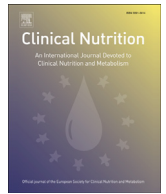




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## Original article

## Dietary intakes in geriatric orthopaedic rehabilitation patients: Need to look at food consumption not just provision

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## SUMMARY

**Background & aims:** Elderly orthopaedic rehabilitation patients are potentially at high nutritional risk and thus nutrition provision is a fundamental component of the multidisciplinary care to optimise physical rehabilitation. Hospital food service (catering) is internationally recognised as a key component of good clinical care of patients and has the potential to provide a population approach to managing under-nutrition. Within Scotland, there have been significant developments with regards to food, fluid and nutritional care within clinical settings including the setting of clinical standards. However audits to date have focused on processes being in place and not patient outcomes. Therefore, this study aimed to evaluate food provision and consumption in elderly orthopaedic rehabilitation settings to determine whether nutrition standards are being met.

**Methods:** A service evaluation of food provision and consumption to inpatients 65 years and older in post-acute geriatric orthopaedic wards over 24 h in National Health Service (NHS) hospitals in Scotland, UK was conducted. Food provision from each meal, in-between meal snacks from the trolley service and also on ward provisions were measured by weighing all items prior to being served to the patient. Any leftover food items were also weighed to allow the amount of food consumed to be determined. Estimated energy and protein contents of foods provided and consumed were compared against nutrient standards for hospital foods.

**Results:** Food provision to  $n = 175$  patients, across seven wards and three hospitals was significantly less than standards set for energy and protein provision for 'nutritionally well' patients; (Hospital B mean diff  $- 549$  kcals,  $-19$  g  $p < 0.01$ ; and Hospital C mean diff  $-250$  kcals,  $-12$  g,  $p < 0.001$ ). Patients consumed approximately three quarters (74%) of the food they were provided. Higher provision of both energy and protein was associated with higher levels of consumption ( $r = 0.77$  and  $r = 0.79$ ,  $p < 0.001$ ), respectively.

**Conclusion:** Significant work has been undertaken to improve the nutritional care of patients in hospitals. However, at a time where inefficiencies in clinical services must be reduced along side improvements in patient outcomes, there is a need for greater monitoring of patient food intakes to enable improvements in food production and food service systems to this end.

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## 1. Introduction

Food and fluid provision have a central role to play in the management and prevention of malnutrition within institutions such as care homes and hospitals. Food service is now widely recognised as a key component of good clinical care of patients

across Europe [1–6] {{63 Council of Europe Resolution 2003}} and internationally [7,8]. The hospital catering service has the potential to provide a population approach to managing under-nutrition. The British Association of Parental and Enteral Nutrition (BAPEN) report the 'risk of malnutrition in individuals admitted to hospitals in the UK to be 25 per cent, with this rising to 34 per cent in Medicine of the Elderly [9]. Recognition of the prevalence of malnutrition and importance of screening, increased education and training around nutritional care and the role of the hospital food service have become much higher on political and health agendas, in the UK [3–6], Europe [2,8,10] and further afield [7].

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Evaluation of food and fluid provision in hospitals to date have shown that all food served is not always consumed [11–13]. Differences are noted across different specialities of clinical care, with wastage ranging from 13 to 55 percent [11,12,14,15]. An increased risk of 30 day mortality with greater patient plate-wastage was highlighted in the multicentre Nutrition Day study carried out across Europe [16], along with greater nutritional risk and poorer nutritional outcomes [2]. Patients in medicine of the elderly wards and also those with reduced mobility have also identified to be at increased risk [2,13]. This is of concern especially for those with acute or chronic illnesses who are likely to have increased requirements [17], including older orthopaedic patients [18].

Historically, hospital food provision often receives poor ratings [19]. In Scotland, the Better Together Inpatient survey [20] found that although 71 per cent of inpatients were happy with food and drink provision, nearly one fifth of inpatients (19 per cent) were dissatisfied. Food and drink provision was in the top five most poorly rated aspects of hospital care suggesting the need for review and improvement.

Poor food intakes in institutionalised older adults may happen for a number of reasons, including, lack of assistance with eating and drinking, lack of choice of suitable foods, specific dietary needs not being met [21,22], poor food aesthetics (temperature, taste, appearance) [16,23–25] in addition to menu fatigue, with a significant inverse relationship between length of stay and satisfaction with food [24]. However, many of the UK studies are now more than ten years old, and within this time-frame there have been significant developments with regards to all aspects of food, fluid and nutritional care within clinical settings in the UK and throughout Europe [8]. In Scotland, this includes the setting of Clinical Standards for food, fluid and nutritional care in hospitals (NHS QIS, 2003; updated [6]) along with a national implementation programme, including guidance for nutrient, food and fluid provision [26] to assist health boards in meeting these clinical standards.

Setting of standards does not always mean improvements in practices [27], however, national inspections and self assessments by health boards in Scotland, suggest that most hospitals have processes in place to improve food and fluid provision and nutritional care, with more than 90 percent of standards being met [28]. However it needs to be acknowledged that these audits focus primarily on processes being in place and not patient outcomes, such as dietary intakes or changes in nutritional status. Studies from around the world have highlighted that patients in Medicine of the Elderly and those with reduced mobility have been identified at high nutritional risk due to poor dietary intakes [2,13] and potentially may have increased requirements [18]. Nutrition provision is therefore a fundamental component of the multidisciplinary orthopaedic rehabilitation to optimise physical rehabilitation. Thus, this study aimed to evaluate food provision and consumption in elderly orthopaedic rehabilitation settings to determine whether nutrition standards are being met and whether differences exist for different methods of food service. Additionally the study aimed to determine the relative contribution different eating occasions make to energy and nutrient intakes in these settings (formal mealtimes and also provision between meals, including snacks). Findings for fluid provision and consumption have been reported elsewhere [29].

## 2. Methods

A cross-sectional study was undertaken of food service provision and consumption in post-acute long stay wards in three National Health Service (NHS) hospitals in Scotland, UK. Hospitals were chosen to provide representation of the different food production and food service methods in place within the NHS. The

project was deemed service evaluation and as no patient identifiable information was accessed or collected, no consent was required and thus patient cognition and presence of other comorbidities was unknown.

Participants were male or female, 65 years or older and inpatients for more than 24 h on a geriatric orthopaedic rehabilitation ward. Anyone receiving enteral or parenteral nutrition, nil by mouth, or on a texture modified diet was excluded from data collection.

### 2.1. Setting

Hospital 'A' (three wards; two female, one male ward) provided a cook-serve, plated food service system. A three week menu cycle that consisted of three main meals and three snacks daily with midday and evening meals consisting of two and three courses respectively, with choice (more than one option) provided at each occasion. Patients were provided with a menu from which they selected their menu choices two days in advance of the meal. Breakfast was provided at 8.30am, midday meal at 12.30pm and evening meal served at 6pm. Portion sizes were standardised at the catering department level, based on yields from standard recipes; patients being given the option to choose a large portion if desired. A large portion provided an increased amount of potatoes, rice or pasta and vegetables. All patients were offered biscuits mid-morning and mid-afternoon, and toast before bed. On weekend afternoons, scones or pancakes with butter and jam were provided for all patients. Each ward had a fridge containing items like yoghurts and cheese which patients may be given with meals or as a snack. A separate snack menu was available for patients recommended to have extra energy and protein by the dietitian.

Hospital 'B' (two mixed wards) provided a cook-freeze bulk food service on a three week menu cycle to two geriatric orthopaedic rehabilitation wards. Breakfast consisted of a choice of cereal/porridge and a roll or slice of bread with butter and jam/marmalade. Three courses, hot meals with a choice of four different mains, a selection of sandwiches or salad at both lunch and evening meal was provided. Food was regenerated within the catering department; then multiple portions of the menu choices were transported in bulk to each ward. Care assistants advised patients of the menu choices available at the point of meal service. Food was then served by the nursing staff, taking into account patient preferences and tailoring portion sizes to perceived patients' needs. A glass of juice or milk was offered to patients at lunch time and a cup of tea or coffee at breakfast and evening meal. Between meals (11am and 3pm) patients were offered a cup of tea or coffee and a biscuit by domestic staff and again at 7pm by nursing staff. At all times standard snacks were available from the ward kitchen including biscuits, crackers with cheese, pots of yoghurt or scone & butter. Mealtimes were breakfast 8am, midday meal 1230pm and evening meal 5pm.

Hospital C (two mixed wards, total of 72 beds) used a bulk trolley meal service with a three week menu cycle. Main meals (lunch and supper) were provided by an outside catering company which provided bulk frozen cooked meals to hospitals. Meals were regenerated in batch within one of the 14 regeneration kitchens located across the hospital and then were served from a hot meal trolley on the ward. Nursing staff served the requested menu items detailed on patient menu cards, the catering hostess then brought the meals to each patient's bedside. Patients selected their main meal choices (lunch and supper) from a menu card one day in advance of receiving their meal. For breakfast, a trolley providing a selection of breakfast cereals including porridge (made with water), toast (white or wholemeal) and soft rolls was brought through the ward and offered to patients at their bed. Meal times were;

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