintain a patient’s nutritional status and hasten and improve recovery.

Nutritional support teams/units (NST)
A multidisciplinary team/unit with expertise in nutrition, which is involved in nutritional support, whose remit varies according to local circumstances, interest and
resource allocations. Usually takes active part in nutritional support, and serves in a quality control capacity, standardising practice, gathering new information and educating other health care professionals.

Nutritionist
A professional (usually holding a MSc degree) who can identify nutritional problems and plan, organise, implement and evaluate nutrition interventions at the individual and community level.

Parenteral nutrition
Nutrients provided intravenously either into a large central vein or a peripheral vein.

Sous-vide
The food is wrapped up before it is cooked.
ABBREVIATIONS

ADI = Italian Association of Dietetic and Clinical Nutrition
AEH = Academy for Nutritional Medicine Hanover
AKE = Austrian Society for Nutritional Medicine
APNEP = Portuguese Association of Enteral and Parenteral Nutrition
ASPEN = American Society of Parenteral and Enteral Nutrition
BAPEN = British Association of Parenteral and Enteral Nutrition
BMI = Body mass index (w/h²)
DAEM = German Academy for Nutritional Medicine
DGE = German Nutrition Society
DGEM = German Society for Nutritional Medicine
DSKE = Danish Society of Parenteral and Enteral Nutrition
ESPEN = European Society of Parenteral and Enteral Nutrition
FENS = Federation of European Nutrition Societies
GESKES = Swiss Society of Clinical Nutrition
JCAHO = Joint Commission on Accreditation of Health Care Organisations
ICNSO = International Confederation of Nutrition Support Organisations
ICU = Intensive care units
IUNS = International Union of Nutrition Sciences
NESPEN = Netherlands Society for Parenteral and Enteral Nutrition
NHS = National Health Service
NSC = Nutritional steering committee
NST = Nutritional support team
SFNEP = French-speaking Society for Enteral and Parenteral Nutrition
SINPE = Italian Society for Parenteral and Enteral Nutrition
SINU = Italian Society for Human Nutrition
SVERB = Swiss Association of Registered Dieticians.
SWESPEN = Swedish Society for Parenteral and Enteral Nutrition
The Council of Europe

The Council of Europe is a political organisation, which was founded on 5 May 1949 by ten European countries in order to promote greater unity between its members. It now numbers 44 member states. The main aims of the Organisation are to reinforce democracy, human rights and the rule of law and to develop common responses to political, social, cultural and legal challenges in its member states. Since 1989 the Council of Europe has integrated most of the countries of central and Eastern Europe into its structures and supported them in their efforts to implement and consolidate their political, legal and administrative reforms.

The Council of Europe has its permanent headquarters in Strasbourg (France). By Statute, it has two constituent organs: the Committee of Ministers, composed of the Ministers of Foreign Affairs of the 44 member states, and the Parliamentary Assembly, comprising delegations from the 44 national parliaments. The Congress of Local and Regional Authorities of Europe represents the entities of local and regional self-government within the member states.

The European Court of Human Rights is the judicial body competent to adjudicate complaints brought against a state by individuals, associations or other contracting states on grounds of violation of the European Convention on Human Rights.

Partial agreement in the social and public health field

Where a lesser number of member states of the Council of Europe wish to engage in some action in which not all their European partners desire to join, they can conclude a “Partial Agreement” which is binding on themselves alone.

The Partial Agreement in the social and public health field was concluded on this basis in 1959. At present, the Partial Agreement in the social and public health field has 18 member states.

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1 Albania, Andorra, Armenia, Austria, Azerbaijan, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, The Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, San Marino, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, "the former Yugoslav Republic of Macedonia", Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland.

2 Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, The Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland.
The principal areas of activity include:

- protection of public health and especially the health of the consumer
- rehabilitation and integration of people with disabilities.

The activities are entrusted to committees of experts, which are responsible to a steering committee for each area.

The work of these Partial Agreement committees occasionally results in the elaboration of conventions or agreements, but the more usual outcome is the drawing-up of recommendations to member states in the form of resolutions adopted by the Committee of Ministers. The resolutions should be considered as statements of policy for national policy makers. Governments have actively participated in their formulation: the delegates on the Partial Agreement committees are both experts in the field in question and responsible for the implementation of government policy in their national ministries.

A less formal procedure is the publication of general guidelines intended to serve as a model for member states. Each government can interpret these guidelines in accordance with its own law and practice in the matter.

Furthermore, scientific reports aimed at informing both governments and experts in the field are published on specific questions of current concern.

The present report and recommendations on food and nutritional care in hospitals have been prepared by an ad hoc Group on nutrition programmes in hospitals for the Committee of experts on nutrition, food safety and consumer health.
SUMMARY AND RECOMMENDATIONS

The existence of disease-related undernutrition among patients in the European hospitals is a fact. So is the benefit of procuring adequate nutritional care to sick patients. This has been common knowledge for a long time. However, despite many attempts to improve the situation, success has been meagre.

National initiatives to enhance understanding and promote good practice in nutritional care and support are slowly gathering momentum. Among these initiatives are the publication of national guidelines for hospital food provision and nutritional care and support, and the establishment of organisations/committees with main focus on clinical nutrition.

Five major factors, common for Europe, seem to be the major barriers for proper nutritional care in hospitals:

1. Lack of clearly defined responsibilities in planning and managing nutritional care.
2. Lack of sufficient education with regard to nutrition among all staff groups.
3. Lack of influence and knowledge of the patients.
4. Lack of co-operation between different staff groups.
5. Lack of involvement from the hospital managers.

Recommendations outlined in this report to surmount these five common barriers can be summarised as follows:

Lack of clearly defined responsibilities in planning and managing nutritional care
The responsibilities of staff categories and the hospital management with respect to procuring nutritional care should be clearly assigned. This means that standards of practice for assessing and monitoring nutritional risk/status of the patient should be developed at a national level, and the responsibility of each task clearly assigned. The responsibility of the hospital with regard to the nutritional care and support of the patient should not be limited to the hospital stay.

Lack of sufficient educational level with regard to nutrition among all staff groups
A general improvement in the educational level of all staff groups is needed. Specifically, a continuing education programme on general nutrition and techniques of nutritional support for all staff involved in the nutritional care of patients should be available with focus on the nutritional training of the non-clinical staff members, and the definitions of their area of responsibility.

Lack of influence and knowledge of the patients
The provision of meals should be individualised and flexible, and all patients should have the possibility to order food and extra food – and be informed about this possibility. Also, patients should be involved in planning their meals and have some control over food selection. This should include the possibility of immediate feedback
from the patients’ likes and dislikes of the served food – and the use of this feedback to develop appropriate, target group specific menus. Patients should be informed of the importance of good nutrition for successful treatment prior to admission and at discharge.

**Lack of co-operation between different staff groups**
The hospital managers, physicians, nurses, dieticians and food service staff should work together toward the common goal: optimal nutritional patient care – and the hospital management should give priority to co-operation, e.g. by initiating organisational research to optimise co-operation. Also, organised contact between the hospital and the primary health care sector should be established.

**Lack of involvement from the hospital management**
The provision of meals should be regarded as an essential part of the treatment of patients, and not as a hotel service. The hospital management should acknowledge responsibility for food service and the nutritional care of the patients, and give priority to food policy and management of food services. The hospital managers should take account of the costs of complications and prolonged hospital stay due to undernutrition when assessing the cost of food service.

Besides the five common barriers, the following research topics have been revealed, which also need to be dealt with in order to improve nutritional care and support in hospitals:

- The development and validation of simple screening methods, aimed for use in hospitals and primary health care sector.
- The development and validation of simple food recording methods.
- The effect of nutritional support on both nutritional status and clinical outcome (including physical and mental functioning i.e. quality of life measures).
- The effect of nutritional support teams and nutrition steering committees in improving the nutritional care and support of patients.
- The effect of energy and protein dense menus on food intake and patient outcome.
- Methods to secure the intake of ordinary hospital food by the patients.
- Methods to assess patient satisfaction.
- The influence of food service practice on food wastage.
- The influence of food service practice on nutrient losses.

In recent years, an increasing number of successful initiatives to improve the situation with respect to the nutritional practices have been documented from all over Europe. It therefore seems to be a proper time to combine the experiences from all these efforts in a common struggle to secure an adequate food intake of patients and prevent disease-related undernutrition in hospitals.
1. INTRODUCTION

“Food is medicine – hence let your medicine be your food” (Hippocrates ca. 400 BC).

In European countries the increasing prevalence of obesity is of great concern to health care professionals. However, focusing on overnutrition means that undernutrition is often overlooked. Although there is growing awareness that undernutrition, in association with disease, is a significant problem in affluent countries, with a considerable economic bearing, it is not widely recognised, acknowledged or accepted. Disease-related undernutrition is common; it escapes recognition and almost always become worse during hospital stay. From all over Europe, studies of undernutrition in hospitals, of poor and inflexible provision of food and of conflicting clinical priorities continue to be published – and have been published for more than 100 years. However, most studies have been unsystematic and small, and quite often published in national journals and in the domestic language, ignored by the local authorities and seldom recognised internationally.

All patients have the right to nutritional care and, whenever able to eat, to choose what they want to eat, and when and with whom. Patients also have a collective right to be involved in the planning and evaluation of food service, and nutritional care and support.

Meals should contribute to the quality of life and the well being of the patients, not only their physical, but also their social and mental well being. Hence, all staff groups must not only have considerable knowledge and skill in nutritional matters; other factors such as meal ambience and environment, are also of utmost importance.

All patients have the right to expect that their nutritional needs will be fulfilled during a hospitalisation. The benefits of providing nutritional support have been documented in several specific clinical situations. While some patients may benefit from special techniques of nutritional support by the enteral or parenteral routes, the majority of patients depend on ordinary hospital food to improve or maintain their nutritional state in order to optimise their recovery from illness. In the recent years, an increasing number of successful initiatives to improve the situation with respect to the nutritional practices have been documented from all over Europe. It therefore seems to be a proper time to combine the experiences from all these efforts in a common struggle to prevent undernutrition in hospitals.

The specific aims of this document have been:

- To review the current practice in Europe regarding hospital food provision and highlight deficiencies in the current food service practices.
• To issue recommendations, which secure that assessment of nutritional status and requirements, hospital food, and nutritional support and monitoring are regarded as important and necessary components of patient care.

• To consider how politicians, hospital managers, food service and health care professionals might work together to improve the nutritional care and support of hospitalised patients.

The current practice in Europe has been reviewed on the basis of the answers to the “Revised questionnaire for national contributions to the report on nutrition programmes in hospitals” (Appendix 1.1.) from, respectively, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal, Slovenia, Sweden, Switzerland and United Kingdom/England. The information obtained has been extended by means of a search on the database MEDLINE.1

The problems elaborated with regard to undernutrition in hospitals, the nutritional care provider, food service practices, hospital food and health economics are discussed in separate chapters, starting with a short summary of the content. All chapters include general Recommendations on how to improve the situation.

Where appropriate the specific answers to the “Revised questionnaire for national contributions to the report on nutrition programmes in hospitals” are presented in the Appendices.

Delegates from Denmark have prepared the document in co-operation with the Council of Europe ad hoc Group on nutrition programmes in hospitals. The group met 6 times in 1999 - 2002.2

Professor S. Allison, Professor B. Isaksson, Dr J. Kondrup, Director T. Mossberg, Professor R. Roubenoff, Professor A. Tershakovec, the Federation of European Nutrition Societies and the Standing Committee of Hospitals of the European Union have given extremely valuable comments on the third draft of the document.3

Since the document is based mainly upon the undernourished patient group, the ad hoc group has chosen not to consider the aspects of so-called healthy eating. Also, due to insufficient expertise the ethics of feeding and the health economic aspects are mostly based on the experiences from others. Finally, since the consequences of undernutrition among children are always more significant than among adults, they are dealt with specifically in some of the chapters in the document.

An increasing number of patients suffering from undernutrition are currently treated at home after discharge from hospital. Often, the primary health care sector lacks confidence in prescribing nutrients or dealing with nutritional problems. Also, the

1 With few exceptions restricted to literature from the last decade.
2 A list of participants in the ad hoc group is given in Appendix 1.3
3 Further information can be found in Appendix 1.4
responsibility between the hospital and the primary health care sector is often ill-defined. Solutions to these problems are considered.

The document and its general recommendations are directed to national authorities, hospital managers, health care and food service professionals, and patients in the hope to improve awareness and, most importantly, initiate the implementation of country specific guidelines regarding proper and effective nutritional care and support in hospitals, with special focus on undernutrition.

That is not an easy task. If so, it would have been solved more than 100 years ago. This document is not a criticism of specific groups of health care professionals. Rather most of the problems highlighted necessitate a combined team effort from all staffs involved in the nutritional care and support of the patient, including hospital managers.

Again, all patients have the right to expect that their nutritional needs will be fulfilled during a hospitalisation. Optimal supply of food and nutrients is a prerequisite for an optimal effect of the specific treatment offered to the patient. From a health economical perspective, the hospital, which handles well-nourished patients, is the most profitable.
2. UNDERNUTRITION IN HOSPITALS

Many patients with severe illness are at risk from an often unrecognised complication – undernutrition. A prevalence of up to 30% at admission to hospitals has been reported from all over Europe. The majority of patients has an average food intake less than recommended and continues to lose weight while in hospital. The causes to disease-related undernutrition are numerous ranging from individual to systemic factors. Undernutrition and acute rapid weight loss of as little as 2-3 kg (5%) in combination with disease, increases the risk of complications, lowers resistance to infection, impairs physical and mental functioning, delays recovery, and may be life threatening. In these circumstances nutritional support can hasten and improve recovery, and in some cases prevent complications and death. However, not all cases of undernutrition call for aggressive nutritional support, and in some cases such an approach may be of little benefit and even harmful. Nutritional risk screening should therefore be performed taking both the nutritional status and the severity of disease into consideration. Also, the nutritional support should be expanded to the pre- and post-hospitalisation periods. Finally, ordinary hospital food should be the primary feeding choice.

2.1 Consequences of undernutrition

An English medical cookbook from 1390 ends with the words: “Explicit de coquina quae est optima medicina”, translated as: “Food is the best medicine”. In spite of the old knowledge of the importance of the right food and sufficient food in the treatment of illness, Florence Nightingale later wrote (1859): “Thousands of patients are annually starved in the midst of plenty”.


There are many adverse consequences of disease-related undernutrition. Silk (1994) has extracted the majority of these. The patient becomes apathetic and depressed, and this may lead to loss of morale and loss of will to recover. Inability to concentrate means that the patient cannot benefit from instructions about techniques needed for self-care. A general sense of weakness impairs appetite and ability to eat. The respiratory muscles are weakened, making it difficult to cough and expectorate effectively, with increased risk of lung infection. Impaired ventilatory drive may also make it difficult to wean a critically ill patient from a ventilator. Cardiac function is impaired, with reduced cardiac output and risk of heart failure. Gastro-intestinal function and structure is injured. Mobility is reduced, delaying recovery and predisposing to thrombo-embolism and bedsores. The undernourished patient develops impaired resistance to infection, which in turn can worsen nutritional status (see also Sobotka et al. 2000, for a thorough review).
Undernutrition, in combination with disease, is thus an insidious factor which prolongs recovery, increases the need for high-dependency nursing care and sometimes intensive care, increases the risk of serious complications of illness and, at its worst, leads to death either from a preventable complication or from inanition (Silk 1994). To all this is added the reduced quality of life of the patients (Larsson et al. 1994, Ovesen et al. 1993).

**2.1.1. Clinical relevance of insufficient energy intake and weight loss**

To be of clinical relevance insufficient energy intake has to be of a certain low “level” and persist for some time. It took 3 months for healthy persons who received 50% of their energy requirements to lose 15% of their weight. After 6 months the loss was 20%, and several changed their behaviour and experienced increased tiredness, muscle soreness, depression, moodiness, irritability and apathy, and their ambition, mental alertness, concentration and self-discipline decreased (Keys et al. 1950).

Irish hunger strikers undergoing prolonged total starvation lost a mean of 38% of their weight after 60 days. A relationship between degree of weight loss and reduction in organ function, immune status, wound healing and muscle strength was found. It was concluded that a rapid weight loss of between 5 and 10% causes clinically significant organ function changes, that a weight loss between 35 and 40% is associated with a 30% risk of death and that survival beyond 50% weight loss is unlikely (Allison 1992, Allison 1995). The magnitude of the consequences will depend on initial body weight since obese persons can tolerate much longer fasts than persons with normal weight. The reason is that the fatter the person is the less will be the relative contribution of muscle mass to the total weight loss (Forbes 1987). Nevertheless, overweight and obese patients can also suffer from disease-related rapid weight loss.

Based on the starvation studies mentioned, Allison has constructed a theoretical curve (Figure 2.1), expressing the rate of weight loss with starvation and disease. It shows that a patient receiving 50% of energy requirement (semi-starvation) is likely to lose 15-20% of body weight in 3-4 weeks.
Low food intake, in combination with disease, has a larger and more rapid impact on body weight and function than simple starvation. A disease process increases levels of catabolic hormones (epinephrine, glucagon and cortisol), which deplete body substrates having an effect on immune function, blood clotting, wound healing etc. In view of these changes it is not surprising that, in contrast to simple starvation, the catabolic state of stress starvation cannot be reversed by nutrition alone. However, adequate nutritional support remains important to minimise undernutrition and should be adapted to the situation (Barendregt & Soeters 2000).

2.2 Assessing and treating undernutrition

Different methods of nutritional assessment and different criteria for defining undernutrition have been used. Many studies, which attempt to define nutritional values that can be used to select undernourished patients, do not take into account the severity of the illness. If nutritional assessment focuses on physiological or biochemical functions alone (e.g. the use of S-albumin), it may reflect the severity of illness that is not caused (solely) by inadequate intake nor can be reversed by nutritional support (Corish & Kennedy 2000, Franch-Arcas 2001). Hence, it is important to assess the nutritional status of the patient with proper measures, such as (unintended recent or rapid) weight loss, body mass index (BMI) and (recent) food intake (Allison 2000). In patients of old age, one should be aware of the age-related changes in body composition, which means that the ideal BMI increases (to 24-29) and that any degree of weight loss becomes of significance (Beck & Ovesen 1999).
The need for nutritional assessment may be better understood if deterioration in nutritional status is considered in stages. In the first stage, the availability of nutrients is inadequate due to poor food intake, to increased nutrient requirements, or to reduced utilisation or excessive loss of nutrients. Nutrient stores then become depleted resulting in (further) weight loss and impairment of physiological or biochemical processes. These stages of undernutrition are best identified by a nutritional risk screening process. Finally, severe nutrient deficiencies result in deterioration of cells and tissues and change in organ function. The latter stage of undernutrition requires formal nutritional assessment carried out by an individual with appropriate expertise (Corish & Kennedy 2000).

2.2.1. Nutritional risk screening

Assessment of the nutritional risk of the patients is the first step in the treatment of disease-related undernutrition. Hence, it should be performed already at admission and repeated regularly (e.g. once a week) during the hospital stay.

Several screening systems have been developed to assess nutritional risk. What has not been stressed, however, is the need to monitor patients during their hospital stay in addition to the screening on admission (Hall et al. 2000). In most cases, these systems are predictive in nature, e.g. of postoperative complications, yet there is a lack of intervention studies to document improved clinical outcomes when patients identified by these systems are given nutritional support.

Ideally, a screening method should be scientifically documented to be capable of identifying patients, who will experience an improved clinical outcome when given nutritional support. It would follow that a worse clinical course can be expected if patients fulfilling the criteria are not identified and treated satisfactorily.

In addition, the method should be easy to apply and be intuitively understandable by those health care professionals who are not experts in the field. It is a balance between a simple method, which is less accurate but easy to use – and therefore probably will be used - and a more accurate, but also more complex method, - which therefore might not be used.

The Danish Society of Parenteral and Enteral Nutrition (DSKE) is in the process of developing an evidence based screening tool (table 2.1). It is based on the assumption that it is the combination of undernutrition and severity of disease that leads to the indication for nutritional support, and that severe undernutrition or severe stress metabolism by their own are indications for nutritional support (Kondrup 2001).

---

1 The tool is included in the Danish recommendations regarding hospital food provisioning and nutritional care and support (Pedersen & Ovesen 2000)
Table 2.1 Nutritional risk screening (modified after Pedersen & Ovesen 2000)

Calculate the score:
1. Find grade (1-3) for **Impaired nutritional status** (only one: the highest grade) and **Severity of disease** (=stress-metabolism) in the table below:
2. Add the 2 grades (=> score)
3. If score ≥ 3: Start nutritional support
4. If score < 3: Consider preventive nutritional support (*e.g.* if the patient is scheduled for a major operation). **Repeat the screening on a weekly basis**

<table>
<thead>
<tr>
<th>Impaired nutritional status</th>
<th>Severity of disease (= stress-metabolism)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slight</td>
<td>Slight</td>
</tr>
<tr>
<td>Wt loss &gt; 5% in 3 months</td>
<td>Hip fracture</td>
</tr>
<tr>
<td>Or</td>
<td>Chronic patients, in particular with acute complications: cirrhosis, COPD</td>
</tr>
<tr>
<td>Food intake below 50-75% in the preceding week.</td>
<td><em>Solid tumours/Radiotherapy</em></td>
</tr>
<tr>
<td>Grade 1</td>
<td>Grade 1</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Wt loss &gt; 5% in 2 months</td>
<td>Major abdominal surgery</td>
</tr>
<tr>
<td>Or</td>
<td>Geriatric patients in long admissions</td>
</tr>
<tr>
<td>BMI 18.5 - 20.5 + impaired general condition</td>
<td>Stroke</td>
</tr>
<tr>
<td>Or</td>
<td>Postoperative kidney failure</td>
</tr>
<tr>
<td>Food intake 25-50% in the preceding week.</td>
<td><em>Haematology/Chemotherapy</em></td>
</tr>
<tr>
<td>Grade 2</td>
<td>Grade 2</td>
</tr>
<tr>
<td>Severe</td>
<td>Severe</td>
</tr>
<tr>
<td>Wt loss &gt; 5% in 1 month (= &gt;15% in 3 month)</td>
<td>Head injury</td>
</tr>
<tr>
<td>Or</td>
<td>Bone marrow transplantation</td>
</tr>
<tr>
<td>BMI &lt;18.5 + impaired general condition</td>
<td><em>Intensive care patients</em></td>
</tr>
<tr>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>Food intake 0-25% in the preceding week.</td>
<td></td>
</tr>
<tr>
<td>Grade 3</td>
<td>Grade 3</td>
</tr>
</tbody>
</table>

Grade: = SCORE:

*Wt = Body weight, BMI = Body mass index, COPD = Chronic obstructive pulmonary disease*

---

1. Grade 3 severity of disease is defined by intervention studies showing an effect of nutritional support in patients who were well-nourished before becoming severely ill (*Rapp* et al. 1983, *Graham* et al. 1989, *Weisdorf* et al. 1987). Grade 2 severity of disease is defined with major abdominal surgery, geriatric patients and patients with dysphagic stroke as examples, since in most cases these studies have involved patients with a slight degree of impaired nutritional status (*Keele* et al. 1997, *Rana* et al. 1992, *Beier-Holgersen* & *Boesly* 1996, *Unosson* et al. 1992, *Norton* et al. 1996, *Abel* et al. 1973). Patients with fractured neck of the femur, liver cirrhosis or COPD (chronic obstructive pulmonary disease) define grade 1 severity of disease, since nutritional support was only effective in those, who were moderately undernourished (*Bastow* et al. 1983, *Cabre* et al. 1990, *Schols* et al. 1995). Groups of patients for whom no satisfactory intervention studies are available, can be inserted into the system according to “Conceptual interpolation”, examples of this are given in italics. Also the right half of table 2.1 can be modified according to the diagnoses of patients in individual departments (*J Kondrup* personal communication) (see also Table 2.4).
In brief, the patient can have a score of 0-3 for each component (nutritional status and severity of disease) and a total score of 0-6. Any patient with a total score $\geq 3$ is considered a risk patient and should be offered nutritional support, based on a more detailed nutritional assessment (see below), e.g. under supervision of a clinical dietician or a member of a nutrition support team.

An important problem relative to the identification of nutritional risk by use of body height and body weight measurements is related to the patients, who are confined to bed, since undernutrition probably is over-represented in this population. In such cases, one has to rely on the estimation of food intake$^1$.

To some physicians and nurses, i.e. those dealing with patients who seldom experience nutritional problems, the Danish nutritional risk-screening tool might seem too complex. Instead an extraction of the questions in the screening tool could be used as a level 1 screening: 1) Is BMI $<20.5$? 2) Has energy intake been reduced during the last week? 3) Has there been a recent weight loss? And 4) Is the patient severely ill? If the answer is yes to any of these 4 questions, the level 2 screening in table 2.1 is carried out.

2.2.2. Nutritional assessment

Nutritional assessment is defined as a comprehensive evaluation to define nutritional status of the patients. The goal is to identify patients who have or are at risk of developing deficiencies of energy, protein or specific nutrients, to quantify patients’ risk of developing complications related to undernutrition, and to monitor the adequacy of nutritional support.

In a formal nutritional assessment as in nutritional risk screening, consideration is given to recent weight loss, nutrient intake and disease state. In addition, information regarding the fluid balance, the duration of disease symptoms (e.g. fever), the presence of anorexia, dysphagia, gastro-intestinal symptoms or additional losses from wounds, fistulae etc., vitamin and mineral deficiencies, and the effect of nutritional status on mental and physical function should be gathered (ASPEN 1995).

2.2.3. Treatment plan and dietary goals

In designing a treatment plan for the patient at nutritional risk, energy requirement can be calculated by the factorial method (Souba & Wilmore 1994). Basal metabolic rate (BMR) can be estimated from Harris-Benedict’s or Schoefield equations (WHO 1985) and multiplied by a diurnal activity factor (AF). Typical values for ambulatory patients are 1.2 to 1.3, and for bedridden patients 1.0 to 1.05. If the aim is weight gain an additional gain factor (GF) of 1.3 could be included$^2$ (Garrel et al. 1996, Kondrup et al. 1998, Pedersen & Ovesen 2000).

$^1$ Based on 8 studies, which have reported mean values for body weight and height and mid-arm-circumference it can be estimated that a mid-arm-circumference $<80\%$ of reference value corresponds to a BMI $<20.5$ (J Kondrup, personal communication)

$^2$ More specific: At an initial body weight of 60 kg, a gain of 1 kg requires 29 MJ, and a loss of 1 kg will supply 22 MJ (Kondrup et al. 1998)
Protein requirements for patients suffering from chronic disease and with impaired nutritional status are estimated to be 1.0-1.5 protein/kg/day (Allison 1999, Pedersen & Ovesen 2000).

Besides the estimation of the energy- and protein requirement of the patient the nutrition treatment plan should include the immediate and long term goals of the nutritional support, routes appropriate for use of feeding, anticipated duration of treatment and discharge planning/or home training. The patient (and their relatives) should be involved in decisions regarding goals and provide informed treatment consent (ASPEN 1995).

2.2.4. Monitoring and adjustment

Therapeutic and adverse effects should be monitored including clinical changes that may impact the nutritional treatment (ASPEN 1995). Also, level of progress compared to immediate and long-term goals of the nutritional support as defined in the treatment plan should be probed.

Recording of dietary intake should be carried out on a daily basis. Depending on the degree of nutritional risk the patient should be seen, e.g. by the clinical dietician, at least 3 times a week or even on a daily basis if needed. Patients should be weighed 3 times a week (if possible), and if goals are not being achieved, the dietary regimen has to be adjusted accordingly (Kondrup et al. 1998, Pedersen & Ovesen 2000). Suggestions for treatment failures could be a weight loss >5% or an energy intake <75% of estimated maintenance energy requirement (Kondrup 2001).

2.2.5. Follow-up of treatment

Investing money (and time) in expensive treatment could be a waste if patients cannot optimally respond, due to a decrease in nutritional status. Hence, a system of on-going review of nutritional status is appropriate for patients in the hospital, even if the initial screen shows no nutritional risk. The importance of follow-up is underlined in a prospective study in old patients, which showed that inadequate food intake during hospitalisation was associated with increased morbidity among patients who were initially assessed to be in good nutritional status (Hall et al. 2000). This is supported by another study, which found that patients who declined nutritionally (according to the Subjective Global Assessment\(^1\)), regardless of nutritional status at admission had significantly higher hospital costs (Braunschweig et al. 2000). The screening tool depicted in table 2.1 can probably be used for follow-up.

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\(^1\) Subjective Global Assessment – includes questions regarding (recent) weight change, dietary intake change, gastrointestinal symptoms, functional capacity, the disease and its relation to nutritional requirements plus a physical inspection (regarding presence of oedema or muscle wasting).
2.2.6. Rehabilitation

Restoration of nutritional status improves mental state and cellular function including muscle strength and respiration, thereby accelerating rehabilitation. Real weight and tissue gain is usually minimal in the short term and has to wait discharge from hospital and resumption of activity and increase in appetite and food intake (Sobotka 2000). Hence it is of utmost importance that the nutritional support continues after discharge. Close co-operation between home-care personnel, general practitioners, meals-on-wheels services etc. are therefore mandatory.

**Recommendations**

- The assessment of nutritional risk should take into account nutritional status and the severity of disease.
- The nutritional risk screening method should be evidence based, in order to identify the patients who may benefit from nutritional support.
- The nutritional risk screening method should be easy to use and simple to understand.
- The influence of age, growth and sex should be taken into consideration when the nutritional risk of the patient is determined.
- A system of on-going review of nutritional risk should be mandatory for all patients, regardless of their (initial) nutritional risk.
- Studies should be undertaken to develop and validate simple screening methods, aimed for use in hospitals and primary health care sector.
- Identification of a patient at nutritional risk should be followed by a thorough nutritional assessment, a treatment plan including dietary goals, monitoring of food intake and body weight, and adjustment of treatment plan.
- Standards of practice for assessing and monitoring nutritional risk/status, should be developed at a national and European level.

2.3 The magnitude of the problem

Regardless of the methods that have been used to assess the nutritional status of the patients in the European hospitals the conclusion is the same: undernutrition is significant. If BMI is used as an indicator of the nutritional status the prevalence of underweight (BMI <20) has been found to be 20-30%. This has been seen in, respectively, Denmark (Beck et al. 2000), Germany (Schauder et al, in press), Italy (Comi et al. 1998, Incalzi et al. 1996), Norway (Mowé et al. 1994), Sweden (Sjöberg et al. 1992), Switzerland (Mühlethaler et al. 1995, Kyle et al. 2001) and United Kingdom (McWhirter & Pennington 1994).

When estimating the size of the problem one should take into consideration the high and increasing prevalence of overweight and obesity in Europe, which means that the prevalence of healthy people with lower anthropometrical values is decreasing (Corish et al. 2000). Besides patients who have an adequate nutritional status according to BMI
could be undernourished due to low amount of fat-free mass (Kyle et al. 2001). Most of the studies assessing the nutritional status of patients have excluded the ones most ill and, hence, the patients most likely to be undernourished (e.g. Beck et al. 2000, Edington et al. 2000). Finally, obese patients could easily become undernourished due to a massive weight loss, e.g. critically ill patients.

The prevalence of undernutrition is evidently much higher among some patient groups, e.g. gastro-intestinal patients, than among other patient groups, e.g. obstetric patients and patients admitted for elective surgery. Also, undernutrition is higher among old patients (Beck et al. 2000, Cederholm et al. 1993, Cianciaruso et al. 1995, McWhirter & Pennington 1994, Taylor 1993). Finally, a slightly higher prevalence is suggested among medical compared to surgical patients (McWhirter & Pennington 1994), among the female patients (Constans et al. 1992, Larsson et al. 1990, Paillaud et al. 2000), and among teaching hospitals compared with district general hospitals (Edington et al. 2000, Elia & Stratton 2000).

The majority of the European studies examined patients at the time of admission to hospital. Thus, those patients found to be undernourished had already become undernourished whilst at home. This is confirmed by a study of ambulatory patients (Edington et al. 1997) and by studies, where hospitalised old patients were found to have a lower energy intake in the month preceding the hospitalisation and a reduced nutritional status compared to a healthy group (Cederholm & Hellström 1992, Mowé et al. 1994).

Importantly, many studies have shown that the risk of undernutrition increases during hospital stay (table 2.2).
Table 2.2. Studies have repeatedly shown that undernutrition increases during hospital stay.

- Based on the Subjective Global Assessment the frequency of undernutrition increased (non-significantly) from 41% to 51% in non-surgical gastrointestinal and internal medicine patients (Naber et al. 1997).
- Of 112 patients with all kinds of diagnoses, hospitalised for more than 1 week, 64% had lost weight (mean weight loss: 5.4%) when discharged, including 75% of those initially most undernourished. In contrast, weight gain was observed in 20%, including only 12.5% originally classified as undernourished. However, none of these patients gained sufficient weight to allow them to be reclassified as having normal weight (McWhirter & Pennington 1994).
- 50% of surgical gastrointestinal and orthopaedic patients lost up to 5% of body weight, 25% lost between 5 and 10%, and 8% lost between 10 and 15%. However, 21% of the patients had oedema when their weights were first measured (Bruun et al. 1999).
- The most dramatic deterioration in nutritional status was seen in the first 2 weeks of the study period. For example, 64% of surviving stroke patients lost weight, 30% gained weight and 6% had stable weight, compared with 45%, 47% and 8%, respectively, during the second week of the hospital stay (Gariballa et al. 1998).
- In surgical patients 89% lost weight during their postoperative stay, 33% lost 5-10% of their admission weight and 5% lost >10% (Ulander et al. 1998).
- Weight loss occurred in 65% of overweight and obese patients, and in 66% of normal weight and 43% of underweight patients (Corish et al. 2000).

2.4 Causes of undernutrition

Most patients experience a loss of appetite in relation to their disease. Consequently, food intake in European hospitals has generally been found to be low (Elmståhl et al. 1997, Hessov 1977, Incalzi et al. 1998, Klipstein-Grobusch et al. 1995, Ulander et al. 1998). In some studies of old patients almost all had an energy and protein intake below estimated requirements (Delmi et al. 1990, Hartgrink et al. 1998) – and accordingly low intake and blood level of vitamins and minerals (Schmuck et al. 1996, Thomas et al. 1988). A study by Todd et al. (1984) exemplifies that low food intake may often be surmised to be a normal intake. One fourth of patients, considered by the senior ward nursing staff to eat “normally”, had an energy intake below their estimated basal metabolic rate.

Disease-related undernutrition can be caused by many factors, see table 2.3.
Table 2.3. Causes of disease-related undernutrition (Green 1999)

<table>
<thead>
<tr>
<th>Category</th>
<th>Cause</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced food intake.</td>
<td>Anorexia.</td>
<td>Poor appetite, nausea and vomiting as a result of disease process, treatment or depression.</td>
</tr>
<tr>
<td></td>
<td>Change in taste and smell.</td>
<td>Due to treatment or medication.</td>
</tr>
<tr>
<td></td>
<td>Episodes of fasting.</td>
<td>Prior to investigative procedures or operations, missed meals due to these procedures or avoidance of food due to diarrhoea.</td>
</tr>
<tr>
<td></td>
<td>Pain on eating.</td>
<td>Sore mouth due to disease process or partial gastrointestinal obstruction.</td>
</tr>
<tr>
<td></td>
<td>Difficulties in chewing and swallowing.</td>
<td>Dysphagia (e.g. due to stroke, dementia), ill-fitting dentures, poor oral health.</td>
</tr>
<tr>
<td></td>
<td>Inability to eat independently.</td>
<td>Physical handicap, arthritis, dementia.</td>
</tr>
<tr>
<td></td>
<td>Respiratory problems.</td>
<td>Pulmonary disease.</td>
</tr>
<tr>
<td>Malabsorption.</td>
<td>Impaired digestion.</td>
<td>Pancreatic insufficiency, enzyme deficiencies (e.g. cystic fibrosis).</td>
</tr>
<tr>
<td></td>
<td>Impaired absorption.</td>
<td>Intestinal resection (short bowel syndrome), mucosal damage (e.g. inflammatory bowel disease).</td>
</tr>
<tr>
<td></td>
<td>Excess losses from the gut.</td>
<td>High output fistulae, protein-losing enteropathy, short bowel syndrome.</td>
</tr>
<tr>
<td>Modified metabolism.</td>
<td>Metabolic response to disease.</td>
<td>Malignancy (cancer), trauma, chronic sepsis, multiple organ failure, advanced HIV-infection.</td>
</tr>
<tr>
<td></td>
<td>Metabolic consequences of impaired organ function.</td>
<td>Renal disease, liver disease, pulmonary disease.</td>
</tr>
</tbody>
</table>

Individual factors of central importance are difficulties in swallowing or chewing, including poor oral health (Gariballa et al. 1998, Mowé & Bøhmer 1991, Persson et al. 1999 Thomas et al. 1988) and impaired cognitive function (Kennedy et al. 1997, Lumbers et al. 1996, Ponzer et al. 1999). Emotional problems secondary to illness, social isolation or bereavement can easily escalate to apathy and anorexia, causing undernutrition and possibly creating a vicious circle (Bettany & Powell-Tuck 1995, Goodwin 1989). Emotional problems (depression) are one of the most common reversible causes of undernutrition particularily in old persons (Cederholm et al. 1993, Wilson et al. 1998). Alternatively, even subclinical nutritional deficiencies result in depressed cognitive state (Sullivan et al. 1999). A specific cause of undernutrition is
identified among patients with eating disorders, particularly patients suffering from anorexia nervosa. These patients do not want to eat because they have an intense fear of gaining weight and undue preoccupation with body shape - even when they are underweight (American Psychiatric Association 1994). Other causes are old age (Beck et al. 2000, Cederholm et al. 1993, Taylor 1993) and loneliness (Green 1999).

The eating environment has significant importance (Elmståhl 1987, Mathey et al. 2001, Ragneskog et al. 1996). In France healthy male hospital employees, 25-35 years of age, were offered exclusively the food served to the patients at that hospital for 5 consecutive days (Ravel et al. 1995). The food provided 9.2 MJ/day, but without any obvious reason or logical explanation the young healthy subjects had an energy intake around 7.8 MJ/day, only half of estimated requirements. This underlines the difficulties to achieve a sufficient energy intake in sick patients.

If systemic factors are present eating without aid is difficult (Kennedy et al. 1997, Sidenvall & Ek 1993, Unosson et al. 1995), and restrictive diets on a medical indication are often instituted (Buckler et al. 1994). Also, there are the effects of hospitalisation and treatment on nutritional status, including inappropriate dietary choice, the interruption of meals by staff, missed meals due to therapeutic or investigative procedures, and lack of flexibility in hospital food service systems (Pennington 1998). Finally, both disease and medications can alter taste and smell, cause anorexia, nausea, gastro-intestinal symptoms, and drug-nutrient interactions (Schiffman 1997, White & Ashworth 2000, Lourenco 2001).

2.4.1. Other causes

It is a long-standing surgical tradition, and still routinely performed (Cheatham et al. 1995), to use naso-gastric decompression after gastrointestinal surgery\(^1\), despite the fact that many clinical trials, reviews and editorials have demonstrated the routine to be unnecessary at best. One consequence is that patients are allowed “nil-per-mouth” until passage of flatus, after which successively a liquid-menu, a protective menu and ordinary hospital food are administered resulting in long periods with insufficient energy intake and loss of weight (Carr et al. 1996, Rana et al. 1992, Wara & Hessov 1985). Besides, a recent meta-analysis, which compared enteral feeding or free oral intake started within 24 hours after surgery with the traditional nil-by-mouth routine found a decrease in risk of infections and length of stay among patients fed early (Lewis et al. 2001).

For many years overnight fasting has been a routine before surgery to reduce the risk of aspiration of stomach contents during anaesthesia. However, studies have shown that the stomach is emptied 90 minutes after ingestion of both a carbohydrate-rich drink and water (Nygren et al. 1995), and that intake of carbohydrate-containing beverage results in improved well-being post-operatively and may reduce length of stay (Ljungqvist et al. 1995).\(^1\)

\(^1\) It is believed that its use significantly decreases the risk of postoperative complications including nausea, vomiting, aspiration, wound dehiscence and anastomotic leak (Cheatham et al. 1995).
al. 2001). It appears that the patients could be allowed free intake of clear energy-containing fluids until 2 hours before anaesthesia, but many patients are starved for longer periods preoperatively than is physiologically necessary (Holmes 1999).

Difficulty in finding the optimal scheme for bowel preparation before a diagnostic barium enema is reflected in the large number of preparation schemes. In spite of data showing that the importance relies on the type of medication used in the cleansing protocol (Present et al. 1983), almost all schemes involve restriction of foods, adding to the risk of undernutrition during hospitalisation (Hellström & Brolin 1987, Tjon A Tham et al. 1993).

An effective management of patients implies that it is necessary to go further than solely to assess nutritional status, but also to address the underlying causes of undernutrition, since their correction may result in improvement without elaborate nutritional support. Effective management of undernutrition, therefore, is not solely a nutritional exercise. The undernutrition must be seen in the context of an overall clinical picture (Allison 1995). This implies that disease-related undernutrition should be treated as any other clinical diagnosis.

### Recommendations

- The multiple causes of disease-related undernutrition should always be considered for every patient.
- Specific care should be taken of mental disease characterised by undernutrition.
- The use of medications and combinations with side effects of anorexia, nausea, and other gastrointestinal symptoms, drug-nutrient interactions or alterations of taste and smell should be well grounded and avoided as much as possible while physicians and nurses should be aware of these side-effects.
- “Nil-by-mouth” regimes, over night fasting and bowel-cleansing protocols with dietary restrictions should not be used routinely.
- The literature regarding “nil-by-mouth” regimes, over night fasting and bowel-cleansing protocols with dietary restrictions should be reviewed in order to assess which patients will really benefit.
- The definition of disease-related undernutrition should be universally accepted and used as a clinical diagnosis and treated as such.

### 2.5 Effect of nutritional support

The argument for nutritional support is based on two closely related concepts: 1) undernutrition is associated with increased morbidity and mortality, and if this association is causative then 2) the prevention or correction of undernutrition can minimise or eliminate undernutrition-related morbidity and mortality (Klein et al. 1997).
A number of studies have demonstrated that undernourished patients receiving nutritional support benefit clinically in terms of reduced risk of complications, shortened length of stay and/or reduced mortality. This effect has also been demonstrated in patients who were only mildly undernourished, but exposed to severe catabolic stress (Green 1999) (see table 2.4).

Table 2.4. Nutritional support in clinical practice - the degree of evidence for clinical effect based on randomised controlled trials (Avenell & Handoll 2000, Klein et al. 1997) ¹

<table>
<thead>
<tr>
<th>Patients</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peri-operative (gastrointestinal surgery)²</td>
<td>TPN given to patients with recent weight loss and gastrointestinal cancer for 7 to 10 days before surgery decreases postoperative complications (A).</td>
</tr>
<tr>
<td>Fractured femur</td>
<td>Oral supplements reduce complications and LOS among old women with low skin fold measurements (A)³.</td>
</tr>
<tr>
<td>Liver cirrhosis⁴</td>
<td>Providing adequate enteral nutrition or TPN improves some parameters of liver function in patients with chronic alcoholic liver diseases with poor food intake. Data are inconclusive to determine whether the morbidity and mortality is decreased (A).</td>
</tr>
<tr>
<td>AIDS</td>
<td>TPN, enteral and oral nutritional support may prevent or reverse weight loss and replenish body cell mass in patients who have poor food intake or malabsorption, and do not have an active opportunistic infection (A).</td>
</tr>
<tr>
<td>Bone marrow transplantation</td>
<td>Short-term TPN may increase long-term survival (&gt;6 months) and decrease tumour relapse in patients in good nutritional status (A).</td>
</tr>
<tr>
<td>Trauma (gastrointestinal surgery)</td>
<td>Patients in good nutritional status fed by early enteral nutrition have fewer complications than those given TPN (A).</td>
</tr>
</tbody>
</table>

TPN = Total parenteral nutrition  
LOS = length of stay

¹ Degree of evidence: A = supported by randomised controlled trials or meta-analyses, B = supported by well-designed non-randomised, controlled studies, or prospective or retrospective epidemiological studies, C = supported by uncontrolled published experiences, case reports, or expert opinion (Klein et al. 1997).
² The available documentation has resulted in consensus statements regarding peri-operative nutrition from Italy and France (Bozetti 1996, Zazzo 1996).
³ See also text.
⁴ The available documentation has resulted in a consensus statement regarding nutrition in liver disease and transplantation from ESPEN (Plauth et al. 1997).
The randomised clinical trial is considered to be the most reliable method for evaluating clinical efficacy of a treatment. In a number of cases it would seem unethical to perform such trials. If so one has to rely on uncontrolled published experiences or case reports (level C recommendation) (Klein et al. 1997).

The clinical benefit of nutritional support has primarily been obtained by means of artificial nutritional support. However, in recent years nutritional support studies using energy-dense menus have also been published (Barton et al. 2000, Gall et al. 1998, Kondrup et al. 1998, Maciá et al. 1991, Olin et al. 1996). All studies have demonstrated an increased energy intake by using energy and protein dense menus, but unfortunately none of these studies have examined the effect on clinical outcome. In the study by Gall et al. (1998) the simple dietetic intervention of fortifying food and providing in-between meals was sufficient to remove most (82%) patients from energy deficit. In the study by Barton et al. (2000) all the patients had higher energy intakes on the menu with increased energy density (due to the addition mainly of fat in the form of butter, cream and cheese).

With the use of the scoring system presented in table 2.1, 106 trials of nutritional support were reviewed. Trials on patients with a score $\geq 3$ tended to have a positive outcome, whereas the majority of those with a score lower than 3 were negative, suggesting that a nutritional risk scoring system has clinical validity and can form a useful basis for prospective studies (Allison 2000, Kondrup et al. 2001).

A high number of studies have found no clinical beneficial effect of artificial nutritional support, primarily in the form of parenteral nutrition (Klein et al. 1997, Koretz et al. 2001). This has resulted in level A recommendations against the routine use of parenteral nutrition for patients receiving chemotherapy, radiotherapy or waiting for surgery (American College of Physicians 1989, Buzby et al. 1991, Klein et al 1986, Koretz et al. 2001). Overuse and improperly use of artificial nutritional support could explain the lack of positive findings (Souba 1997, Torosian 1999). In some of the early studies of peri-operative nutrition, the patients were provided with around 15 MJ/day of parenteral nutrition (Klein et al. 1997). Another explanation could be that the duration of the nutritional support was too short. Artificial nutritional support should be given for at least 7 days (Campos & Meguid 1992, Klein et al. 1997, Souba 1997). Also, there are inadequate data to assess the efficacy of parenteral nutrition in patients who are severely undernourished (Koretz et al. 2001), even though a recent meta-analysis suggests that they might benefit from parenteral nutrition (Braunschweig et al. 2001). Finally, disease-related undernutrition is caused by many factors (see table 2.3.), including the disease itself, which makes it difficult to improve outcomes in all patient categories. Only randomised controlled trials will ultimately teach when to feed and how.

The positive effect of postoperative nutritional support demonstrated in undernourished old people recovering from hip fracture (Klein et al. 1997, Ofman & Koretz 1997) has recently been reviewed (Avenell & Handoll, 2000). The scientific evidence was found to be weak, and it was recommended that future studies should be conducted with specific consideration on sample size, methodology and outcome assessment.
All in all there is no doubt as to the efficacy of nutritional support in terms of improving undernutrition and its consequences to the hospitalised patient. However, nutritional support should always go hand in hand with other correctional measures.

2.5.1. Nutritional support pre- and post-hospitalisation

The average length of stay in somatic European hospitals is between 5 and 10 days. However, these figures cover a wide distribution, stressing the importance to assess the nutritional risk of the patient already at the admission to the hospital.

An American study found that patients at risk of undernutrition\(^1\) had significantly longer length of stay, with higher costs and primary health care sector needs, despite the fact that 91% received nutritional support while hospitalised (Chima et al. 1997). The authors concluded that with a 5- to 7-day acute in-patient stay, the impact of nutritional support on nutritional status is limited, and that nutritional support should be extended to pre- and post-hospitalisation periods. This is supported by reviews of the effect of artificial nutritional support that conclude that the intensive nutritional treatment should last for at least 7 to 15 days to be of any benefit (Campos & Meguid 1992, Klein et al. 1997, Souba 1997).

Studies have shown that patients followed for up to 4 months after discharge had not regained their preoperative weight (Beattie et al. 2000, Jensen & Hessov 1997, Keele et al 1997). A study of old female patients after discharge from hospital for emergency and elective orthopaedic surgery suggests that nutritional losses continue for some time after discharge. After discharge weight loss occurred in 50% of patients, and at 8 weeks averaged 4.2 kg, far exceeding the weight loss that occurred during their hospital stay (Williams et al. 1990).

In general, patients undergoing major surgery or patients with acute serious illness will usually have weeks or even months with insufficient food intake and low body weight, before they begin to regain muscle strength and tissues (Jensen & Hessov 2000). Studies have shown that nutritional support either preoperatively or after discharge improve both the nutritional status and the well being of patients (Beattie et al. 2000, van Bokhorst-de van der Schueren et al. 2000, Jamieson et al. 1997, Klein et al. 1997, Lewis et al. 2001, Woo et al. 1994)\(^2\).

These studies together with the findings in most of the European studies assessing the nutritional status of hospitalised patients that the patients are undernourished already at admission (Cederholm & Hellström 1992, McWhirter & Pennington 1994, Mowé et al. 1994, Mühlethaler et al. 1995, Naber et al. 1997) suggest that there is a need for expanding the nutritional support to both pre- and post-hospitalisation. Therefore for

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\(^1\) Risk of undernutrition was assessed by a body weight less than 75% of the ideal or recent weight loss >10% (Chima et al. 1997)

\(^2\) The largest benefit is probably obtained among patients with recent weight loss (Jensen & Hessov 2000).
each patient, a note about the nutritional status and the nutritional care or support prescription should always be present in medical and nursing admission, discharge and outpatient records. Otherwise efforts and costs in hospitals will be lost.

This should not lead to the misconception that one should not have to care very much about these problems in hospitals: 1) Many of the nutritionally at risk patients have a long stay in hospitals. 2) During the pre-surgery outpatient diagnosis and examination, the hospitals will have to deal with the patients’ nutritional problems before surgery is performed. And 3) When discharged from hospital, it will be the duty of the hospital to prescribe a treatment plan to be followed, and also in some cases the hospital will be responsible for follow-up after discharge.

2.5.2. Immune-modulating oral or enteral nutritional support

Certain key nutrients (L-arginine and L-glutamine, ribonucleic acid (RNA) and the n-3 essential fatty acids (EFA)) seem to be able to modulate a variety of inflammatory, metabolic, and immunological processes when ingested in excess of the normal daily requirements. A commonly used combination has been L-arginine, EFA and RNA (Heys et al. 1999).

Meta-analysis of recent trials suggests reduced risk of infections, fewer days on a ventilator, and reduced length of intensive care and hospital stay, and reduced hospitalisation costs, but mortality does not appear to be affected (Beale et al. 1999, Heyland et al. 2001, Heys et al. 1999, Zaloga et al. 1998). Thus, a level A recommendation (i.e. highest strength of evidence supporting its use) was proclaimed for the clinical use of enteral immune-modulating diets (Klein et al. 1997). Besides, consensus recommendations regarding its use were made (U.S. Summit Consensus Panel 2001).

However, it is still debated whether the beneficial effect is a general effect by the nutritional support of the undernourished patient or a therapeutic effect of (a) specific ingredient(s) (Ofman & Koretz 1998). Another question is whether benefits of immune-modulating nutritional support in patients suffering from shock, sepsis and organ failure are equal to those in moderately traumatised surgical patients. In this context it should be noted that meta-analyses did not show any improvements in the former group of patients, rather demonstrated a tendency towards a poorer outcome (Beale et al. 1999, Heyland et al. 2001, Heys et al. 1999). These results might be a serious warning to the unrestricted use of immune-modulating formulas in the most seriously ill patients (Heyland et al. 2001, Suchner et al. 2000). Finally, no studies have examined the clinical benefit of immune-modulating nutritional support among the majority of patients - those who are not critically ill or suffering from surgical stress.
Recommendations

- Nutritional support as part of the treatment of patients should be considered more frequently.
- Nutritional support should be properly targeted to the individual patient.
- Nutritional support with the use of artificial nutrition should be continuous over a period of at least seven days.
- No patient should receive artificial nutritional support without proper evaluation of indications, risks, benefits and informed consent of the patient as well as close supervision of side effects.
- Specific immune-modulating formulas should be limited to those patients who may benefit from them in the light of randomised controlled trials.
- Nutritional support, if appropriate, should be continued by the primary health care sector after discharge from hospital.
- Medical and nursing admission, discharge and outpatient records should contain information about each patient’s nutritional status, and physical and mental condition in relation to food intake.
- Patients in need of nutritional support should receive such treatment before admission (where possible) and after discharge.
- Medical discharge letters should, where appropriate contains the diagnosis disease-related undernutrition.
- Randomised trials and systematic reviews by specialists in clinical nutrition should be performed to evaluate the effect of nutritional support on nutritional status, clinical outcome, and physical and mental functioning.
- Randomised trials evaluating the effect of ordinary (hospital) food on clinical outcome should be given high priority.

2.6 Route of feeding

The simplest and safest way to provide nutritional support is to get the patient to eat more of the ordinary hospital food. This may mean frequent small meals, or tempting the patient with appetising dishes of favourite foods, or encouraging nutritious meals rather than the patient’s usual choice of low calorie items. In a study from Denmark the use of appropriately designed and targeted energy and protein dense hospital menus prevented the weight loss normally observed during hospital stay (Kondrup et al. 1998).

Others have been quite successful in improving the intake of ordinary hospital food with simple means. In Sweden the usual menu was fortified by adding cream, milk, oil and similar natural ingredients resulting in increased energy and protein intake (+30%) (Olin et al. 1996). In United Kingdom, a selection of fortified meals and snacks was introduced that halved the proportion of patients who had dietary intake below 75% of requirement (Kondrup 2001). Also, in United Kingdom, meals served at lunch and supper to old patients were reduced in size and enriched in energy and resulted in an increased intake of 25% (Barton et al. 2000) (for other examples – see Kondrup 2001).
To facilitate the provision of frequent small appetising meals, several liquid or semi-solid preparations are available. These sip feedings can be a valuable addition to the hospital food for some patients with low intake. Hospital food, including sip feedings, can often bring intake to desired levels, and only if these measures fail or are inappropriate artificial nutritional support becomes necessary (Lennard-Jones 1992).

The majority of the early published studies of nutritional support, used parenteral nutrition. However, since then studies reporting the effect of enteral or oral supplements (sip feedings) has been steadily increasing (table 2.5).

**Table 2.5. Conclusions from a systematic review (Potter et al. 1998) of 30 studies**

- Sip feedings and enteral supplementation with energy and protein may be associated with improvements in weight gain and anthropometrics and significant reductions in case fatality.
- The benefits of routine nutritional supplementation are not restricted to particular subgroups or trials.
- More old people than young adults have been studied, and for each outcome the old people seem to benefit as much as the young.
- Considerable uncertainties remain; thus large pragmatic randomised controlled trials of routine oral or enteral nutritional supplementation are justified.

In general better hospital food provision may diminish the necessity to use sip feeding and artificial nutrition, and allow earlier weaning from these treatments. This may cause worthwhile reductions in costs and offset any increased expenditure on food service. Sip feedings should not be used as a substitute for the adequate provision of normal food, and should only be used if there are clear clinical indications (Allison 1999).

**Recommendations**

- Ordinary hospital food by the oral route should be the first choice to correct or prevent undernutrition in patients.
- Good practice to ensure the intake of ordinary food by the patients should be studied and documented.
- Sip feedings should not be used as a substitute for the adequate provision of ordinary food, and should only be used where there are clear clinical indications.
- Artificial nutritional support should only be started, when the use of ordinary food fails or is inappropriate.

---

1 Eighteen used oral sip feedings, 2 used ordinary food supplements, 9 used enteral nutrition and 1 used a combination of oral and enteral nutrition.
2.7 When to withhold or withdraw artificial nutritional support

Medical ethics are based on 4 principles: 1) Beneficence – do good. 2) Non-malfeasance – do no harm. 3) Autonomy – right to self-determination. And 4) Justice – equal access to all (Allison 2000b, MacFie 2001). The caring professions have an ethical duty to recognise and treat undernutrition, as part of optimal care for patients - usually by attention to drinking and eating but also by means of artificial nutritional support. Only when such care prolongs the period of dying or maintains an unacceptable quality of life should artificial nutritional support be reconsidered (Lennard-Jones 1988).

All professionals are influenced by own personal experiences. With the best of intentions, therefore, health care professionals may try to do well, but unless it accords with the patient’s wishes, they may behave unethically. There are specific instances, however, where force is legal and even ethical, e.g. in patients at risk from dying of undernutrition due to anorexia nervosa may be force-fed in some countries (Allison 2000b).

Withholding or withdrawal of artificial nutrition and fluids often implies ethical considerations, and it is a decision that is always difficult and often controversial. Unlike other medical treatments, food and feeding has an emotional and symbolic significance for many people playing a significant role in religious, cultural and ethnic traditions, and has evolved as a symbol of caring and comfort (ASPEN 1993). As a consequence, some physicians, hospitals and judges have held that withdrawal of artificial nutrition and fluids from a patient in a persistent vegetative state would be similar to murder. However, professional medical groups and courts of final jurisdiction have consistently concluded that artificial nutritional support is legal medical treatment and not basic care. Furthermore, where there is evidence that the patient would not want such treatment, its withdrawal is an acceptable medical practice (Lennard-Jones 1988, Paris 1993).

Today a wealth of techniques to deliver artificial nutrition exists. As evidence accumulates that undernutrition impairs and nutritional support improves outcome, the more it becomes apparent that failure to consider these techniques, is not only a failure of the duty to do good and avoid doing harm, but may well be construed as negligence and lead to court. Artificial nutritional support will often be initiated in patients with e.g. chewing- and swallowing problems due to diseases, which in the long-term might be lethal. An expensive but ineffective nutritional treatment provided to one patient might reduce the resources in money, staff and equipment available to treat another patient who might benefit.

It is not easy to recognise when the patient is close to the end of life, and when artificial nutritional support is futile or indeed harmful or uncomfortable. Besides, a situation can arise when a patient or relatives expect or demand artificial nutrition and fluids against the physician’s judgement of what is in the patient’s best interest. Even though such
cases could be settled by court, it is important to bear in mind that relatives are acutely aware of the smallest details of care as their loved one dies and recall incidents long afterwards. It is essential that their memories should be free from anger or resentment against the physicians and other health care professionals at this critical time (Lennard-Jones 1988).

The European Association for Palliative Care has made guidelines, which deal with some of the raised topics (Bozetti 1996b). Also the 4 principles of beneficence, non-malfeasance, autonomy and justice may be used to assist the physician in the decision as to whether to feed or not to feed (MacFie 2001).

The decision to terminate artificial nutritional support does not mean that oral intake should be terminated. Ordinary hospital food and fluids should be offered to all patients capable of oral intake. Providing food and drink is an important expression of concern and caring (Gastmans 1998). Hence, all attempts to maximise the actual or illusory sense of nurturing, caring and comfort provided by ordinary food should be encouraged (ASPEN 1993).

**Recommendations**

- Ordinary hospital food and fluids should be offered to all patients capable of eating—regardless of prognosis.
- The use and withdrawal of artificial nutritional support should be discussed with the patient at an early stage of terminal illnesses.
- Prolongation of misery before dying by burdensome technology such as artificial nutritional support should be avoided.
- Where there is evidence that the patient would not benefit from artificial nutritional support, its withdrawal is an acceptable medical practice.
- Research and clinical trials to enlarge the evidence base for artificial nutritional support technology should be supported.

**2.8. Children**

**2.8.1. Consequences of undernutrition**

In children undernutrition can have early and serious consequences, such as slowing of growth, increased susceptibility to infections, decreased neurodevelopment and increased length of hospital stay (Ashworth & Milward 1986, Fjeld et al. 1989, Hendriks et al. 1997, Papadopoulou et al. 1998, Sermet-Gaudelus et al. 2000, Waterlow 1992). Besides, children cannot survive starvation as long as adults because of their lesser stores of energy substrates relative to their higher rate of energy expenditure (Cunningham 1995).
2.8.2. Assessing and treating undernutrition

Screening paediatric patients at risk of undernutrition is relatively easy to perform by evaluating the growth charts (weight-for-age, height-for-age and weight-for-height). There is general agreement that all children admitted to hospital should have a growth chart that is updated weekly, but often the reality is that this is not done. The use of growth charts is also important in children after discharge, especially in those with chronic disease (Fjeld et al. 1989, Henderson et al. 1992). Assuring that all children admitted and followed as outpatients have an updated growth chart is pivotal in improving nutrition in hospitals.

There are 2 main types of undernutrition in children: wasting (low weight-for-height) and stunting (low height-for-age). The anthropometric indicator most often used is weight-for-age, but this is inferior to weight-for-height and height-for-age, as a low weight-for-age does not distinguish between wasting and stunting. The 3 anthropometric measures can be expressed as percentiles, standard deviation scores (SDS) or percent of median (Fjeld et al. 1989).

As in adults, nutritional risk assessment should involve both nutritional status and severity of disease. Such simple screening methods have been developed and found useful among paediatric patients (Reilly et al. 1995, Sermet-Gaudelus et al. 2000).

More detailed nutritional assessment can be performed by simple measures of body composition (mid-upper-arm circumference and triceps skinfold or impedance) (Baer & Harris 1997).

As in adults the energy requirement of sick children can be estimated by means of the Schoefield equations (Hayter & Henry 1994, WHO 1985). A rough estimate of the protein requirement is that children require around 150% of the requirement of healthy children – however some uncertainty exists in this context (Michaelsen 1998).

A simple strategy for improving the intake of ordinary food by undernourished hospitalised children is given in table 2.6.
Table 2.6. Simple strategy for improving the intake of ordinary food by hospitalised children (Michaelsen 1998)

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus on energy intake</td>
<td>The child should preferably decide what he/she wants to eat. The child should eat when he/she wants to. Increase energy density and frequency of meals. Favourite dishes should be available round the clock. Unknown and “strange” food should be avoided.</td>
</tr>
<tr>
<td>No reasons to focus on protein intake</td>
<td>The protein requirement is almost covered when the energy requirement is covered. Avoid high (&gt;20E%) protein intake as it might reduce appetite.</td>
</tr>
<tr>
<td>Give a multi vitamin-mineral tablet</td>
<td>This will cover for some of the possible deficits due to the disease or an unvaried menu.</td>
</tr>
</tbody>
</table>

As in adults, ordinary food should always be the first choice of nutritional support. If that is not sufficient the energy density of the ordinary food should be optimised. Sip feedings could also be used, but children often do not like these. If energy intake is still not sufficient enteral feeding should be started without unnecessary delay. Parenteral nutrition should only be started if nutrition via the enteral route is not sufficient (Michaelsen 1998). Enteral nutrition seems as effective as parenteral nutrition in maintaining nutritional status (Papadopoulou et al. 1998).

In the first 3 years of life a traumatic incident could lead to total refusal of food. Enteral feeding should be used in this case. If the child is over 3 years, psychological treatment should be considered (Wilson 1987). In chronic diseases such as cystic fibrosis or Chrohn’s disease nocturnal enteral feeding is often used with success (Griffith 1993, Sheperd et al. 1988).

Children under 4 years need nutritional support within 24 hrs after surgery due to their low energy reserves. Children above this age should meet their nutritional requirements within 3 days after surgery. All children, regardless of age, who are undernourished before an operation, should receive nutritional support immediately after the operation (Wesley & Coran 1995). Early start of nutritional support is also recommended in children with cancer (den Broeder et al. 2000).

Few children start to regain weight (and height) during hospitalisation. However, the use of long-term artificial nutritional support after discharge has been found to result in improvements (Kist et al. 1993, Lenssen et al. 1990, Miller et al. 1995, Sharp & Freeman 1993, Smith et al. 1991).
2.8.3. The magnitude of the problem

Relatively few studies have assessed the prevalence of undernutrition among children in hospitals. However, a common finding is that a significant proportion of the children are underweight-for-age, stunted or wasted (Hendrikse et al. 1997, Merrit et al. 1979, Moy et al. 1990, Parsons et al. 1980, Smith et al. 1990). As in adults, the prevalence of undernutrition increases during treatment and after discharge (Lenssen et al. 1990, Smith et al. 1990).

3. THE NUTRITIONAL CARE PROVIDERS

In spite of their documented efficacy, few of the European hospitals have nutritional support teams or nutritional steering committees. There is no clear assigned responsibility with regard to nutritional care and support, and food service. There is a lack of nutritional practices, which suggests that improved education with regard to clinical nutrition is needed for all health care professionals involved in the nutritional care and support of the patients. More specifically the staffs need appropriate training and suitable protocols and aid by nutritional support teams for the early identification and treatment of nutritional risk patients. Beside this there is a need for improved communication and co-operation between different staff categories. Finally, the political/management level must give the hospital food, and the nutritional care and support a higher priority. In spite of the apparent gloomy situation several initiatives are going on to improve the situation including the initiation of nutritional education programmes.

3.1 Organisation in hospitals

Nutritional support teams (NSTs) or, in larger hospitals, nutritional support units and nutrition steering committees (NSCs) are not widely established, (except in the Netherlands) (Appendix 2.1). Even though studies from Switzerland and United Kingdom indicate that the setting up of NSTs has increased somewhat (Payne-James et al. 1995, Pichard et al. 2001) the rare occurrence stands in contrast to the number of studies, which have documented their benefits with regard to securing the nutrient requirements of the patients and saving money (table 3.1; see also Braga et al. 1994, Howard 2001, Johansson et al. 1996, Jonkers et al. 2001, Kondrup et al. 1998).

**Table 3.1. The impact on parenteral nutrition when a nutrition support team (NST) authorises the supply (Newton et al. 2000)**

<table>
<thead>
<tr>
<th></th>
<th>Pre-NST</th>
<th>Post-NST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients receiving parenteral nutrition</td>
<td>242</td>
<td>72</td>
</tr>
<tr>
<td>Inappropriate prescribing rate (%)</td>
<td>31</td>
<td>3</td>
</tr>
<tr>
<td>Infection rate (%)</td>
<td>21</td>
<td>2</td>
</tr>
<tr>
<td>Material costs (%)</td>
<td>100</td>
<td>20 *)</td>
</tr>
</tbody>
</table>

*) Percentage of pre-NST (which has been set to 100%)

Nutrition involves a personal dimension as well as an organisational dimension. Therefore, it is important that physicians, nurses, dieticians and food service staff, and hospital management work together, as for example in an NSC.
A major common problem in all the European countries is the lack of involvement from the hospital management (see also Appendix 4.1), and in most hospitals the provision of a meal is seen as a routine task. It is, however, important to look at the provision of meals in hospital food service systems as a management issue. Hospital food service is a complex process where food becomes meals and where meals become nutrition, and where many different actors are involved. Therefore, management must give priority to create the organisational framework in which food service and nutritional issues can be discussed.

Responsibilities for the NSC could be to negotiate and manage the food service system and nutritional support, and to ensure that the hospital purchasing authorities include contract specifications regarding food service and nutritional supports, to establish NSTs, to set standards for the nutritional risk screening, so that risk patients are recognised, to develop protocols for the action to be taken, when a risk patient is identified and to implement an agreed process of audit in this context (see Silk 1994, for suggestions for further responsibilities).

Some of the suggested responsibilities for the NST could be to implement the standards of nutrition support agreed by the NSC, monitor patients receiving nutritional support and audit its clinical activities (see Howard 2001 and Jonkers et al. 2001, for suggestions for starting and running a NST).

3.1.1 Responsibilities

Denmark, Finland, Norway, Sweden and United Kingdom have recommendations regarding the responsibilities, duties and tasks of different ward and food service staff with respect to clinical nutrition and food service (Appendix 2.2). The recommendations are very similar. Besides, Sweden, Norway and Finland also place some responsibility at the political/management level. Still, responsibilities seem to be unclear in many wards (table 3.2).

Table 3.2. A study from Denmark has shown that there is a lack of agreement between nurses and physicians when asked who they think are responsible for the nutritional care of the patient (Rasmussen et al. 1999).

- 86% of the physicians felt that they should decide when to register nutrient intake, but 73% of the nurses thought that the nurses should decide.
- 96% of the physicians and 89% of the nurses were of the opinion that physicians were responsible for assessing the nutritional status of the patients, however 76% of the nurses, thought that they were also responsible.
- Most physicians, 96%, felt that they were responsible for reacting to the nutritional status of the patients, and 89% of the nurses’ thought that they were responsible.
What seems to be important is that hospitals have a clearly formulated description of responsibilities and tasks of each personnel group involved in the nutritional care and support of the patient and the food service.

**Recommendations**

- Hospital management should acknowledge their responsibility with regard to nutritional care and support and food service.
- Hospital management, physicians, pharmacists, nurses, dieticians and food service staff should work together in providing nutritional care while the hospital management should give due attention to such a co-operation.
- The responsibility of different staff categories with respect to nutritional care and support, and food service should be clearly assigned.
- The NSC/NST should set standards for the nutritional care and support in relation to costs, contract specifications, nutritional risk screening and audits.
- The NSC/NST should implement standards for, and control, supervise and audit nutritional care and support.
- Research should be initiated with regard to the effect of NSTs and NSCs in improving the nutritional care and support of patients.

**3.2 Communication**

According to the official recommendations from Denmark, Finland, Norway and Sweden the communication between different staff categories should be managed by means of a contact person from either the kitchen or the ward. In practice, however, this seldom functions. In a survey of the hospitals in the Nordic region the specific requirements for communication were outlined based on meal ordering, time frame, information, flexibility and co-operation (Nordic Council of Ministers, 1995). Only 8 of the 42 hospitals that participated were judged to have a “high level of communication”. One characteristic of these hospitals was that the food service and ward personnel had co-operated in the design of meal order forms. Other characteristics were a varied food delivery system, menu choices, and existence of contact persons and NSCs. In a majority (64%) of the hospitals the communication level was found to be low. There were some discrepancies in the answers from, respectively, ward and food service staff. As an example, the management of 12 hospital food services stated that the patients had a choice of menu, however, in only 5 of the hospitals the ward staff were aware of this.

In England a new role of ward housekeeper is being developed. The ward housekeeper will be part of the ward team and will be responsible for making sure that patients receive a food service, which meets the needs of the patients. They will play an important role in communication.

None of the official recommendations from, respectively, Denmark, Sweden, Norway and Finland deal with the communication (and co-operation) between hospitals and
primary health care sector. Today this kind of communication is virtually non-existent, however, due to the very short length of stay for many patients, communication between hospitals and primary health care sector should be improved.

**Recommendations**

- Organisational research should be conducted to assess and improve the co-operation between different staff groups.
- Food service personnel, ward staff and patients should develop, test and implement forms for menu ordering.
- Regular contacts between ward and food service staff should be established.
- One or more representatives in each ward should be designated to have primary responsibility for communication and information in nutrition-related issues.
- One or more representatives at the kitchen should be designated as contact person(s) for the ward staff.
- Regular contacts between the hospital and the primary health care sector should be established.

**3.3 The practice of nutritional support**

When a patient screens positive for nutritional risk, a nutritional treatment plan needs to be developed, based in many cases on a more detailed nutritional assessment to establish the severity of undernutrition, and whether the most appropriate form of feeding is ordinary food, sip feedings, texture modified menus or artificial nutritional support. Also the nutritional treatment plan should include suggestions for monitoring, e.g. in the form of food intake registration and weighing frequency, and adjustment of the plan once a week as a minimum (see section 2.2).

In practice however, routine nutritional risk screening and assessment is generally not performed at admission or during hospitalisation (table 3.3, Appendix 2.3). When it is performed body weight, recent weight loss and BMI are used most frequently as screening tools. Neither is nutritional counselling commonly practised. Finally, the use of nutritional support for undernourished patients and nutritionally at-risk patients is sparse and inconsistent. The most common explanations why nutrition-related practices are not done are lack of time, staff, nutritional education and interest, while none of the European countries put the blame on the quality of the food (Appendix 2.3).

Table 3.3. The prevalence of nutritional assessment, recording of food intake and body weight measurement according to a Danish survey (Rasmussen et al. 1999)

<table>
<thead>
<tr>
<th>Question</th>
<th>No</th>
<th>Sometimes</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutritional assessment a routine during hospital stay</td>
<td>33%*)</td>
<td>44%</td>
<td>23%</td>
</tr>
<tr>
<td>Food intake systematically recorded</td>
<td>25%</td>
<td>57%</td>
<td>18%</td>
</tr>
<tr>
<td>Body weight recorded at admission and discharge</td>
<td>50%</td>
<td>29%</td>
<td>22%</td>
</tr>
</tbody>
</table>

*) Still, 76% think it should be a routine procedure during the hospital stay and 65% on discharge from hospital.

The Italian Society for Parenteral and Enteral Nutrition (SINPE) and the Italian Society of Hospital Pharmacy identified a number of problems and shortcomings in the current practice of artificial nutrition. Examples of these were misapplication of nutritional support, misuse of parenteral nutrition, too short treatment periods and high rates of complications (Braga et al. 1994). There does not seem to be consistency across Europe with respect to nutritional support practices (Howard et al. 1999), and when guidelines have been given for specific patient groups these are infrequently followed in practice (Lanoir et al. 1998, Weimann et al. 1998).

Hence, European hospitals face two major common problems: 1) Lack of clearly defined responsibilities in planning and managing nutritional care. And 2) Lack of cooperation between different staff groups (see also Appendix 4.1).

The gloomy situation may not apply to intensive care patients (Preiser et al. 1999). One survey performed by the Spanish Society of Intensive Care Medicine and Coronary Units (Planas 1995) and one performed in an intensive care unit (ICU) in Switzerland (Berger et al. 1997), concluded that the onset of artificial nutrition in ICUs seemed “appropriate”. However, recent data show that nutrition support provided is inappropriate (Montejo et al. 1999, Ravasco & Camilo, in press).

It must be recognised that there are several initiatives going on in the European countries to improve the situation with respect to the nutritional practices (see Appendix 2.4 for a review of these).

In the United States sufficient nutrition is part of the general requirements for approval of hospitals. The Joint Commission on Accreditation of Health Care Organisations (JCAHO), which surveys the quality of the American hospitals, has drawn up the requirements presented in table 3.4 together with the American Society of Parenteral and Enteral Nutrition (ASPEN) (ASPEN 1995). These requirements have formed the basis of similar standards in the Danish Copenhagen hospital corporation, now undergoing accreditation by the Joint Commission International.

1 Has an official journal: the Journal of Parenteral and Enteral Nutrition (JPEN).
Table 3.4. Nutritional requirements for approval of hospitals, including the responsibility of different health care professionals (ASPEN 1995)

- Criteria shall\(^1\) be established for identification of patients who are nutritionally at risk by an initial screening mechanism.
- All patients identified, as nutritionally at risk by the patient screening mechanism shall undergo a formal nutritional assessment. The formal nutritional assessment shall be performed by or under the supervision of a clinical dietician or a physician and be documented and available to the patient care providers.
- A NST shall function to assess and manage patients to be nutritionally at risk.
- The nutritional treatment plan should be developed with an interdisciplinary approach involving the NST, the patient's physician, and other health care professionals.
- The patients shall be monitored for therapeutic and adverse effects and clinical changes that may influence nutritional support.
- Reassessment and the resulting changes in the nutritional support plan shall be documented.

Recommendations

- Standards of practice for initiation and termination of nutritional support, should be developed at a national and European level.
- The nutritional risk of all patients should be routinely assessed either prior to or at admission and repeated at least once a week during hospital stay.
- Nutritional risk screening should be linked to a nutritional treatment plan in those patients found to be at risk.
- The nutritional treatment plan should be adjusted on at least a weekly basis, by means of information about the patient’s food intake, weight change and other nutritional and clinical variables.
- Nutritional risk screening, assessment and monitoring should be included in the accreditation standard for hospitals.

3.4 Education and nutritional knowledge at all levels

In the early 1970s a publication entitled: “The skeleton in the hospital closet” highlighted the medical profession’s profound ignorance regarding disease-related undernutrition and the profession’s practice habits, which contributed to and sustained the problem (Editorial 1993).

\(^1\) Use of the word “shall” within this document indicates a standard strictly to be followed to conform to the document (ASPEN 1995).
More than 30 years later, physicians’ education only contains few lessons addressing nutrition-related topics. The same is the case with regard to the nurses and most other health care professionals (Appendix 2.5). Apparently only clinical dieticians acquire some knowledge and skills in nutrition during pre-registration training. This assumption is certified in a survey where different staff members completed a questionnaire regarding undernutrition. The results showed that the clinical dieticians had most correct answers followed by the medical students. Lowest came the nurses and physicians (Nightingale & Reeves 1999).

Hence one major common problem exists in Europe - the lack of sufficient educational level with regard to nutrition among all staff groups.

Teaching has lagged behind nutritional research, which has forged ahead, increasing the gap between knowledge and practice. This means that it might be difficult for individual physicians, who use nutritional support techniques only occasionally (see e.g. Payne-James et al. 1995), to provide optimal nutritional support according to the principles of best-documented practice (Lennard-Jones 1992, Silk 1994). According to a European survey performed by the education committee of the European Society of Parenteral and Enteral Nutrition (ESPEN) in 1996-97 there were no organised post-graduate courses identified for either physicians or nurses in any of the participating countries (Howard et al. 1999). Seventy-nine % of the survey respondents considered that clinical nutrition should be a recognised speciality. The same interest in nutrition was found in a Danish survey, however, with exception of the ICUs, there was a large discrepancy between attitudes and practices (Rasmussen et al. 1999).

Based on the survey performed by the education committee of ESPEN some general educational themes that could benefit from a more focused approach were identified (table 3.5).

**Table 3.5. Educational themes that should require high priority (Howard et al. 1999)**

- The organisation of nutritional support services.
- The content of training programmes for clinical staff.
- Nutritional assessment methodology.
- Monitoring/audit protocols.

As a consequence of this a “European advanced course in clinical nutrition” (including a textbook: “Basics in clinical nutrition”) has been launched by ESPEN¹ (table 3.6).

¹ This course is planned to accept the attendance of 3 persons each year from each country (physicians, nurses, pharmacists or clinical dieticians).
Table 3.6. Topics covered in the ESPEN course

- Nutritional assessment.
- Estimation of nutritional requirements.
- Nutrient metabolism.
- Regulation of metabolic pathways.
- The impact of nutritional disorders on clinical status.
- Nutritional support and outcomes.
- Nutrition in specific diseases.
- Specific nutrient-related diseases.

3.4.1. Physicians

A study conducted by a working party of the British Association of Parenteral and Enteral Nutrition (BAPEN) found that almost half of the physicians, who did not know whether their patients had been weighed, regarded measurement of body weight as unimportant. This reason was also given by approximately two thirds of the physicians who did not ask simple questions about recent weight loss and altered food intake (Lennard-Jones et al. 1995). The authors concluded that the remedy laid in altered teaching of nutrition during training, showing the relevance of undernutrition – as a cause or consequence of illness – to clinical management. Lately some important initiatives in this context have been started (see also Appendix 2.4):

Based on a survey of the medical education in Europe, the Federation of European Nutrition Societies (FENS)\(^1\) has initiated the development of a programme for nutrition education in medical schools (FENS 1997). FENS recommends that every medical student should have a basic training in nutrition, either obtained during university training or during a postgraduate education programme and/or continuing education (table 3.7).

Table 3.7. Learning objectives of the FENS educational program (FENS 1997)

<table>
<thead>
<tr>
<th>The participants should be able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe basic aspects of food and nutrition.</td>
</tr>
<tr>
<td>Describe the epidemiology and aetiology of the relations between nutrition and health.</td>
</tr>
<tr>
<td>Identify groups at risk of developing nutrition-related diseases.</td>
</tr>
<tr>
<td>Explain the physio-pathology, diagnosis and treatment of nutrition and nutrition-related diseases.</td>
</tr>
<tr>
<td>Perform and evaluate different methods of measurements of nutritional status.</td>
</tr>
<tr>
<td>Prescribe appropriate nutritional interventions to individuals and groups from a curative and preventive perspective.</td>
</tr>
<tr>
<td>Suggest relevant public health strategies in connection with nutrition-related diseases and their prevention.</td>
</tr>
</tbody>
</table>

\(^1\) FENS has an official journal: Annals of Nutrition and Metabolism.
It was planned to introduce the recommendations to the International Union of Nutrition Sciences (IUNS), the EU-Commission and individual countries. Also, national nutrition societies were requested to inform health and educational authorities as well as the medical schools (FENS 1999). Until now only the IUNS has received the recommendations, and further work has apparently been suspended (B. Miranda-da-Cruz, personal communication).

The German Federal Chamber of Physicians (Bundesärztekammer) recently issued a course in clinical nutrition for postgraduate education (Bundesärztekammer 1998). It is now the official programme in the field. Chambers of physicians in the various federal states, as well as other organisations are offering the curriculum. Participation in this 100 hour course is certified by the chambers, but some legal aspects still need clarification. In medical schools comprehensive nutrition education is not yet available (Schauder et al. 2000).

The United States has already introduced nutrition education in the majority of medical schools (Schulman 1999). This has happened by means of free distribution of computer-assisted instructions (see e.g. www.med.unc.edu/nutr/nim), case-based tutorial discussions, use of physician nutrition specialist and clinical dieticians and observed structured clinical examinations (Cooksey et al. 2000, Hark & Morrison 2000, Lo 2000).

The ESPEN Education Committee has started to publish consensus guidelines on a wide range of clinical topics, e.g., peri-operative nutritional support, nutrition in liver disease and transplantation, and renal insufficiency (Bozzetti 1996, Plauth et al. 1997, Toigo et al. 2000, Zazzo 1996).

Also, the above-mentioned courses in nutritional support, which are held each year by ESPEN, are helping to meet some of the identified specific needs.

Finally, relevant contacts in relation to improvement of education could be the Standing Committee of European Doctors (www.cpme.be/), which among other things has as a purpose to work towards the highest standards of medical training, and the World Federation for Medical Education (WFME) (www.sund.ku.dk/wfme/).1

3.4.2. Nurses

Compared to physicians the nurses seem to show a greater interest in the nutritional care and support of the patient (Lennard-Jones et al. 1995, Rasmussen et al. 1999). However, this is not reflected in their nutritional knowledge (Nightingale & Reeves 1999). In spite of their education focused on patient care, including the nutritional care of the individual patient, there seems to be problems with the nurses’ management of undernutrition in practice (Sidenvall & Ek 1993). Nurses generally find it difficult to identify risk patients, to set up nutrition plans and monitor the effect of the nutritional

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1 WFME has its own journal: Medical Education
support (Rasmussen et al. 1999). Widespread deficiencies in the communication and co-ordination required ensuring consistent good nutritional practice has been reported (Davis & Bristow 1999, Sidenvall et al. 1994).

The results indicate that the nutrition related training given to all nurses should be re-evaluated and restructured to be more relevant to clinical practice. This might be accomplished by means of e.g. the Standing Committee of Nurses of the EU (www.pcn.yucom.be), which recently has issued a position paper on education. Besides knowledge about optimal practice with regard to nutritional care and support could be improved by means of societies for nurses involved in clinical nutrition, as is seen in e.g. the Netherlands.

3.4.3. Clinical and general dieticians

Clinical and general dieticians seem to receive the most up-to-date training (Appendix 2.5). However, their educational level and responsibility are in practice very varied. The Finnish clinical dieticians obtain a master degree, and work with specialised care, while the German general dieticians only have limited access to patient data, and are mainly occupied in the kitchens producing diets on a medical indication.

The role played by the clinical and general dieticians in hospital nutrition management varies widely throughout Europe, probably caused by several factors, including education, clinical awareness of the benefits of nutritional support and access to adequate financial resources. With the overall intention to identify minimum educational standards for practice in this field throughout Europe, the Dieticians’ Group of ESPEN (www.espen.org) (in a preliminary report) has made some recommendations in this context (table 3.8).

Table 3.8. Minimum educational standards for the practice of nutritional support of clinical dieticians (Howard et al. 1999b)

- There should be agreement about the key functions of the clinical dietician working in nutritional support.
- There should be a common standard at first-degree level for all nutritional support clinical dieticians.
- There should be an identified programme of post-graduate studies for clinical dieticians (both clinical and academic) leading to specialisation in nutritional support.
- There should be an innovative approach to providing clinical support by clinical dieticians for emerging specialists.
- ESPEN should investigate the potential for developing an accredited and integrated European standard in nutritional support.
3.4.4 Administrative dieticians

Managers and physicians do not generally consider food service to play a particularly important role in the service the hospital is providing. Food provision is seen simply as a “hotel” service rather than an important therapeutic aspect of patients’ hospital stay. Consequently, food service departments are usually grouped with general facilities rather than patient treatment services (Davis & Bristow 1999).

Food service staff may not be aware of the importance of providing highly nutritious food to ill patients. One result of this is the lack of a powerful voice for food service systems, unlike clinical services, when it comes to financial control and the allocation of budgets. Nutrition is not taught on all courses and what is taught may be insufficient. Also, there is an educational lack with regard to management. As can be seen from Appendix 2.5 very few countries have an education of the administrative dietician, which is targeted at hospital food service management. Often cooks are in charge of the production with an educational background emphasised on “healthy eating” (i.e. cutting down on fat and sugar), which is usually not appropriate for undernourished or at risk patients with poor appetites who require energy-dense food (Davis & Bristow 1999).

The European Forum of Administrative Dieticians (EFAD) (www.efad.org), which also has general and clinical dieticians as members have goals as to improve the education and initiate European forum for dieticians.

In some countries, e.g. United Kingdom the role of the dietician is not split into the 2 areas of clinical and administrative. When dieticians do not manage food service, it is important that they have some input into monitoring food service contracts, particularly in relation to nutritional quality and patient satisfaction.

3.4.5 Non-clinical staff members and others

Nurses traditionally had a “hands on” role in feeding patients, but changes in modern health care has increased the demand on their time. Among other things this means that they might need additional help and support from new grades of staff. This help could be provided by part-time care assistants employed by the hour or by ward housekeepers usually of domestic orderly grade. Common to these staff members is their lack of nutritional knowledge. In practice this means that the staff members who have the closest contact with the patient in relation to food, are the ones who know least of all about nutrition. Carefully designed and detailed job description and specification of their area of responsibility, as well as a proper nutritional (in-house) training programme, is crucial to obtain a benefit of their aid (Allison 1999).

Other occupational groups, which could play a role, are pharmacists (in relation to the composition of enteral and parenteral nutrition, drug-nutrient interactions etc.), psychologists (in relation to anorexia, depression in chronic disease etc.), physiotherapists (in relation to mobilisation to increase lean body mass, appetite etc.)
and occupational therapists (in relation to assistance with eating, chewing and swallowing, specialised utensils etc.).

3.4.6. Patients

The majority of patients are not aware of the importance of a good nutritional status to secure a proper treatment (see section 5.4). Therefore the topic of education and information of the patient should receive high priority in the educational themes at all levels.

**Recommendations**

✓ A continuous education programme on general nutrition and techniques of nutritional support for all staff involved in the feeding of patients should be implemented.

✓ Clinical nutrition should be included in under- and post-graduate education of physicians.

✓ Chairs in clinical nutrition should be established.

✓ Clinical nutrition for the adults and the children should be recognised as a specialised discipline by medical schools. The teaching should cover preventive as well as therapeutic aspects of nutritional care and support.

✓ An academic forum for clinical nutrition should be established in every medical school to foster education and research.

✓ The education of nurses in clinical nutrition, with special emphasis on nutrition risk assessment and monitoring and feeding techniques, should be improved.

✓ The education of clinical and general dieticians should be improved among other things to enable them to assume a more central role in nutritional support.

✓ The education of administrative dieticians should be upgraded, especially in the field of management.

✓ Special focus should be placed on the nutritional training of non-clinical staff members and the definitions of their area of responsibility.

✓ Special emphasis should be given to educating and informing the public (including the patients) regarding the importance of good nutrition.

✓ European initiatives on clinical nutrition education should be encouraged.

3.5 Children

Most likely paediatric patients are receiving a better nutritional support than adults, as there is more focus on growth in children. Still, as in adults undernutrition often goes unrecognised (Hendrikse et al. 1997, Smith et al. 1990, Smith et al. 1991).

There are only few paediatric NSTs in Europe, which reflects a lack of focus on nutritional problems in children. The lack of knowledge about the nutritional needs of children has been suggested as one of the major causes of neglecting this group of hospitalised patients (Howard et al. 1999).
4. FOOD SERVICE PRACTICES

In general, food service practices receive little attention from both the political/management level and the physicians. However, food service is not merely a hotel function and the food served is part of the clinical treatment. Out-sourcing of food service is increasing. Major efforts are needed from the management in order to secure that all significant terms and conditions in relation to food service are described in the contract. Arrangements for food preparation, distribution and serving should deliver hospital food of defined standards in terms of nutritional quality, balances, palatability and temperature. Each method of food preparation and distribution has its advantages and disadvantages in terms of nutrient losses, menu flexibility, food wastage, food hygiene requirements, staff skills in the kitchen, staff skills in the wards, and other factors. The choice of method should therefore depend on the patients in question.

4.1 The organisational dimension of hospital food service

Improved nutrition involves changing the way hospital food service systems work. It involves decisions on a range of issues including food service technology, food service management, and organisation of food service and serving systems, food purchasing management, human resource management and distribution systems. Many of these decisions are political issues, and adoption and implementation of a meal, or a food or a nutrition policy at hospital or regional level can be a way to address these issues.

Improving nutrition requires a change of both attitudes and routines. In many cases the food service is regarded as a subject matter that can be addressed separately, and as a simple task any food service operator could handle.

Compared to the attention consumers pay to food the low status of food service and nutrition in hospitals at management level is surprising. In many cases, food service and nutrition is regarded as low status both from the management’s perspective and from the physician’s perspective. But also the attitudes of the physicians and nurses are important. Food cannot solely be regarded as something that is prescribed by a physician and as a result eaten by the patient. The meal is a complex cultural and social phenomenon for the patient. A successful meal includes eating in a proper environment, having choices, friendly staff, good information about meal options, and the possibility to eat with relatives or other patients.

Improving hospital nutrition is far from just being a question of changing attitudes of the physicians and nurses. A changed attitude of the hospital management is necessary giving priority to such matters as food policy and management of food service and nutritional aspects (table 4.1).
Table 4.1. Suggestions for how the management can improve hospital nutrition

- Implementations of a food policy, which secures that all patients receive adequate and appropriate nutritional care and support.
- Setting up an NSC and taking active part in this.
- Taking into account the potential cost of complications and prolonged hospital stay due to undernutrition when assessing the cost of ordinary food and nutritional support.
- Taking into account the different patient needs when deciding on serving systems.
- Taking into account the social context of eating when number of staffs on duty, serving hours, dining environment etc. is considered.

Recommendations

✓ The responsibilities for hospital nutrition among health care professionals and hospital management should be clearly assigned.
✓ A food service policy should be adopted and implemented at hospital or regional level.
✓ Hospital managers should give proper attention to food service policy and management of food service and nutritional support.
✓ All hospital staff - clinical and non-clinical should acknowledge food service as an important part of treatment and care of patients.

4.2 In-house and contract food service

The provision of meals in hospitals is carried out either by the hospital itself, known as in-house food service or by an external operator, known as contract food service. Apparently, most countries use in-house food service (Appendix 3.1). Contract food service can be operated by a private company or by a non-governmental organisation (NGO)/non-profit organisation.

In most countries the public has taken the responsibility for the management of hospitals, including the provision of meals. If the food service is out-sourced local authorities still have the responsibility for the food service, but an external operator carries out management. In other cases local authorities co-operate and establish independent joint venture companies to carry out food service. Joint private/public food service companies have also been established.

4.2.1 Contract management

The general trend is that hospital food service is increasingly managed through contracts. This means that the hospital managers negotiate a contract with the food service operator. All significant terms and conditions in relation to the food service should be described in the contract. Accordingly, the process of establishing the contracts and tenders becomes an extremely important tool when trying to improve
hospital nutrition. Contracting out also creates difficulties in making food service part of the clinical delivery. However, experience at a number of hospitals suggests that contractors are able to be sufficiently flexible if the requirements are specifically written into their contract/service agreement and they are paid enough to cover the costs (Davis & Bristow 1999). Such experience should be gathered in order to develop common guidelines for out-sourcing hospital food service.

A food service contract can be structured into themes related to:

1) Management, setting goals for service level at the system/patient interface, establishing systems dealing with hygiene, quality, environment and working conditions, establishing NSCs and NSTs, assigning responsibilities for different staff categories and creating environments for innovation of food services.

2) The basics of the service, including the quantity and types of meals, the quality of raw materials, frequencies of meals, mealtimes, and conditions for extra meals.

3) Finances, laws and regulations, including the price of the service, and extra services, payment conditions, and what to do in case of disagreements or malfunction of the food service.

4) Intra-kitchen operational tasks, describing how the production facilities and quality assurance systems are operated, and how the maintenance of systems that manage hygiene and cleaning, working environments, environmental issues, human resources, the organisation of the production facility, procurement routines are dealt with.

5) The inter-kitchen-ward operational tasks, describing how the co-operation is established and maintained, e.g. the appointment of a contact person, characterisation of routines and responsibilities related to the delivery of meals at the wards, how feed back from wards to the kitchen is given.

6) The service level as experienced by the patient, including adequate menu options, easy ordering, convenient meal hours, co-dining options, friendly dining environments, easy access to information about food service and methods for empowerment of patients.

High quality meals are not only a question of skilled food service operators. It also requires very competent purchasers at hospital management level. If the management is unable in well-defined terms to describe what the food service should include the performance of the out-source service is going to be poor. An important task of the NSC in this context could be to secure that the hospital purchasing authorities include contract specifications for hospital food service and nutritional support. Another could be to ensure that the standards for these two items, agreed by the authorities are adhered to (Silk 1994).
4.3 Size of hospital food service systems

Hospital food service systems can be categorised according to the number of patients served. Small hospital food service systems serve less than 300 patients per day. Medium sized systems serve between 300 and 600 patients per day and large hospital food service systems more than 600 patients. Most hospital food service systems include one central food service production unit servicing a number of wards distributed throughout the hospital site. However, in some cases a central production unit services different hospital locations.

The type and size of the hospital is important because it influences the way food service can be organised, the usable technology and distribution system, and the organisational framework in which food service and nutrition can be discussed.

4.4 Serving and production of meals

Serving systems can be divided into centrally plated and de-centrally plated systems. In the centrally plated system, food is plated at an assembly line in the central food service production unit and then distributed to the wards. In de-centrally plated systems the food is plated either by the nurse (the non-buffet or trolley type) or by the patient (the buffet type). The centrally plated system seems to be predominant in the European hospitals (Appendix 3.1).

There are advantages and disadvantages by both serving systems (table 4.2). Centralised serving is suitable for use in for example geriatric wards, but not in children's and psychiatric wards. The system involves extensive transport between the wards and the central kitchen before and after every mealtime. It also means that work on the wards must be organised to coincide with mealtimes. Food will have to be served at specific hours, and if patients happen not to be on the ward at those hours, then other ways of providing food must be found.
In de-central plating the staff must know the nutrient content of the food to be able to secure the patients a sufficient intake. As an alternative, kitchen staff will send or employ personnel to assist the ward staff during the serving of meals. The buffet type of de-central plating makes it easy for the patient to design individual meals. However, the buffet serving systems require kitchen facilities locally at the wards depending on the type of production technology.

Both central and de-central plating require tight logistics and a range of hygienic considerations.

**Table 4.2. The major advantages and disadvantages of serving systems (Pedersen & Ovesen 2000, McGlone et al. 1995)**

<table>
<thead>
<tr>
<th>Serving system</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central plating</td>
<td>The prescribed/wanted food is served.</td>
<td>Changes in the patients’ needs and appetite are difficult to cope with.</td>
</tr>
<tr>
<td></td>
<td>The portion control is effective.</td>
<td>No extra food is available at the wards to cover unexpected needs.</td>
</tr>
<tr>
<td></td>
<td>The nutrient content of the food can be secured.</td>
<td>There is a need for extra personnel in the kitchen.</td>
</tr>
<tr>
<td></td>
<td>The kitchen staff can influence the appearance of the served food,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>which increases the interest.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The food is easy to serve for the staff at the ward.</td>
<td></td>
</tr>
<tr>
<td>De-central plating</td>
<td>The patients’ needs and appetite can be coped with.</td>
<td>The kitchen has less influence on the appearance, composition and nutrient</td>
</tr>
<tr>
<td></td>
<td>There is a possibility for a daily discussion of the food between patient</td>
<td>content of the served food.</td>
</tr>
<tr>
<td></td>
<td>and ward (and kitchen) staff.</td>
<td>Problems with loss of appetite are easily overlooked.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>There is a need for extra personnel in the ward with knowledge and time to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>handle the meals.</td>
</tr>
</tbody>
</table>

### 4.4.1 Food production

Traditional food service systems are based on preparation of the food followed by immediate consumption, also called cook-serve. However, in most hospital environments immediate serving is not possible due to the spread-all-over nature of most hospital wards. Therefore, a warm-holding process is required while the food is distributed. This process or technology is known as “cook, hold and serve”, and is by far the most widely used technology in hospital food service systems.
With both of the above systems, production and subsequent distribution of food are directly linked to meal times. All meals are prepared in the central kitchen prior to serving, and therefore induce serious peak hour problems in the food service system. To overcome this problem some hospitals have introduced cook-chill technology. In cook-chill food is prepared and subsequently chilled. After the chilling the food can be held for several days before it is reheated and served. This technology creates limitations in the types of meals that can be handled. The advantage is that meal shelf life can be increased, and that a buffer of meals can be kept locally in a chilled stock. However as for cook-serve, cook-chill operations require strict quality management and control of the microbiological risks is essential.

Other production technologies that increase the shelf life and are used in food service systems include cook-freeze, sous-vide and modified atmosphere technologies.

There is a need for a closer co-operation between researchers, authorities and other partners with expertise in food production to track trends in the use of new food production technologies and new ways of operating food service systems. This trend tracking should enable the authorities and planners of hospital food service systems to view the trends and changes from a hospital undernutrition point of view at an early stage.

**Recommendations**

- ✓ The serving system should be adjusted to the patients’ needs taking into consideration their physical and mental functioning. This often requires different serving systems.
- ✓ Close co-operation between different experts in food production should be secured in order to track new trends in this context.

### 4.5 Food temperature and hygiene

The temperature of served food is of central importance when a food service system is selected, since delayed meals can result in cold food, especially for slow eaters and those who need help to eat (Allison 1999). One study examined the temperature profile of the food from time of distribution from the kitchen until the last patient was served on the ward (Kelly 1999). It was found that the de-centrally plated system resulted in a slightly higher average temperature (79°C) than when the food arrived in the ward as plated (70°C). The range of temperatures for food when served was between 45°C and 76°C, similar to the plated system where the temperatures of the food ranged between 48°C and 68°C.
Food hygiene is of growing concern in hospitals. Food borne illnesses are reported from time to time and can be fatal to hospitalised patients. Hygiene can be planned and managed, and, therefore, hygiene in food service systems must be an integrated part of the management issue.

The common approach to hygiene management is Hazard Analysis Critical Control Points (HACCP). The EU directive on food hygiene is based on HACCP and has resulted in national legislations. The legislation is most commonly based on a self-control concept. Self-control means that the food service management establishes a control scheme based on written instructions, which is approved and audited by food control authorities. Self-control can, according to the EU directive be based on a guideline for good hygienic practice, for example covering the hospital food service sector. It is up to the hospital itself to agree on guidelines for good hygienic practice. In some countries the authorities must approve the guidelines.

Since hygiene already is an important management subject matter hygiene can be used to place nutrition on the management agenda. In order for activities in relation to nutritional issues to become implemented in the hospital organisation management must be involved. A starting point is to adopt a food policy and then follow the steps in the Plan Do Check Act (PDCA) cycle known from the HACCP approach.

**Recommendations**

- All patients should receive hospital food, which has been stored, prepared and transported in such a way as to ensure the palatability, the safety and the nutrient content.
- All hot meals should be served at temperatures around 60-70° C.
- The kitchen and ward staff should receive proper education in food hygiene.
- An appointed person should be responsible for the hygienic aspects of food service.
- Hygienic control in hospital food production should be used to engage hospital management in the wider concept of hospital nutrition.

**4.6 Bedside or dining room eating?**

Food service systems can be divided into systems where meals are eaten at the bedside or in bed and systems where meals are eaten in a dining room. Eating at bedside or in bed seems to be the more common in the European hospitals (Appendix 3.1).

Eating in bed can be difficult. Also, exasperation or frustration may limit intake if food is, as not uncommonly done, placed outside the patient’s reach (Holmes 1999, McGlone et al. 1995).
Most hospitals are built without dining rooms (Elmståhl 1987, Holm et al. 1996, Kok et al. 1997). If available, the dining rooms in hospitals are often characterised by sparse and standardised decorations. Studies from long-term care and nursing homes have found that improving the eating environment (i.e. by means of flowers, table cloths, and increase in personnel and avoidance of disturbance during meals) could improve the nutritional status and well being of the old participants (Elmståhl 1987, Ragneskog et al. 1996, Mathey et al. 2001). Results obtained among hospitalised children suggest that these findings are probably transferable to hospital settings (Kok et al. 1997).

However, it should be realised that eating in the company of others in a dining room is not always good for food intake. One of the questions raised has been whether patients with severe eating problems took small portions to avoid too many failures in the presence of others (Sidenvall et al. 1994).

**Recommendations**

- All patients should have the possibility to choose their dining environment.
- All patients should have the possibility to sit at a table when eating their main meals.
- The eating environment should be improved, with focus on surroundings and the presence of personnel.

### 4.7 Food service practices and undernutrition

In the early 1960’s, hospital food came under heavy criticism, because of the findings of a high prevalence of undernutrition among patients. The debate led to a change in the production system to centralise portioning, giving the kitchens a larger responsibility for providing food to the patients. The nursing staff, previously responsible for ordering, arranging and serving the food, now “only” had to distribute the food (DCC 1995).

However, centrally plated serving systems have not solved the undernutrition problem. Simply changing a serving system can of course not remove a problem, which might primarily be found in motivation of the patient to eat and in access to food. Also it is a misperception that the responsibility of the nurses ends with the serving of the food in a centralised portioning system. Of course the nurses should still observe, note and report the food intake of the patients, and their reactions to the food offered and eaten, and as in de-central plating take necessary actions to combat undernutrition among their patients. Finally, centralised plated systems make it difficult to provide purpose-cooked meals or frequent snacks, and the disappearance of the ward kitchen has not helped either (Silk 1994).

In general, the simplest and safest way to provide adequate nutritional support – getting the patient to eat more – requires close collaboration between the patient, and the nursing, dietetic and food service staff, regardless of type of serving system.
4.7.1. Lack of flexibility

“In the old days” if a patient had fasted for blood tests in the morning and returned from radiology in the afternoon having missed lunch, the ward nurse could provide the patient a small meal made in the ward kitchen. Today food service is supplied on a tightly budgeted contract, and extra meals require referral to the clinical dietician. Further, implementation of high hygienic standards has precluded nurses from preparing food in the ward kitchens. This inflexibility could impede food intake for the fasting patient (Garrow 1994). In some hospitals in-between meals are available in the wards or from the kitchens, however sometimes they are not offered to the patient (Frost et al. 1991, Hickson et al. 1999, Sidenvall et al. 1994).

In England the National Health Service (NHS) Plan proposes a new NHS menu, which will ensure that patients can receive nutritious and tasty food at any time (Appendix 2.4).

4.7.2. Lack of individuality

In dysphagial patients with intellectual disability a “thin man/fat women” effect has been noted, resulting from the inappropriate delivery of similar quantities of food to male and female wards (Kennedy et al. 1997). In another study it was found that the hospital food provided only 4.8 MJ per day (Jones et al. 1988). Compared with several nineteenth century hospital menus (1829, 1840 and 1870) the amount of energy served was about the half. Despite the low energy content plate wastage was high, and hence the low amount of food served could be seen as an attempt to minimise this waste. This was probably also a reason why patients postoperatively ordered meals of half a portion size, which would not cover their nutritional needs but would reduce the amount of food they had to leave untouched on the plate (Arveby 1995). The patients were all routinely offered the general hospital menu with a low fat content and a high volume, with no squint at their problems with loss of appetite and nausea.

4.7.3. Lack of feeding aid

To feed an eating-dependent patient properly requires 30 to 45 minutes and time for the labour-intensive task is not available in many hospitals, so often more than one patient is fed at the same time (Kerstetter et al. 1992). One study found that the need of more than 25 minutes to consume an adequate meal was highly associated with the presence of undernutrition among 200 institutionalised old people (Keller 1993). Further, there is a gap between the observations made by the nursing staff and the experiences of the patients. A study of 18 old people receiving long-term care found that only 6 of the 14 who experienced problems were documented to have a dysfunction and were prescribed a feeding aid (Sidenvall & Ek 1993). Hence it is mandatory to obtain information about the dependency of patients regarding feeding (and other physical and mental abilities) from patients, relatives and primary health care sector. Besides, relatives are often able to assist the patients at meals.
All in all many problems exist with regard to food service practices. However, some countries have introduced measures to improve the practices in an attempt to prevent undernutrition (Appendix 2.4). The experienced obtained could be of great value to other countries, and should be made public. Also the majority of European countries have national clinical nutrition societies. Since a common aim is to improve the nutritional care and support of the patients, the international co-operation between these societies should be expanded.

**Recommendations**

- Regardless of which serving system is used, close collaboration between the patient, relatives and the nursing, dietetic and food service staff is required to get the patient to eat.
- All patients should have the possibility to order food and extra food at any time and be informed of this possibility.
- The provision of meals should be flexible and individualised.
- Menus should be specifically targeted to different patient categories.
- Proper feeding-aid should be provided.
- Standards for food service systems, based on patient needs rather than hospital needs, should be developed.
- Successful measures to prevent undernutrition should be given publicity.
- Co-operation between clinical nutrition societies in different countries should be expanded.

### 4.8. Children

The contents of the above sections are relevant for children as well as for adults. The role of the relatives has proved to be of major importance since most hospitals they are allow them to nurse the child during the hospital stay and this includes the intake of food.

Also, the type of food service has to be taken into consideration since it has a considerable impact on both the nutritional intake and the enjoyment of meals (Holm et al. 1996, Kok et al. 1997). Topics to consider are listed in table 4.3 (see also section 2.8).

**Table 4.3. Topics to consider when food service is offered to sick children (adapted from Holm et al. 1996)**

- Flexibility regarding the provision of meals (24 hour availability).
- Good social and physical environments for meals (e.g. in the form of a large kitchen-dining room at the ward resembling a kitchen in a home rather than a hospital).
- Possibility of children and relatives to participate in the preparation of meals.
- Presence of clinical dieticians or other health care professionals with a specific knowledge about nutrition in children.
5. HOSPITAL FOOD

Several steps are involved in the process of improving dietary intake in hospitals. Screening of patients to identify those at nutritional risk, monitoring dietary intake, modifying the hospital menus continuously according to patient preferences, and assuring that serving and ambience of serving are focused on the patient with reduced appetite. However, hospital food has a poor image. A limited food choice, the way it is served, and the lack of help for those unable to feed themselves properly are significant problems with regard to the nutritional care and support of the undernourished vulnerable patients. The provision of nutritious and appetising food must be recognised at all levels of staff as a key component of an effective high quality hospital treatment. Hospital menus should provide sufficient choice to offer adequate nutrition for all patients. Focus should be moved away from the production and serving of specific diets on medical indications. Instead, more attention should be given to the frequent provision of appropriate energy and protein dense meals for the undernourished patients.

5.1 Food served in hospitals

In 1918 a surgeon wrote: “It is generally conceded that the sooner after any operation a patient can be supplied with an adequate amount of fluid and nourishment, and the sooner the normal gastro-intestinal peristalsis can be re-established, the better are the chances of the patients for recovery”. In practice he started the feeding (whiskey, coffee or other normal stimulants) “at the table”, through a tube inserted in the jejunum (Andresen 1918).

The use of ordinary food to prevent or treat undernutrition is cheap and has no complications. Consequently, the Danish, Swedish and Norwegian recommendations regarding the food served in hospitals give examples on how the recommended nutrient composition is translated to ordinary (hospital) food (ESS 1991, Norwegian Council on Nutrition 1995, Pedersen & Ovesen 2000).

In all the countries the most commonly produced hospital menu is the “general menu” (Appendix 3.2). The recommendations regarding the protein content in this menu lie between 15 and 20E%. However, the general menu in Finland, France, Germany, Italy, Portugal, Slovenia, Sweden, and Switzerland is recommended to have a maximal energy content from fat of about 30E%, whereas the Danish, Netherlands and Norwegian recommendations opt for a higher fat content of 35-40E%¹. Besides, the recipes developed in England to the NHS-menu have a high fat-content. Both a German

¹ In practice this is managed by an increase in the use of butter, cream, fatty meat products and so one, resulting in a high content of saturated fatty acids. This is not considered a problem as long as the intake of essential fatty acids is secured (Pedersen & Ovesen 2000).
(Schauder et al. 1994) and a Swiss (Müller et al. 1991) study have shown that the recommended fat content of 30E% is not followed in practice, but is much higher, respectively 41E% and 44E%. In contrast the protein content has been found to be lower than recommended.

In most countries a menu rich in energy and protein is available, but according to studies from Sweden (Arveby 1995) and Germany (Hermann et al. 1996) and unpublished results from Slovenia, the use of energy and protein dense menus is not very widespread.

5.1.1. Why an energy dense menu?

Different macronutrients do not affect satiety to the same degree. Per unit of energy protein and carbohydrates suppress appetite, and, hence, energy intake to a greater extent than fat. Also, if a menu is energy dense over-consumption is more likely to occur (Stubbs & Elia 2001).

The argument for a higher fat content in the general menu has been that meals with high energy density would be easier to eat for patients with reduced appetite. Besides, studies have shown that eating an energy dense menu increases the energy intake and the protein intake – and reduces the wastage of food (Gall et al. 1998, Kok et al. 1997, Kondrup et al. 1998, Lorefält et al. 1998, Olin et al. 1996, Schwenk et al. 1999, Stephen et al. 1997). A low dietary fat content decreases energy intake (Frost et al. 1991) and reduces the body fat stores (Fenton et al. 1995). Further, the positive association between energy density and energy intake is supported by studies showing that patients voluntarily choose meals with a high fat content, from 41% to 56% (Levine & Morgan 1996, Ovesen et al. 1991, Winograd & Brown 1990). Finally, a study of wastage showed that the “sweet” (energy dense) meals were most likely to be eaten completely (Jones et al. 1988).

Focus is consequently directed towards the intake of energy instead of the intake of protein. This does not mean that the intake of protein is unimportant. In the up till now randomised controlled trials of the effect of nutritional support, the patients have received a mixture of nutrients, and hence it is impossible to know whether it is energy, protein or specific micronutrients which have resulted in the beneficial effects observed. Specifically, in a study of old people suffering from a hip fracture, protein was found to be of importance for the recovery (Tkatch et al. 1992).

Different opinions exist with regard to the satiety of different macronutrients (Stubbs et al. 2001). Cultural and personal factors also have a role to play. Hence, the main point should not be the fat content of the served meals, but rather that the patient can find something attractive on the menu to eat. An example of this is the NHS-menu, in which the planners deliberately have avoided providing nutritional specifications since their main purpose have been to get dishes, which look good, taste good and smell good and since a nutritional specification is immaterial if a dish is not eaten (R. Wilson, personal communication).
5.1.2. Specific diets on medical indications

In Sweden the prevalence of patients receiving diets on a medical indication was 10% (Sjöberg et al. 1992). In a German survey of 214 hospitals it was shown that the frequency of specific diets on a medical indication (mainly diets for patients with diabetes mellitus, hyperlipidemia and obesity) varied between 24 and 29%, which was a stable increase since 1981 (Herman et al. 1996). However, the number of diets not founded in science has been markedly reduced, from 9% in 1981 to below 1% of the total production of diets on medical indications (Hermann et al. 1996), probably as a consequence of recommendations published from DGEM (Kasper et al. 1994) (Appendix 3.2). Many of the non-scientific diets have also been discarded in the Danish and Swedish recommendations.

From publications reviewing the relevance of these, the conclusion is that many of them lack scientific documentation. If dietary restrictions are instituted for medical reasons, the indications should be well grounded (Coulston et al. 1990, Fine et al. 1997, Gardner et al. 1996, Marotta & Floch 1991, Plauth et al. 1997). The abolition of these needless restrictive diets is important, because their long-term use can cause undernutrition (Buckler et al. 1994).

Of specific consideration in this context are the “alternative” diets, e.g. the “anti-fungal diet”, which are widely propagated by the lay press and used by many patients. These alternative diets often restrict the use of certain foods, e.g. refined sugars and milkproducts, or recommend that the food is eaten in raw form instead of cooked, which could add to the risk of undernutrition. No scientific data supports the benefit of such diets (e.g. Christensen & Hessov 1990, Doron et al. 2001, Weig et al. 1999), however it may add to the quality of life of the patients to be able to do “something” on their own behalf.

In contrast to both Germany and Denmark most of the remaining diets on medical indications in the Swedish recommendations take their origin from and are similar to the food recommended to the healthy population (ESS 1991). A comparison of the types of diets recommended in these 3 countries is shown in table 5.1.

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1 An unpublished survey performed before the publication of the Danish recommendation documented the existence of 201 different diets.
Table 5.1. Comparison of types of diets on medical indications recommended in, respectively, Denmark, Sweden and Germany (selected) (Kluthe et al. 2000, Pedersen & Ovesen 2000, ESS 1991).

<table>
<thead>
<tr>
<th>Disease</th>
<th>Denmark</th>
<th>Sweden</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperlipidaemia</td>
<td>Lipid lowering</td>
<td>The general menu</td>
<td>Lipid lowering</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>Diabetic</td>
<td>The general menu</td>
<td>Diabetic</td>
</tr>
<tr>
<td>Obesity</td>
<td>Energy reduced</td>
<td>The general menu</td>
<td>Energy reduced</td>
</tr>
<tr>
<td>Liver disease - chronic</td>
<td>Acute encephalopathy</td>
<td>Acute encephalopathy</td>
<td>Protein reduced</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>Pre-uraemia</td>
<td>Pre-uraemia</td>
<td>Pre-uraemia</td>
</tr>
<tr>
<td>Gout</td>
<td>Puric acid reduced</td>
<td>The general menu</td>
<td>Puric acid reduced</td>
</tr>
<tr>
<td>GI disease</td>
<td>Anti dumping</td>
<td>The general menu</td>
<td>Anti dumping</td>
</tr>
<tr>
<td></td>
<td>Lactose reduced</td>
<td>Lactose reduced</td>
<td>Lactose reduced/free</td>
</tr>
<tr>
<td></td>
<td>Fat reduced</td>
<td>Fat reduced</td>
<td>Fat reduced</td>
</tr>
<tr>
<td></td>
<td>MCT</td>
<td>Fat reduced</td>
<td>MCT</td>
</tr>
<tr>
<td></td>
<td>High fibre</td>
<td>The general menu</td>
<td>High fibre</td>
</tr>
<tr>
<td>GI disease  - diarrhoea</td>
<td>The general menu</td>
<td>The general menu</td>
<td>Low fibre</td>
</tr>
<tr>
<td></td>
<td>Gluten free</td>
<td>Gluten free</td>
<td>Gluten free</td>
</tr>
<tr>
<td>Allergy</td>
<td>Elimination</td>
<td>Elimination</td>
<td>Elemental</td>
</tr>
<tr>
<td></td>
<td>Free of different products</td>
<td>Free of different products</td>
<td></td>
</tr>
<tr>
<td>Hypertension, oedema</td>
<td>Sodium, liquid reduced</td>
<td>The general menu</td>
<td>Sodium, potassium reduced</td>
</tr>
<tr>
<td>Immunosuppression</td>
<td>-</td>
<td>-</td>
<td>Low-germ</td>
</tr>
</tbody>
</table>

GI = Gastro-intestinal, MCT = Medium chain triglyceride

It is important to notice that also patients with a diet-requiring disease (e.g. diabetes mellitus, hyperlipidemia) can be at nutritional risk or undernourished, and hence should be offered a more energy and protein dense menu (Pedersen & Ovesen 2000).

1 The general menu in Sweden and Germany has a fat content of 30E%. In Denmark the general menu has a fat content of 40E%
Other commonly used menus, such as liquid menus and texture modified menus, may be nutritionally inadequate and cause undernutrition, especially if used over a prolonged time (Cluskey 1989). One survey from Sweden found that the use of texture modified menus on 55 different wards varied between 12 and 70% (Berlin et al. 1991), but the indication for serving the menu was seldom stated. Another study performed among elderly persons prescribed a mechanically altered menu, found that 91% consumed less than their needs, and only 5% took in appropriate amounts of food (Groher & McKaig 1995).

Guidelines for diets on medical indications should be reassessed regularly. In general, very few patients need specific diets on medical indications during hospitalisation, and much time and money are spent on producing a variety of different diets to these patients. It seems far more appropriate to secure a proper use of the energy and protein dense menu – a use, which apparently lacks far behind the estimated need (Hermann et al. 1996, Sjöberg et al. 1992).

5.1.3. Micronutrient content

Vitamin losses can be substantial, depending on the handling practices and processing techniques of hospital food. It is of nutritional interest to get a high retention of vitamins during processing.

Studies from Denmark, Finland, Germany and Norway have shown that the concordant between measured and calculated contents of micronutrients is low (Lassen 1994, Løvik et al. 1993, Mattila & Kumpulainen 1999, Schauder et al. 1994), most often with the analysed nutrient values to be lower than the calculated values. Some of the observed discrepancy might be due to losses during preparation (Lassen 1994, Løvik et al. 1993) and the use of a high amount of prefabricated foodstuffs (Thomas et al. 1988). Still, the measured values were higher than the recommended values, despite a relatively high fat content (Lassen 1994, Schauder et al. 1994).

Some uncertainty exists regarding the micronutrient requirements during disease (Pedersen & Ovesen 2000). It should therefore be considered, whether some patients (e.g. in long-term care or those with a long-lasting decrease in food intake due to chronic diseases such as kidney, cancer and liver diseases) might benefit from a vitamin-mineral supplementation (Doerr et al. 1998, Penn et al. 1991, Plauth et al. 1997, Toigo et al. 2000). Besides, specific micronutrients may play a role in e.g. wound healing (vitamin C and zinc), osteoporotic fractures (calcium and vitamin D), re-feeding syndrome and severely injured patients (Berger et al. 1998, Chaupey et al. 1992, Crook et al. 2001, Shenkin 1997, Shenkin 2000). On the other hand supplementation with specific micronutrients might also have adverse effects (Braunschweig et al. 1997).

5.1.4. Taste of food

Sensory sensations are primary enforcers of eating. It has not been firmly established if undernutrition in itself affects taste and smell. However, several diseases are known to be associated with disturbances of taste and smell, such as cancer, renal failure and liver
disease. Also, drugs and other treatments can alter taste and smell, e.g. antibiotics, asthma medications, and chemo or radiation therapy (Schiﬀmann 1997). It is important to be aware of sensory disturbances in sick people and modify menus accordingly.

Perception of foods is highly individual. To maintain a quality level that most people find satisfactory requires the establishment and operation of a quality management system. This system should include methods for: 1) Routine intra-kitchen quality supervision. 2) Measurement of user satisfaction. 3) Strategic decisions on the quality level of the raw materials (a food purchasing policy). 4) A range of operational issues specific to the operation of the production facility. The methods are described in the literature on quality management systems. The basic approach to quality is to expect that if the production facility is operated properly, based on descriptions of “how things are done”, if routine methods of quality supervision are maintained and if methods for constantly improving the quality management systems are at hand, then a good chance exists that the quality of the food is satisfactory.

**Recommendations**

- Recommendations for hospital food should be developed and agreed upon at a national level.
- Studies should be undertaken to evaluate the effect of energy and protein dense menus on food intake and patient outcome.
- A range of meals enriched in energy and protein should be available in every hospital.
- The physician should only prescribe diets with scientiﬁcally documented effects.
- The physician should always be aware of the nutritional state of patients – also, when prescribing diets on medical indications with a low fat content and texture modified menus.
- The health care personnel should be aware of the patient’s use of “alternative diets” and the inﬂuence these might have on the nutritional status.
- Immediate feedback from the patients to the kitchen and ward staff in relation to the liking or disliking of the food served should be encouraged.
- The nutrient content and the portion size of the food should be audited annually.
- The nutrient sufficiency of a menu should be documented already at the planning stage.
- The physician should consider whether some patients might beneﬁt from a vitamin-mineral supplementation or speciﬁc micronutrients.
- Research should be conducted to generate more reliable data on nutrient losses with different food service systems.
5.2 Meal pattern

Despite a recommended meal pattern of 6 meals per day in some of the countries, it appears that European patients in general are served only 3 meals per day (Appendix 3.3). Meal times are often inflexible or ill adapted to patients’ habits. There can be long gaps between some meals, e.g. 12 hours between evening meal and breakfast, and narrow gaps between others – more suited to administrative convenience than patient needs. Also, there is often interference with meal times by ward rounds and diagnostic procedures (Allison 1999). No data of the use of fortified meals, energy and protein dense snacks and drinks are available from the European countries.

Food brought from outside the hospital can increase the total amount eaten by patients (Frost et al. 1991, Hessov 1977, Todd et al. 1984). However, e.g. in United Kingdom the number of ward kitchens has decreased, due to increased emphasis on hygienic aspects, making it more difficult for relatives to bring along food from home (McGlone et al. 1995). This dilemma should be dealt with.

5.2.1. In-between meals

Availability of in-between meals seems to increase total food consumption. In one study it was found that offering patients a choice of cake or one quarter cheese sandwich at mid-afternoon and bedtime increased total energy intake (Gall et al. 1998). In another study the anthropometrical parameters were stabilised in anorectic cancer patients given small volume, energy and protein dense foods during a 2-year period (Maciá et al. 1991). Finally, a Swedish study found that 3 main meals in combination with (at least) 1 in-between meal were superior to a “brunch”-system with regard to securing a sufficient intake of energy (Nilsson 1980). The main problems with regard to the “brunch”-system were the prolongation of the night fast and the decrease in the number of meals.

Many of the nutritional support studies performed up till now have examined the effect of sip feedings on nutritional state and clinical outcome (Potter et al. 1998). The overall solid food intake does not seem to be altered by sip feedings, and even an increase in main meal intake was reported after gastro-intestinal surgery (Rana et al. 1992) (table 5.2). Also, the compliance is usually high with these supplements (Hessov 1996, Green 1999). Even low levels of intake from sip feedings can significantly increase the total energy intake (Lawson et al. 2000).

These findings together with the observed positive effect on energy intake of in-between meals support the recommendations of a more frequent meal pattern than is available at present.
Table 5.2. The influences of sip feedings on the overall energy intake

<table>
<thead>
<tr>
<th>Reference</th>
<th>Patients</th>
<th>Energy intake (MJ/day)</th>
<th>+sip feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delmi et al. 1990</td>
<td>Femur fracture</td>
<td>Control: 4.6</td>
<td>Intervention: 6.6, +23%</td>
</tr>
<tr>
<td>Rana et al. 1992</td>
<td>GI-surgery</td>
<td>Control: 4.7</td>
<td>Intervention: 7.7</td>
</tr>
<tr>
<td>Ovesen 1992</td>
<td>Medical *)</td>
<td>Control: 4.8 #)</td>
<td>Intervention: 7.0</td>
</tr>
<tr>
<td>Ovesen 1992</td>
<td>Medical *)</td>
<td>Control: 4.2 #)</td>
<td>Intervention: 6.6</td>
</tr>
<tr>
<td>McWhirter &amp; Pennington 1996</td>
<td>Medical</td>
<td>Control: 5.3</td>
<td>Intervention: 4.6, 7.1 §)</td>
</tr>
</tbody>
</table>

GI = Gastro-intestinal

*) The nutritional intakes are estimated from a figure presenting the energy intakes.

#) Energy intake before start of the nutritional support with, respectively, energy dense and standard concentration sip feedings.

§) Sip feedings.

Two large surveys from the United Kingdom found that the data about the nutritional status of the patients receiving sip feedings was limited and so was the documentation as to why they received the oral supplements (Brosnan et al. 2001, Gale et al. 2001). In general it is important that the use of sip feedings is targeted and supervised properly (Allison 1999).

**Recommendations**

- Serving hours should be reviewed to ensure that there is sufficient time between each main meal to allow for in-between meals in the morning, afternoon and late evening.
- The mealtimes should be spread out to cover most of the hours spent awake.
- Interruption of patients’ meal times by ward rounds, teaching and diagnostic procedures should be minimised.
- Snacks and nourishing drinks between meals should be offered when appropriate and be available on every ward.
- The involvement of relatives in serving meals to patients should be encouraged, when appropriate.
- The use of sip feedings should be properly targeted and supervised.

5.3 Monitoring of food intake

It is important to assess the food intake of the patients as part of the nutritional risk screening and monitoring of nutritional status. Many diseases can lower food intake, most often by decreasing appetite, so that the patient does not feel hungry or is full after only a few bites (Pedersen & Ovesen 2000). It is therefore essential to observe the food
intake of the patients. In this respect the semi-quantitative system, i.e. recording food intake in quartiles, as developed in a Swedish study (Olin et al. 1996), is promising. This method can also be used to assess nutritional risk (see table 2.1.).

When a patient is diagnosed to be at risk nutritional support should be initiated and the food intake should be supervised more closely. Food intake should be compared with estimated requirements to predict whether the patient’s nutritional status is likely to improve or deteriorate (Barendregt et al. 2000). It is also important to learn, largely by trial and error, which types of food different patient categories can tolerate in order to determine appropriate, target group specific menus (Kondrup 2001).

Training in how to monitor food intake seems to be a key element in improving dietary intake (Kondrup et al. 1998, Kondrup 2001, Olin et al. 1996). In practice food intake is infrequently recorded in the European hospitals (see Appendix 2.3). As an author comments: “Patients are asked about their bowel habits almost every day and this is diligently recorded. Why not their food intake?” (MacFie 1998).

Recommendations

- The personnel on the wards should be trained in how to monitor food intake.
- The food intake of patients should be noted by means of a semi-quantitative system.
- Tray collection should be supervised closely to enable monitoring of patients’ food intake.
- The level of food intake should be used to assess the patients’ need for nutritional support.
- The food intake of patients at nutritional risk and receiving nutritional support should be recorded by means of dietary records.
- Information from the kitchen regarding portion size and energy content of the hospital food should be available to aid ward personnel in the monitoring of patients’ food intake.
- The information about patients’ food intake should be used to develop appropriate, target group specific menus.
- Studies should be undertaken to develop and validate simple food recording methods.

5.4 Knowledge of the patient

European hospitals seem to have an image problem when it comes to the quality of the food served. Before even tasting it patients often expect poor quality (Holmes 1999), and after tasting it their expectation is many times confirmed. As one study stated: “Both patients and relatives were concerned about the non-availability and poor quality of food and drink” (Spalding 1999). Yet few patients are aware of the fact that a weight loss in relation to disease will increase their risk of complications.
England, the Netherlands, and Sweden have made efforts to spread the knowledge about the importance of a good nutritional status to secure optimal treatment, by means of articles in public journals, use of local resource persons and websites (e.g. www.nvdietist.nl/ondervoeding). In Denmark much emphasis has been put on information regarding the discrepancy between optimal foods in relation to, respectively health (i.e. with a low energy density) and disease (i.e. with a high energy density).

It is known that in-between meals is infrequently offered by the staff or asked for by the patients, even when available (Frost et al. 1991, Hickson et al. 1999, Sidenvall et al. 1994). Some patients might even opt for sip feedings, which they apparently find more convenient (Schwenk et al. 1999).

Also, the influence of the individual factors such as age, nutritional status, mood, appetite or oral health are able to inflict on satisfaction with the quality of food service, and thus to modify food intake and nutritional status (Rigaud et al. 1999).

One major common problem among the European hospitals is the lack of influence of the patients (see also Appendix 4.1). In general, life in hospitals entails that patients loose control and personal identity through the loss of clothes, make-up and privacy – even as regards most intimate bodily functions – and the loss of the right to decide what and when to eat (Holm et al. 1996).

This is in spite of the evidence that food consumption can be improved without a change of menu, if patients are involved in planning their meals, have some control over food selection and feel responsible for following given advice (Holmes 1999).

### 5.4.1. Menu choice

In most hospitals the patients have a choice between menus, and in some hospitals questionnaires to gauge satisfaction are used (Appendix 3.3). A choice of menus is not necessarily beneficial if, for example, undernourished patients choose food from the low nutrient density healthy eating option. As can be seen from Appendix 3.3, the information given to the patients regarding this topic is sparse and inconsistent.

Assistance with menu choice is imperative to prevent patients from choosing foods, which are inadvisable with respect to their clinical condition (McGlone et al. 1995). Also, there is seldom a good description of the offered menus. One study found that 82% of the patients receiving a texture-modified menu had never had access to a menu-plan (Berlin et al. 1991). Finally, a menu often has to be ordered the day in advance, and a change in the medical condition of the patient may make foods chosen 24 hours before unsuitable (McGlone et al. 1995).

Yet another barrier could be the attitude of the patients, highlighted in a Swedish study of geriatric patients, who did not want to participate in the decision-making regarding their own menu, rather it was up to those who worked in the kitchen to decide (Sidenvall et al. 1994).
People of different ethnical and/or cultural backgrounds are especially vulnerable. The information given may not be understood, and also particular methods of food preparation and eating practices may be extremely important (Holmes 1999, McGlone et al. 1995).

5.4.2. Meal ambience

To have a meal differs essentially from the mere intake of food. People do not eat only to stay alive since meals also have a social, psychological and religious meaning. The satisfaction people feel at mealtime depends not only on the quality and quantity of the food, but also on the social context in which the meal is eaten, and the extent to which a meal is attuned to personal eating habits and to the prevailing circumstances (Gastmans 1998).

The term “food chain” has been adapted to emphasise that all stages in the provision of food must be adequate from nutritional risk screening and menu design to distribution and serving. A failure at any point negates the system (Allison & Stanga 2000). However, most importantly, is the food culture among staff members of the hospital.

Since lack of appetite due to the disease is probably the main reason for hospital undernutrition the ambience, with its element of informing the patient, preparing the patient, motivating the patient, urging or feeding the patient, and other aspects of doing and showing care are essential in relation to the food chain (Kondrup 2001). A patient served with respect, feels respectable. In many cases attentive mealtime-care can postpone the use of artificial nutritional support (Gastmans 1998). However, in the majority of the European countries the ward staff today lacks interest in this field (see Appendix 2.3).
Recommendations

- The positive role of nutrition as treatment should be made known to the public to engender general awareness and support.
- On admission or before admission patients should be informed about the importance of good nutrition for their successful treatment.
- Adequate information in written and oral form should be given to patients regarding available dishes and foods.
- Dishes should be described accurately so that patients have a reasonable idea of what to expect.
- All patients should receive information regarding the nutrient composition of different foods and drinks.
- All patients should receive help and guidance with respect to the ordering of food by the ward staff.
- Patients should be involved in planning their meals and have some control over food selection.
- At discharge patients (and their relatives) should receive advice regarding proper food at home.
- Methods to assess patient satisfaction should be developed and implemented.
- Patients should be able to receive a menu, which is in accordance with their religious, ethnic or cultural background.
- Meal ambience should receive proper emphasis by ward staff.
- Managers and health care professionals should acknowledge the social and psychological aspects of eating.

5.5. Children

Most hospitals have special menus for children. However, since it often has to be ordered in advance it is probably seldom used. Instead the relatives often cook for the children at home and bring the food to the hospital (Holm et al. 1996). Only in some paediatric wards kitchens are available for relatives to prepare the food the child likes best.

The provision of meals has to be more frequent and more flexible than at adult wards, since children eat more frequent and will often not eat at scheduled times (Michaelsen 1998).
Snacks with a high energy density, including items that are often regarded as unhealthy, e.g. chocolate bars, cookies and potato chips, should be available outside the normal meal times. Menus for children should also include foods with a high energy density (Michaelsen 1998, Pedersen & Øvesen 2000).

The reasons for hospitalisation of children can be different from adults and often metabolic disorders or allergic reactions to food bring children to hospitals. Therefore there should be a provision of diets on medical indications, which could fit the strict requirements of such diseases. Most of the time specific sip feedings are used next to the diets to provide a healthy intake of all nutrients (Elsas & Acosta 1999).
## 6. HEALTH ECONOMICS

Disease-related undernutrition is associated with an increased likelihood of developing complications, which may have significant cost implications. Evidence shows that nutritional support of undernourished patients improves recovery rates, decreases complications, and reduces length of stay and cost per day and in total. Hence improved or expanded nutrition services can actually help cut hospital costs or increase revenue. Studies of hospital food wastage show high levels of waste. There are many factors involved in determining how much food is wasted. These range from food palatability to portion size, and from individual patients’ appetites to availability of help with feeding. In general waste represents a major clinical problem because it reflects inadequate food intake. It is also a major economic problem.

### 6.1 Cost-effectiveness and cost-benefit considerations

“It seems almost absurd to talk about the cost-effectiveness of a treatment when we are not even collecting the information necessary to make the diagnosis” (Allison 1995).

Disease-related undernutrition is associated with increased prevalence of complications and a prolonged length of stay, and, therefore, higher costs (Shulkin et al. 1993), so intuitively one would expect nutritional support to be cost-beneficial, i.e. to reduce the cost of the hospital stay.

Cost-benefit analysis of hospital treatment is not a simple task due to the many factors involved. Still, a few attempts have been made.

Denmark has reported a cost-benefit analysis on the effect of nutritional support. The assumptions were that 100,000 patients per year could benefit from nutritional support\(^1\). That would result in a reduction in length of stay of 4 days and a saving of 67 million EURO per year. On top of that the average daily bed price was assumed to decrease because of a reduced rate of complications. The resulting savings totalled 133 million EURO per year. The Danish calculations were relatively straightforward. For example, they did not take into consideration that the bed price is highest at admission.

Corresponding calculations have been made in the United Kingdom and the United States. The Kings Fund Centre report calculated that providing comprehensive nutrition support would result in a decrease in length of stay of 5 days for approximately 10% of

\(^1\) In the Danish figures it is important to notice that the prevalence of undernutrition was estimated to 30% corresponding to 300,000 patients. However, not all of those would benefit from nutritional support. Unnecessary use of nutritional support will increase the expenses (Jendteg et al. 1987). Also, the Danish calculations did not take into consideration the well-nourished patients exposed to severe catabolic stress, who would also benefit from nutritional support (see section 2.2.1).
the patients. The consequent savings were estimated to be 453 million EURO per year (Davis & Bristow 1999). Green (1999) calculated that providing nutritional support to surgical patients would save at least 560 EURO per patient.

An audit of about 2,500 cases in 20 American hospitals found substantial reductions in length of stay in the patients who received early nutritional support. On average, length of stay was reduced 1 day for every 2 days earlier the treatment was started (Tucker & Miguel 1996). The conclusion of the American study was that appropriate and timely nutritional support could save a typical large American hospital about 1.1 million EURO per year. These findings are supported by several European studies (Bastow et al. 1983, Beier-Holgersen & Boesby 1996, Delmi et al. 1990, Larsson et al. 1990, Rana et al. 1992).

Another audit of 10 years experience looking at long-term outcome of in-patient parenteral nutrition for prolonged gastro-intestinal failure has been performed. The audit showed that the average cost per year of life saved compared favourably with other well-established medical technologies, like dialysis, renal transplantation, breast cancer screening and coronary artery by-pass surgery, and, hence, was cost-effective (Shields et al. 1994).

All studies suggest that nutritional support is both cost-beneficial and cost-effective. However, physicians who are not experts in this field have primarily performed the calculations and the calculations should be extended (e.g. in relation to the cost of medication, the cost of treatment provided alternative to nutrition, and the cost of infectious complications), and performed by experts in health economics.

6.1.1. Cost of food and artificial nutritional support

The choice of nutritional support determines treatment costs. The BAPEN has calculated that the approximate weekly cost of food for a patient is 24-34 EURO for a general hospital menu, 26-36 EURO for an energy and protein dense hospital menu – 30-39 EURO if snacks are included – and 34 -41 EURO with a supplement of 1 MJ per day as sip feedings. In comparison the weekly costs are 120 EURO for enteral and 600-850 EURO for parenteral feeding (Allison 1999).

In addition, two main issues have to be balanced: the cost required to avoid complications and extended length of stay from not identifying a high likelihood of undernutrition vs. the cost of providing aggressive artificial nutritional support unnecessarily (Bernstein et al. 1993).

After all, the cost-effectiveness of providing nutritional support is difficult to substantiate. A clinical economics review regarding nutritional support concluded: “There have been a few areas in which nutritional support may be of benefit. Enteral supplements given to underweight women who suffer hip fractures reduce the hospital stay and, presumably, overall cost. Preoperative parenteral nutrition may produce a small absolute reduction in post-operative morbidity, but its cost becomes prohibitive. Preoperative enteral nutritional support, especially if carried out in the home, may be of economical benefit” (Ofman & Koretz 1997).
Reading this one should remember that the majority of the up till now performed studies of cost-benefit and cost-effectiveness primarily have examined the effect of nutritional support in the form of expensive artificial feeding on morbidity and mortality, which are influenced by many other factors. More (economical) benefit could probably be demonstrated if the nutritional support was in the form of energy and protein dense menus and outcome parameters were more “soft”, such as factors related to quality of life, i.e. muscle strength and tiredness, and capacity to cope with everyday life (Avenell & Handoll 2000).

**Recommendations**

- Calculations of cost-benefit and cost-effectiveness of nutritional support should also be made at hospital level.
- Calculations of cost-benefit and cost-effectiveness of nutritional support should involve experts in health economics.
- When estimating the cost-benefit and the cost-effectiveness the choice of nutritional support should be considered.
- When estimating the cost-benefit and the cost-effectiveness of nutritional support, outcome parameters should be functional capability and life satisfaction of patients.

### 6.2 Food service and food wastage costs

The costs of the food service system can be divided into the costs of the initial design and construction of the food service premises, the distribution system, and the serving premises and the day-to-day “running costs”. The design and construction includes planning, designing of the site, and installation and purchasing of hardware. The running costs include food, labour and other costs such as water, electricity, cleaning aids and maintenance. A rough estimate is that food and labour account for 40% each and that other costs account for the remaining 20%.

Specific data from the European participants regarding the total costs of food service are sparse. Anyhow, the amount of money spent on food is negligible compared to the total hospital budget (Arveby 1995, DCC 1995). As an example the total cost of hospital stay in United Kingdom and Denmark was about 1,900 EURO per week in 1994 (Silk 1994). Even though costs probably have increased since then a weekly estimated cost of ordinary hospital food of around 30 EURO would still constitute less than 2% of the total budget.

It should be remembered that ordinary hospital food is the major source of nutrition. In Denmark e.g. the total amount of money spent on food and artificial nutrition is about 127 million EURO, of which food is about 96%, enteral nutrition is about 3% and parenteral nutrition is about 1% (Kondrup 2001).
6.2.1. Costs of different food preparation systems

Sophisticated food service technologies such as cook-chill and sous-vide require modern hardware and are expensive to establish. Often consultants are necessary, adding cost to the system in the start-up phase. On the other hand these technologies are cheaper to operate in terms of cost per portion, when compared to traditional cook-serve and cook, hold and serve systems.

Long shelf life systems are advantageous especially in systems where transportation is involved. The explanation is that sophisticated food service technologies offer increased shelf life, which means that meals can be produced in large batches, which then can keep for days, unlike the traditional warm held system where meals have to be consumed immediately after production. Sophisticated technologies run in a more rational “industry like” mode, while traditional cook-serve production runs in a more traditional “artisan” mode. In addition, the equipment involved in the more sophisticated technologies can be utilised around the clock, whereas traditional equipment only can be utilised immediately prior to meal times.

When the cost of different food preparation systems is discussed it is of utmost importance to take the patients opinion about the food produced into consideration.

6.2.2. Reasons for food wastage

Recent studies from United Kingdom, France and Denmark have shown that the percentage of food wasted is even higher than previously thought, corresponding to 40% of the amount produced (Allison 1999, Almdal et al., submitted, Barton et al. 2000b, Valla et al. 2000). The large value of food wasted is most likely caused by low intake by the patients (Almdal et al., submitted, Edwards & Nash 1999, Stephen et al. 1997). Other reasons are that patients since ordering have been discharged, transferred or have died, or made “nil-by-mouth” (Allison 1999). Sometimes too much food is produced compared to energy requirements of the patients and the size of the hospital (Almdal et al., submitted, Kelly 1999). Since patients should have the opportunity to choose their meals as close to the serving time as possible, such surplus of food might be an advantage.

Many other reasons for plate wastes in hospitals have been noted, for example the negative effect of stress and treatment on patients’ appetite, and the way in which food is prepared. Ethnic and/or cultural background or food preferences, the appearance of the food on the tray, and the temperature of the food have been found to be of importance. It has also been suggested that the selective menu reduces plate waste by motivating patients to eat better and have cited specific savings experienced in their institutions. Others contend that selection does not reduce plate waste, increase patient satisfaction or even ensure that patients will choose a balanced menu.

Additional factors, such as the hours of meals, the length of mealtimes, and the selection of food as close as possible to the mealtimes, seem to affect the way patients enjoy and consume their food. Disturbances during mealtimes, such as rounds by medical
personnel and phlebotomists have a negative effect on the amount of food eaten (Hirsch et al. 1979, Kelly 1999, McGlone et al. 1995).

Finally, the food service practices seem to be of importance. A study of plate waste in a hospital cook-freeze production system showed that mean percentage waste of all food served was 21%, with little variation between meals or between modified and non-modified menus (Frakes et al. 1986). Another study found that changing from a central plate system to a system with de-centralised plating and buffet reduced the daily food wastage per meal from approximately 0.5 to 0.4 kilos (DCC 1995).

6.2.3. Wastage of artificial nutrition

A review of the management of clinical nutrition in hospitals has looked at the issue of waste of artificial nutrition and estimated that substantial savings could be made through a better management of artificial feeding practices, including improved monitoring, providing protocols and more prudent purchasing (Davis & Bristow 1999).

Providing the most appropriate kind of nutritional support is also important. There is evidence of the inappropriate and unnecessary use of expensive forms of nutritional support, for example where parenteral nutrition is used when enteral nutrition would have been more appropriate (Braga et al. 1994, Johansson et al. 1996, Newton et al. 2000).

Recommendations

✓ The influence of food service practice on food wastage should be examined.
✓ Flexibility with regard to the patient’s menu choice and serving size should be ensured.
✓ When assessing the cost of different food preparation systems, the patient’s satisfaction with the food served should be considered.
✓ The food budget should be valued as part of the budget spending on clinical support and treatment services.
✓ Hospital managers should take into account the potential cost of complications and prolonged hospital stay due to undernutrition when assessing the cost of nutritional care and support.
✓ The wastage of nutrient intake from food, sip feedings and artificial nutrition should be recorded.
✓ Inappropriate use of expensive artificial nutritional support techniques should be minimised.

6.3. Children

No literature on the topic of health economics, specifically for children, is available.

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1 Ninety-nine percent of the patients consistently rate food and foodservice average to excellent.
7. PRESENT RECOMMENDATIONS

In Denmark, Finland, Norway, Sweden, Slovenia and United Kingdom recommendations regarding the food served in the hospitals, and the nutritional care and support have been issued on a governmental level. The same is not the case with regard to France, Germany, Italy, the Netherlands, Portugal, and Switzerland. However, in the majority of the countries different clinical nutrition societies have taken the initiative to make some guidelines. Compared to the participating European countries, the United States have taken the issue one step further and made nutrition a part of the general requirements for approval of hospitals.

7.1 National recommendations for hospital food provisioning and nutritional care and support

Five of the participating European countries, Denmark, Finland, Norway, Sweden and United Kingdom, have issued official recommendations for the food served in hospitals and the nutritional care and support of the patients. The main emphasis in these recommendations is placed on ordinary (hospital) food. Besides, Slovenia has official recommendations for the nutritional composition of the food served in hospitals. The recommendations are summarised below¹.

7.1.1. Denmark

The Danish Veterinary and Food Administration published the first edition of the recommendations for Danish institutional menus in 1995. In 2000 a revised third edition was published (Pedersen & Ovesen 2000). All editions are based on the work of an expert group consisting of physicians, clinical dieticians and representatives from the Danish Ministry of Health and the Danish Ministry of Food ².

Recommendations are given for institutional food service menus. Topics include basic nutritional principles, food groups and practical aspects of institutional food service (with advantages and drawbacks of different serving systems). Further, there are recommendations regarding tasks and responsibilities, communication and collaboration and patient information. The menus that should be served in the hospitals are given in table 7.1.

¹ Further information can be obtained in the Appendixes.
² There had been recommendations before but they were only regarding the composition of the hospital menu.
Table 7.1. Danish hospitals shall offer the following menus:

- A Normal menu with 30E% from fat for patients without nutritional problems.
- A Hospital menu (= the general menu), which is energy and protein dense with 40E% from fat for patients who are undernourished or at risk of undernutrition, and for patients with a poor appetite or increased energy and protein needs.
- An energy and protein dense menu, with 50E% from fat for patients with a very poor appetite and a very low food intake.
- An energy dense menu for children.
- Menus with modified texture for patients with difficulties in chewing and swallowing.
- Diets on medical indications for patients with specific diseases, e.g. diabetes mellitus, kidney disease.

The Normal menu and energy and protein dense Hospital menu includes 3 in-between meals constituting 15-30% of the total energy intake per day. The energy and protein dense menu for patients with a very low food intake consists of 6-8 meals per day, and in-between meals constitute about 50% of the daily energy intake. The energy dense menu for children should also consist of 6-8 meals per day, offer possibility for choice and mainly consist of favourite dishes.

The recommendations regarding food service practices are given in table 7.2.

Table 7.2. Recommendations regarding food service practices in Danish hospitals

- Individual and flexible food service.
- Calculation of nutrient content of recipes, menus and diets on medical indications.
- Choice between different menus and portion sizes.
- Food supplies at the wards, if patients become hungry between mealtimes.
- Portioning and serving adjusted to patient needs.
- Pleasant environments at mealtimes.
- If necessary, help with eating from experienced staff.

Recommendations in the field of nutritional care and support are given in table 7.3.

Table 7.3. Recommendations regarding nutritional care and support in Danish hospitals

- Nutritional risk screening (dietary intake before admission and during hospital stay, etc.).
- Energy and protein requirements in different patient categories.
- Individual nutritional support.
In 1997 the Minister of Health asked how many of the Danish counties that followed the recommendations (more specifically with regard to the possibility of in-between meals and a menu for patients with very poor appetite and low food intake). Fifteen counties answered, and 27% stated that they followed the recommendations completely, 53% said that they followed them in part, and 20% said that they did not. Among 86 hospitals 42% claimed to follow the recommendations, and 39% did partly, and the remaining 19% did not. The survey was repeated 1 year later – this time as an initiative from the Danish Dietetic Association. In 10 of the participating hospitals progress had been made, but 7 hospitals apparently had taken steps backwards. An explanation is that managers located far away from the “real world” in the hospital answered the surveys.

### 7.1.2. Finland

The first recommendations were issued in 1985. The guidelines were revised in 1994 by an expert group of the Ministry of Social Affairs and Health (Von Fieandt & Hasunen 1994).

The main focus of the recommendations is on co-operation, communication and responsibilities in nutritional care, and on tasks of the in-patient wards and food service centre. The guidelines emphasise the responsibility of each personnel group in the hospital, on the nutritional care and on food-related issues. The topics included are presented in table 7.4.

*Table 7.4. Topics included in the Finnish recommendations regarding hospital food and nutritional care and support*

- Menus for adults, children, patients in long-term care, lacto-vegetarian (*General menus*: fat content 30E%).
- Nutrient content.
- Estimation of energy needs of adult patients and children.
- Nutritional/dietary management of children, disabled patients, psychiatric patients, old patients, terminal care.
- Diets on medical indications.
- Energy and protein dense menus.
- Texture modifications of menus.
- Parenteral nutrition.
- Nutritional management of patients with different religious or cultural background.

### 7.1.3. Norway

The guidelines give an introduction to why nutrition is important during disease, which patients are at risk for developing undernutrition, and how to detect, prevent and treat undernutrition. It then gives advice concerning production of food in the kitchen. The main part of the recommendation describes the composition of the ordinary hospital food and the diets on medical indications.

The hospital menus consist of a general menu (fat content 35%), a normal menu (fat content 30%) and an energy and protein dense menu (fat content ≥35%), diets on medical indications etc. Other recommendations, including the ones for children, are very similar to the Danish recommendations (mentioned above).

7.1.4. Slovenia

In 2001 the Medical Council and Food and Nutrition Council of Ministry of Health accepted recommendations for nutritional composition of a general menu (fat content 30%), a high protein menu (protein content 23%, fat content 36%) a high energy and high protein menu (protein content 21%, fat content 36%). The recommendations enable enrichment of menus by enlargement of portions, standardised supplements (milk, fruit, meat, cheese and eggs) and additional food for individual patients. The possibilities are not frequently used.

7.1.5. Sweden

Sweden was the first country to publish national recommendations on hospital food. The first recommendation was published in 1965 in the Swedish medical journal “Läkartidningen”. The recommendations obtained official status in 1971 when published by the Swedish National Food Administration. The fourth edition was published in 1991, and the main contents are given in table 7.5. The fifth edition (“Foods for those who are sick”), which will be published in 2002 will include recommendations for food served in hospitals and for other institutions dealing with sick people.

All editions are based on the work by an Expert Group for Coordination of Hospital Food (ESS-group), appointed by the Swedish National Food Administration. The Expert Group consisted of physicians, nurses, clinical and administrative dieticians, nutritionists and representatives from officials of the Swedish health care system. The national recommendations for hospital food are guidelines for all Swedish hospital kitchens. They are instruments in budget negotiations and in revisions of the general menu. They also serve as a textbook in clinical nutrition for different social service educations.
Table 7.5. Main topics included in the Swedish recommendations regarding hospital food and nutritional care and support

- Introduction: In the hospital food is part of patient treatment and care. A good nutritional state is a prerequisite for optimal treatment.
- Responsibilities, duties and tasks of the different staff categories and health authorities.
- Guidelines in nutritional assessment, menu choice, portion size.
- Recommendations for energy and nutrient content of hospital food (General menus: fat content 30E%).
- Recommendations for meal pattern.
- Menus for children, adults and old patients.
- Menus for ethnic and/or cultural groups.
- Special menus: Energy and protein dense menus (fat content ≥35E%), texture modified menus, liquid menus.
- Sip feedings, enteral nutrition.
- Diets on medical indications include fat reduced diets (20E%), gluten-free diets, lactose-reduced and lactose-free diets and pre-uremic diets.
- Guidelines for choosing optimal menus for individual patients.
- Medical effects of food and food habits in different clinical conditions.
- Economical support for certain diets on medical indications.

7.1.6. United Kingdom/England

Several publications regarding hospital food provisioning and nutritional care and support has been released from the Department of Health (some of these are presented in table 7.6).

Table 7.6. Examples of publications of relevance for hospital nutrition (Davis & Bristow 1999)

- The Nutrition Guidelines for Hospital Food Service (1995). Provides nutrition guidelines on general standards and standards for specific patient groups, provides pointers to areas of particular concern or where there may be potential problems.
- Eating Matters (1997). This is a resource pack for use by ward staff, which aims to assist hospital staff to meet patients’ dietary needs. It focuses particularly on the needs of old patients and provides evidence, examples and case studies.
In England a major initiative is underway to improve the quality of and access to hospital food. The Better Hospital Food programme was announced in the NHS Plan published in July 2000 and requires clinical dietitians to advise and check on the nutritional values in hospital food (see also Appendix 2.4 and www.betterhospitalfood.com). Through the Better Hospital Food programme, all hospitals in England must provide for all patients the Estimated Average Requirement (EAR) for food energy, and the Reference Nutrient Intake (NRI) for all other nutrients.

Scotland, Northern Ireland and Wales are working on similar health service plans, which will include nutritional elements.

### 7.2 Initiatives regarding hospital food provisioning and nutritional care and support taken by different nutrition societies

In France, Germany, Italy, Netherlands, Portugal, and Switzerland no official guidelines exist regarding the food served in hospitals, and the nutritional support and care of the patients. Instead other measures of managing hospital nutrition are used in some of the countries. These are summarised below.

In addition, different clinical nutrition societies, of which many can be reached through the ESPEN (www.espen.org), have taken some initiatives in this context (table 7.7).

**Table 7.7. Clinical nutrition societies in the different countries**

<table>
<thead>
<tr>
<th>Society</th>
<th>Contact</th>
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<tbody>
<tr>
<td>Danish Society of Parenteral and Enteral Nutrition (<a href="mailto:kondrup@rh.dk">kondrup@rh.dk</a>)</td>
<td></td>
</tr>
<tr>
<td>French-speaking Society for Enteral and Parenteral Nutrition (<a href="http://www.sfnep.org">www.sfnep.org</a>)</td>
<td></td>
</tr>
<tr>
<td>German Society for Nutritional Medicine (<a href="http://www.dgem.de">www.dgem.de</a>)</td>
<td></td>
</tr>
<tr>
<td>Italian Association of Dietetic and Clinical Nutrition (<a href="http://www.adiitalia.it">www.adiitalia.it</a>)</td>
<td></td>
</tr>
<tr>
<td>Italian Society for Human Nutrition (<a href="http://www.sinu.it">www.sinu.it</a>)</td>
<td></td>
</tr>
<tr>
<td>Italian Society for Parenteral and Enteral Nutrition (<a href="http://www.sameint.it/sinpe">www.sameint.it/sinpe</a>)</td>
<td></td>
</tr>
<tr>
<td>Netherlands Society of Parenteral and Enteral Nutrition (<a href="http://www.nvge.nl">www.nvge.nl</a>)</td>
<td></td>
</tr>
<tr>
<td>Portuguese Association of Enteral and Parenteral Nutrition (<a href="mailto:p.ravasco@fm.ul.pt">p.ravasco@fm.ul.pt</a>)</td>
<td></td>
</tr>
<tr>
<td>Swedish Society for Parenteral and Enteral Nutrition (<a href="mailto:olle.ljungquist@ersta.se">olle.ljungquist@ersta.se</a>)</td>
<td></td>
</tr>
<tr>
<td>Swiss Society of Clinical Nutrition (<a href="http://www.ssnc.ch/">www.ssnc.ch/</a>)</td>
<td></td>
</tr>
<tr>
<td>British Association for Parenteral and Enteral Nutrition (<a href="http://www.bapen.org.uk">www.bapen.org.uk</a>)</td>
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#### 7.2.1. Germany

In 1991 the German Nutrition Society (DGE) launched the first recommendation regarding the nutrient content of the *General menu* served in hospitals (German Nutrition Society 1991). In 1994 the German Society of Nutritional Medicine (DGEM) released a paper regarding the recommended type of diets on medical indications (Kasper et al. 1994). In 2000 came an extended version of the recommendations
prepared in collaboration between DGE, DGEM and other organisations. In these are recommendations for the nutrient content of a General menu and a light general menu (fat content: 30E%) plus several diets on medical indications (Kluthe et al. 2000). DGEM has stressed the importance of only using diets with a documented clinical effect, and gives examples of diets that should be avoided (Kasper et al. 1994). DGEM and the Austrian Society for Nutritional Medicine (AKE) are currently developing guidelines for clinical nutrition.

### 7.2.2. Switzerland

Clinical dieticians use recommendations published by the German Nutrition Society. There are guidelines regarding indication and financial re-compensation of enteral and parenteral nutrition published by the Swiss Society for Clinical Nutrition (GESKES). Nutrition guidelines are only described in some individual hospitals by NSTs.

### 7.2.3. Different organisations

An American committee¹, SINPE and SFNEP has each made a consensus statement regarding peri-operative nutritional support (Bozzetti 1996, Klein et al. 1997, Zazzo 1996). The last one referred to has been commented on, and most often approved by experts in clinical nutrition from different countries (Canada, Italy, Netherlands, New Zealand, Spain, Sweden, United Kingdom and United States)².

BAPEN has made recommendations regarding the organisation of nutritional support in hospitals. Among the recommendations are that all patients at risk of developing undernutrition should be routinely screened for undernutrition and have access to an NST (Silk 1994).

ESPEN ³ has made a consensus statement regarding nutrition in liver disease and transplantation. This contains recommendations for the energy and protein intake, and methods of nutritional support (Plauth et al. 1997). Also, they have approved a consensus report regarding nutrition in adult patients with renal insufficiency (Toigo et al. 2000a, Toigo et al. 2000b).

The European Society of Intensive Care Medicine (ESICM) has made recommendations regarding enteral nutrition in intensive care patients. The purpose was to provide the physicians caring for ICU patients with practical guidelines to determine the optimal timing and modalities of enteral nutrition (Jolliet et al. 1998). (This position paper has later been published in the ESPEN journal Clinical Nutrition (Jolliet et al. 1999))

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³ Official journal: Clinical Nutrition.
The European Society of Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN)\(^1\) has a committee on nutrition, which up till know have focused on infant nutrition and Recommended Dietary Allowances, but is planning to institute work regarding the nutritional care and support of hospitalised children.

The European Association for Palliative Care has made guidelines on artificial nutrition vs. hydration in terminal cancer patients in an attempt to reach a decision on the type of treatment support. The guidelines contain 8 key elements necessary to reach a decision based on well-defined end points. Among these are expected length of survival and psychological profile (Bozzetti 1996b).

The American College of Physicians has made a position paper regarding parenteral nutrition to patients receiving cancer chemotherapy. The recommendations, based on the scientific evidence available at that time (1989), were that the routine use of parenteral nutrition for such patients should be strongly discouraged (American College of Physicians, 1989).

The Infectious Disease Society of America and the American Society of Blood and Marrow Transplantation has issued some guidelines for preventing opportunistic infections among bone marrow transplant recipients. Included are guidelines regarding food safety.

7.2.4. ASPEN/United States

ASPEN has made “Guidelines for the use of parenteral and enteral nutrition in adult and paediatric patients” (ASPEN 1993) and “Standards of Practice” for physicians, nurses, pharmacists and clinical dieticians. These contain standards regarding competency, screening and assessment, and standards regarding development, implementation, monitoring, reassessment, updating and termination of nutritional support. Beside this, the responsibilities regarding administrative management, education, training, communication and research are stated (www.clinnutr.org). All of this is part of the nutritional requirements for approval of hospitals (see section 3.3).

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\(^1\) Official journal: Journal of Pediatric Gastroenterology and Nutrition (JPYN).
CONCLUDING REMARKS

Anyone who has gone without food for one or two days will know the discomfort it gives. In European hospitals it is common that patients go without food for several days. It has been amply demonstrated that this starvation has human, functional, clinical and financial implications. The money spent treating nutrition-related complications is enormous as is the monetary value of hospital food wasted.

Despite the significant number of hospitalised patients affected, disease-related undernutrition is rarely recognised or treated, meaning that only few of those who need nutritional support receives it. There is a general lack of awareness of the untoward consequences of disease-related undernutrition among not only health care professionals but also hospital managers despite the potential savings resulting from better nutritional care.

A major cause of the failure in nutritional care of hospitalised patients can be linked to lack of appropriate education and training. Also, there is disagreement between different health care professionals as to whom, is responsible for the nutritional treatment of the patients. Meals are rarely pleasant social occasions, all patients are considered equal with respect to food needs and furthermore have little control over food choice, methods of preparation and times of eating. The provision of meals is regarded as a hotel service, rather than as an essential part of treatment for many patients.

However, all patients have the right to expect that their nutritional needs will be fulfilled during hospitalisation. Patients in good nutritional status are sound indicators of the quality of care provided. Also adequate energy intake is a prerequisite for an optimal effect of medical and surgical treatments. The costs of identifying nutritionally at-risk patients are low. So is the use of energy and protein dense menus for nutritional support. Finally, early and adequate nutritional support is associated with cost-benefit. Most patients, relatives and hospital managers are not aware of this. To secure their active involvement and engagement, such information has to be made public.

The average length of stay in European hospitals has been steadily decreasing and is now between 5 and 10 days. Besides, the majority of patients are undernourished already at admission. Therefore, the monitoring and follow-up of the patient has to continue all the way through the hospital stay and out in the community. Hence:

- Organised contact between the hospital and the primary health care sector should be established.
- Medical and nursing admission, discharge and outpatient records should contain information about each patient’s nutritional status, physical and mental abilities, in relation to food intake.
- The nutritional risk of all patients should be routinely assessed prior to admission.
• The patient (and relatives) should be informed of the importance of good nutrition throughout the disease process to attain a successful treatment.
• The involvement of relatives in the nutritional care and support of patients should be welcomed.

In recent years national initiatives to enhance understanding and promote good practice in nutritional care and support are gathering momentum. Among these initiatives are the publication of national recommendations for hospital food provisioning and nutritional care and support, and the establishment of different organisations and committees with main focus on clinical nutrition. Such initiatives should be expanded and the experiences obtained shared at a European level.
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Appendix 1. Sources of information
Appendix 1.1. Questionnaire

REVISED QUESTIONNAIRE
for national contributions to the report on nutrition programmes in hospitals

Please, answer all questions; i.e. also indicate if no information is available to some of the questions.

Wherever possible, please, give references or enclose actual reports/scientific papers.

NATIONAL STUDIES OF UNDERNUTRITION IN HOSPITALS

What is the prevalence of undernutrition in different patient categories (the size of the problem in your country)?

What is the intake of energy, protein and micronutrients in relation to the nutritional requirements?

THE SIZE OF THE HOSPITAL SECTOR

What is the number of:
- Hospitals of different sizes:
  ⇒ < 300 beds?
  ⇒ 300-600 beds?
  ⇒ > 600 beds?
- Employees in the kitchen?
- Patients’ treated/bed days per year?
- Meal days per year (please, give a definition of a meal day; are between meals/snacks included?)

ORGANISATION IN THE HOSPITAL

Are nutritional steering committees and nutritional support teams/units established in most hospitals in your country?
- In case of yes, who are represented in the above-mentioned committees and teams/units?
- In case of no, how many hospitals have established these committees/teams/units? Why is it not done more often?
Which are the responsibilities, duties and tasks of the different staff categories with respect to nutritional care and support and hospital food service? Are they clearly defined?

How are the communication and the collaboration between the different staff categories organised?

What are the main problems concerning the organisation in relation to undernutrition?

**PRACTICES IN RELATION TO NUTRITIONAL CARE AND SUPPORT**

Is nutritional screening and assessment performed on admission to hospital as a common practice?
- How often is it done?
- Which screening tools are used to identify and stratify risk patients?
- What are the barriers against nutritional screening and assessment?

Are the nutritional status of the patients and the food/nutrient intake monitored during hospital stay as a common practice?
- How often is it done?
- How is it done (e.g. registration of body weight etc.)?
- What are the barriers against monitoring?

Is nutritional support used for undernourished patients and risk patients as a common practice?
- How often is it done?
- What kind of nutritional support is used?
- What are the barriers against nutritional support?

Do the patients get nutritional counselling as a common practice?
- How often is it done?
- What kind of counselling is given?
- What are the barriers against nutritional counselling?

Which other barriers against the use of nutritional care and support exist in the hospitals in your country?

What other initiatives have been taken in relation to clinical nutrition in the hospitals in your country?

Have cost-benefit analyses been performed in relation to nutrition in hospitals?
EDUCATION AND NUTRITIONAL KNOWLEDGE

Please, describe the education and training in clinical nutrition of the different staff categories
Is the nutritional knowledge adequate?

FOOD SERVICE PRACTICES

How many hospitals:
• Use in-house food service?
• Have outsourced hospital food service?

Which kind of production and serving systems are used in the hospitals in your country?

How are the eating environments and conditions?

Which kind of general hospital menus are produced (not diets on medical indications)?
Which is the most prevalent?

What is the meal pattern (number of meals a day, meal timing, type of meals, use of fortified meals, nutritious snacks and drinks etc.)?

How are the patients informed about the food services offered?

Does the individual patient have a choice with respect to menu and portion size?

Does the patient have any other influence on the food?

Are patient questionnaires used in the hospitals?

What other food service practices have been adopted to prevent undernutrition?

How do the food service practices affect the prevalence/occurrence of undernutrition?

FOOD SERVICE COSTS

What are:
• The total costs of hospital food provisioning?
• The costs of food and wages?
• The monetary value of hospital food wasted?
NATIONAL GUIDELINES/RECOMMENDATIONS REGARDING HOSPITAL FOOD AND NUTRITIONAL CARE AND SUPPORT

Has your country issued national guidelines/recommendations for hospital food and nutritional care and support?
• In case of yes, please, give a brief description of the guidelines.
• In case of no, why not? Are there any plans to do it?

NEW AND SIGNIFICANT PROJECTS CONCERNING UNDERNUTRITION IN HOSPITALISED PATIENTS

Please, fill in the enclosed form (PROJECT CONCERNING UNDERNUTRITION IN HOSPITALISED PATIENTS), one for each project

CONCLUSION

What are the main problems concerning undernutrition in hospitals?
Appendix 1.2. National references

List of the literature, which together with the opinions of the delegates from the different European countries formed the basis of the answers given to the “Revised questionnaire for national contributions to the report on nutrition programmes in hospitals”. The list does not include those already cited in the document, unless further information seems relevant to give).

Denmark

Danish Veterinary and Food Administration. Considerations regarding the public meal service (in Danish). 1997.


Rasmussen HH, Kondrup J, Ladefoged K, Staun M. Clinical nutrition in Danish hospitals: a questionnaire-based investigation among physicians and nurses. Clin Nutr 1999;18:153-8. A study based on the answers to a questionnaire send to 2000 physicians and nurses on 40 (49%) Danish hospitals and answered by 857 (43%).


Finland


**France**


**Germany**


Gebhardt A. Checking the nutritional quality of hospital diets – a comparison of chemical analysis and calculation of nutrients (in German). Verlag, Dr. Köster Berlin 1996.


**Italy**


Netherlands


Bokhorst-de van der Schueren MAE, van Leeuwen PAM, Klop C, Sauerwein HP, Snow GB, Quak JJ. The impact of nutritional status on the prognosis of patients with advanced head and neck cancer. Cancer 1999;86:107-11

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Norway

National Nutritional Council 1990. A report based on a study about the knowledge on nutrition among nurses.

National Nutritional Council 1993. A report based on a questionnaire send to 600 health institutions in Norway and answered by 72%.

Health statistics of Norway 1999.

Portugal


Slovenia


Sweden


Switzerland


United Kingdom


Shaping the future NHS: Long-term planning for hospitals and related services. Consultation document on the findings of the national beds enquiry 2000 (www.doh.gov.uk/nationalbeds1.htm)

NHS Executives. Hospital catering: Delivering a quality service 1996
Appendix 1.3. Members of the ad hoc group on nutrition programmes in hospitals

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E-mail oz@dankost.dk
Appendix 1.4. List of organisations and specialists consulted about the document

European Academy of Nutritional Sciences (EANS)
European Association of Hospital Administrators (EAHA)
European Catering Association (ECA)
European Public Health Alliance (EPHA)
European Society of Enteral and Parenteral Nutrition (ESPEN)
Federation of European Nutrition Societies (FENS)
Food Service Consulting International (FSCI (EUROPE))
International Alliance of Patients’ Organizations (IAPO)
International Association for the Study of Obesity (IASO)
International Union of Nutritional Sciences (IUNS)
Standing Committee of Doctors of the European Union
Standing Committee of Hospitals of the European Union (HOPE)
Standing Committee of Nurses of the EU
World Health Organization (WHO), Regional Office for Europe

Prof. S. Allison, Nottingham University Hospital, United Kingdom
Prof. J. G. Hautvast, Wageningen Agricultural University, The Netherlands
Prof. B. Isaksson (Emeritus), Sweden
Dr. J. Kondrup, Rigshospitalet, Copenhagen, Denmark
Prof K. F. Michaelsen, Research Department of Human Nutrition, Denmark
Dr. T. Mossberg, Socialstyrelsen, Sweden
Dr. V. Young, Massachusetts Institute of Technology, USA
Appendix 2. Practices in relation to nutritional care and support
Appendix 2.1. NSTs and NSCs

Table 2.1.1. The distribution of nutritional steering committees (NSC) and nutritional support teams (NST)/units

<table>
<thead>
<tr>
<th>Country</th>
<th>NSC in most hospitals?</th>
<th>NST/units in most hospitals?</th>
<th>NST(%)</th>
<th>Units (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Yes</td>
<td>No</td>
<td>14 (14%)</td>
<td>4 (4%)</td>
</tr>
<tr>
<td>Finland</td>
<td>No *)</td>
<td>No *)</td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td>France</td>
<td>No</td>
<td>No</td>
<td>634 (20%) combination of NSC and NST</td>
<td>No data available</td>
</tr>
<tr>
<td>Germany</td>
<td>No, in 290 (45%) #)</td>
<td>No</td>
<td>297 (47%) #)</td>
<td>No data available</td>
</tr>
<tr>
<td>Italy</td>
<td>No</td>
<td>Some *)</td>
<td>No data available</td>
<td>70-80 (7-8%)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Yes</td>
<td>No</td>
<td>52 (50%) and increasing</td>
<td>&amp;)</td>
</tr>
<tr>
<td>Norway</td>
<td>No, in 10 (12%)</td>
<td>No</td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td>Portugal</td>
<td>No, in 12 (12%) ⊥)</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td>Slovenia</td>
<td>No, in 10 (40%)</td>
<td>No</td>
<td>4 (16%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Sweden</td>
<td>No, in &gt;8 (14%)</td>
<td>No</td>
<td>No data available</td>
<td>&gt;2 (3%)</td>
</tr>
<tr>
<td>Switzerland</td>
<td>No *)</td>
<td>No *)</td>
<td>52% §)</td>
<td>*)</td>
</tr>
<tr>
<td>UK</td>
<td>No</td>
<td>Some</td>
<td>No data available</td>
<td>No data available</td>
</tr>
</tbody>
</table>

*) But in some/most/all large or larger hospitals
& A Dutch Society of NSTs was established in 1996 with the aim of exchanging information about nutritional care and support among the NSTs.
#) A survey performed among 662 hospitals (Schauder et al., in press).
⊥) Most are medium size. In practice NSTs are functioning as NSC in the majority of hospitals
§) A survey where 63% of the Swiss hospitals participated (Pichard et al. 2001).
## Appendix 2.2. Responsibility

### Table 2.2.1. The responsibilities of the different health care professionals

#### Denmark
Official recommendations (Pedersen & Ovesen 2000)

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess nutritional status</td>
<td>Physician</td>
</tr>
<tr>
<td>Prescribe hospital food, enteral and parenteral nutrition</td>
<td>Physician</td>
</tr>
<tr>
<td>Secure optimal nutrition as part of the overall management</td>
<td>Physician</td>
</tr>
<tr>
<td>Inform, order and serve hospital food</td>
<td>Nurse</td>
</tr>
<tr>
<td>Observe food intake and secure a sufficient intake</td>
<td>Nurse</td>
</tr>
<tr>
<td>Produce and deliver hospital food</td>
<td>Administrative dietician</td>
</tr>
<tr>
<td>Secure the nutritional value and the palatability of the food</td>
<td>Administrative dietician</td>
</tr>
<tr>
<td>Manage individual nutritional counselling and support</td>
<td>Clinical dietician</td>
</tr>
<tr>
<td>Educate personnel</td>
<td>Clinical dietician</td>
</tr>
</tbody>
</table>

#### Finland
Official recommendations (Von Fieandt & Hasunen 1994)

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsibility group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognising nutritional care as an essential part of patient care</td>
<td>Management</td>
</tr>
<tr>
<td>Decide food management and delivery system</td>
<td>Management</td>
</tr>
<tr>
<td>Allocate resources</td>
<td>Management</td>
</tr>
<tr>
<td>Identification of the basic dietary needs</td>
<td>Ward staff*)</td>
</tr>
<tr>
<td>Food ordering</td>
<td>Ward staff*</td>
</tr>
<tr>
<td>Eating and assistance</td>
<td>Ward staff</td>
</tr>
<tr>
<td>Follow-on</td>
<td>Ward staff</td>
</tr>
<tr>
<td>Evaluations of the nutritional care and risk of undernutrition</td>
<td>Ward staff</td>
</tr>
<tr>
<td>Nutritional counselling</td>
<td>Ward staff</td>
</tr>
<tr>
<td>Qualitative requirements of food</td>
<td>Food service staff</td>
</tr>
<tr>
<td>Menu planning</td>
<td>Food service staff</td>
</tr>
<tr>
<td>Food portioning</td>
<td>Food service/Ward staff</td>
</tr>
<tr>
<td>Communication between the kitchen and the ward</td>
<td>Food service/Ward staff</td>
</tr>
</tbody>
</table>

*) Apparently no differentiation between physicians, nurses and nutritionists
### France

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribe hospital food and artificial nutrition</td>
<td>Physician</td>
</tr>
<tr>
<td>Assess nutritional status</td>
<td>Physician and general dietician</td>
</tr>
<tr>
<td>Inform, order and serve hospital food</td>
<td>Nurse</td>
</tr>
<tr>
<td>Observe food intake and secure a sufficient intake</td>
<td>Nurse and general dietician</td>
</tr>
<tr>
<td>Produce and deliver hospital food</td>
<td>Food service staff</td>
</tr>
<tr>
<td>Menu planning</td>
<td>Food service staff</td>
</tr>
<tr>
<td>Secure nutrition as part of the overall management</td>
<td>General dietician</td>
</tr>
<tr>
<td>Manage individual nutritional counselling and support</td>
<td>General dietician</td>
</tr>
</tbody>
</table>

### Germany

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocate resources</td>
<td>Management</td>
</tr>
<tr>
<td>Nutritional assessment</td>
<td>Physician</td>
</tr>
<tr>
<td>Prescription of hospital food and artificial nutrition</td>
<td>Physician</td>
</tr>
<tr>
<td>Serve hospital food</td>
<td>Nurse</td>
</tr>
<tr>
<td>Observe food intake</td>
<td>Nurse</td>
</tr>
<tr>
<td>Produce and deliver hospital food</td>
<td>General dietician, cook</td>
</tr>
<tr>
<td>Individual nutritional counselling and support</td>
<td>General dietician</td>
</tr>
<tr>
<td>Qualitative requirements of food</td>
<td>Unclear *)</td>
</tr>
</tbody>
</table>

*) Schauder et al. 1994.
**Italy**

Some of the tasks are official recommendations defined by national and regional directives in health fields others are dominant practice.

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocate resources</td>
<td>Management</td>
</tr>
<tr>
<td>Secure optimal nutrition as part of the overall management</td>
<td>Management/Physician</td>
</tr>
<tr>
<td>Assess nutritional status and suggest treatment</td>
<td>Physician or clinical nutritionist</td>
</tr>
<tr>
<td>Prescribe hospital food, enteral, parenteral nutrition and general</td>
<td>Physician or clinical nutritionist</td>
</tr>
<tr>
<td>dietician assistance</td>
<td></td>
</tr>
<tr>
<td>Information of patients, education of staff</td>
<td>Physician/General dietician</td>
</tr>
<tr>
<td>Assessment of nutritional status</td>
<td>Physician/General dietician</td>
</tr>
<tr>
<td>Prescribe and secure nutritional support</td>
<td>Physician/General dietician</td>
</tr>
<tr>
<td>Secure the serving of adequate food</td>
<td>Nurse</td>
</tr>
<tr>
<td>Observe food intake and secure a sufficient intake</td>
<td>Physician/General dietician</td>
</tr>
<tr>
<td>Educate staff</td>
<td>Physician/Nurse/General dietician</td>
</tr>
<tr>
<td>Nutritional counselling</td>
<td>Physician/General dietician/</td>
</tr>
<tr>
<td></td>
<td>Foodservice staff *)</td>
</tr>
<tr>
<td>Secure the nutritional value and the palatability of the hospital</td>
<td></td>
</tr>
<tr>
<td>food</td>
<td></td>
</tr>
<tr>
<td>Produce and deliver hospital food</td>
<td></td>
</tr>
</tbody>
</table>

*) Hotel services / facilities

**Netherlands**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not clearly defined, different in different hospitals</td>
<td>Not clearly defined</td>
</tr>
</tbody>
</table>

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**Norway**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure optimal nutrition as part of the overall management</td>
<td>Management</td>
</tr>
<tr>
<td>Allocate resources</td>
<td>Management</td>
</tr>
<tr>
<td>Information of patients, education of staff</td>
<td>Management</td>
</tr>
<tr>
<td>Assessment of nutritional status</td>
<td>Physician</td>
</tr>
<tr>
<td>Prescribe and secure nutritional support</td>
<td>Physician</td>
</tr>
<tr>
<td>Secure the serving of adequate food</td>
<td>Nurse</td>
</tr>
<tr>
<td>Observe food intake and secure a sufficient intake</td>
<td>Nurse</td>
</tr>
<tr>
<td>Produce and deliver hospital food</td>
<td>Administrative dietician</td>
</tr>
<tr>
<td>Secure the nutritional value and the palatability of the hospital food</td>
<td>Administrative dietician</td>
</tr>
<tr>
<td>Educate staff</td>
<td>Administrative dietician</td>
</tr>
<tr>
<td>Assess nutritional status and suggest treatment</td>
<td>Administrative dietician</td>
</tr>
<tr>
<td>Nutritional counselling</td>
<td>Clinical dietician</td>
</tr>
<tr>
<td>Educate staff</td>
<td>Clinical dietician</td>
</tr>
</tbody>
</table>

**Portugal**
No official recommendations – statements reflect the dominant practice.

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group *</th>
<th>*) NSTs are often functioning also as NSCs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess nutritional status</td>
<td>Physician/Nurse/NSC</td>
<td></td>
</tr>
<tr>
<td>Prescribe hospital food, enteral, parenteral nutrition and assistance from a clinical dietician</td>
<td>Physician/NSC</td>
<td></td>
</tr>
<tr>
<td>Consult a clinical dietician</td>
<td>Physician/Nurse</td>
<td></td>
</tr>
<tr>
<td>Produce and deliver hospital food</td>
<td>Hotel services/facilities</td>
<td></td>
</tr>
<tr>
<td>Adapt menus according to patient needs</td>
<td>Clinical dietician/Food service staff</td>
<td></td>
</tr>
<tr>
<td>Provide nutritional support</td>
<td>Clinical dietician/Nutritionist/NSC</td>
<td></td>
</tr>
<tr>
<td>Educate personnel</td>
<td>NST</td>
<td></td>
</tr>
</tbody>
</table>

**Slovenia**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not clearly defined</td>
<td>Not clearly defined</td>
</tr>
</tbody>
</table>
**Sweden**  
Official recommendations (ESS 1991)

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure optimal nutrition as part of the overall management.</td>
<td>Politician</td>
</tr>
<tr>
<td>Evaluate nutritional status</td>
<td>Physician/Nurse</td>
</tr>
<tr>
<td>Prescribe hospital food, enteral, parenteral nutrition and clinical dietician assistance</td>
<td>Physician</td>
</tr>
<tr>
<td>Consult a clinical dietician</td>
<td>Physician</td>
</tr>
<tr>
<td>Inform, order and serve hospital food</td>
<td>Nurse</td>
</tr>
<tr>
<td>Observe food intake and secure a sufficient intake</td>
<td>Nurse</td>
</tr>
<tr>
<td>Produce and deliver hospital food</td>
<td>Administrative dietician</td>
</tr>
<tr>
<td>Secure the nutritional value and the palatability of the hospital food</td>
<td>Administrative dietician</td>
</tr>
<tr>
<td>Manage individual nutritional counselling and support, as prescribed</td>
<td>Clinical dietician</td>
</tr>
</tbody>
</table>

**Switzerland**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnose undernutrition</td>
<td>Physician</td>
</tr>
<tr>
<td>Prescribe assistance from clinical dietician</td>
<td>Physician</td>
</tr>
<tr>
<td>Inform, order and serve hospital food</td>
<td>Nurse</td>
</tr>
<tr>
<td>Observe food intake and secure a sufficient intake</td>
<td>Nurse</td>
</tr>
<tr>
<td>Prepare hospital food with a defined nutrient content</td>
<td>Cook</td>
</tr>
<tr>
<td>Order the individually tailored diets on medical indications and menus in the kitchen, design plans of diet menus</td>
<td>Clinical dietician *)</td>
</tr>
<tr>
<td>Perform nutritional counselling</td>
<td>Clinical dietician</td>
</tr>
</tbody>
</table>

*) Clinical dieticians are not available in smaller hospitals; in these cases diet cooks usually assume these tasks.
United Kingdom/England
Official recommendations

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Responsible group *)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall care, including nutritional care and support</td>
<td>Physicians</td>
</tr>
<tr>
<td>Screen for nutritional risk</td>
<td>Nurses</td>
</tr>
<tr>
<td>Secure that the patients receive the food they need and give help if needed</td>
<td>Nurses</td>
</tr>
<tr>
<td>Observe food intake</td>
<td>Nurses</td>
</tr>
<tr>
<td>Secure that the patients receive a food service, which meet their needs</td>
<td>Ward housekeepers *)</td>
</tr>
<tr>
<td>Provide and deliver food service</td>
<td>Hotel services/facilities</td>
</tr>
<tr>
<td>Adapt menu according to patient needs</td>
<td>Clinical dietician/food service staff</td>
</tr>
<tr>
<td>Assess nutritional status</td>
<td>Clinical dietician</td>
</tr>
</tbody>
</table>

*) A new staff group, which will be introduced in connection with the NHS menu in England
## Appendix 2.3. Nutrition-related practices

### Table 2.3.1. The use of initial nutritional risk screening

<table>
<thead>
<tr>
<th>Country</th>
<th>Routine nutritional risk screening performed at admission?</th>
<th>How often?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>No</td>
<td>24% of the patients.</td>
</tr>
<tr>
<td>Finland</td>
<td>Varies</td>
<td>Seldom</td>
</tr>
<tr>
<td>France</td>
<td>No</td>
<td>20% of the patients *)</td>
</tr>
<tr>
<td>Germany</td>
<td>Varies</td>
<td>Varies</td>
</tr>
<tr>
<td>Italy</td>
<td>No (in most hospitals)</td>
<td>No data available</td>
</tr>
<tr>
<td>Netherlands</td>
<td>No</td>
<td>Seldom</td>
</tr>
<tr>
<td>Norway</td>
<td>Yes - in around 60% of the hospitals</td>
<td>Routinely</td>
</tr>
<tr>
<td>Portugal</td>
<td>No</td>
<td>Varies</td>
</tr>
<tr>
<td>Slovenia</td>
<td>No</td>
<td>Seldom #)</td>
</tr>
<tr>
<td>Sweden</td>
<td>No (probably)</td>
<td>No data available</td>
</tr>
<tr>
<td>Switzerland</td>
<td>No (only in selected units)</td>
<td>No data available</td>
</tr>
<tr>
<td>UK</td>
<td>Varies</td>
<td>Varies</td>
</tr>
</tbody>
</table>

*) Are primarily performed by general dieticians or physicians  
#) 73% performs assessment – however this is more oriented towards overnutrition.
Table 2.3.2. The used screening tools in practice, compared with (eventual existing) official recommendations.

<table>
<thead>
<tr>
<th>Country</th>
<th>Used screening tools</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>No data available. However, where clinical dieticians are involved it seems like the official recommended screening method is used</td>
<td>Nutritional status (weight loss &gt;5-15% in 1-3 months, BMI &lt;20.5, food intake 0-75%≥1 week) combined with the severity of illness</td>
</tr>
<tr>
<td>Finland</td>
<td>Laboratory tests, clinical status, S-albumin, body weight, BMI, interviews</td>
<td>BMI &lt;19, weight loss &gt;2%/1 week or &gt;5%/1 month, eating problems</td>
</tr>
<tr>
<td>France</td>
<td>Varies</td>
<td>No</td>
</tr>
<tr>
<td>Germany</td>
<td>Body weight, BMI, laboratory tests</td>
<td>No</td>
</tr>
<tr>
<td>Italy</td>
<td>Body weight, weight loss, BMI, food intake, laboratory tests, clinical judgement</td>
<td>No</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Body weight, body height, change in food intake, excessive losses (vomiting, diarrhoea, fistulas)</td>
<td>Undernutrition: Weight loss &gt;10% in 6 months, BMI &lt;18.5 At risk: Weight loss &gt;5% in 6 months, no food intake &gt; 10 days.</td>
</tr>
<tr>
<td>Norway</td>
<td>Clinical judgement, BMI, body weight, laboratory tests, food intake</td>
<td>Body weight, weight loss &gt;5-10%/2 months, BMI, food intake.</td>
</tr>
<tr>
<td>Portugal</td>
<td>Body weight, weight loss, BMI, food intake, poor appetite &gt;10 days, clinical judgement (+oedema)</td>
<td>No</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Body weight, laboratory tests, clinical judgement</td>
<td>No</td>
</tr>
<tr>
<td>Sweden</td>
<td>Weight loss, eating problems, presence of disease with likely associated weight loss and poor appetite for &gt;10 days. Subjective Global Assessment. Mini Nutritional Assessment</td>
<td>BMI &lt;20, weight loss &gt;5%/1 month, &gt;10%/6 months, severity of illness, eating problems (appetite, nausea, vision, chewing, swallowing).</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Nutritional history, BMI, S-albumin, elements of a “nutritional risk score”</td>
<td>No</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Body weight, weight loss, BMI, food intake, laboratory tests, clinical judgement</td>
<td>No</td>
</tr>
</tbody>
</table>
Table 2.3.3. The barriers of nutritional risk screening.

<table>
<thead>
<tr>
<th>Country</th>
<th>Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Lack of specific screening tools, difficult to identify risk patients</td>
</tr>
<tr>
<td>Finland</td>
<td>Lack of interest, knowledge, and resources</td>
</tr>
<tr>
<td>France</td>
<td>Lack of interest and knowledge, difficult to identify risk patients</td>
</tr>
<tr>
<td>Germany</td>
<td>Lack of resources, staff, time, knowledge and interest</td>
</tr>
<tr>
<td>Italy</td>
<td>Unimportant, lack of time, instructions, training, interest, and knowledge</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Lack of interest from the physician, time, and nursing staff</td>
</tr>
<tr>
<td>Norway</td>
<td>Lack of awareness of importance of risk-screening, time, instructions, training and knowledge</td>
</tr>
<tr>
<td>Portugal</td>
<td>Lack of resources, staff, time, knowledge, instructions and training</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Lack of standards for nutritional monitoring, knowledge, and awareness of importance of risk-screening and controlling undernutrition in medical treatment</td>
</tr>
<tr>
<td>Sweden</td>
<td>Lack of resources, staff, time, knowledge and interest</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Lack of time and nutritional education</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Unimportant, lack of time, instructions and training</td>
</tr>
</tbody>
</table>
Table 2.3.4. The prevalence of nutritional assessment and recording of food intake

<table>
<thead>
<tr>
<th>Country</th>
<th>Nutritional status and food intake monitored</th>
<th>How often is it done?</th>
<th>How is it done?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>See table 3.3</td>
<td></td>
<td>Body weight, laboratory tests, food intake and dietary habits. Hospitals are developing questionnaires</td>
</tr>
<tr>
<td>Finland</td>
<td>Varies. Mainly patients referred to a clinical dietician</td>
<td></td>
<td>Body weight, laboratory tests, food intake and dietary habits. Hospitals are developing questionnaires</td>
</tr>
<tr>
<td>Germany</td>
<td>Varies</td>
<td>Varies</td>
<td>33% of hospitals register food intake. 90% register body weight</td>
</tr>
<tr>
<td>Italy</td>
<td>Never (except for patients referred to specialised physician and/or general dietician NST units)</td>
<td>Once a month or more</td>
<td>Body weight, nutritional history</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Varies</td>
<td>Varies</td>
<td>10% of hospitals record weight change, food intake and extreme loses (vomiting, fistulas, diarrhoea, high output stoma) in risk patients</td>
</tr>
<tr>
<td>Norway</td>
<td>Once a month or more</td>
<td>Varies</td>
<td>11-23% of hospitals registers food intake</td>
</tr>
<tr>
<td>Portugal</td>
<td>Varies</td>
<td>Varies</td>
<td>In patients referred to a clinical dietician or NST; weight change, food intake (daily); Subjective Global Assessment. Otherwise body weight at admission and discharge</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Frequently</td>
<td></td>
<td>Registration of body weight (weekly/daily (risk patients)), food intake, laboratory tests, clinical condition</td>
</tr>
<tr>
<td>Sweden</td>
<td>Varies</td>
<td></td>
<td>Registration of body weight (weekly) and food intake (daily), comparison with estimated energy requirement</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Never - except for patients referred to a clinical dietician</td>
<td></td>
<td>Body weight, nutritional history</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Varies</td>
<td></td>
<td>Internal audits, nutritional assessment by clinical dieticians</td>
</tr>
</tbody>
</table>
### Table 2.3.5. The barriers against monitoring of nutritional risk/status

<table>
<thead>
<tr>
<th>Country</th>
<th>Barriers against monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Need for specific guidelines, difficult to set up a nutrition plan</td>
</tr>
<tr>
<td>Finland</td>
<td>No data available</td>
</tr>
<tr>
<td>France</td>
<td>Lack of knowledge and interest from the physician</td>
</tr>
<tr>
<td>Germany</td>
<td>Lack of generally accepted criteria for monitoring nutritional risk</td>
</tr>
<tr>
<td>Italy</td>
<td>Lack of knowledge and interest. Short duration of hospitalisation, difficulty to find out whether a patient is eating well, perception that the underlying disease should be treated and the undernutrition “cure itself”</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Lack of interest from the physician, time, and nursing staff</td>
</tr>
<tr>
<td>Norway</td>
<td>No barriers – 50% of nurses and physicians think that registration of food intake should be done more often</td>
</tr>
<tr>
<td>Portugal</td>
<td>Lack of resources, staff time, knowledge, and specific guidelines</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Lack of standards for nutritional monitoring, knowledge, and time. Influence of diseases and mental status of patients</td>
</tr>
<tr>
<td>Sweden</td>
<td>Lack of interest from the physician, time, knowledge and interest</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Short duration of hospitalisation, lack of time, no agreement regarding who is responsible for monitoring, difficulty to find out whether a patient is eating well (the meal trays are removed by non-clinical staff members, not by nurses), perception that the underlying disease should be treated and then undernutrition “cure itself”</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Lack of resources, staff time, knowledge and interest</td>
</tr>
</tbody>
</table>

### Table 2.3.6. The use of nutritional support

<table>
<thead>
<tr>
<th>Country</th>
<th>Use of nutritional support as a common practice?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Yes – 53% use it in some patients and 20% use it in all patients</td>
</tr>
<tr>
<td>Finland</td>
<td>Only when nutritional status is clearly weakened or in cases the weakening is a considerable risk to delay an operation</td>
</tr>
<tr>
<td>France</td>
<td>Yes – but how often is unknown</td>
</tr>
<tr>
<td>Germany</td>
<td>Yes – how often depends on the prevalence of patients at risk</td>
</tr>
<tr>
<td>Italy</td>
<td>Only when nutritional status is clearly weakened or in cases the weakening of the status is a considerable risk of impairing the outcome</td>
</tr>
<tr>
<td>Netherlands</td>
<td>If undernourished patients are discovered they are referred to a general dietician in 53% (general hospital) to 66% (university hospital) of the cases</td>
</tr>
<tr>
<td>Norway</td>
<td>No data available</td>
</tr>
<tr>
<td>Portugal</td>
<td>Used when protocols are established or when patients are referred to NST</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Yes, in undernourished patients and risk patients</td>
</tr>
<tr>
<td>Sweden</td>
<td>No data available</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Not routinely – depending on the training and the speciality of the treating physician</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Used where a clinical need is identified following assessment</td>
</tr>
</tbody>
</table>
Table 2.3.7. The kind of nutritional support used.

<table>
<thead>
<tr>
<th>Country</th>
<th>Kind of nutritional support used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>The average feeding regimens used by a nutrition unit to patients referred for nutritional support were 1.1 weeks on ordinary hospital food (fat content 40-45E%), 1.8 weeks on an energy and protein dense menu (fat content 50E%), 0.8 weeks on enteral nutrition and 1.1 weeks on parenteral nutrition *)</td>
</tr>
<tr>
<td>Finland</td>
<td>Attention to the palatability of food, frequent and good quality in-between meals, energy and protein rich menu, texture modification, food supplements, enteral feeding</td>
</tr>
<tr>
<td>France</td>
<td>Oral supplementation, enteral and/or parenteral nutrition</td>
</tr>
<tr>
<td>Germany</td>
<td>Often in the form of enteral nutrition</td>
</tr>
<tr>
<td>Italy</td>
<td>Changing the food from ordinary hospital food to a specific menu (different for disease), texture modified, more frequent meals, enteral and parenteral nutrition</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Patients start with energy and protein dense meals. If this does not work they start sip feedings. If this does not work they start enteral nutrition. Parenteral nutrition is used in case of lack of gut function</td>
</tr>
<tr>
<td>Norway</td>
<td>Nutritional snacks and drinks are often used to treat or prevent undernutrition</td>
</tr>
<tr>
<td>Portugal</td>
<td>Step 1. Texture modified food and increase in frequency, energy and/or protein. Step 2. Sip feedings in between meals. Step 3. Enteral nutrition (or parenteral nutrition if lack of gut function)</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Sip feedings as supplement to hospital menus, in-between meals, enteral feeding</td>
</tr>
<tr>
<td>Sweden</td>
<td>Changing the food from ordinary hospital food (fat content 30E%) to an energy- and protein rich menu (fat content ≥35E%), texture modified, more frequent meals, sip feedings, enteral and parenteral nutrition</td>
</tr>
<tr>
<td>Switzerland</td>
<td>As a first step, sip feedings are used in between meals. Patients with long term inability to eat enough to maintain their body weight receive a gastrostomy tube for enteral nutrition (most frequent indication is patients with oro-pharyngeal cancers).</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Step 1. Menu modifications (increase in energy and protein). Step 2. Sip feedings in addition to food. Step 3. Enteral nutrition (or parenteral if lack of gut function).</td>
</tr>
</tbody>
</table>

*) Kondrup et al. 1998
### Table 2.3.8. Barriers against nutritional support

<table>
<thead>
<tr>
<th>Country</th>
<th>Barriers against nutritional support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Resistance from patients, inconvenience to the patient, technical difficulties (enteral nutrition), complications, cost (parenteral nutrition), no documentation of effect</td>
</tr>
<tr>
<td>Finland</td>
<td>Lack of communication between kitchen and ward, decreased quality of sip feedings, lack of knowledge about available offers from the kitchen</td>
</tr>
<tr>
<td>France</td>
<td>Lack of interest and knowledge of professionals’ involved, short duration of hospitalisation</td>
</tr>
<tr>
<td>Germany</td>
<td>Lack of awareness and knowledge of when and how to use nutritional support</td>
</tr>
<tr>
<td>Italy</td>
<td>Lack of knowledge, no NST/units, no generally accepted guidelines most physicians do not now whether nutritional support is cost-benefit-effective. Technical difficulties, complications, and costs of artificial nutrition</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Tubes are not easily placed because physicians and nurses always hesitate to start a therapy like this. If general dieticians and/or NSTs are involved more aggressive nutritional support is possible</td>
</tr>
<tr>
<td>Norway</td>
<td>Lack of awareness and knowledge of when and how to use nutritional support</td>
</tr>
<tr>
<td>Portugal</td>
<td>Lack of appropriate screening tools and widespread awareness to the need. Lack of resources, staff, time, knowledge and political support from hospital executive board to NSC/NST</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Lack of nutritional screening and monitoring, knowledge, and money for sip feedings. Poor appetite, nausea and mental status of patients</td>
</tr>
<tr>
<td>Sweden</td>
<td>Lack of resources, staff, time, knowledge and interest</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Lack of time, knowledge, priority for nutritional support, no NST/units, no generally accepted guidelines, most physicians do not know whether nutritional support is cost-benefit-effective</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Lack of appropriate screening. Cost may be prohibitive. Ethical issues need to be considered</td>
</tr>
<tr>
<td>Country</td>
<td>Common practice</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Denmark</td>
<td>No data available</td>
</tr>
<tr>
<td>Finland</td>
<td>Varies</td>
</tr>
<tr>
<td>France</td>
<td>Varies</td>
</tr>
<tr>
<td>Germany</td>
<td>No</td>
</tr>
<tr>
<td>Italy</td>
<td>Varies</td>
</tr>
<tr>
<td>Netherlands</td>
<td>On request of the physician</td>
</tr>
<tr>
<td>Norway</td>
<td>Varies</td>
</tr>
<tr>
<td>Portugal</td>
<td>Varies</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Yes</td>
</tr>
<tr>
<td>Sweden</td>
<td>Varies</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Yes</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Varies</td>
</tr>
</tbody>
</table>
### Table 2.3.10. The barriers against nutritional counselling

<table>
<thead>
<tr>
<th>Country</th>
<th>Barriers against nutritional counselling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>No data available</td>
</tr>
<tr>
<td>Finland</td>
<td>Lack of resources and in most cases lack of nutrition expertise</td>
</tr>
<tr>
<td>France</td>
<td>Lack of general dieticians and lack of interest from physicians</td>
</tr>
<tr>
<td>Germany</td>
<td>No barriers</td>
</tr>
<tr>
<td>Italy</td>
<td>Lack of staff awareness of the need of specific dietary advice.</td>
</tr>
<tr>
<td></td>
<td>Lack of screening to identify nutritional risk</td>
</tr>
<tr>
<td>Netherlands</td>
<td>In hospitals all patients can consult a general dietician on request of the physician/nurse. All hospitals have general dieticians available on all wards. Consulting a general dietician outside the hospital is not always reimbursed, and in home-care there is a long waiting list for referral to a general dietician</td>
</tr>
<tr>
<td>Norway</td>
<td>Lack of time and nutrition expertise</td>
</tr>
<tr>
<td>Portugal</td>
<td>Lack of screening guidelines to identify nutritional risk, clinical dieticians and organisation</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Lack of general dieticians, knowledge and patient motivation</td>
</tr>
<tr>
<td>Sweden</td>
<td>Most often it depends on lack of clinical dieticians and knowledge among the other staff members</td>
</tr>
<tr>
<td>Switzerland</td>
<td>The number of clinical dieticians is limited</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Lack of staff awareness of the need for specific dietary advice.</td>
</tr>
<tr>
<td></td>
<td>Lack of screening to identify nutritional risk. In some cases, lack of appropriate staff</td>
</tr>
</tbody>
</table>
Appendix 2.4. Initiatives taken

Table 2.4.1. Some general initiatives to improve the situation

Denmark

- DSKE were established in 1996. 45% of its members are physicians. One aim of the DSKE is to give hospital food service and nutritional support a higher priority
- The Danish Ministry of Health has supported two large-scale studies: “Hospital food –communication of benefit to the patients” (1997) and “Undernutrition at hospitals” (1999)
- Initiatives have been taken to establish a master’s degree in clinical nutrition, to improve the education in clinical nutrition for medical students and the appointment of professors in clinical nutrition
- The management of the 4 hospitals situated in the capital of Denmark has acknowledged the implementation of the requirements drawn up by JCAHO regarding sufficient nutrition (see table 3.4) in March 2001

Finland

- Late sixties the first Finnish nutritionists were trained. In 1994 they received authorised health care professional status
- The Society of Nutritionists was founded in 1970
- In 1980’s data based nutrient content calculation programmes were developed for institutional use and national Food Data Bank was established
- Old people, food and quality of life (in Finnish). Guidelines for institutions and health and social care personnel. Ministry of Social Affairs and Health 1992
- Nutritional care and meals (in Finnish). Ministry of Social Affairs and Health 1994
- In 1997 the Society of Nutritionists carried out a study on nutritional care practices in Southern Finland. Published by the Ministry of Social Affairs and Health
- Nutritional care in the developing service system (in Finnish). Guidelines. The Society of Nutritionists 2002
- Since 1993 the Ministry of Social Affairs and Health in co-operation with the Society of Nutritionists has arranged Nutrition Days (annual two days training in different nutrition topics for health care professionals and nutritionists)
France

- The French Ministry of Health has released a National Nutritional Health Programme 2001-2005
- One priority is to prevent, detect and treat nutritional disorders in the health care system. The objectives are:
  - To facilitate access to nutrition consultations
  - To develop nutritional care in hospitals (e.g. developing professional practices and reinforce quality standards in food service)
  - Use of a disk for nutritional assessment in clinical practice
  - To define the functions and professions in nutrition, to revise the educational curricula for health professionals
  - Recommendations for clinical practice (e.g. diagnosis and treatment of undernutrition in hospitals and evaluation of the nutritional status of patients)
  - Dissemination of scientific reviews carried out

Germany

- In 1991 the DGE developed guidelines for nutrition in hospitals
- In 1991 the DGEM was founded. About two thirds of the membership of this scientific organisation are physicians
- DAEM and DGEM has issued a list of menus and diets on medical indications, to be available for nutritional therapy and counselling
- In 1992 the AEH was founded. The presidents of the chambers of physicians from 12 federal states are cooperating in this organisation to foster education and research in clinical medicine. The nationwide study on the basis of the Revised questionnaire was coordinated by the AEH (Schauder et al., in press)
- In 1995 quality of standard of meals in hospitals has been discussed in parliament, because a survey (Schauder et al. 1994) showed that the general hospital menu had a higher fat content (43E%) than recommended (30E%)
- In 1998 the Federal Chamber of Physicians (Bundesärztekammer) issued the Curriculum Ernährungsmedizin” for postgraduate education in clinical nutrition
- In 2000 the first chairs in clinical nutrition were founded in Berlin and München

Italy

- The first and second national Health Service Plan (1999-2003) considered the nutritional problem for different kind of pathology
- In 1994, the Carta dei Servizi Pubblici Sanitari – Principi e Criteri di attuazione, finalità e materiale illustrativo was published by Central Government
- In 1995, ADI and SINPE published guidelines for artificial nutrition in hospitals.
- There are scientific and professional organisations that regularly organise teaching workshops, mainly for physicians and general dieticians
- Since 1950 are active scientific societies dealing with clinical nutrition
- Since 1970 there has been a school of specialization in science of nutrition for physicians at the medical faculty of some Italian University
Netherlands

- Since 1985, grand’s given by the Netherlands Nutrition Society have supported professors in nutrition
- In 1994 guidelines were made regarding clinical nutrition based on a questionnaire performed amongst different caregivers
- In 2000 the Dutch Dietician Society (NVD) did a national campaign for public and caretakers about undernutrition, including TV programmes and articles in national newspapers
- In 2001 NVD coordinated a national screening *Nutritional status of patients in the Netherlands* (article in press)
- In 2001 the Academic Medical Centre performed a questionnaire amongst physicians about their intention to use body weight as the ideal parameter for detecting undernutrition (article in press)
- In 2002 guidelines will be made regarding peri-operative nutrition
- In 2002 a project will start to implement a national screening tool for undernutrition in and outside the hospitals
- Postgraduate education in clinical nutrition exists for both nurses, general dieticians, physicians and NST members

Norway

- Norwegian Council on Nutrition issued in 1985 the first *Dietary guidelines for health institutions*, and the most recent version was issued in 1995
- In 1994 the Norwegian Council on Nutrition developed a method for preventing and treating undernutrition for old people living at home
- In 2000 nutritionists received authorised health care professional status

Portugal

- APNEP was established in 1997. 38% of its members are physicians, 36% are clinical dieticians/nutritionists, 14% pharmacists, 9% nurses. One aim of the APNEP is to give hospital food service and nutritional support the highest priority
- APNEP has launched questionnaires and is implementing multi-centre studies to evaluate or promote nutritional support, mainly artificial nutrition
- APNEP endeavours to influence the employment of more clinical dieticians, physiotherapists and nurses in the hospitals to improve nutritional care
- Post-graduate education in clinical nutrition, to different professions or multi-professional, is available since 1985
- There are two master degrees in Nutrition running since 1996
- A multi-professional master’s degree in Clinical Nutrition by the medical faculty of Lisbon University (FMUL) is due to start in 2002
- At the FMUL, nutrition will be integrated in the medical curriculum from 2003
- Ward housekeepers are to receive specific education concerning nutritional care
Slovenia

- In 1998 the Slovene Association of Nutritionist and Dieticians organised the seminar and issued a booklet about enteral nutrition. In 2002 the second seminar for general dieticians, physicians and nurses will be held
- In 2001 the Working Group for Hospital Nutrition of Food and Nutrition Council of Ministry of Health was constituted. It has a plan to prepare the recommendations for nutritional care and support in hospitals in Slovenia in 2002
- The members of ESPEN in Slovenia has not yet been organised in a Slovene ESPEN – but it is foreseen in the next year
- A multi-professional specialisation in Clinical Nutrition by High Health School in Maribor for physicians, general dieticians and nurses, started in autumn 2001

Sweden

- In 1965, the Swedish National Food Administration published the first recommendations of hospital food
- The first clinical dieticians were graduated in 1968; provisional courses were given annually until 1977, after which courses were permanent
- In 2000, the National Board of Health and Welfare published Problems of Nutrition in health care and human services – prevention and treatment (available in English on www.sos.se)
- Food and nutrition support for the elderly. Problems and solutions (in Swedish). Swedish National Food Administration 1998
- In 1999 clinical dieticians became registered
- Since 1972 there has been a ward of clinical nutrition at Gothenburg University.
- Since 1970 an active section for nutrition of the Swedish Society of Medicine has been dealing with clinical nutrition
- Since 1997 there has been a master’s degree in clinical nutrition at the medical faculty at Göteborg University designed for physicians, nurses, clinical dieticians, occupational therapists and physiotherapists
- The Federation of Swedish County Councils endeavours to employ more clinical dieticians, physiotherapists, and others in the hospitals to relieve workload from the nurses and physicians

Switzerland

- Clinical nutrition is now a topic of more and more teaching courses for nurses and for physicians during hospital training
- There are professional organisations (GESKES and SVERB) that regularly organise teaching workshops, mainly for physicians and clinical dieticians
In England the NHS plan was announced in July 2000 by the government. Amongst its many facets is a range of projects aiming to improve food provision in hospitals (www.betterhospitalfood.com):

1. A 24-hour food service with a new NHS menu, designed by leading chefs in England. It will cover continental breakfast, cold drinks and snacks at midmorning and in the afternoon, light lunchtime meals and an improved two-course evening dinner. This will be minimum standard for all hospitals

2. A national franchise for NHS food service will be examined to ensure hospital food is provided by organisations with a national reputation for high quality and customer satisfaction in England

3. Half of all hospitals in England will have new “Ward housekeepers” in place by 2004 to ensure that the quality, presentation and quantity of meals meets patient needs; that patients, particularly old people, are able to eat the foods on offer; and that the service patients receive is genuinely round the clock

4. Clinical dieticians will advice and check on nutritional values in hospital food. Patient’s views will be measured as part of the assessment framework and there will be unannounced inspections of the quality of hospital food in England

- Innovative ways of providing food for patients are being explored
- National guidelines have been produced titled *Eating Matters*. This is a resource for improving nutritional care in hospitals and was compiled by the University of Newcastle and funded by the NHS. Several other reports regarding nutrition have been published
- An attempt has been made to implement nutrition in the medical curriculum.
- Establishment of standing committees of nutrition in some Royal colleges (*e.g.* Royal College of Physicians)
- *DoH Nutritional Guidelines for Hospital Food (1995)* and *Hospital catering: Delivering a Quality Service (1996)*

\[1\] An extra 16.5 million EURO will be made available to deliver these improvements in hospital food provision.
Table 2.4.2. Some specific initiatives to improve the situation

- 42% of hospital kitchens calculate, albeit not systematically, the nutrient content of the menus (Denmark)
- There is an increased awareness of the importance of sensory quality, presentation and serving conditions (Denmark)
- Nutrient content of the menus are calculated (Finland)
- Most hospitals calculate the nutrient content of the menus. Chemical analyses are performed 1-2 times per year (Germany)
- Most hospital kitchens calculate, albeit not systematically, the nutrient content of the menus. In a minority of hospitals, a clinical dietician supervises menu composition (Portugal)
- Sip feedings are regularly available. Physicians, nurses and clinical dieticians/nutritionists encourage patients with low food consumption to ingest these supplements (Portugal)
- The preparing of the trays has been decentralised. Education programs for the staff have been instituted. Nutrition responsible nurses have been appointed (Sweden)
- In some hospitals there are on-going projects with health care assistants, trained to provide support during all aspects of feeding (Sweden). These projects are very similar to the trial at Hammersmith hospital (Hickson et al. 1999)
- Sip feedings are regularly available. Physicians, nurses and clinical dieticians encourage patients with signs of undernutrition to consume these supplements (Switzerland)
- The importance of nurses in relation to nutrition is emphasised in an initiative on Clinical Practice Benchmarking launched in February 2001 (United Kingdom)
Appendix 2.5. Education

Education programmes give qualification as administrative, clinical or general dietician. Sweden, Denmark and Norway educate administrative dieticians; Denmark, Finland, Norway, Portugal, Sweden, Switzerland and United Kingdom educate clinical dieticians; and Germany, France, Italy, Netherlands and Slovenia educate general dieticians (EFAD 1999).

Table 2.5.1. The education with regard to nutrition related topics and management of administrative dieticians (EFAD 1999).

<table>
<thead>
<tr>
<th>Country</th>
<th>Years of education</th>
<th>Degree</th>
<th>Nutrition related topics (% of total study time)</th>
<th>Management related topics (weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark *)</td>
<td>2</td>
<td>Non-BSc</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>Norway</td>
<td>2</td>
<td>Non-BSc</td>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td>Sweden</td>
<td>3</td>
<td>BSc</td>
<td>37</td>
<td>10</td>
</tr>
</tbody>
</table>

*) The education is being revised

Table 2.5.2. The education with regard to nutrition related topics of clinical dieticians (EFAD 1999).

<table>
<thead>
<tr>
<th>Country</th>
<th>Years of education</th>
<th>Degree</th>
<th>Nutrition related topics (% of total study time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark *)</td>
<td>2</td>
<td>Non-BSc</td>
<td>44</td>
</tr>
<tr>
<td>Finland</td>
<td>5</td>
<td>MSc □)</td>
<td>40</td>
</tr>
<tr>
<td>Norway</td>
<td>5</td>
<td>MSc □)</td>
<td>68</td>
</tr>
<tr>
<td>Portugal</td>
<td>3</td>
<td>BSc</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>5 □)</td>
<td>MSc</td>
<td>60</td>
</tr>
<tr>
<td>Sweden</td>
<td>4</td>
<td>MSc</td>
<td>60</td>
</tr>
<tr>
<td>Switzerland</td>
<td>3</td>
<td>Non-BSc</td>
<td>55</td>
</tr>
<tr>
<td>United Kingdom #)</td>
<td>4</td>
<td>BSc</td>
<td>42</td>
</tr>
</tbody>
</table>

*) The education is being revised.
#) In United Kingdom there are 2 routes of training: 1) A 4-year BSc course or 2) A 2-year post-graduate course following a relevant first degree (e.g. nutrition, physiology and biochemistry). This may be either a post-graduate diploma or an MSc. Both courses lead to UK State Registration in Dietetics.
□) Equal to nutritionists
Table 2.5.3. The education with regard to nutrition related topics of general dieticians (EFAD 1999).

<table>
<thead>
<tr>
<th>Country</th>
<th>Years of education</th>
<th>Degree</th>
<th>Nutrition related topics (% of total study time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>3</td>
<td>Non-BSc</td>
<td>37</td>
</tr>
<tr>
<td>Germany *)</td>
<td>3</td>
<td>Non-BSc</td>
<td>63</td>
</tr>
<tr>
<td>Italy</td>
<td>3</td>
<td>BSc</td>
<td>50</td>
</tr>
<tr>
<td>Netherlands</td>
<td>4</td>
<td>BSc</td>
<td>26</td>
</tr>
<tr>
<td>Slovenia #)</td>
<td>3</td>
<td>BSc</td>
<td>56</td>
</tr>
</tbody>
</table>

*) The general dieticians do not have an academic degree and thereby are not involved in science. They have only limited access to patient data. More than 50% are still working in the kitchen. Only 12% are working exclusively as nutritional counsellors. #) The education is being revised.

Table 2.5.4. Number of clinical dieticians examined/year in relation to the population of the country (EFAD 1999)

<table>
<thead>
<tr>
<th>Country</th>
<th>Population (in millions)</th>
<th>Clinical dieticians (examined pr. year)/100.000 (population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>5.1</td>
<td>0.39</td>
</tr>
<tr>
<td>Finland</td>
<td>5.1</td>
<td>1.40 *)</td>
</tr>
<tr>
<td>France</td>
<td>60.0</td>
<td>0.58 #)</td>
</tr>
<tr>
<td>Germany</td>
<td>80.0</td>
<td>0.58 #)</td>
</tr>
<tr>
<td>Italy</td>
<td>56.0</td>
<td>0.36</td>
</tr>
<tr>
<td>Netherlands</td>
<td>16.0</td>
<td>1.38</td>
</tr>
<tr>
<td>Norway</td>
<td>4.2</td>
<td>0.24</td>
</tr>
<tr>
<td>Portugal</td>
<td>9.5</td>
<td>0.02 □)</td>
</tr>
<tr>
<td>Slovenia</td>
<td>2.0</td>
<td>No data available</td>
</tr>
<tr>
<td>Sweden</td>
<td>8.8</td>
<td>0.57-0.63</td>
</tr>
<tr>
<td>Switzerland</td>
<td>6.0</td>
<td>0.67-0.83</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>58.0</td>
<td>0.37</td>
</tr>
</tbody>
</table>

*) Nutritionist. Only 41 are working in hospitals. The others work in health care and/or hospitals/wards of the primary health care centres. #) General dieticians. □) Clinical dieticians and nutritionists, working only in hospitals.
Table 2.5.5. The education of nurses with regard to nutrition related topics.

<table>
<thead>
<tr>
<th>Country</th>
<th>Years of education</th>
<th>Nutrition related topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>4</td>
<td>60-70 lessons</td>
</tr>
<tr>
<td>Finland</td>
<td>4</td>
<td>2 weeks (+ alternative courses)</td>
</tr>
<tr>
<td>France</td>
<td>3</td>
<td>&lt;10 hours depending on schools</td>
</tr>
<tr>
<td>Germany</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Italy</td>
<td>3</td>
<td>0.5% of total study time</td>
</tr>
<tr>
<td>Netherlands</td>
<td>4</td>
<td>30 hours</td>
</tr>
<tr>
<td>Norway</td>
<td>3</td>
<td>Varies</td>
</tr>
<tr>
<td>Portugal</td>
<td>4</td>
<td>&lt; 10 hours</td>
</tr>
<tr>
<td>Slovenia</td>
<td>3</td>
<td>45 hours (30 hours practical work)</td>
</tr>
<tr>
<td>Sweden</td>
<td>3</td>
<td>It varies</td>
</tr>
<tr>
<td>Switzerland</td>
<td>3</td>
<td>Approx 20 hours (varies)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>3 or 4</td>
<td>It varies</td>
</tr>
</tbody>
</table>

? = No information given.

Table 2.5.6. The education of physicians with regard to nutrition related topics.

<table>
<thead>
<tr>
<th>Country</th>
<th>Years of education</th>
<th>Nutrition related topics Pre-graduate</th>
<th>Nutrition related topics Post-graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>6½</td>
<td>2-24 h</td>
<td>0</td>
</tr>
<tr>
<td>Finland</td>
<td>6</td>
<td>2 weeks</td>
<td>No formal</td>
</tr>
<tr>
<td>France</td>
<td>8</td>
<td>20-60 lessons</td>
<td>Internship (4y), specialisation on clinical nutrition (2y)</td>
</tr>
<tr>
<td>Germany</td>
<td>6</td>
<td>Few hours *)</td>
<td>nutrition (2y)</td>
</tr>
<tr>
<td>Italy</td>
<td>6</td>
<td>Varies (usually few hours)</td>
<td>100 h #)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>6</td>
<td>Few hours</td>
<td>4 y specialisation in clinical nutrition (clinical nutritionist)</td>
</tr>
<tr>
<td>Norway</td>
<td>6</td>
<td>5 seminar, 18 lectures</td>
<td>Varies</td>
</tr>
<tr>
<td>Portugal</td>
<td>6</td>
<td>Varies □)</td>
<td>Varies</td>
</tr>
<tr>
<td>Slovenia</td>
<td>6</td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td>Sweden</td>
<td>5½</td>
<td>10-55 h</td>
<td>Occupationally</td>
</tr>
<tr>
<td>Switzerland</td>
<td>6</td>
<td>Few hours</td>
<td>Not formally contained in most specialisations.</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>6</td>
<td>Varies</td>
<td>Varies</td>
</tr>
</tbody>
</table>

*) Only in some universities.

#) Based on a training programme including 80 hours of theory and 20 hours of practice (Bundesärztekammer 1998).

□) Only in one university (Lisbon) is nutrition being fully integrated.
Appendix 3. Food service practices
Appendix 3.1. Food service and eating environment

Table 3.1.1. The use of, respectively, in-house or contract food service

<table>
<thead>
<tr>
<th>Country</th>
<th>In-house food service</th>
<th>Contract food service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Most common</td>
<td>? – but increasing</td>
</tr>
<tr>
<td>Finland</td>
<td>≈100%</td>
<td>No data available</td>
</tr>
<tr>
<td>France</td>
<td>Both types exist, prevalence not given</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>96%</td>
<td>4% - but increasing</td>
</tr>
<tr>
<td>Italy</td>
<td>Most common</td>
<td>It is increasing</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Most common</td>
<td>10% and increasing</td>
</tr>
<tr>
<td>Norway</td>
<td>Most common</td>
<td>No data available</td>
</tr>
<tr>
<td>Portugal</td>
<td>≈10%</td>
<td>≈90%</td>
</tr>
<tr>
<td>Slovenia</td>
<td>96%</td>
<td>4%</td>
</tr>
<tr>
<td>Sweden</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>≈100%</td>
<td>Few private hospitals</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>50-60%</td>
<td>30-40% *)</td>
</tr>
</tbody>
</table>

*) 10% is a mixture of both.

Table 3.1.2. The eating environment and conditions in hospitals

<table>
<thead>
<tr>
<th>Country</th>
<th>Eating environments and conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Bedside</td>
</tr>
<tr>
<td></td>
<td>Common dining areas <em>(i.e. when buffet system is used)</em></td>
</tr>
<tr>
<td>Finland</td>
<td>Bedside or sitting room</td>
</tr>
<tr>
<td>France</td>
<td>Bedside or sometimes sitting room</td>
</tr>
<tr>
<td>Germany</td>
<td>?</td>
</tr>
<tr>
<td>Italy</td>
<td>Bedside and common dining areas</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Bedside or in their room, dining areas in some hospitals</td>
</tr>
<tr>
<td>Norway</td>
<td>Bedside or in their room (80%)</td>
</tr>
<tr>
<td>Portugal</td>
<td>Bedridden, bedside</td>
</tr>
<tr>
<td></td>
<td>Common dining areas</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Bedside or in their room (&gt;50%)</td>
</tr>
<tr>
<td></td>
<td>Common dining areas, sitting rooms (&lt;50%)</td>
</tr>
<tr>
<td>Sweden</td>
<td>Bedside</td>
</tr>
<tr>
<td></td>
<td>Common dining areas (seldom)</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Bedside</td>
</tr>
<tr>
<td></td>
<td>Common dining areas (sometimes)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Bedside (most common)</td>
</tr>
<tr>
<td></td>
<td>Common dining areas (sometimes)</td>
</tr>
</tbody>
</table>

? = No information given.
### Appendix 3.2. Types of hospital food

#### Table 3.2.1. The kind of hospital food produced

**Denmark**

<table>
<thead>
<tr>
<th>Hospital food</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menu</td>
<td>40E% fat, 18E% protein</td>
<td>50-64%</td>
</tr>
<tr>
<td>Normal menu</td>
<td>30E% fat, 18E% protein</td>
<td>17-27%</td>
</tr>
<tr>
<td>Energy and protein dense menu</td>
<td>50E% fat, 18E% protein</td>
<td>9-&gt;10%</td>
</tr>
<tr>
<td>Diets on medical indications</td>
<td></td>
<td>10%</td>
</tr>
</tbody>
</table>

**England**

<table>
<thead>
<tr>
<th>Hospital food *)</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menus</td>
<td>No specifications but in general a high fat content</td>
<td>80%</td>
</tr>
<tr>
<td>Diets on medical indications</td>
<td></td>
<td>20%</td>
</tr>
</tbody>
</table>

*) A new menu – the NHS menu has been published in 2001.

**Finland**

<table>
<thead>
<tr>
<th>Hospital food *)</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menu</td>
<td>30E% fat, protein ?</td>
<td>Most prevalent</td>
</tr>
<tr>
<td>Lacto-vegetarian menu</td>
<td></td>
<td>No data available</td>
</tr>
<tr>
<td>Energy and protein dense menu</td>
<td></td>
<td>No data available</td>
</tr>
<tr>
<td>Diets on medical indications</td>
<td></td>
<td>No data available</td>
</tr>
</tbody>
</table>

*) 2-3 main meal alternatives are recommended (one of them vegetarian). All hospitals have a low-lactose alternative as a normal choice.

**France**

<table>
<thead>
<tr>
<th>Hospital food</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menu</td>
<td>30E% fat, 15 %E protein</td>
<td>70-100%</td>
</tr>
<tr>
<td>Vegetarian menu</td>
<td>30 % E fat, 15 % E protein</td>
<td>variable</td>
</tr>
<tr>
<td>Menu adapted for ethnical or/and cultural group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General menu-light (hypocaloric)</td>
<td>30 % E fat, 15 % E protein</td>
<td>variable</td>
</tr>
<tr>
<td>Diets on medical indications</td>
<td></td>
<td>Variable: 3-60 %*</td>
</tr>
<tr>
<td>Protein rich diet</td>
<td>35 % E fat, 20 % protein</td>
<td></td>
</tr>
<tr>
<td>Energy and protein dense diet</td>
<td>35 % E fat, 20 % protein</td>
<td></td>
</tr>
</tbody>
</table>

*) The production of diets on medical indications varies between 3-60% (average 20-30%). Some hospitals do not produce any medically indicated diets at all.
Germany (Hermann et al. 1996).

<table>
<thead>
<tr>
<th>Hospital food</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital menus:</td>
<td>30E% fat, ≤15E% protein *)</td>
<td>72% (of total)</td>
</tr>
<tr>
<td>- General menu</td>
<td></td>
<td>62%</td>
</tr>
<tr>
<td>- General menu – light</td>
<td></td>
<td>22%</td>
</tr>
<tr>
<td>- Vegetarian</td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>- Texture modified menus</td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>Diets on medical indications:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Protein rich diet</td>
<td></td>
<td>28% (of total)</td>
</tr>
<tr>
<td>- No scientific documentation</td>
<td></td>
<td>&lt;1% *) η)</td>
</tr>
</tbody>
</table>

*) In practice 41E% fat and 12E% protein
η) In 1981 the prevalence was 25%.
Η) In 1981 the prevalence was 9%.

Italy

<table>
<thead>
<tr>
<th>Hospital food</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menus</td>
<td>30E% fat, 15E% protein</td>
<td>75-90% of total</td>
</tr>
<tr>
<td>Diets on medical indications</td>
<td></td>
<td>10-25% of total *)</td>
</tr>
</tbody>
</table>

*) Some hospitals do not produce any diets at all.

Netherlands

<table>
<thead>
<tr>
<th>Hospital food</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menus</td>
<td>30-40E% fat, 12-15E% protein *)</td>
<td>60-80%</td>
</tr>
<tr>
<td>Menus for ethnical and/or cultural groups</td>
<td></td>
<td>Varies</td>
</tr>
<tr>
<td>Vegetarian</td>
<td></td>
<td>Varies</td>
</tr>
<tr>
<td>Diets on medical indications</td>
<td></td>
<td>0-40%</td>
</tr>
<tr>
<td>Energy and protein dense</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*) A discussion is started whether hospitals should provide a healthy menu to patients in hospitals (according to the Dutch Nutritional Council) or whether optimal nutrition should be given (i.e. an energy dense menu and 1.5 g protein/kg body weight)

Norway

<table>
<thead>
<tr>
<th>Hospital food</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menu</td>
<td>35E% fat, 15-20E% protein</td>
<td>Most prevalent</td>
</tr>
<tr>
<td>Normal menu</td>
<td>30E% fat, 10-15E% protein</td>
<td>No data available</td>
</tr>
<tr>
<td>Energy and protein dense menu</td>
<td>≥35E% fat, 15-20E% protein</td>
<td>No data available</td>
</tr>
<tr>
<td>Diets on medical indications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Portugal

<table>
<thead>
<tr>
<th>Hospital food</th>
<th>Specifications *)</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menu</td>
<td>30E% fat, protein ?</td>
<td>80-90%</td>
</tr>
<tr>
<td>Energy and protein dense menu</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Diets on medical indications</td>
<td>≈10%</td>
<td></td>
</tr>
</tbody>
</table>

*) No exact data available, content adapted to age group.

Slovenia

<table>
<thead>
<tr>
<th>Hospital food</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menu</td>
<td>30E% fat, 18E% protein *)</td>
<td>67%</td>
</tr>
<tr>
<td>Energy and protein dense menus</td>
<td>36E% fat, 21-23E% protein</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Individual menus</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Diets on medical indications</td>
<td>30%</td>
<td></td>
</tr>
</tbody>
</table>

*) In practice 15-36E% fat and 10-25E% protein (unpublished data)

Sweden

<table>
<thead>
<tr>
<th>Hospital food*)</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menu</td>
<td>30E% fat, 15E% protein</td>
<td>Most prevalent.</td>
</tr>
<tr>
<td>Vegetarian menu and menus for ethnical and/or cultural groups</td>
<td>≥35E% fat, 18-20E% protein</td>
<td>Around 1%</td>
</tr>
<tr>
<td>Energy and protein dense menu</td>
<td>In some hospitals as prevalent as the general hospital menu.</td>
<td></td>
</tr>
</tbody>
</table>

*) All menus can be transformed into texture-modified menus.

Switzerland

<table>
<thead>
<tr>
<th>Hospital food</th>
<th>Specifications</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>General menus</td>
<td>30E% fat, 15E% protein *)</td>
<td>No data available</td>
</tr>
<tr>
<td>Diets on medical indications</td>
<td>#)</td>
<td>No data available</td>
</tr>
</tbody>
</table>

*) In practice 44E% fat and 15E% protein (Müller et al. 1991)

#) In practice 32-43E% fat and 19-25E% protein in diabetic diets
Appendix 3.3. Meal pattern

Table 3.3.1. Meal pattern of general menu

Denmark (Pedersen & Ovesen 2000)

<table>
<thead>
<tr>
<th>Meal pattern</th>
<th>Recommended Distribution (E%)</th>
<th>In practice Serving time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>Nothing</td>
<td>20-25</td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td>25-30</td>
</tr>
<tr>
<td>Dinner</td>
<td></td>
<td>20-25</td>
</tr>
<tr>
<td>In-between meals</td>
<td></td>
<td>20-35 *)</td>
</tr>
</tbody>
</table>

*) 3 in-between meals are recommended.

Finland (von Fieandt & Hasunen 1994)

<table>
<thead>
<tr>
<th>Meal pattern</th>
<th>Serving time</th>
<th>Recommended Distribution (E%)</th>
<th>In practice Serving time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>07.00-08.30</td>
<td>15-20</td>
<td>As recommended</td>
</tr>
<tr>
<td>Snack (if needed)</td>
<td>09.30-10.30</td>
<td>5-10</td>
<td>&quot;</td>
</tr>
<tr>
<td>Lunch</td>
<td>11.00-12.30</td>
<td>20-30</td>
<td>&quot;</td>
</tr>
<tr>
<td>In-between meal</td>
<td>14.00-15.00</td>
<td>5-10</td>
<td>&quot;</td>
</tr>
<tr>
<td>Dinner</td>
<td>17.00-18.00</td>
<td>20-25</td>
<td>16.00-18.00</td>
</tr>
<tr>
<td>Night meal</td>
<td>20.00-21.00</td>
<td>10-15</td>
<td>19.00-20.00</td>
</tr>
</tbody>
</table>

France

<table>
<thead>
<tr>
<th>Meal pattern</th>
<th>In practice Serving time (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>7-9 (7-8)</td>
</tr>
<tr>
<td>Lunch/dinner</td>
<td>11-13 (12-13)</td>
</tr>
<tr>
<td>Dinner/supper</td>
<td>17-19 (18-19)</td>
</tr>
<tr>
<td>In-between meal</td>
<td>? *)</td>
</tr>
</tbody>
</table>

*) 49% of the hospitals offer in-between meals (in 2000). In 1997 the prevalence was 30% (Guy-Grand 1997).

Germany (Schauder et al. 1994)

<table>
<thead>
<tr>
<th>Meal pattern</th>
<th>In practice Distribution (E%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>33</td>
</tr>
<tr>
<td>Lunch/dinner</td>
<td>34 (=3 MJ)</td>
</tr>
<tr>
<td>Dinner/supper</td>
<td>33</td>
</tr>
</tbody>
</table>
### Italy

<table>
<thead>
<tr>
<th>Meal pattern</th>
<th>Recommended Serving time</th>
<th>Distribution (E%)</th>
<th>In practice Serving time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>07.00-08.30</td>
<td>10-15</td>
<td>As recommended</td>
</tr>
<tr>
<td>Lunch</td>
<td>11.00-12.30</td>
<td>45-55</td>
<td>“</td>
</tr>
<tr>
<td>Dinner</td>
<td>17.00-18.00</td>
<td>35-40</td>
<td>“</td>
</tr>
</tbody>
</table>

### Netherlands

<table>
<thead>
<tr>
<th>Meal pattern</th>
<th>Recommended Serving time</th>
<th>Distribution (E%)</th>
<th>In practice Serving time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>07.00-08.30</td>
<td>15</td>
<td>Varies</td>
</tr>
<tr>
<td>In-between drink</td>
<td>10.00-10.30</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td>11.30-13.30</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>In-between drink</td>
<td>14.00-15.00</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Dinner</td>
<td>17.30-18.30</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>In-between drink</td>
<td>19.30-20.30</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

### Norway (Norwegian Council of Nutrition 1995)

<table>
<thead>
<tr>
<th>Meal pattern *)</th>
<th>Recommended Serving time</th>
<th>Distribution (E%)</th>
<th>In practice Serving time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>08.00</td>
<td>Nothing</td>
<td>No data available</td>
</tr>
<tr>
<td>Dinner</td>
<td>12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coffee-meal</td>
<td>16.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evening-meal</td>
<td>20.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-between meal</td>
<td>At least once</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*) Morning meal and a late-evening meal also available.

### Portugal

<table>
<thead>
<tr>
<th>Meal pattern</th>
<th>Recommended Serving time</th>
<th>Distribution (E%)</th>
<th>In practice Serving time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>08.30-09.30</td>
<td>15-20</td>
<td>Main meals served from 8-19 *)</td>
</tr>
<tr>
<td>In-between meal</td>
<td>10.30-11.30</td>
<td>5-10</td>
<td></td>
</tr>
<tr>
<td>Lunch/dinner</td>
<td>12.30-13.45</td>
<td>20-30</td>
<td></td>
</tr>
<tr>
<td>In-between meal</td>
<td>16.30-17.00</td>
<td>5-10</td>
<td></td>
</tr>
<tr>
<td>Dinner/ supper</td>
<td>19.00-20.00</td>
<td>20-30</td>
<td></td>
</tr>
<tr>
<td>Night meal</td>
<td>21.30-22.00</td>
<td>10-15</td>
<td></td>
</tr>
</tbody>
</table>

*) Seldom time for in-between meals. Nutritional snacks and drinks are not served as a common practice.
### Slovenia

<table>
<thead>
<tr>
<th>Meal pattern</th>
<th>Serving time</th>
<th>Distribution (E%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>07.00-08.00</td>
<td>20-30</td>
</tr>
<tr>
<td>Lunch</td>
<td>11.20-13.00</td>
<td>30-35</td>
</tr>
<tr>
<td>Supper</td>
<td>17.30-18.00</td>
<td>25-30</td>
</tr>
<tr>
<td>In-between meals *)</td>
<td></td>
<td>5-10</td>
</tr>
</tbody>
</table>

*) The majority of hospitals offer at least 4 meals a day, with the possibility of supplements of sip feedings and fruits. Some menus (protein dense/energy and protein dense) and diets on medical indications (e.g. diabetic) have 5 meals a day.

### Sweden (ESS 1991)

<table>
<thead>
<tr>
<th>Meal pattern</th>
<th>Serving time</th>
<th>Distribution (E%)</th>
<th>In practice Serving time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>07.00-08.30</td>
<td>15-25</td>
<td>Main meals served from 8-18 *)</td>
</tr>
<tr>
<td>In-between meal</td>
<td>09.30-10.30</td>
<td>5-10</td>
<td></td>
</tr>
<tr>
<td>Lunch/dinner</td>
<td>11.15-12.45</td>
<td>20-30</td>
<td></td>
</tr>
<tr>
<td>In-between meal</td>
<td>14.00-15.00</td>
<td>5-10</td>
<td></td>
</tr>
<tr>
<td>Dinner/supper</td>
<td>17.00-18.30</td>
<td>20-25</td>
<td></td>
</tr>
<tr>
<td>Night meal</td>
<td>20.00-21.00</td>
<td>10-15</td>
<td></td>
</tr>
</tbody>
</table>

*) Seldom time for in-between meals. Nutritional snacks and drinks are not served as a common practice.

### Switzerland

<table>
<thead>
<tr>
<th>Meal pattern *)</th>
<th>In practice Serving time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>07.30, 08.00</td>
</tr>
<tr>
<td>Lunch/dinner</td>
<td>11.00, 11.30</td>
</tr>
<tr>
<td>Dinner/supper</td>
<td>17.00, 17.30</td>
</tr>
</tbody>
</table>

*) Diabetes diet: 6 meals. In some hospitals additional snacks are available.

### United Kingdom

<table>
<thead>
<tr>
<th>Meal pattern *)</th>
<th>In practice Serving time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td>No data available</td>
</tr>
<tr>
<td>Lunch/dinner</td>
<td></td>
</tr>
<tr>
<td>Dinner/supper #)</td>
<td></td>
</tr>
</tbody>
</table>

*) In-between meals and snacks are also available. The new NHS menu, introduced in England in 2001 will provide patients with a mid-afternoon and evening snack with beverages. Also there will be a 24-hour availability of food by providing snack boxes and an improved ward kitchen service.

#) In the new NHS menu the main meal of the day is moved to the evening in England.
### Appendix 3.4. Influence of patients

**Table 3.4.1. Patients’ possibilities of choice of menu and portion size**

<table>
<thead>
<tr>
<th>Country</th>
<th>Choice of menu</th>
<th>Choice of portion size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>50% menu choice at hot meal</td>
<td>2-3 different kinds in many hospitals</td>
</tr>
<tr>
<td>Finland</td>
<td>In a survey of 19 hospitals it was stated the hospitals offered only one meal choice at each meal *)</td>
<td>The nurses order the portion size. Patients have influences</td>
</tr>
<tr>
<td>France</td>
<td>37% menu choice #)</td>
<td>Yes</td>
</tr>
<tr>
<td>Germany</td>
<td>In most hospitals the choice between 2-3 general menus</td>
<td>Basically the patients have influence</td>
</tr>
<tr>
<td>Italy</td>
<td>Menu choice in some hospitals</td>
<td>No (hospital menus). Yes (diets on medical indications)</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Yes, in most hospitals all patients have a menu choice</td>
<td>Yes, both general menus and diets on medical indications</td>
</tr>
<tr>
<td>Norway</td>
<td>38% menu choice (general menus)</td>
<td>Yes</td>
</tr>
<tr>
<td>Portugal</td>
<td>Menu choice at most hospitals</td>
<td>No</td>
</tr>
<tr>
<td>Slovenia</td>
<td>No (except undernourished patients)</td>
<td>Yes</td>
</tr>
<tr>
<td>Sweden</td>
<td>Menu choice at all hospitals</td>
<td>A physician or a nurse should order the portion size ?</td>
</tr>
<tr>
<td>Switzerland</td>
<td>In most hospitals</td>
<td>?</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Menu choice at most hospitals</td>
<td>Yes, in many hospitals</td>
</tr>
<tr>
<td></td>
<td>The new NHS menu will provide patients with a choice from 3 of the leading chef dishes each day</td>
<td></td>
</tr>
</tbody>
</table>

? = No information given.

*) Mattila & Kumpulainen 1999

#) Data from year 2000. In 1997 the prevalence of hospitals, with menu choice was 25% (Guy-Grand 1997).
Table 3.4.2. Other possible influences of the patients

<table>
<thead>
<tr>
<th>Country</th>
<th>Other influences</th>
<th>Questionnaires</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Via contact persons from the kitchen</td>
<td>≈50% of hospitals – not regularly used</td>
</tr>
<tr>
<td>Finland</td>
<td>Choice of components for breakfast, varieties of bread and beverages, likes and dislikes</td>
<td>Not regularly used</td>
</tr>
<tr>
<td>France</td>
<td>None</td>
<td>In 61% of the hospitals *)</td>
</tr>
<tr>
<td>Germany</td>
<td>?</td>
<td>In most hospitals</td>
</tr>
<tr>
<td>Italy</td>
<td>Sometimes in case of medical reasons</td>
<td>Rarely</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Patients are part of menu planning committees</td>
<td>Yes, in most hospitals, questionnaires are used to evaluate the quality of the food served</td>
</tr>
<tr>
<td>Norway</td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td>Portugal</td>
<td>Ward housekeepers may help patients</td>
<td>No</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Possibility of choice components for breakfast, milk dish for supper, any meal from other menus, if it is not contraindicated and exclusion of disliked food</td>
<td>Yes in 73% of hospitals</td>
</tr>
<tr>
<td>Sweden</td>
<td>Chose components for breakfast and exclude food items, which they do not like</td>
<td>In most hospitals</td>
</tr>
<tr>
<td>Switzerland</td>
<td>In case of medical reasons</td>
<td>In most hospitals</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Ward housekeepers will help patients</td>
<td>Frequently, but will be used in all hospitals in England from 2001</td>
</tr>
</tbody>
</table>

? = No information given.

*) Data from year 2000. In 1997 the prevalence of hospitals which assessed the patients’ satisfaction with the meals, was 78% (Guy-Grand 1997).
Table 3.4.3. Kind of patient information provided in praxis and (eventually) as recommended

<table>
<thead>
<tr>
<th>Country</th>
<th>Patient information - recommended</th>
<th>Patient information – in praxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Time and place for meals, daily menu, choices of food, possibility of alternatives, possibility of assistance from a clinical dietician, significance of food in treatment, difference between food composition to, respectively, sick and healthy persons, possibility of comments to the food served</td>
<td>Leaflets, by mouth about the food service offered and the significance of food in treatment</td>
</tr>
<tr>
<td>Finland</td>
<td>Principles of hospital food, weekly/daily menus, time and place of meals, possibility of in-between meals/snacks, possibility of alternatives, drinks and portion sizes, possibility of assistance and supportive devices, principles of diets on medical indications when appropriate</td>
<td>By mouth and by leaflets</td>
</tr>
<tr>
<td>France</td>
<td>No</td>
<td>By the nurses and the general dieticians</td>
</tr>
<tr>
<td>Germany</td>
<td>No</td>
<td>Sometimes booklets are distributed</td>
</tr>
<tr>
<td>Italy</td>
<td>No</td>
<td>Sometimes by mouth, leaflets or booklets</td>
</tr>
<tr>
<td>Netherlands</td>
<td>No</td>
<td>Most hospitals have a general brochure in which food service has a part (time and place of meals, possibility of alternatives, drinks, assistance)</td>
</tr>
<tr>
<td>Norway</td>
<td>Brochures about the food and meals</td>
<td>40% has distributed brochures to the patient about the food and meals</td>
</tr>
<tr>
<td>Portugal</td>
<td>No</td>
<td>Information about the food service via nurses and ward housekeepers and menu-plans, if a clinical dietician is involved</td>
</tr>
<tr>
<td>Slovenia</td>
<td>No</td>
<td>By mouth and/or by leaflets</td>
</tr>
<tr>
<td>Sweden</td>
<td>Time and place for meals, daily menu, choices of food, possibility of alternatives, possibility of assistance from a clinical dietician, significance of food in treatment</td>
<td>By mouth and by leaflets</td>
</tr>
<tr>
<td>Switzerland</td>
<td>No</td>
<td>Leaflets describing food service. By mouth about wanted food components</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Hospitals in England are required to provide patients with a menu setting out the meals available over the hospital’s menu cycle and giving information regarding availability of food through the 24-hour service</td>
<td>Information about the food service via nurses, menu-plans and, in certain settings, through ward display</td>
</tr>
</tbody>
</table>
Appendix 4. Problems identified
Appendix 4.1. Common and specific problems

Main problems with respect to undernutrition in hospitals

Each participating European country was asked to indicate main problems (non-prioritised) with respect to undernutrition in hospitals, in the “Revised questionnaire for national contributions to the report on nutrition programmes in hospitals”. Five of these were common in most/all countries. The remains are presented specifically for each country.

Table 4.1. Some common problems in the European countries (non-prioritised)

- Lack of clearly defined responsibilities in planning and managing nutritional care.
- Lack of sufficient education with regard to nutrition among all staff groups.
- Lack of influence and knowledge of the patients.
- Lack of co-operation between different staff groups.
- Lack of involvement from the hospital management.

Table 4.2. Some specific problems in the European countries (non-prioritised)

Denmark

- There is a lack of individual and flexible food service systems.
- The consideration for the eating conditions and environments is unsatisfactory.
- The assessment of nutritional status and nutrient intake is seldom performed.
- The hospital food service and nutrition often has low priority.

Finland

- There is no systematic evaluation of the follow-on systems or the information received at any level of the organisation.
- There is little or no information on the nutritional care or support of individual patients with regard to working methods, care documentation, remittance and feedback papers.
- There is no systematic arrangement of the nutritional care or support, no nutritional goals and no follow-up.

France

- There is insufficient availability of general dieticians in many hospitals.
- There is insufficient education of the general dietician with regard to nutritional support.
- The physicians do not consider the nutritional status as significant.
- The assessment of the patients’ nutritional risk is not performed.
- There are no national guidelines on hospital nutrition.
Germany

- There is no adequate recognition of the problem of undernutrition.
- There is no formal nutritional assessment, no recording of food intake.
- In most hospitals there is not a sufficient number of general dieticians.
- Only a part of hospitals have nutritional support teams and/or nutrition steering committees.
- Only a part of hospitals have guidelines how to treat patients nutritionally.

Italy

- There is a lack of understanding of the importance of nutrition in hospital care.
- The assessment of nutritional status and nutrient intake is seldom performed.
- The consideration for the eating conditions and environments is unsatisfactory.
- The hospital food service and nutrition often has low priority.
- The physicians do not consider the nutritional status as significant.
- There are no national guidelines on hospital nutrition.
- Most of hospitals have not guidelines how to treat patients nutritionally.
- There is insufficient availability of physician experts in clinical nutrition and clinical dieticians in many hospitals.
- There are no nutritional support teams in the vast majority of hospitals.

Netherlands

- There is a lack of interest in nutritional status by the physician and the nurse, both in hospitals and home-care.
- The general dieticians are only consulting; they do not take care in daily routine.
- Nutrition is not based in basic hospital care.
- Finances to provide optimal nutrition do not have priority.
- Physicians do not worry about some weight loss in an overweight patient.

Norway

- There is a lack of nutritionists/clinical dieticians at hospitals and other health institutions.
- There is a lack of implementing of the national recommendations for hospital food provisioning and nutritional care and support in many hospitals and health institutions.
- Assessment of the patients’ nutritionally risk is seldom performed.
- Allocation of responsibility concerning nutrition is seldom clearly defined.
- There is a lack of knowledge and time of physicians and nurses.
Portugal

- There is a lack of quality and flexibility in food service especially in relation to mealtimes and individual needs.
- Autonomous private companies almost always operate food service.
- There is inconsistency in the assessment of nutritional status and food intake, due to few and inexperienced staff.
- The increasing understanding of the importance of nutrition in hospitals is restrained by organisational and staff constraints.
- There is a lack of guidelines about practical ways to improve food intake in hospitals.
- The patients often perceive the hospital food to be of bad quality.
- There is an increasing number of old patients with complex food needs and dependent of feeding aids.

Slovenia

- There is a lack of standards for nutrition monitoring and nutritional support.
- There is a lack of time and knowledge of physicians and nurses.
- The provision of meals is seen as a routine task.
- The hospital management is not aware of the existence of undernutrition in their hospitals.

Sweden

- There has been a radical reorganisation of the health cares.
- There has been a reduction of staff in the hospitals.
- The length of hospital stay has been reduced.
- There is less time to supervise the patients.
- There is a lot of newly enrolled and inexperienced staff.
- A high amount of patients are sent from hospital to primary health care sector.
- There is a low knowledge of treatment and disease and nutrition in the organisations (e.g. nursing homes) that are now responsible for most patients.

Switzerland

- There is no formal nutritional assessment, and no recording of food intake.
- There is insufficient availability of clinical dieticians in many hospitals.
- There are no nutritional support teams in the vast majority of hospitals.
- There are usually no local guidelines in hospitals regarding undernutrition/nutrition in hospitals.
- There are no national guidelines on hospital nutrition.
United Kingdom

- There is lack of flexibility in food service, especially in relation to mealtimes.
- There is inconsistency in the assessment of nutritional status and food intake.
- There is a lack of understanding of the importance of nutrition in hospital care.
- There is a lack of information about practical ways to improve food intake in hospital.
- The hospital food is perceived to be of poor quality.
- There are an increasing number of old patients with complex food needs.
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