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Nutrition and food service systems for long stay elderly patients: a contextual analysis : "making every mouthful count"

Karen Louise Walton
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**NUTRITION AND FOOD SERVICE SYSTEMS FOR LONG STAY ELDERLY
PATIENTS. A CONTEXTUAL ANALYSIS.**

“MAKING EVERY MOUTHFUL COUNT”

A thesis submitted in fulfilment of the requirements
for the award of the degree

Doctor of Philosophy

from

University of Wollongong

by

Karen Louise Walton

Bachelor of Science (Nutrition/Chemistry Joint Major)

Master of Science (Nutrition and Dietetics)

University of Wollongong

Smart Foods Centre

School of Health Sciences

2009

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CERTIFICATION

I, Karen Louise Walton declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Smart Foods Centre and School of Health Sciences, University of Wollongong, is my own work unless otherwise referenced or acknowledged. This document has not been submitted in whole, or in part, for qualifications at any other academic institution.

Karen Louise Walton

20th February 2009

DEDICATION

To Mum and Dad (Margaret and Richard Davies), my Husband (Dale), my wonderful children (David and Alyssa), my Mother-in-Law and late Father-in-Law (Margaret and Fred Walton).

Thank you for your encouragement, understanding, patience, love and support during the course of this thesis. You have all experienced this PhD with me.

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PUBLICATIONS

Peer reviewed journal publications in support of this thesis

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Walton K, Williams PG & Tapsell LC (2006). A web based survey of foodservice practices and provision in Australian hospitals. 24th National Dietitians Association of Australia DAA Conference, Sydney, Australia. [Oral Presentation by Walton]

Walton K, Williams PG & Tapsell LC (2005). Stakeholder views of hospital food services and barriers to patient nutrition. 23rd National DAA Conference, Perth, Australia. [Oral Presentation by Walton]

Walton K, Williams PG & Tapsell LC (2005). Stakeholders views of hospital food services and barriers to patient nutrition. 18th International Congress of Nutrition, Durban, South Africa. [Poster presentation]

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LIST OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
ADA	American Dietetic Association
ALOS	Average length of stay
APD	Accredited Practising Dietitian
BAPEN	British Association for Parenteral and Enteral Nutrition
BMI	Body mass Index
CBORD®	Trade name of a computerised food service and diet management system
CNA	Certified nursing assistant
CPU	Central Production Unit
CQI	Continuous quality improvement
CVA	Cerebrovascular accident
Diet	Dietitians
DAA	Dietitians Association of Australia
DON	Director of nursing
EN	Enrolled nurse
FSA	Food service assistant
FSANZ	Food Standards Australia New Zealand
FSM	Food service managers
g	Gram
HACCP	Hazard analysis and critical control point
HP	High protein
HPHE	High protein, high energy
IHHC	Institute of Hospitality in Health Care
kJ	Kilojoule
LOM	Likelihood of malnutrition
LOS	Length of stay
MNA	Mini nutrition assessment
NA	Nutrition Assistant or Diet Aide
NHMRC	National Health and Medical Research Council
NHS	National Health Service
NRV	Nutrient Reference Value

LIST OF ABBREVIATIONS

NSW	New South Wales
NUM	Nurse unit manager
PG-SGA	Patient generated subjective global assessment
QA	Quality assurance
RCT	Randomised control trial
RDI	Recommended Dietary Intake
RN	Registered nurse
SGA	Subjective global assessment
SD	Standard deviation
Suppl.	Supplement
TQM	Total quality management
UK	United Kingdom
USA	United States of America
WD	Weekday
WE	Weekend

ABSTRACT

The ageing Australian population and the increased need for health care services have influenced many changes to hospital food service systems in an attempt to make them more cost effective. Food service departments have traditionally been viewed as 'non clinical, hotel style' services, and as such are often targeted to make budget savings. It is known that older patients have more frequent and longer hospital admissions, which creates a higher demand on hospital services. Patients are often admitted to hospital with multiple co-morbidities, with some already malnourished and many others 'at risk'. Early detection of malnourished patients is critical due to its influence on complication rates, wound healing, immunity, length of stay, health care costs and patient outcomes.

This thesis represents a contextual analysis of the nutrition and food service systems available to long stay elderly hospital patients in Australian hospitals today. It involved exploring and interpreting social, behavioural and biological determinants of nutritional health. It aimed to explore the issues that influence the dietary intakes of long stay, elderly patients, identifying barriers to nutritional support and priority interventions to assist in a more effective and efficient food service provision in Australian hospitals.

The first study involved focus groups and individual interviews with six key stakeholder groups to investigate the context and to better understand the range of current practices, barriers and opportunities for improvement in nutrition and food services. Thematic analysis resulted in five key themes: food service, menu, medical condition, ward environment and management. A number of common barriers (e.g. lack of feeding assistance, lack of customisation, inadequate monitoring of intakes and increased use of pre-packaged foods and beverages) and priorities (e.g. additional feeding assistance, food fortification and more nourishing snacks) were identified. The findings from the stakeholder analysis formed the basis of a national survey that investigated the provision of food services across Australian public and private hospitals. It involved dietitians, food service managers and nurse unit managers and aimed to measure and quantify elements in the research context; and to quantify the barriers, and priority interventions to improve dietary intakes by long stay patients. A lack of choice due to a special diet, boredom due to length of stay, lack of feeding assistance, limited variety, packaging difficult to open and lack of meal set up assistance were the six barriers ranked within the top ten amongst all stakeholder groups. Five agreed priority interventions included food fortification, assistance with packaging, nutrition assessment of all patients, adequate monitoring of intakes and adequate flexibility of menu choices.

The results of both these studies lead to several more questions: 1. What are the patients eating? 2. What happens in aged care rehabilitation wards at meal times? and 3. What activities have a positive influence on dietary intakes and which ones have a negative impact? This led to an ethnographic study that involved observations of activities at meal times in three rehabilitation wards, as well as a quantitative study of the estimated daily energy and protein requirements and the measured plate waste and resultant dietary intakes. Social and behavioural aspects were able to be explored by the observational method and it was evident that patients were provided with more than adequate amounts of energy and protein, however most patients failed to meet their estimated daily requirements due to factors such as: poor appetite, level of feeding assistance required, amount of packaging, meal and snack options available and interruptions to meals. Fifty-eight percent of supplements were wasted, yet they provided up to 21.5% of energy and protein requirements for patients receiving them. To see how these issues might translate into action a volunteer feeding assistance program was then evaluated in an aged care ward at Sutherland Hospital, South of Sydney. This was implemented in response to the need for additional non nursing mealtime assistance with setting up, feeding, socialisation and encouragement for patients. The pilot study reported in this thesis involved observations with meals, measurement of dietary intakes and surveys with nurses and volunteers. The protein intake was significantly increased at the week day lunches when volunteers were present (extra 10.1g; $P=0.015$ at lunch); while the energy intakes were increased, though not significantly so (439kJ at lunch). This study indicated the potential to improve dietary intakes with a targeted intervention.

Clearly there are numerous barriers to adequate dietary intakes, and a 'toolbox' of interventions is needed to assist individuals in different situations. Additional priority interventions include: food fortification, assistance with packaging, nutrition screening of all patients, adequate flexibility of menu choices, additional feeding assistance, more nourishing between meal snacks and an improved variety of menu options. A number of these interventions involve a significant financial outlay, however the cost of these should be balanced against the cost savings from enhanced nutritional care. It is time that food services were seen as a core component of holistic patient care and further longer term, outcomes focussed research is essential to provide the evidence. The complex web of relationships and institutional systems exposed in this thesis provides a basis for taking further action.

CHAPTER 1 INTRODUCTION AND AIMS

“Food is Medicine- hence let medicine be your food”

(Hippocrates ca. 400BC, cited in Council of Europe 2002, p17)

1.1 INTRODUCTION

The issue of malnutrition in hospitalised patients and the associated risks and complications were first identified over thirty years ago (Butterworth 1974). The prevalence of malnutrition in Australian hospitals has been reported to be between seven and 49% in recent years (Beck et al 2001a, Middleton et al 2001, Visvanathan et al 2004, Neumann et al 2005, Vivanti & Banks 2007, Vivanti et al 2008). Malnourished patients usually have longer lengths of stay (LOS), increased rates of complications and increased risks of adverse medical outcomes than well nourished patients (Wood et al 1985, Reilly et al 1988, McWhirter and Pennington 1994, Chima 1997, Green 1999, Braunschweig et al 2000). Undernutrition is a form of malnutrition, and is the focus of this thesis.

The causes are multi-factorial and include issues such as the patients' medical diagnosis and physical factors such as their health, vision, hearing, sense of taste and swallowing ability. Other contributing factors include appetite, intakes prior to admission, diet type, choices available, level of nutrition screening and assessment, level of nutrition knowledge by medical staff, priority given to nutrition over other care demands, the amount of feeding assistance and level of encouragement provided and the monitoring of intakes (Garrow 1994, Kowanko et al 2001, Lipski 2003).

These issues are not confined to Australia. Researchers from around the world have investigated numerous issues including: the prevalence of malnutrition, the need for timely nutrition screening and assessment (Lipski 1993, McWhirter & Pennington 1994, Ferguson et al 1998, Barone et al 2003), the use of nutritional supplements (Potter et al 2001, Roberts et al 2003) and food fortification (Gall et al 1998, Barton et al 2000a).

There has also been much research conducted and strategies implemented recently in the United Kingdom (UK) in response to reports such as *A Positive Approach to Nutrition as Treatment* (Kings Fund 1992, cited in Schenker 2003), which indicated that up to 66% of hospital patients were malnourished and *Hungry in Hospital* (1997). The Better Hospital Food Program was implemented in late 2001 to address many hospital food related issues so as to improve food services in English hospitals (National Health Service (NHS) Estates 2008). The use of protected meal times, snack boxes, 24 hour

catering, a revised menu and a red tray system to flag patients needing extra time and assistance with meals were recommended and have been instigated in some trusts (or area health services, as they are known in Australia). The Council of Europe (2002) document titled, *Food and Nutritional Care in Hospitals: How to Prevent Undernutrition* has paved the way for a strategic focus on improvements to the preparation and delivery of foods and beverages to hospitalised patients throughout Europe and the United Kingdom (UK).

These challenges to nutrition and food service delivery have occurred when patients' expectations about quality and service are increasing (DeLuco & Cremer 1990, Lau & Gregoire 1998, Chang et al 2003). At the same time the risk of patient malnutrition remains a key issue in hospitals around the world today, particularly for older, longer stay patients (Green 1999, Beck et al 2001a, Lazarus & Hamlyn 2005). Patients are often admitted with multiple medical problems and may already be malnourished, or at an increased risk for malnutrition prior to their admission (Zador & Truswell 1987, Green 1999, Adams et al 2008), which makes the food service provided and their ability to access it all the more important.

Optimising the dietary intakes of individuals is complex and challenging with the following quote summarising key aspects requiring consideration in providing foods and beverages to hospitalised patients,

"The meal is not simply about the food but incorporates three variables, the food, the consumer (patient) and the situation under which the food is consumed" (Meiselman 1996, cited in Edwards et al 2000, p263).

There have been several Australian studies investigating areas such as nutritional status, length of stay, nursing interactions at meals, patient satisfaction, dietary intakes, changes to food service delivery and menus (Ferguson & Capra 1998, Beck et al 2001a, Kowanko et al 2001, Middleton et al 2001, Mibey & Williams 2002, Chang et al 2003, McClelland & Williams 2003, Barone et al 2003, Visvanathan et al 2003, Neumann et al 2005, Lazarus & Hamlyn 2005, Banks et al 2007). However there is a paucity of coordinated research investigating barriers and opportunities to optimise the nutritional status of long stay, elderly and aged care rehabilitation patients as well as published accounts of priority intervention strategies to improve dietary intakes. The research in this thesis takes a dietetic approach to reviewing food service. It examines the problems contributing to suboptimal dietary intakes by long stay, elderly hospital

patients. It uses a health service continuous quality improvement framework, triangulation of data from multiple methods and documents priority recommendations from a collaboration with key stakeholders across Australia

1.2 HYPOTHESES

The food service and dietetics environment for elderly long stay hospital patients is very complex and is dependent on numerous interwoven variables. These include, but are not limited to the type of food service production and distribution system, the roles and beliefs of each of the many stakeholders, which include nurses, patients, doctors, dietitians, nutrition assistants, food service staff and management, the level of importance placed on nutrition, the view of food services held by management, the budget provided, the patient's length of stay, their level of empowerment and the patient's health and appetite.

Hospitals are under increasing pressures due to the ageing population, staff shortages and budget constraints, and patients are often sicker on admission. The appropriate and coordinated screening of patients, provision of appropriate meals, adequate feeding assistance, further screening and monitoring of intakes is likely to be limited due to the plethora of other priorities. Because of all these factors, the theoretical mantra that '*Food is Medicine*' is not likely to be evidenced in practice and the achievement of optimal dietary intakes by patients will be difficult.

1.3 AIMS OF THE RESEARCH:

In the context of contemporary Australian hospitals this thesis aimed to critically evaluate the complex interplay between the hospital nutrition and food service systems, by examining the range of views of stakeholders, the measurable extent of inadequate dietary intakes, how related behaviours influence dietary intakes, and the development of feasible priorities for future interventions.

The objectives of this research were to:

1. Explore the range of views held by key stakeholders regarding food service provision in Australian hospitals.
2. Confirm the key barriers and priority opportunities to adequate dietary intakes in the Australian hospital context.
3. Assess the dietary intakes of aged care rehabilitation inpatients in a case study context.

4. Identify the positive and negative influences on dietary intakes in a case study context.
5. Assess the impact of a volunteer feeding assistance program.

These objectives were examined through five respective studies:

Study 1. Determining the views of key stakeholders (nurses, patients, nutrition assistants/diet aides, dietitians, food service assistants and food service managers) about the current food service provision in Australian hospitals (objective 1).

Study 2. A national survey of nurse unit managers, dietitians and food service managers to identify key barriers to adequate dietary intakes and priority interventions for the provision of hospital food services (objectives 1 and 2).

Study 3. An assessment of the energy and protein intakes of aged care rehabilitation patients (objective 3).

Study 4. An observational report of the daily activities at main meals in aged care rehabilitation wards (objectives 3 and 4).

Study 5. An evaluation of the impact of a volunteer feeding assistance program on the dietary intakes of aged care hospital patients (objective 5).

CHAPTER 2 THE FOOD SERVICE AND NUTRITION RELATED ISSUES FACING LONG STAY ELDERLY HOSPITAL PATIENTS

2.1 INTRODUCTION

This thesis sets out to investigate the multifactorial issues influencing the dietary intakes of long stay elderly patients in Australian hospitals. It must be stated at this point that this area of research involves many stakeholders, a variety of methodologies, numerous variables of interest, multidisciplinary roles, emotions and financial considerations. The thesis research aims to produce feasible, priority recommendations. The complex interplay between nutrition and foodservice systems, the stakeholders within, and between these systems and the dietary intakes by patients are a key focus of the research. These aspects will be referred to regularly and are the metaphorical thread that binds each of these thesis chapters.

Food is a phenomenon that everyone knows something about because all people eat, and as such it is often undervalued in the health care context. It isn't technological, it is very familiar and as such it is often seen as a 'hotel service' that doesn't get the due attention it rightly deserves (Wood et al 1985, Lipski 2003). The likely changes to dietary intakes posed by hospitalisation and resultant factors such as: anxiety, the diagnosis, treatments, altered environment and ill health to name a few are often disregarded as it is thought that patients will improve their dietary intakes and regain any lost weight when the treatment is successful and they are better. This is sometimes the case for some bureaucrats, hospital managers, finance departments, doctors and nurses. A sentiment that is sadly lacking here is the fact that nutrition is an essential part of the 'treatment' and that complications are more likely to occur due to a poor nutritional status (Naber et al 1997, Lazarus & Hamlyn 2005). The provision and consumption of an adequate diet is a critical aspect of health care as patients will lose weight, will be at increased risk of malnutrition and won't respond as well to therapy if they are not well nourished (Visvanathan et al 2003, Banks et al 2007).

Clearly there are varied perspectives regarding the views of policy makers, hospital management, doctors, dietitians, food service managers, patients and nurses regarding the roles and importance of hospital food services. These will vary depending on the stakeholder that is spoken with. The stakeholders involved in this research are numerous and include; the patients, nurses, dietitians, nutrition assistants, food service

managers, food service assistants and hospital management, as a number of directors of nursing contributed to the stakeholder analysis (Chapter 4).

This research considers numerous factors influencing the dietary intakes of long stay, elderly hospital patients, the many influences on their dietary intakes and their nutritional status. This descriptive, contextual analysis will assist in understanding the environment in which Australian hospitals provide nutrition and food services and will allow consideration of suitable interventions to improve dietary intakes.

This chapter outlines the beginning of the social, behavioural and biological journey that explores issues impacting on inadequate dietary intakes, coupled with feasible strategies to facilitate improved intakes to make every mouthful count. Many important and interrelated issues will be discussed in detail in this chapter that will encapsulate a review of the relevant scientific literature. These issues will each be discussed as a component of one of the following four key topic areas:

- Patient demographics
- Meeting nutritional requirements
- Food Service
- Gaps in meeting the nutritional requirements of elderly patients via the food service system

Clearly each hospital setting, each food service setting and each patient is unique. However this chapter will provide a substantial overview of the issues that will compliment the accompanying new research outlined later in this thesis to better understand the context of nutrition and food services in Australian hospitals for long stay, elderly patients during the first decade of the 21st century.

2.2 PATIENT DEMOGRAPHICS

2.2.1 The ageing population

People over the age of 65 years made up 13% of the Australian population in 2005, while those over 85 years accounted for 1.5% of the population. The median age in Australia was 36.6 years, while it is predicted to increase to 46.8 years in 2051 (Australian Institute of Health and Welfare 2006; Australian Bureau of Statistics 2007). It is likely that people aged over 65 years will make up approximately 27.1% of the population by 2051, and that those over 85 years will account for 6-8% of the

population. While some people are well, even with advanced chronological age, it is usual that health status declines with older age, which suggests that a significant increase in the already high demand for health services and associated care is likely in the near future (Schofield & Earnest 2006, Australian Bureau of Statistics 2007, Banks et al 2007). Figures 2.1 and 2.2 indicate the likely changes to the percentages of males and females in each age range between 2005 and 2051 due to the reduced fertility rate and ageing population in Australia (Australian Bureau of Statistics 2007).

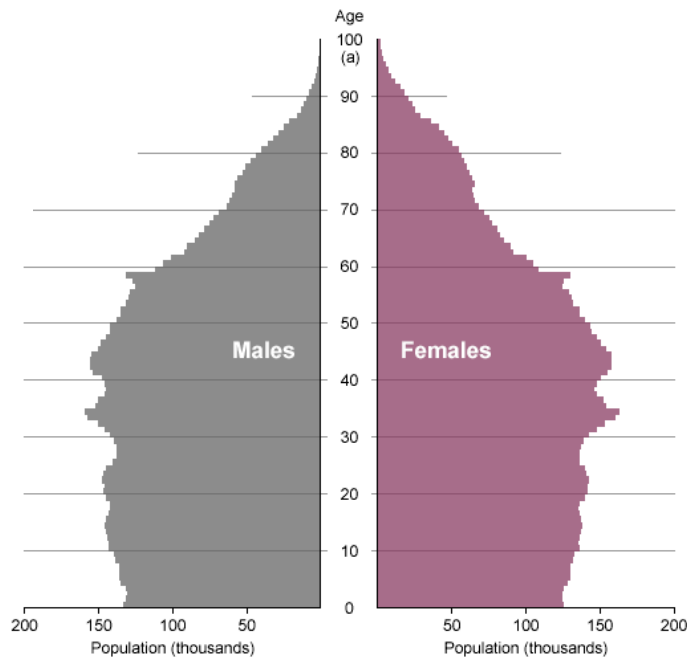


Figure 2.1: Age structure in Australia in 2005

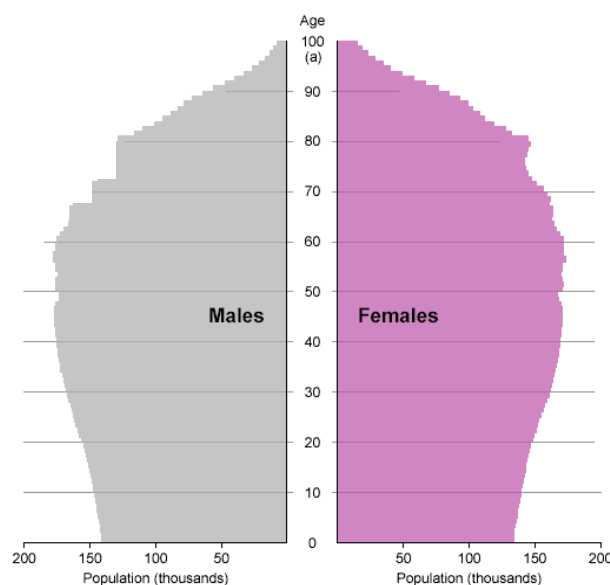


Figure 2.2: Projected age structure in Australia in 2051

There is a positive association between increasing age and length of stay (Liu et al 2001, Neumann et al 2005). While people aged 65 years and over make up 12.7% of the general Australian population, they account for 32% of hospital separations and 51% of total bed days within New South Wales (NSW) (NSW Health HIE 2002-2003, cited in NSW Health 2005). As the population ages there will be an increased demand for hospital bed days (predicted to increase from approximately 50%, up to 70%) by older people, many of whom will have multiple medical ailments. The ageing workforce will also influence the numbers, and the experience of the health, nursing and allied professionals that are available to care for future patients (Schofield & Earnest 2006).

The situation in several other countries

In the UK, people aged 65 years and over are also the fastest growing population group. They currently make up 16% of the population, but are expected to constitute 20% of the population by 2021 (Nematy et al 2006).

The situation in the United States of America (USA) is similar, with 12.7% of the population above 65 years in 2000 and it is predicted that they will constitute 20.3% of the population by 2050. The proportion of people aged above 85 years will particularly increase, with this group likely to increase from 1.6% in 2000 to 4.8% with medical advances and improved care (Wiener et al 2002).

2.2.2 Changes to the length of hospital stay in Australia

There were 7.3 million hospital separations in Australia during 2005-2006, which accounted for 24.3 million patient days. Public hospitals accounted for 61% of separations and 67% of the patient days, while 53% of the separations overall were related to females (Australian Institute of Health and Welfare 2007).

The average length of stay (ALOS) decreased by 21.4%, from 4.2 days in 1996-1997 to 3.3 days in 2005-2006, with public hospitals contributing 3.8 days and private hospitals contributing 2.6 days. This reduced ALOS, due to medical advances and efficiencies has increased day only surgery from 44.7% in 1996-1997 to 55.8% in 2005-2006. However, when day only patients are disregarded from the calculations and only patients staying at least one night are included, the ALOS increases to 6.6 days for public hospitals, 5.4 days for private hospitals, with 6.2 days being the ALOS overall. The focus of this research is on longer stay elderly patients, thus the more appropriate reference ALOS for this research is 6.2 days, rather than the 3.3 days

which is often quoted (Australian Institute of Health and Welfare 2007, Australian Bureau of Statistics 2008).

Vivanti & Banks (2007) recently highlighted issues regarding the interpretation of length of stay (LOS) data in Australia. They reported on the Australian ALOS figures, with and without day only patients, before analysing the data from the Princess Alexandra Hospital (750 beds) in Brisbane for the 2002-2003 period. An increased ALOS, from 4.1 days to 8.4 days was highlighted when day only patients were removed from their data. A large proportion of the hospitals' bed days were occupied by a small number of occasions of service (separations), with approximately 50% of bed days being occupied by those staying longer than 14 days or more, and approximately 34% being occupied by those staying 28 days or more. Vivanti & Banks (2007) highlight the importance of these recent findings:

"The fact that half of the hospital beds have people staying longer than previously recognised reinforces the importance of skilfully designed nutrition and food services that consider not only a nutritionally adequate menu, but the multitude of other factors that ensure successful meal consumption" (p285).

The majority of long stay patients received acute care, rather than rehabilitation, which reflects the multiple comorbidities of an ageing population. The authors also point out that hospital LOS data routinely starts from day one again when a patient enters rehabilitation. The true length of stay for a patient who has an acute admission, followed by prolonged rehabilitation, is therefore likely to be much longer than indicated. In any case, they rightly recommend caution related to the use of ALOS, as it is skewed if it includes day only patients, who make up just over half of all admissions (55.8%), particularly when the focus of the research is the on long stay patients. It is agreed that reporting the median LOS, and ranges also would be more useful (Vivanti & Banks 2007).

Average LOS data is often used to plan and justify changes to hospital service delivery, including food services and it is known that hospital menu cycles have got shorter over the last decade or so (Morris et al 1994, Mibey & Williams 2002, McClelland & Williams 2003). Menu cycles have been shortened and thus variety and the nutritional content of the menus influenced on the basis of the ALOS being less than one week. It has previously been reported that both oral intake and the level of satisfaction with food declines with increasing LOS (Stanga et al 2003, Vivanti & Banks 2007).

2.2.3 How is a long stay patient defined?

This is a question that remained unanswered for much of the time that this research was being conducted due to the issues related to the inclusion of day only patients in the calculations, specific consideration of an elderly cohort and the difficulties in accessing specific and timely national details. The indecision related to whether seven days or greater or 14 days or greater was more appropriate.

In developing a definition for this research, considerations were made regarding the ALOS of elderly patients in NSW (11.5 days), the Average Australian LOS for patients above 65 years (8.5 days), the Average Australian LOS (excluding day only) for all age groups (6.2 days) and the fact that 24% of patients stay longer than seven days and 10% stay longer than 14 days in NSW. As this research is primarily focused on long stay elderly patients, then a long stay patient will be defined to as someone who stays in hospital for 14 days or longer (NSW Health HIE 2002-2003, cited in NSW Health 2005).

2.2.4 Longer stay elderly patients

The nutritional status of older people can deteriorate as their hospital stay extends (McWhirter and Pennington 1994, Neumann et al 2005, Thorsdottir et al 2005) and in New South Wales (NSW), Australia, they have a much longer average length of stay (ALOS) as inpatients than the younger patients: 11.5 days for those over 65 years versus 5.2 days for those under 65 years (NSW Health HIE 2002-2003, cited in NSW Health 2005). Patients above 75 years have a higher length of stay than any other age group (Australian Institute of Health and Welfare 2007).

2.3 MEETING NUTRITIONAL REQUIREMENTS

2.3.1 The risk of malnutrition before, during and after hospital admission

“Nutritional status needs to be determined at hospital admission in order to initiate early active treatment in at-risk patients” (Kyle et al 2004, 101).

Patients are often admitted in poor health, with multiple comorbidities such as heart and lung disease, chronic pain, dementia and depression, so the number of patients with a suboptimal nutritional status, or who are ‘at risk’ prior to, and on admission to hospital is growing (McGlone et al 1995, Edington et al 1996, Kyle et al 2004, Nematy et al 2006). Acute illness, and many chronic illnesses are characterised by hypercatabolism and hypermetabolism which result in increased energy and protein

requirements, particularly as their reserves are often depleted. Patients with a lower energy intake the month before hospitalisation have been shown to have a reduced nutritional status compared to healthy patients (Mowe et al 1994, cited by Council of Europe 2002, p36). Nightingale et al (1996) examined malnutrition in medical patients, and identified a second group of patients, who while not malnourished on admission, are at high risk of becoming so. As such these patients need to be identified early and treated effectively to minimise a further decline in their nutritional status.

Visvanathan et al (2003) studied 250 elderly people living at home and receiving domiciliary care services. Their nutritional status was measured at baseline and one year later using the mini nutrition assessment (MNA), while the outcomes of nutritional risk were also reviewed (Vellas et al 1999). Initially 38.4% of the people were nutritionally 'at risk', while 4.8% were malnourished. The one year follow up with 240 people indicated that those who were not well nourished were more likely to have had two or more urgent admissions to hospital, a fall, weight loss, or to have spent more than four weeks in hospital, compared with those who were initially well nourished.

It is well known that chronically ill patients, many of whom are elderly, will be in and out of hospital regularly. Adequate flagging of these patients on admission is required, as is appropriate domiciliary follow up on their discharge.

"Premature discharge from hospital can result in early readmission, often to a different health service where assessment and treatment begin again." (Lipski 1996, p5).

It is estimated that at least 5% of people living in the Australian community are malnourished, with this figure increasing to above 10% when you include people with one or more illness (Banks et al 2007). Internationally it is estimated that up to 44% of the community living elderly are 'at risk' of malnutrition (deGroot et al 1998, cited in Australian and New Zealand Society for Geriatric Medicine 2007, p2) due to such factors such as living alone, ill health, immobility, poor dentition, inability to shop and/or cook and social isolation (Lipski 2003). Nutritional screening in the community, and certainly on admission to hospital is essential so as to identify patients who need additional nutrition support in a more time efficient manner (Capra 2007).

It is estimated that poor nutrition amongst the elderly in hospitals and the community in the UK costs approximately 7.3 billion pounds annually! This is three times the cost of

treating overweight and obesity related conditions, and over half of this money was spent on people aged 65 years and over (Age Concern 2006, p8).

Clearly significantly more needs to be done at the community level to identify people nutritionally 'at risk' and to develop innovative strategies to provide effective nutritional support and monitoring (Lipski 2003, Visvanathan et al 2003, Capra 2007, Leggo et al 2008). The focus here is on hospitals; however it is essential that future research also consider strategies to avoid preventable admissions by providing better targeted community level care (Hartwell et al 2006).

Undernutrition and rapid weight loss of as little as two to three kilograms in combination with disease can increase the risk of complications, lower resistance to infection, impair physiological and mental functioning and delay recovery (Council of Europe 2002). A patient who is consuming only 50% of their estimated daily requirements (semi-starvation) is likely to lose 15-20% of body weight in three to four weeks (Allison 1992, cited in Council of Europe 2002, p22). Undernutrition is a crippling factor that prolongs recovery and reduces quality of life (Silk 1994, Larsson et al 1994 & Ovesen et al 1993, cited in Council of Europe 2002, p22). It is suggested that functional ability is influenced with a weight loss of less than 10% (Mayr et al 2000) and nutrient deficiencies can be seen in people who have had a balanced diet withheld for as little as 10 days (Silberman & Eisenberg 1982, cited in Messner et al 1991).

Further evidence that patients can show a marked deterioration in nutritional status during four weeks in hospital was seen in a study by Gariballa (2001). Although albumin is no longer readily used to indicate nutritional status (Capra 2007), it has been shown to be a useful prognostic predictor. A study of predictors for early readmission found that patients with any amount of weight loss and no improvement in serum albumin during the first month after hospitalisation were at a higher risk of non-elective readmission than those who at least maintained or increased their weight and improved their serum albumin levels (Gariballa 2001).

2.3.2 Causes of malnutrition

Malnutrition may be defined as, *"A state of nutrition in which a deficiency, excess or imbalance of energy, protein or other nutrients, including minerals and vitamins, causes measurable adverse effects on a person's body function and clinical outcome"* (Royal College of Physicians 2002, pxi). The focus of this research is undernutrition, which may present as protein-energy malnutrition (PEM). PEM is defined as, *"A clinical*

syndrome characterised by weight loss associated with significant depletion of fat stores and muscle mass" (Australian & New Zealand Society for Geriatric Medicine, 2007, p2). It results from inadequate intakes of energy and protein, or increased requirements due to disease. It is very costly in terms of recovery time and health outcomes, particularly in the elderly (Australian & New Zealand Society for Geriatric Medicine, 2007).

Although the issue of malnutrition and its consequences are not new (Butterworth 1974, Bistrian et al 1976), unfortunately the risk of patient malnutrition is still a very real issue in hospitals around the world today (Green 1999, Middleton et al 2001, Lazarus & Hamlyn 2005) as patients are often admitted with multiple medical problems, may already be malnourished, or may be at an increased risk of malnutrition prior to admission (Zador & Truswell 1987, Green 1999, Dudek 2000). Malnourished patients usually have longer lengths of stay (LOS), generate increased hospital costs, have increased rates of complications and an increased risk of adverse medical outcomes and mortality than well nourished patients (Wood et al 1985, Reilly et al 1988, McWhirter and Pennington 1994, Chima 1997, Green 1999, Braunschweig et al 2000).

McWhirter and Pennington (1994) identified 40% of patients as malnourished on admission to hospital, with 75% of these malnourished patients losing further weight when in hospital for more than one week. They also reported a mean weight loss of 5.4% during hospital stay, irrespective of the patients' initial nutritional status.

A further concern for many is that their nutritional status may continue to decline throughout their stay (McWhirter & Pennington 1994, Chima et al 1997, Kowanko 1997, Allison 2002, Hall et al 2000, Banks et al 2007). Reasons for this decline may include: poor appetite and disinterest in food, their medical condition, the variety of food options available, poor dentition, difficulty with manipulating cutlery and accessing food, lack of feeding assistance and encouragement, the amount of food packaging, lack of recognition of malnutrition and referral for treatment, difficulties with chewing and swallowing, gastrointestinal upsets, malabsorption, depression and dementia (Kowanko et al 1999, Lazarus & Hamlyn 2005, Hickson 2006, Adams et al 2008).

The causes of malnutrition are multifactorial, and are influenced by the metabolic effects of underlying disease, increased requirements and reduced nutritional intake. Other factors such as polypharmacy, educational level and living situation also increase the risk of nutritional deficits (Naber et al 1997). Increasing age, malignant

disease and a major comorbidity were identified as independent risk factors for malnutrition in a recent German study (Pirlich et al 2006).

Naber et al (1997) described an interwoven triangle made up of the underlying disease, complications and the nutritional status of the patient in discussing the prevalence of malnutrition in nonsurgical patients in hospital. Nutrition status on admission and disease category are useful predictors regarding the occurrence of complications.

2.3.3 Nutrition screening

“Each health care setting should have a transparent policy about nutritional screening” (Elia et al 2005, p867).

Nutrition screening may be defined as, *“A simple and rapid process of identifying clinical characteristics known to be associated with malnutrition”* (British Dietetics Association, cited in Australian and New Zealand Society for Geriatric Medicine, 2007, p4).

Barone et al (2003) studied the role of nurses in screening and dietitians in the assessment of patients in a hospital setting. Early administration of the screening component of the Mini Nutrition Assessment (MNA) by adequately trained nursing staff was recommended, followed by referral to a dietitian when assessment of nutritional status was required. This strategy assists in improving awareness of malnutrition in older patients amongst stakeholders and would give dietitians the time to assess, plan interventions and monitor patients, rather than conduct all of the screening.

Adams et al (2008) investigated knowledge and practices regarding nutrition screening by doctors and nurses in a Victorian hospital. It is evident that further education and training is required in this area as risk factors such as recent weight loss and reduced intake were not routinely recognised. Screening of all patients on admission and improved surveillance by rescreening at regular intervals is recommended for long stay patients during their hospital stay (Sullivan et al 1999, Hall et al 2000). Visvanathan et al (2004) also highlighted the need to regularly screen patients in sub-acute facilities because their risk of malnutrition is high.

2.3.4 Nutritional assessment

Nutrition assessment may be defined as, *“A comprehensive process of identifying and evaluating the nutritional status of an individual using appropriate measurable*

methods" (British Dietetics Association, cited in Australian & New Zealand Society for Geriatric Medicine 2007, p4). There are numerous nutrition assessment tools in use around the world today. Unfortunately there is no gold standard assessment tool, and as such prevalence rates do vary and it is difficult to compare rates determined using different methods. Numerous other variables such as the setting, types of patients, diagnosis and time that the assessment is conducted (eg. soon after admission vs some later date) also makes useful comparison difficult (Schenker 2003, Singh et al 2006, Banks et al 2007).

Subjective Global Assessment (SGA), the Patient Generated Subjective Global Assessment (PG-SGA) and the Mini Nutrition Assessment (MNA) are three methods often used by dietitians in Australian clinical practice to determine the nutritional status of patients. Subjective Global Assessment involves a review of weight history, dietary intake, gastrointestinal symptoms, functional capacity and physical examination to determine if a patient is 'A' well nourished, 'B' moderately malnourished or 'C' severely malnourished (Detsky et al 1987). The Patient Generated Subjective Global Assessment is a modified version of SGA that is used by some researchers, which includes a score from 0 to 35, with 35 representing the highest risk of malnutrition. The validity of this tool has been determined in a number of patient groups (Martineau et al 2005, Thomas et al 2007).

The MNA includes a review of anthropometry, living situation, mobility, diet, medical history and self perception of health, and is used with older patients (>65 years). The maximum score is 30, with a score of less than 17 indicating malnutrition, between 17 and 23.5 suggesting 'at risk' of malnutrition and 24 or above indicating that the patient is well nourished (Guigoz et al 1996).

2.3.5 The prevalence of malnutrition

Malnutrition in hospitals is a serious concern. Banks et al (2007) highlighted that malnutrition rates in Australian hospitals range from 12-42% in acute care and from 49% in rehabilitation. There is wide variation due to the method used, diagnoses, setting and time of the assessment (12-20% on admission and 30-50% across the admission).

Older patients have a higher prevalence of malnutrition, with patients above 80 years of age suggested to have five times the rate of malnutrition as those patients younger than 50 years (Corish & Kennedy 2000, The European Nutrition for Health Alliance

2005, Pirlich et al 2005, Age Concern 2006). The frequency appears to increase with age, and those patients above 80 years have a higher odds risk of being malnourished compared with those between 61-80 years (Banks et al 2007).

Information about the nutritional status of older Australian rehabilitation patients is limited but several studies estimate the rate of malnutrition to be between 29-63%. (Thomas et al 2002). In rehabilitation patients, malnutrition is associated with a longer LOS (Finestone et al 1996, Thomas et al 2002) and discharge to accommodation with higher levels of support (Neumann et al 2005).

An Australian study compared the nutritional status of patients in acute and rehabilitation settings using subjective global assessment (SGA) and found much higher levels of malnutrition amongst the older longer stay patients: 7-14% of acute care patients versus 49% of rehabilitation patients, $P < 0.01$ (Beck et al 2001a).

Middleton et al (2001) also used SGA to determine the nutritional status of 819 inpatients at two acute care Sydney hospitals and determined that 36% were malnourished. They also found the length of stay of the older, malnourished patients to be significantly longer (17 days vs 11 days, $P < 0.0005$), mortality at 12 months follow up significantly greater ($P < 0.0005$) and that only 36% of these patients had already been referred to a dietitian.

Lazarus & Hamlyn (2005) utilised SGA to assess the nutritional status of 324 patients at a Sydney hospital and found that 42.3% (137) were malnourished, with only one patient being documented in the medical notes as malnourished, and only 21 (15.3%) being referred for dietetic intervention. A shortfall of \$125 311 was also calculated for the hospital as the diagnostic related group (DRG) for malnutrition was not coded.

Banks et al (2007) utilised the SGA and reported malnutrition prevalence rates of 34.7% and 31.4% in two acute Brisbane hospitals and 50% and 49.2% in two aged care residential settings. Males in residential care and patients above 80 years had a higher risk of malnutrition. The prevalence increased as the LOS extended due to the severity of illness and the fact that nutritional status declines during admission.

A study of 777 patients at Royal North Shore Hospital, in Sydney, found that 51% of patients had some level of malnutrition. The average LOS for the malnourished patients was 30 days vs 17 days for the well nourished patients, which was statistically

significant. Similarly to other studies, a large proportion of patients identified as being malnourished (43%) had not been referred on to a dietitian (Matthews et al 2007, p12).

Adams et al (2008) reported 30% of patients to be malnourished on admission to hospital in Victoria with a further 61% 'at risk', using the MNA. Patients were often not referred on to dietitians, further highlighting issues related to the recognition of malnutrition by doctors and nurses. Symptoms such as reduced appetite and recent weight loss were not followed up to the extent that you would expect.

Despite a high prevalence of malnutrition among hospitalised patients, recognition, treatment and documentation of malnutrition is often poor." (Lipski 1996, p5).

Numerous Australian studies have shown that an alarming number of the patients identified in prevalence studies had not already been diagnosed with malnutrition, or documented as such, and were therefore not getting the specialised nutrition support they required (Middleton et al 2001, Lazarus & Hamlyn 2005, Matthews et al 2007). Lazarus & Hamlyn (2005) discussed the *"Underlying global complacency towards malnutrition within hospital culture because it is regarded as an expected occurrence among hospitalised patients and it is difficult to diagnose routinely"* (p46-47).

There is a perception among nurses that low food intakes are usual for older patients. It has previously been reported that one quarter of patients who were considered to have 'normal' intakes by senior ward staff, had intakes of energy below their estimated basal metabolic rate (Todd et al 1984, cited in Council of Europe 2002, p30). There may be a lack of awareness of malnutrition amongst hospital staff and management due to such issues as a lack of knowledge and training regarding nutritional status and assessment, communication issues, failure to recognise food and nutrition as a key part of care and the lack of a consistent team approach (Singh et al 2006). However, with the correct treatment, malnutrition is reversible, even in older patients (Persson et al 2007).

Kopelman (2004) addresses a number of these issues in saying, *"It is not the intention of doctors to allow patients to starve, but they aren't familiar with the need to take nutrition seriously."* *"The only way to ensure nutrition remains a high profile issue within Trusts is to engage doctors". "We can only do that if we make sure nutrition is embedded in training and education: both undergraduate training and professional development"* (p7).

A quote from a registered nurse raises serious concerns about practice and highlights the difficult road ahead to improve the profile of nutrition and food services and nutritional support, *“I make the most important referrals first- don’t often make referrals to the dietitians”* (Matthews et al 2007, p14).

Although malnutrition is still prevalent, it is not well identified by medical teams and may be partly a problem of medical attitude. Despite the large, and varied prevalence (7%-82.4% across a range of countries in Table 2.1), nutritional therapy is often only prescribed to some patients who require additional nutritional support as has been the case in several recent Australian studies (Middleton et al 2001, Lazarus & Hamlyn 2005, Banks et al 2007, Adams et al 2008). Nutrition screening should be performed on admission so that referral of patients requiring nutrition assessment can be done soon after admission, and thus prioritise the importance of medical nutrition therapy. Malnutrition is the result of numerous risk factors, including the disease per se (Isabel et al 2003).

Similarly to Lazarus & Hamlyn (2005), Ockenga et al (2005) highlighted the need to document malnutrition to obtain the appropriate financial reimbursements for the hospital which assists in aiding nutrition support, as well as the need to raise the profile of nutrition in hospital practice. They outline a clear model for screening and assessing patients in hospital, documenting their nutritional status and promoting nutritional support. The model clearly involves doctors, nurses and dietitians.

Table 2.1 attempts to summarise the findings from a number of studies investigating the prevalence of hospital malnutrition since 2000. Clearly the prevalence will vary depending on the age of the patients, the setting and the nutrition assessment method used.

Malnutrition is a significant issue and *“Action must be taken to increase the recognition, prevention and appropriate treatment of malnutrition especially in higher-risk groups”* (Banks et al 2007, p172).

Table 2.1: Key studies investigating the prevalence of malnutrition in hospitals since the year 2000

Author/s	Year & Country	Patients (No. & mean age in years)	Setting	Prevalence (%)	Assessment method used	Comments
Beck et al	2001(a) Australia	5149 Mean age not available	2 regional hospitals Acute and Rehabilitation	7-14% 49%	SGA	Malnutrition rate significantly higher amongst older, long stay patients (49%), than acute patients (7-14%); (P<0.01).
Middleton et al	2001 Australia	819 Median age 66	2 large acute hospitals	36%	SGA	LOS significantly longer and higher mortality at 12 months when malnourished
Isabel et al	2003 Brazil	709 Mean age 50.6	25 hospitals	34.2%	SGA.	Complications, LOS & mortality increased when malnourished Hospital costs increased by 308.9%
Visvanathan et al	2004 Australia	65 Mean age 76.5-79.8	Rehabilitation hospital	35.4-43.1%	MNA	Assessed standard nutrition assessment, rapid screen MNA and two-tired MNA. The lower prevalence relates to the rapid screen, while the higher value represents the other 2 assessment methods.
Kagansky et al	2005 Israel	414 Mean age 84.8	Geriatric hospital	82.4%	MNA	Mortality 3x higher over 2.7ys when malnourished
Neumann et al	2005 Australia	133 Mean age 81	Rehabilitation hospital	6%, with another 47% at risk	MNA	Malnourished patients had longer LOS, poorer functional ability, reduced QOL on admission, and were discharged to higher level care

Author/s	Year & Country	Patients (No. & mean age in years)	Setting	Prevalence (%)	Assessment method used	Comments
Lazarus et al	2005 Australia	324 Mean age 66.8	1 large acute hospital	42.3%	SGA	Malnourished patients are not being highlighted or referred appropriately
Martineau et al	2005 Australia	73 Mean age 72	Acute stroke unit in a private hospital	16.4% moderately & 2.7% severely malnourished	PG-SGA	Associations between malnutrition and increased LOS, dysphagia and complications.
Pirlich et al	2006 Germany	1886 Mean age 62.2	13 hospitals	27.4% 17.6% moderately, and 9.8% severely malnourished	SGA	A higher age, number of co-morbidities and malignancies were key risk factors. 44% of those >70yrs were malnourished, compared with 7.8% <30yrs
Banks et al	2007 Australia	2208 Mean age 66.5 and 65	20 hospitals	34.7% in 2002 31.4% in 2003	SGA	Data collected initially, then one year later. Prevalence increased as LOS extends, males >80ys at higher risk
Thomas et al	2007 Australia	64 Mean age 79.9	1 hospital	53% moderately, 9.4% severely malnourished	PG-SGA	Trend towards increased LOS when malnourished. Overall a short LOS, which emphasises the need for domiciliary dietetics follow up
Adams et al	2008 Australia	100 Mean age 81.9	1 teaching hospital	30%, Another 61% at risk	MNA	Recent weight loss and reduced appetite not routinely seen as risk factors

2.3.6 The cost of malnutrition

Twenty years ago hospital costs were shown to be greater in malnourished patients, when Robinson et al (1987) stated that *“Early recognition of malnutrition and aggressive treatment may lead to a decrease in the length of stay and cost deficit incurred by malnourished patients (p49).”* Hospital support services, including food services are under ongoing pressure to prove their cost effectiveness. This is because the large scale RCTs required to prove this would be costly themselves and they would also raise numerous ethical questions regarding the types and amounts of foods and beverages provided to treatment and control groups. Reilly et al (1988) conducted a retrospective chart audit of 771 patients from two acute care hospitals. The mean age was only 58.7 years, but 25% of the patients had been in hospital in the previous six months. The likelihood of malnutrition (LOM) was found to have an effect on minor and major complications, the mortality rate and costs. They reported that the largest proportion of the economic variability was attributed to complications and the influence of the likelihood of malnutrition status amongst patients.

Smith & Smith (1997) reviewed the costs and ALOS of patients receiving one of the following three interventions: high quality nutrition support (early intervention, HPHE nutrition support and frequent review), medium quality nutrition support (early intervention or frequent review) and low quality nutrition support (infrequent, or late review). The difference in the ALOS (12.2 days vs 14 days vs 14.4 days) was statistically significant ($P < 0.001$) for the high quality group, when compared to the other two groups. Providing high quality care would require nutrition services to be increased by 101.5%, which obviously has a cost. However, when all the costs were reviewed, it was apparent that for every \$1 spent on quality nutrition care, \$4.83 could be saved. It is therefore recommended that policy makers, hospital management and financial managers review these calculations and consider shifting their long held paradigm regarding the restricted budgets provided for a ‘hotel service’ like inpatient food services. Recent research has also echoed the influence of malnutrition on increased complications and costs (Isabel et al 2003, Banks et al 2007).

2.3.7 Patient dietary intakes

“Food is an integral and important part of a patient’s treatment but the food must be consumed if it is to be of value. Furthermore, food prepared and not consumed is a waste of scarce resources” (Edwards et al. 2000, p265).

There needs to be some flexibility in the provision of hospital meals and the involvement of the patients in this process. Although adequate amounts may be provided, a substantial amount of patients consume less than half of their estimated daily requirements (Jordan et al 2003, Sullivan 1999, Kowanko 2001, BAPEN 1999).

Kowanko et al (2001) studied two hospitals in Australia and used visual plate waste to determine that although the menu provided enough energy for the patients, about one quarter of them were still eating less than half of their meal. Kondrup et al (2002) studied 740 hospitalised elderly patients and found 22% of these patients were at nutritional risk. Of the 'at risk' patients, 80% were observed to be eating less than 75% of their meals.

Appropriate food service provision is essential for the nutritional support of hospitalised patients. This is particularly important for long stay elderly patients, who are increasing in number at a time when malnutrition is also a significant concern and consumer expectations of hospital patients are heightened. The issue of addressing hospital malnutrition and being vigilant in continuously reviewing and improving food service systems and feeding assistance becomes even more relevant as the population ages (Williams 2002).

Spalding (1999) investigated the provision of food to elderly patients in acute hospital wards and found it to be very rigid in practice and that it was not really clear who was responsible for what. Sidenvall et al (1994) also reported 'ritualised practices' with regard to the care of older patients in hospital wards as more emphasis is placed on the work routines of staff.

"Food and eating events constitute a complex phenomenon linking human beings biological nutritional needs to social and cultural needs, habits and formed culinary rules" (Sydner & Fjellström 2005, p49).

The hospital mealtime situation and the provision of food is not planned by the patients and it is felt that more attention should be paid to the organisation of food provision. Mealtime situations should respect individuality and preferences (Dupertuis et al 2003, Hartwell et al 2003a/b, Gibbs-Ward & Keller 2005) and consider the cognitive, social and environmental impacts on dietary intakes (ASPEN 2007).

A number of long stay elderly patients are at a further elevated risk of malnutrition due to dysphagia and the requirement of a texture modified diet, particularly as neurodegenerative disorders such as dementia, delirium and cerebrovascular accident are common reasons for admission. Undiagnosed swallowing difficulties and poor oral hygiene are other potential contributors to poor dietary intakes. Texture modification is now fairly common, with 15-60% of people in long term care reported to be on a puree diet (Germain et al 2006).

Wright et al (2005) used weighed food records to measure the oral intakes of 55 patients; 25 of whom were on a normal textured (control) diet and 30 who were on a texture modified (intervention) diet. The texture modified diet group had significantly lower energy (3877kJ vs 6115kJ; $p < 0.0001$) and protein intakes (40g vs 60g; $P < 0.003$). Ninety-three percent of the patients on the texture modified diets were not meeting their protein requirements, compared to 40% on the normal textured diet, and the average protein deficit was significantly greater (22g vs 6g; 45% vs 9% of estimated protein requirements). These statistically significant findings indicate that older people on texture modified diets have a lower intake of energy and protein than those attempting a normal textured diet.

Improvements to intakes are possible with suitable interventions. Seventeen residents from a Canadian long term care facility took part in a study where eight residents received their meals as a reshaped minced and puree diet and nine received the usual texture modified diet. The average weight change during the intervention was 3.9(+/-2.3) kg intervention group vs -0.79(+/-4.18)kg in the control group; $p = 0.02$. The intakes of energy, protein, fat and some micronutrients were all significantly increased ($p < 0.05$) and wastage was reduced in the intervention group. It was noted that the pleasant appearance of the reshaped texture modified meals meant that the nurses could recognise the items when feeding, provide further encouragement, and that intakes can be increased with more appealing diets (Germain et al 2006).

2.3.8 Food wastage

There are many reasons for food wastage and it is frequently mentioned in relation to food costs in hospitals. *“Waste represents a major clinical problem because it reflects inadequate food intake. It is also an economic problem”* (Donini et al 2008, p8). The level of hospital food wastage varies depending on the setting, diet type and type of distribution system used. It has been suggested that food wastage is likely to be in the vicinity of 30-42% (Kelly 1999, Barton et al 2000b, Schenker 2003). Some food

wastage is inevitable, however large amounts of wasted food has a financial cost, and more importantly it means that patients are not consuming what is provided, and thus they are not likely to be meeting their requirements (Edwards & Nash 1999). Barton et al (2000b) investigated the continuing weight loss and waste in Nottingham, UK. The hospital menu provided over 8360kJ/day and could meet patient needs, yet wastage rates were above 40%. Four wards were investigated, with the range of wastage being 30-42%. The highest rate was in an elderly care ward where energy and protein intakes were low and patients didn't meet their requirements.

'Institutional malnutrition' has been used to describe the ramifications of poor intakes in hospitals (Bender 1984, cited in Edwards & Nash 1999, p89). Patients with extended hospital stays depend mostly on the hospital for their food supply (Fenton et al 1995) and food wastage has been shown to be higher for patients over 65 years. Mean plate wastage has been shown to be less in wards where meals are plated on the ward as they can respond locally to requirements or changes (Kelly 1999, Wilson et al 2000).

Kelly (1999) showed the potential to reduce the total amount of plate waste by changing from a plated, to a bulk food service system. Breakfast had the lowest rate of wastage for both of the wards investigated and the attitude of the staff delivering the meals was highlighted due to the positive effect on patient satisfaction and the perception of quality.

Wilson et al (2000) investigated wastage from pre-plated and bulk meals in a hospital setting. Higher food wastage, and significantly lower intakes of energy, protein, fat and carbohydrate from pre-plated meals. The intake of the main course was particularly higher with the bulk system and more nurses were also available at meal times.

Kandiah et al (2006) measured visual plate waste for 346 patients (mean age 64+/- 26.56 years) over a four day period. The odds of waste increased by 14.1% ($p=0.008$) for each day admitted, diabetic diet orders decreased the waste by 61.2% ($p=0.015$), while texture modified diets increased the odds of waste by 344% ($p=0.007$). This pilot study indicated that a texture modified diet and increasing LOS resulted in greater plate waste and thus lower intakes.

2.3.9 Influences on dietary intakes

Dietary intake in hospital is complex and can be influenced by numerous factors including: the appetite of the patient, their health status, their interest in food,

appearance of the meals, degree of flexibility of the hospital food service, texture modified or restricted therapeutic diet, amount of packaging, assistance required with eating and lack of acceptance of some of the foods provided (Isaksson 1982, Stephen et al 1997, Green 1999, Watters et al 2003). Differences between some patients' and staff concerns about meal times (Kowanko 1997), the lack of recognition of malnutrition (Adams et al 2008), the lack of nutrition education provided to doctors and nurses (Kowanko et al 1999) and the low priority that is given to nutrition by some doctors and nurses (Garrow 1994, Lipski 2003).

2.3.10 What has been done to address suboptimal dietary intakes?

Given the multitude of issues that can influence intakes, successful treatment relies not only on timely nutrition screening and assessment, but also on finding priority, practical intervention strategies that can be monitored so as to maximise intakes by patients. Nutrition support strategies are used in practice to varying extents, and degrees of success, including: the use of commercial supplements (Larsson et al 1990, Volkert et al 1996, Nolan 1999, Isabel et al 2003, Edington et al 2004, Ryan et al 2004), prescription of commercial supplements on the medication charts (Potter et al 2001, Gazzotti et al 2003), high protein, high energy diets, fortifying regular foods with protein and calories (Gall et al 1998, Barton et al 2000b, Kondrup et al 2002), small, frequent meals and snacks (Isaksson 1982, Edwards & Nash 1999, Schenker 2003) and offering a bulk food service, with meal size and food choices available at the time of consumption (Kelly 1999, Hartwell & Edwards 2003a).

The UK has recently introduced concepts such as protected meal times and snack boxes for after hours, as well as reviewing nutrition screening practices, food service provision, including menu options and meal delivery practices.

The English Advocacy Group, *Age Concern*, has highlighted seven steps to end malnutrition in hospitals utilising many simple and cost effective solutions. They include:

1. Hospital staff must listen to older people, their relatives and carers must act on what they say.
2. All ward staff must become 'food aware'.
3. Hospital staff must follow their own professional codes and guidance from other bodies.
4. Older people must be assessed for the signs or danger of malnourishment on admission and at regular intervals during their stay.

5. Introduce 'protected mealtimes'.
6. Implement a 'red tray' system and ensure that it works in practice.
7. Use volunteers where appropriate (Age Concern 2006, p5, 20-26).

A number of these strategies, along with many others have been reported on in the literature. Several strategies have shown much promise, while others still require a significant amount of refinement.

2.3.10.1 Effective communication

Isakkson (1982) referred to nutrition as a key component of care, however it is evident that many other issues such as the amount of staff, time pressures and the priority of some other tasks, such as drug rounds are barriers to feeding assistance and monitoring at the ward level (Kayser-Jones & Schell 1997a, Kowanko et al 1999, Chang et al 2003). The lack of a team approach to nutritional care has previously been documented by others and referred to as an opportunity for further nutrition policy development and intervention improvements (Kondrup et al 2002, Jordan et al 2003).

Effective communication is essential in any environment. It is common to hear that certain long life snack and beverage items are not being consumed, and are left on the bedside table. This is just one real example of where communication can break down because who will communicate this to the dietitian? Will it be the nurse, the food service assistant, the nutrition assistant, or should the dietitian see these at a meal round? The lack of an efficient feedback mechanism between the ward, the food service department and dietitians can lead to over ordering, waste, inadequate intakes and frustration for the patient and the staff. Better systems are needed to communicate important information from the patients to the nurses, dietitians and the food service department regarding their dietary needs. Further examples that require refinement include regular screening and flagging of patients who require nutrition assessment, highlighting those that need to be fed, monitoring dietary intakes and tailoring therapeutic diets to better meet patient requirements.

A lack of nutrition support teams was identified in the UK. In response, a new role of housekeeper or ward hostess has been introduced to assist patients in receiving food services that meet their needs. They have an important role to play in communication (Hall 2000). The lack of a multidisciplinary team approach, a lack of assistance with meals and problems with communication have also been highlighted in Australia, so there are important lessons to be learnt from the UK experience.

“With better co-ordinated nutritional services and support, we expect better outcomes for malnourished older hospital inpatients” (Lipski 2003, p4).

2.3.10.2 High protein, high energy diets (HPHE) and snack boxes

High protein, high energy diets are often prescribed for patients who are referred due to malnutrition, have increased needs and/or poor appetites. Defining a HPHE diet can vary between hospitals. It may mean a diet that has been fortified with energy and protein and includes commercial supplements and/or regular HPHE foods and beverages as mid meal supplements, or it may be the usual or standard diet with commercial supplements at each mid meal. Clearly the nutritional support provided by these diets varies greatly and it is important that supplements are not just used to ‘bandaid’ a low fat, high fibre, ‘healthy’ hospital diet. Mid meal supplements, whether commercial supplements or regular HPHE food based supplements (e.g. chocolate, crisps, cheese and biscuits) need to be targeted and monitored. To this end several Queensland hospitals utilise a mid meal trolley service for patients on HPHE diets and allow them to make their mid meal choice from a range of HPHE options, rather than have specific items (e.g. milkshake) prescribed by the dietitian. This allows choice at the point of service, provides some control back to the patients and as such is an example of individualised care (M Suter 2007, personal communication 1st November 2007 and M Hoyle 2008, personal communication 12th August).

Changes to the way in which food services are provided in the UK have also included the use of snack boxes. A range of snack boxes are utilised that can be provided outside meal times to provide additional snacks and beverages as required for patients who were not present when the meal was served. In Australia the provision of such extras are provided as additional snacks and beverages that are stored in ward kitchen for use when required (Williams 2005).

2.3.10.3 Supplements

Nutritional treatment for malnutrition in the elderly can positively influence body composition, muscular strength for some, in addition to well-being and immune function (Akner and Cederholm 2001). The Cochrane Bone, Joint and Muscle Trauma Group found no significant effect of oral supplements on mortality, but found they may reduce unfavourable outcomes and reduce the number of medical complications (Milne et al 2006). The Cochrane Metabolic and Endocrine Disorders Group reported that oral supplements can improve nutritional status, reduce mortality (by 2.3%, borderline significance) and may reduce complications. Few trials suggested a functional benefit

and there was no significant difference on LOS. A small, consistent weight gain in older people was noted, but both of these Cochrane reviews discussed the poor quality of some trials and the need for more research. This evidence doesn't support oral supplements for people at home or for other people with a sound nutritional status in any setting (Milne et al 2006).

A meta-analysis of trials found that nutritional supplementation reduced mortality in older hospitalised patients (odds ratio 0.86, CI 0.74-1.0). They were particularly useful for those who were undernourished, 75 years or older, and unwell. Hospital patients who received supplements had less complications (e.g. pressure sores and infections) than those who were not supplemented. There was also a trend to a reduced LOS, but no benefits in terms of quality of life or functional status (Milne et al 2006).

Vanderkroft et al (2007) conducted a systematic review that included 29 studies (totalling 4021 patients) that provided nutritional support to elderly patients. The studies included the following interventions: oral nutrition supplementation (15), enteral nutrition support (6), changes to hospital food provision (4), the influence of a feeding assistant staff member (1) and the application of evidence based practice guidelines (3). Ten meta-analyses were conducted on comparable outcomes and they highlighted significant improvements in weight status and arm muscle circumference with oral supplement intervention ($P < 0.05$).

There was strong evidence that significantly improved weight status and increased lean body mass (as measured by arm muscle circumference) is possible via the use of oral supplements compared with standard care in elderly long stay hospital patients. The findings didn't support significantly improved mid arm circumference, triceps skinfold thickness, albumin, pre-albumin, LOS and mortality. There was no conclusion as to which type of oral supplement, what amount or mode of delivery is optimal, and clearly these will vary for individuals. All reviewed food interventions did increase protein and energy intakes but there was no evidence for other health related outcomes, because they weren't measured. There was agreement with the findings of others, including Capra (2007) and Collins (2007) that the use of albumin and pre-albumin to monitor the effectiveness of interventions is inappropriate.

Questions do arise about patient tolerance and compliance with supplements. Ovesen et al (1992, cited in Council of Europe 2002) reported that high palatability doesn't necessarily imply high intakes and that 400-500ml/day is a reasonable expectation for

the elderly. Peake et al (1997, cited in Nolan 1999, p453) reported on improvements to compliance (from 45% to 69%) when supplements were prescribed on drug charts, however there was still much waste.

The availability, range and budget for supplements can vary from hospital to hospital. In Australia, the manufacturers or wholesalers who provide commercial supplements and food and beverage items are chosen via a tender process, along with enteral feeding products. The types of regular HPHE food and beverage type supplements (e.g. cheese and biscuits, cake, yoghurt, puddings and chocolates) are chosen by the food service manager and/or the dietitians.

2.3.10.4 Food Fortification

Food fortification, or the addition of extra energy and/or protein to meals, snacks and/or beverages, is another strategy to improve intakes. This is particularly suited to patients with small appetites as they obtain a greater nutritional benefit even though they still have small intakes (e.g. high protein mashed potato or high protein creamy pumpkin soup versus the standard options).

Gall et al (1998) compared a standard ward (control) diet and a standard diet supplemented with extras (intervention) in the form of cream, fortified soups, cake and sandwiches at afternoon tea and supper to determine if fortified foods and between meal snacks could increase intakes and also allow patients to meet their estimated requirements. This strategy provided an additional 22.6g protein and 966kJ per day to the intervention group. Their energy deficit was significantly lower (-29kJ/day) than in the control group (-1425kJ/day), which removed 82% of the patients from energy deficit. The protein intake was 8.2% higher in the intervention group, but not significant as most of the extras weren't sufficiently high in protein. Future options may include looking at smaller, fortified meal options and the provision of more nourishing snacks. Hospitals often make little provision for snacks, especially with their budgetary considerations, but this is a simple strategy to improve dietary intakes.

Barton et al (2000a) surveyed elderly patients and 42% of them indicated that the portion sizes were too large. Thirty-five patients were then involved in a 56 day crossover study design. They were randomly allocated to a normal diet or a smaller (approximately 20% smaller), fortified diet for 14 days (836kJ more per day, but 5g less protein). Eight patients were not randomised and had the usual diet, plus a cooked breakfast. Energy was added by the addition of cream, butter and glucose polymers.

The fortified menu had 27% wastage and all of the patients had a higher energy intake on the fortified menu, despite it having less volume. Reducing portion sizes is an appropriate strategy as long as the diet is fortified. This study involved a combination of approximately 20% smaller portion sizes, fortified portions and between meal snacks as nutrition support interventions for elderly patients, who often find regular portion sizes too large. They recommended aiming for at least 125-146kJ/kg energy and 1-1.2g/kg protein.

Freil et al (2006) trialled the implementation of a bulk ward based meal service at the tea meal and the addition of increased fat to the menu to increase the energy density. This observational study compared food intakes before and after the study, and was developed in response to the knowledge that adequate food was provided, but not eaten in sufficient amounts. The study involved patients in gynaecology, breast surgery and orthopaedic wards and was 14 days in duration. This intervention included smaller portions, choice at the time of the evening meal and resulted in meals with higher energy density and less wastage. Ödlund Olin et al (1996) also reported significant increases in energy intake when an energy dense diet was provided instead of the 'standard' diet.

2.3.10.5 Plated vs bulk meal service

Meals may be chosen ahead of time and plated in a central kitchen, either hot (cook fresh) or cold (cook chill or cook freeze) for later retherm. Alternately hot food may be sent to the wards areas in a mobile trolley so that patients can select their choices at the point of service. This has numerous advantages including: selections can be made based on current appetite, different serving sizes are available, the aroma and appearance of the meal may assist appetite, more nursing staff may be involved in alerting patients to the arrival of the trolley and thus further socialisation and encouragement of patients. Disadvantages may include: patients need to be mobile to access the trolley, therapeutic diets are difficult to manage this way as the food service staff aren't trained in this area and there is often more food waste (from the bulk trolley, but not the individual patient meal plates) due to the number of options that need to be included in the trolley to cover the menu (Kelly 1999, Hartwell & Edwards 2003a).

Dietary intakes are not entirely dependent on the distribution system used and it is apparent that the patient's state of health, appetite and many other factors have a role to play. Hartwell & Edwards (2003a) hypothesised that the aroma of the food and enhanced staff interaction with a bulk system would result in higher intakes and better

levels of patient satisfaction when compared to a pre-plated system. Although the patients were more satisfied with the bulk system, their dietary intakes weren't significantly better, further suggesting that there are other barriers to 'complete nutrition'.

Hartwell et al (2007) further investigated this concept as it was felt that, *"There is a complex relation between acceptability of food (liking) and intake. The first does not necessarily guarantee the second"* (p212). They considered key influences between the plated and bulk systems and a logistic regression analysis indicated that meal texture, portion size and food service system did have a significant impact on intakes. Links between the role of food intake and changed personal circumstances in hospitalisation have also been discussed by Holmes (1999).

"It could be that in a hospital there is a threshold of consumption, "complete nutrition" whereby the barrier to food intake is hospitalisation" (Hartwell et al 2007, p215-216).

2.3.10.6 Eating environment

Meiselman (2004) outlined that at home and in restaurants people expect the best in food service and in hospitals they expect the worst. Three aspects also need careful consideration: the food, the environment and the person.

"There is a relationship between how much an individual likes a particular food (acceptability) and how much of it s/he eats (intake). Both should be measured because the relationship is a complex one. In some situations, liking doesn't necessarily predict intake" (p4).

Wright et al (2006b) investigated intakes at lunch of 48 patients who ate in a supervised dining room versus eating at their bedside. The dining room group had higher energy intakes than those that ate by their bedside, but there was no difference in protein intakes. There was also no significant difference in weight gain between the two groups, but a trend to increasing weight in the dining room group. The provision of a supervised dining room has the potential to improve food intakes, in addition to providing a good opportunity for social engagement and nursing assistance.

Edwards and Hartwell (2004) studied the dietary intakes of 13 female post surgical patients who were close to discharge home. They either chose to sit around a table, sit by their bed or sit in bed for their meals. Although this study had a small sample size

and the patients chose their eating location it was apparent that increases in energy and carbohydrate were seen when the patients ate in an ambient area that allowed social interaction and limited other interruptions and noise. Eating in a dining room location may also reduce the risk of silent aspiration due to better patient positioning. Numerous factors may influence the resultant increased intakes when sharing a meal with others, but eating posture may be important in improving energy and protein intakes. Additional factors for consideration include: Are they distracted by the social interaction and thus eat more than usual? Do they have more time as they are being sociable while eating and thus take longer, or does the presence of others increase their stimulation to eat? These are all pertinent questions that warrant further consideration.

2.3.10.7 Protected mealtimes

"Protected Mealtimes are periods on a hospital ward when all non-urgent clinical activity stops. During these times patients are able to eat without being interrupted and staff can offer assistance" (Murray 2006, p18).

Protected mealtimes were implemented in some wards and hospitals in England in 2005 as a strategy to allow patients more time to focus on enjoying their meals in a relaxed, quiet manner that is free of other interruptions. This strategy involved much communication between hospital stakeholders, executive management support, acceptance by key clinicians and a positive shift in the profile of nutrition and food services in the hospital setting, as is evidenced by the following quote,

"Busy nurses working in complex environments often struggle to prioritise with so many competing demands. When a whole organisation embraces the importance of protected mealtimes, patients benefit" (Cunningham 2008).

While this strategy has been successful in numerous hospitals and wards, it has not been implemented across all hospitals yet (A McCree 2008, Plenary session, 12th September 2008). The English advocacy group, *Age Concern* recently conducted a survey of 110 NHS Trusts in England and Wales and found that 43% of these have not introduced protected mealtimes (BBC News 25/08/2008).

2.3.10.8 Red tray

Food is often the highlight of the day and many patients need assistance with setting up for their meal, feeding, or may just need longer to consume their meals. Horan and

Coad (cited in Royal College of Physicians 2002) recommend the availability of more nurses at meal times, more education and responsibility regarding nutrition. Sometimes staff may make the assumption that patients are finished, when they aren't, and remove their tray. At other times trays are removed without questioning why they haven't been touched. The 'red tray' was initiated to flag patients that need support with their meal. The introduction of a 'red tray' strategy and WAASP tool (weight, appetite, ability to eat, stress factors and pressure/sore/wounds) has been effective in that it is a simple, practical strategy that can successfully identify to all staff that a patient requires additional support with their meals (Bradley & Rees 2003).

Concerns have recently been raised about the level of uptake of this important intervention. Bradley (2008) who was one of the innovators regarding this strategy has stated, *"Failure to look at individual risk potential could be disastrous. It could cost patient lives"* (p9). An investigation by Age Concern has also reported that only two-thirds of National Health Service Trusts have introduced this strategy (Age Concern 2008).

2.3.10.9 Feeding assistance

Patients sometimes require complete feeding assistance, while others may require help positioning themselves for a meal, accessing the tray table and/or opening food and beverage items. This has traditionally been the role of nurses, however there are many reasons why they may not always be available to provide timely assistance to patients who require this, including: competing duties such as medication rounds, a lack of skills and/or knowledge in screening and flagging patients at risk, meal breaks and increased responsibilities and increased numbers of patients requiring support on some wards (Kowanko et al 1999). An observational study by Xia & McCutcheon (2006) reported that older hospital patients didn't get enough assistance with meals, had frequent interruptions and inadequate social interaction. Tsang (2008) reported that 70% of patients in a Sydney hospital needed some form of assistance with meals, and that designated staff roles were not consistently assigned responsibility for this important task.

Although many studies have been published regarding additional feeding assistance in nursing homes, there is little literature pertaining to hospitals. Simmons & Schnelle (2004) conducted a two day, one-to-one feeding assistance trial with nursing home residents and found that 46% of 134 residents significantly increased their intakes. Those residents who did not improve their intakes by at least 15% were then offered

mid meal snacks three times per day for two days. Forty-four percent of those who were given additional snacks then increased their intakes.

Kayser-Jones and Schell (1997a/b) investigated nursing home residents and reported meal disruptions and the problems patients had with eating. Residents and their trays were poorly positioned at meal time, and nurses were often responsible for as many as 15 residents each. At lunchtimes, a specialist Restorative Nurse Assistant (RNA) fed only two to three patients and took her time with each patient. They found the patients appreciated the time she took with them and this allowed other nurse more time with feeding (Kayser-Jones & Schell 1997a/b).

Steele et al (1997) reported that 46% of 349 nursing home residents ate half, or less of their meal. This study did only look at one meal for each patient, but suggested that those residents who required the most assistance with feeding actually ate more than those requiring little assistance. This may provide further evidence to suggest that additional assistance is necessary not only for those patients who can't feed themselves, but for all elderly patients who do not eat enough in hospitals and nursing homes. Volunteers provide the added benefit of having time to socialise with the patients, and while the impact is difficult to measure, the improved socialisation may certainly contribute to increased intakes.

'Silver Spoons' is the name given to volunteer feeding assistance programs that have been briefly reported on in two different areas of the USA. Musson et al (1997) outlined a volunteer feeding program in a 240-bed nursing home in Miami. A training program was provided to interested administrative staff who volunteered to assist residents to the dining room, open food and beverage items and feed when required. This program has been well accepted by residents, nurses, dietitians and administrative staff. The other volunteer feeding assistance program has been conducted in a New York hospital for about six years. The volunteers are trained and also take part in a mentoring program. They assist patients with the arrangement of their meal tray at meals, encourage them and feed those patients who require it (Christopher 2003).

Remsburg (2004) reported on a six month trial where paid and trained certified nursing assistants (CNA) were rostered to provide assistance with meals to 'at risk' nursing home residents, while supervised by a registered nurse. Socialisation, sitting with patients in the dining room and discussing food while assisting with the meal was encouraged. While a number of these CNA's were very innovative in encouraging

residents and got to know their preferences, there were significant issues regarding punctuality for the three hour shift and retention of staff in this role. These findings suggest that while rostering staff specifically for feeding assistance may avoid other distractions in the workplace, retaining staff and keeping them attentive, punctual and involved may present new challenges.

Hickson et al (2004) studied the effects of employing one additional health care assistant on an acute ward to assist older patients (>65 years) with two meals per day, five days per week. While food intakes were increased in the intervention group, there was no difference in nutritional status, length of stay, grip strength or mortality. The researchers concluded that the use of specialised assistants, without changes to food provision, or the targeting of higher risk patients had limited impact, but did emphasise that the intervention may be better suited to a longer stay setting.

There is evidence that changes in food and dietary practices can have a positive influence on the nutritional status of inpatients. A recent UK study found that rates of malnutrition appeared to have reduced from 23.5% in 1998, to 19.1% in 2003, while rates of referral and increased from 56.5% in 1998, to 71.2% in 2003, as a result of changes in hospital nutrition care strategies (O'Flynn et al 2005).

Clearly there will never be a 'one size fits all' intervention to optimise dietary intakes, just as increasing nutrient provisions in no way guarantees improved intakes. An ongoing concerted effort is necessary on the part of all involved in patient care, from nutritional screening and assessment, menu and food provision, feeding assistance to inpatients and monitoring, particularly for aged and/or long stay patients (Williams 2005).

2.3.11 Food as medicine

"Every careful observer of the sick will agree with this, that thousands of patients are annually starved in the midst of plenty" (Florence Nightingale 1859, cited in Perry 1997, p315).

The BAPEN Report (1999) indicated the need for across discipline working so that hospital food can be used as part of patients' treatment. It is suggested that missed meals should be reported in the same fashion that missed medications are. *"Everyone in the organisation must recognise that it's as important as the drugs on the chart that*

patients are getting meals and consuming them” (BAPEN Report 1999, cited in Stroud 2004, p6).

Improving nutrition and food service provision means a change of attitude and routines, not just for nurses and doctors, but also for hospital management. Implementation of food policy that secures nutritional care and support is essential (Hartwell et al 2006). The use of bulk ward meal services can make management easier, and the use of smaller, fortified meals and snacks can assist intakes and reduce wastage. (Gall et al 1998, Barton et al 2000a/b, Hartwell et al 2003a). The suitability of mid meal snacks also requires consideration as commonly provided biscuits and tea or coffee on a ‘full’ or ‘standard’ ward diet are hardly adequate choices for elderly, long stay patients. Present feeding policies are not designed to meet nutritional needs of the sick and thus much food is wasted and the patient’s nutritional status compromised (Lipski 2003).

‘Nutrition is one of the key ways to deal with efficiency and bring down costs: speed up healing and bring down length of stay. We must keep reminding people that the outcomes of good care don’t just depend on what doctors do to patients. Food and the environment is a critical part of the way people heal.’ (Morgan 2004, p4).

2.4. FOOD SERVICE

Food service systems are abundant in our environment, whether it be a restaurant, a café, hospital, fast food outlet, home or corner store. People are very familiar with food, and with it usually comes choice and socialisation, however when in hospital these accompaniments are likely to be limited which can impact on the enjoyment of the meal and most likely the resultant dietary intakes.

“A food service system is an integrated program in which the procurement, storage, preparation and service of foods and beverages, and the equipment, methods (and personnel) required to accomplish these objectives are fully coordinated for minimum labor, optimum customer satisfaction, quality, and cost control” (Payne-Palacio & Theis 2001, p43).

Appetite varies during hospital stay and can be influenced by a variety of factors including those not related to food service, such as: medical condition, environment, diagnosis and medications (Holmes 1999, Stanga et al 2003).

2.4.1 Changes to the delivery of food services

The hospital meal experience is an essential component of patient recovery and can be reflected in the LOS (Reilly et al 1988). It would seem that big things are expected from the hospital food service, a system that has been described as the most complicated production process in the hospitality sector (Wilson et al 2000). However in reality, food services in public hospitals are often operating on an extremely tight budget as they have traditionally been viewed as a 'hotel' service rather than a therapeutic or clinical service. As such they are usually grouped with general (corporate) facilities, rather than clinical areas (Davis & Bristow 1999, cited in Holmes 1999) and are regularly targeted when hospitals need to contain costs (Tucker & Miguel 1996).

"Staff cuts and budget constraints can impinge upon the ability to provide a flexible, appropriate and timely meal service" (Lazarus & Hamlyn 2005, p42).

Due to the perception of its role, hospital food services usually get little positive attention from hospital management or physicians. Cooks or chefs are often in charge of food services and they are sometimes more attuned to the 'healthy eating' messages, than to the need for enriched foods by many hospital patients, especially the elderly, already 'at risk' patient that is often seen today. There is often a *"Lack of a powerful voice for food service systems, unlike clinical services, when it comes to financial control and the allocation of budgets"* (Council of Europe 2002, p55).

A review of the average national expenditure (per separation) on several hospital related services assists in describing the poor position of food service in Australian hospitals. New South Wales has the highest food expenditure, with \$49 (1.2%) of the \$4006 for an average patient separation spent on food, while the national figure is \$37 (0.96%) from \$3839. In contrast, domestic services are allocated \$86 (2.2%), repairs/maintenance \$83 (2.2%), medical supplies \$338 (8.8%) and drugs \$195 (5.1%) (Australian Institute of Health and Welfare 2007).

Numerous changes have occurred to food services in New South Wales (NSW), Australia in recent years, due to such things as improvements in technology, national food safety legislation and financial considerations. These have included the significantly increased use of cook chill technology, from 18% in 1993 to 42% in 2001 in NSW ($p < 0.001$) (Mibey & Williams 2002), increased clustering of health services and resultant central kitchen production units (CPUs), increased use of computerised menu and food management systems, shorter menu cycles, reduced provision of a

cooked breakfast, increased use of pre-packaged, portion control food and beverage items, less customisation of meals and snacks, less choice of food at point of service and less time available to assist patients. Not surprisingly, research indicates that many food service managers are not satisfied with the recent food service changes (Mibey & Williams 2002).

2.4.1.2 Types of food service system and distribution system offered

Food service departments may utilise cook fresh, cook chill, cook freeze, or a combination of several of these systems. In a cook fresh system, food is prepared close to the meal time and the hot food is plated hot after some time in 'hot holding', which usually involves holding bulk gastronomy trays of food over a customised hot water bath (bain marie style) (Payne-Palacio & Theis 2001, Spears & Gregoire 2007). To maximise nutrient retention, quality, colour and flavour the time in 'hot holding' should be kept short (ideally <30mins, but certainly <90mins) (Williams 1996).

A cook chill system involves food being cooked in advance and then rapidly chilled for retherming at a later stage. Advantages with this system may include: the availability of further main meal choices at the evening meal because the meals are prepared in advance, improved temperature control, cost savings due to bulk buying and because no cooks are required in the evening, or on the weekends when additional wage penalties would be in place (Payne-Palacio & Theis 2001, Spears & Gregoire 2007). Disadvantages include that some items are not available as they don't retherm well (e.g. boiled eggs, crumbed items, steak); some foods dry out so sauces or gravies are usually required; and for this reason more wet dishes are often used (Light & Walker 1990).

Cook freeze is similar to cook chill, except that the meals that are cooked in advance are quickly frozen (rather than chilled) in a blast freezer for use at a later stage. Items may be frozen in bulk or as individual portions to provide greater menu flexibility, particularly for patients with special dietary requirements (ie. gluten free). Each method of food preparation and delivery has their own advantages and disadvantages in terms of nutrient losses, flexibility, wastage, food safety, staff skills required, food appearance and palatability (Payne-Palacio & Theis 2001, Spears & Gregoire 2007).

There has been an increase in the popularity of the cook chill food service system in recent years due to the apparent cost savings from the development of central production units (CPUs) and the resultant centralised meal plating ahead of the meal

time. This has been met with some reluctance by dietitians and food service managers as it often means that 'traditional' kitchens are modified to either produce cook chill food, or receive and retherm (called satellite receival kitchens) food from another site. Cooks usually work the day shift only and the staff have indicated that they feel that they are not as able to customise options for individual patients who may have special needs (e.g. scrambled egg for a very unwell, frail patient) and that they rely much more on pre-packaged, portion control items as extras (Walton et al 2006a). They may plate meals in a central location (ie: kitchen) or in a decentralised location (e.g. at ward level from bulk gastronom trays of food).

Up until the 1950's, most hospitals in Australia used a cook fresh, decentralised ward delivery system using either a mobile bain marie or covered, insulated serving containers. The meal distribution and accuracy of diets provided was the responsibility of the nursing staff on the ward (McDonald 1984). Since this time, there has been a trend to centralise plating and the responsibility for the plating and delivery of meals has largely shifted to food service or catering departments. Mibey & Williams (2002) reported that approximately 89% of NSW hospitals utilise centralised meal plating. This has had not only the obvious implications on the role of nurses in food service provision, but also an influence on the amount of assistance provided, and the level of knowledge about patients dietary intakes and the way in which dietary intakes are monitored.

2.4.1.3 Menus

The use of shorter length menu cycles has become more popular in recent years. While one, two, three and four week menu cycles are still used, there has been an increase in the number of two week menu cycles, and a number of sites now utilise a one week menu cycle, which is usually rationalised around an ALOS that includes day only patients. Mibey & Williams (2002) reported that 16.2% of NSW hospitals offered menus with less than a 14 day cycle in 2001, compared to only 6.5% in 1993; while 14 day cycles represented 50.6% of hospitals in 2001, compared to 42.5% in 1993.

Menu options are now being made in various ways in Australia. While the traditional paper menus are still available in many settings, software programs, such as CBORD® food management systems are used in some settings to generate paper menus, or to facilitate a spoken menu via palm pilots that are operated by nutrition assistants. Meal choice at the point of service is also used occasionally (e.g. bulk hot meal trolleys in some wards). The method of offering options can subtly alter the variety that is offered,

which has ramifications for resources, both human and otherwise. A patient sees all the available options allowed on a paper menu, while a spoken menu means that patients may just say yes to the first option, or alternately the last one offered, which they may remember. This system obviously lends itself well to a cook chill or cook freeze system where food is prepared ahead of time and the first option (which if accepted may be the only one offered) is historically the most popular option and thus pre-made in the largest quantities.

Australian hospital menus have also seen a reduced use of the standard hot breakfast. Dunn & Williams (1995) found that 47% of the hospitals surveyed had changed from a cooked breakfast to a continental breakfast, with a cooked breakfast usually still available for patients with special dietary requirements (e.g. HPHE and/or texture modified diets). In recent times, it seems that the continental breakfast has declined a little from 47% in 1993, to 40.2% in 2001, yet it is still significantly higher ($P < 0.001$) than the 4% that was reported in 1986 (McClelland & Williams 2003).

The available options on menus and the components within meals are not always explained well to patients. Berlin et al (1991, cited in Council of Europe, p76) reports that 82% of patients receiving a texture modified diet had never been able to make selections, rather the lack of available choices meant that a standard meal was always provided. Patients who are from non English speaking backgrounds may also be disadvantaged regarding menu selections due to their limited understanding of the English language in written or spoken form and due to the fact that cultural requirements are likely to limit their available options within many hospital menus.

2.4.1.4 Aesthetics

Hospital food has a poor image, and as such some patients assume it will be poor quality, before even tasting it (Beck et al 2001b). Presentation is often a problem, with spilt food, burnt soup bowls, similarity in texture and colour of midday and evening meals being among the cited issues (Holmes 1999).

“Food does not have to be of a high quality for the patient to be satisfied as satisfaction is a comparison between an expectation and a reality or experience. Patients may expect the food to be very poor, and as a result will be inclined to rate ‘ordinary’ food well” (Capra 1998, cited in Fallon et al 2008, p44).

Food service should be a key part of clinical care, not an 'afterthought' (Hartwell et al, 2007, p216) and as such the meals should be presented in an appealing manner. Institutional food has a reputation of '*predictable awfulness*' (Bender 1984, cited in Hartwell & Edwards 2003a, p134). Cardello et al (1999) reported on the poor attitudes and 'stereotypes' that consumers held regarding institutional foods. Poor variety, poor sensory characteristics, inadequate presentation and set up of the eating area were several key issues identified. Several nursing home studies have highlighted the positive influence of further meal assistance, encouragement, and a more 'homestyle' approach including: socialisation, music, fine tableware and choice at point of service on dietary intakes (Njis et al 2006, Desai et al 2007).

2.4.1.5 Bedside vs dining room options

The consumption of hospital meals seems to routinely take place in bed, or at the bedside, and to a lesser extent in a designated dining room. Mibey & Williams (2002) reported that 82% of NSW patients ate meals in bed or at their bedside, compared to 17% who ate in a dining room or other area, and 1% who ate meals in a designated dining room. Eating meals away from a dining room can make access harder as the tray and/or tray table may be out of reach, the position of the patient may not be optimal and the ambience is far from ideal (McGlone et al 1995). One major influence on inadequate intake is unsatisfactory eating arrangements and unfortunately many hospitals are built without patient dining rooms, and when present they can be very sparse (Allison et al 2000). A number of elderly patients have dysphagia and there is an increased risk of silent aspiration when frail elderly patients consume meals in bed. Safe and appropriate positioning during meal times is important to improve dietary intakes.

In considering factors influencing dietary intakes it is important to consider the meal 'situation', which includes such aspects as the atmosphere, type of food service system, meal timing and staff attitudes (Edwards et al 2003). Patient satisfaction with meals has been shown to be dependent on who delivers them and the patient 'threshold for consumption' (Hartwell et al 2007). The availability of a dining room, or at least a bulk ward delivery system allows a more customer focused operation, rather than the product-focused operation of pre-plated cooked meals (Hartwell & Edwards 2003b). Edwards & Hartwell (2004) reported increased macronutrient intakes when patients ate their meals with others.

2.4.1.6 More pre-packaged, portion control foods and beverages

Commercial, portion controlled, packaged food and beverage items have become more popular in hospitals for a number of reasons, including standardisation of serving sizes, food safety and budget. Tiivel & Davidson (2002) highlighted concerns with these items, particularly for rehabilitation patients who are encouraged to be independent, but who may find the types and number of packaged items overwhelming. Suggestions have been made regarding lobbying manufacturers and liaison with food service departments regarding this issue. Changes are needed to the types and/or amounts of packaging, so as to meet the needs of an ageing population with regard to accessing their hospital foods and beverages (Schenker 2003, Watters et al 2003, Xia & McCutcheon 2006, Yoxall et al 2007, Tsang 2008, Vivanti et al 2008)

2.4.1.7 Monitoring

“Patients are asked about their bowel habits almost every day and this is diligently recorded. Why not their food intake?” (MacFie 1998, in Council of Europe 2002, p75).

Gallagher-Allred et al (1996) highlighted the importance of many types of nutrition related monitoring in hospital, including regular weights, food charts and supplement intakes. It is suggested that by simply recording body weight routinely that there is an improvement in the frequency of review.

Even when well, the perception of food taste is highly individual. Thus it makes sense that monitoring of intakes should be conducted, particularly for those patients who are identified as not eating well. Quite often such patients will be prescribed a HPHE diet that will incorporate commercial supplements at mid meals. It is not uncommon to see these supplements ‘stockpiled’ at the bedside for a variety of reasons, which may be as simple as not liking the flavour, through to fatigue, poor appetite, not being able to open them or because they don’t want them.

Food intake charts are often commenced for patients who are not eating well, in attempt to monitor their intakes at the three main meals, and sometimes at mid meal snacks. However the usefulness of these is often limited due to the incomplete nature of them and the fact that they are at times filled in afterwards from memory, or before the end of the meal (Schenker 2003). This topic is closely linked to the importance of communication. Optimal monitoring would involve a nutrition support team, where priority patients would be started on food intake charts and the resources would be available to complete them efficiently and to communicate the findings to the relevant

staff members in a timely manner. Regular quality reviews are required to monitor intakes, the acceptance of the menu overall, the level of wastage and thus the resultant dietary intakes (Council of Europe 2002).

2.4.1.8 Food safety and hygiene

Food safety is critical, particularly when preparing and serving food for hospitalised patients who are likely to be more susceptible to foodborne illness due to their ill health and decreased immunity. National food safety legislation was introduced in Australia in 2001 and a risk benefit analysis categorised hospitals and aged care facilities into the 'high risk' category (Food Standards Australia New Zealand 2008). Many Australian hospitals now use the Hazard Analysis and Critical Control Point (HACCP) planning system to identify and minimise food safety risks and to develop their food safety program. Third party food safety auditing of hospitals will be mandatory in NSW hospitals from 1st March 2009 (NSW Food Authority 2008).

Some items have also been removed from menus (e.g. egg flips due to the presence of raw egg), long life portion controlled items (e.g. tetra pack commercial supplements and thickened fluids) are used more readily, in house food and beverage items have use by dates, meal trays are left at the bedside for a specified time and foods brought in from home are monitored more closely. While food safety is paramount, it is also essential that patients can get access to the items provided, that the range is acceptable and that suitable food and beverage items are available in ward kitchens for consumption between meals when required.

2.4.1.9 The evolving role of nurses

Provision of foods and beverages has traditionally been the role of nurses (Kowanko et al 1999). While nurses may view the nutritional care of patients as an important aspect of their job, increased time pressures and competing tasks may mean that they are not able to prioritise feeding above other duties, such as the distribution of medications at meal times (Kowanko et al 1999, Dickinson et al 2005). Most research in this area has reported common themes of time restraints and staff shortages. Attention by nurses and other staff to patient meal times can have a positive affect on patient eating habits (Kayser-Jones & Schell 1997b, Chang et al 2003, Dickinson et al 2005).

Changes to hospital food service over the years has largely seen the removal of the previous 'hands on' approach to feeding with bulk meal services on the wards, assistance and monitoring by nursing staff (Chang et al 2003, Dickinson 2006). The

changes to plated food service systems and the reduced availability of food items in ward kitchens mean that much nursing control had been removed from main meal and snack times (Wilson & Lecko 2005).

Nurses have also referred to competing agendas, difficulty in prioritising nutrition above other demands, lack of staff, time issues, budget cuts, and inadequate training on nutrition as potential issues that can also influence the feeding assistance and monitoring of intakes by nurses (Kowanko 1997, Chang et al 2003). Meal breaks for nurses may also coincide with patient's meals at times, which further diminishes the supply of assistance available for meal set up and feeding assistance. The available nurses will at times be doing medication rounds or ward rounds, and thus will not be able to assist with feeding.

Changes to the roles of registered nurses mean that often more junior nursing staff are the ones providing feeding assistance in practice and they are likely to have the least nutrition knowledge (Kowanko et al 1999). Less qualified staff are often assigned to feed and assist patients, which may further devalue the importance of meal times and patient feeding (Dickinson et al 2005). Well planned job descriptions and appropriate training is therefore required for registered nurses, enrolled nurses and their assistants (BAPEN 1999). While it is acknowledged that the number of patients needing assistance varies, it certainly won't get less with an ageing population.

Kondrup et al (2002) discusses the lack of knowledge and instructions to deal with nutrition related problems. The requirement for a knowledgeable, motivated and well connected nutrition team approach to improve nutritional care in hospitals is emphasised (Perry 1997, BAPEN 1999, Lazarus & Hamlyn 2005, Bachrach-Lindström 2007). Changes to nursing practice at mealtimes are possible. Dickinson (2006) utilised action research to demonstrate the many positive changes that had been made in an English hospital ward, including: engaging with patients, embracing protected mealtimes and the timely provision of assistance.

2.4.1.10 Changing consumer expectations

Patients and their relatives do at times express their concern over the lack of availability, the quality of some foods and beverages, communication and the lack of assistance for those requiring feeding. It is postulated that more education is required for staff and patients, and that there is a key role for dietitians to play (Spalding 1999).

Consumers have higher expectations these days and are also much more familiar with food when compared to medical procedures or treatments. Patients are likely to feel more able to comment and complain about the food service aspect of their care. They may also feel that food and visiting are the high points of their day (Association of Community Health Councils 1997, cited in Edwards et al 2000, p265).

Stanga et al (2003) conducted a questionnaire with patients in two Swiss hospitals and found a negative correlation between LOS and the level of satisfaction with the food. There are few studies investigating the quality of the food that is used to provide patient nutrition requirements, and it is postulated that there are three perspectives to consider: the nutritionist (are they meeting their requirements?), the economist (what are the costs and what is wasted?) and that of the patient (choice, timing, presentation and preferences all need consideration). This study looked at the patient's perspective and reported on important considerations, including flavour, temperature and a reduced appetite when compared to home.

It is recommended that hospital patients enjoy their meals in a relaxed environment, where there is minimal disturbance at meals (Deutekom et al 1991). The fact that this is often not the case in practice does impact on dietary intakes. Patients and staff may have very firm views about their expectations and may also be in favour of 'healthy' which is not good if they are malnourished and need to consume energy dense foods and beverages to assist weight gain and recovery (Allison 1999, cited in Holmes 1999, p176). Financial constraints and economics within hospital food service can also limit the options provided which means that the service on offer doesn't always match patient expectations. For short term patients a reduced level of satisfaction is annoying, but for long stay patients it is much more serious.

2.5. GAPS IN MEETING THE NUTRITIONAL NEEDS OF ELDERLY PATIENTS VIA THE FOOD SERVICE SYSTEM

The Council of Europe (2002) document titled, '*Food and Nutritional Care in Hospitals: How to Prevent Undernutrition*' highlighted five issues that need to be addressed in order to improve food services provided to hospital patients. These included:

1. The lack of clearly defined staff responsibilities.
2. A lack of sufficient nutrition education.
3. A lack of influence and knowledge of patients.
4. A lack of cooperation between different staff groups.
5. A lack of involvement from hospital management (Council of Europe 2002, p15).

The recent UK and European experiences regarding changes to food service provision have included such strategies as: chef designed menus, protected mealtimes, improvements to screening, improvements to communication between staff groups, ward hostesses and snack boxes. While there have been some successes with these approaches, and possible options for use in Australia, there is still more work to be done in the UK and Europe.

Mikkelsen et al (2007) reported that although the outlined initiatives are very important, they have had little impact on the food service provided in Danish hospitals. Around three million Euros have been spent to focus on the establishment and maintenance of cooperation between professionals, adequate exchange of information between the wards and the kitchen, recipe and menu development. Recipes and menus were developed with HPHE options in mind, however general knowledge of nutrition is still limited amongst health care staff and there are differing priorities regarding nutritional care, with longer term solutions needed (Almdal et al 2003, Kondrup et al 2002 and Lassen et al 2006).

“Food delivery for elderly hospital inpatients is a complex task” (Lipski 2003, p44).

It is evident that the adequate provision of food and nutrition services in hospitals to best suit elderly, long stay patients is an enormous collage that is interwoven with numerous facets including: professional expectations, patient expectations, personalities, behaviours, strategies, budgets and communication. It is apparent that much work has been done investigating supplements and some research has been done on the impacts of food fortification, eating location, bulk versus plated delivery on resultant dietary intakes. Much of this research has been conducted overseas, although during the course of this thesis there has been an increase in the number of Australian peer reviewed publications, including both review and original research publications.

2.6 CONTRIBUTION OF THIS THESIS

The research contained in this thesis considers the meaning of food and nutrition services in Australian hospitals. A triangulated approach has been utilised to investigate current practices regarding nutrition and food services in Australia from a range of perspectives, as well as to identify and measure key barriers to dietary intakes and priority interventions. A cumulative approach was utilised to progressively link knowledge from each study and build on in order to better understand the social,

behavioural and biological influences in providing adequate nutrition and strategies likely to succeed.

This research explored the current state of nutrition and food services offered in Australian hospitals, from a number of key stakeholder perspectives. Positive and negative aspects were highlighted and dietary intakes of aged care rehabilitation patients were documented to flag priority interventions. In the current climate of cost effectiveness, and where food services are still seen as 'hotel' services, the cost and feasibility of several interventions needs careful consideration. The findings and resultant publications aim to assist in advocating for lifting the bar regarding nutritional support, moving towards a '*Food as Medicine*' philosophy in institutions and encouraging feasible, priority interventions.

The next chapter outlines the methodology underpinning this research. It describes and critiques each of the methods utilised in the research, reported in subsequent chapters.

CHAPTER 3 METHODOLOGY

3.1 INTRODUCTION

This chapter is integral in laying the foundations in the form of the context, methodologies and methods used in this thesis. The research in this thesis considered social, behavioural and biological aspects of food service in Australian hospitals. There was a rich ethnographic focus, combined with the use of questionnaires, nutritional assessment and the measurement of dietary intakes. As such the position of the researcher is discussed, before a methodological model is outlined, which is followed by a detailed overview of the methodology.

3.2 THE POSITION OF THE RESEARCHER

As much of this research is ethnographic in nature, it is critical that the position of the PhD candidate is acknowledged and discussed from the outset. This research topic had been a particular interest for some time while considering studying for a PhD. The topic was discussed and melded further after discussions with the PhD supervisors, Associate Professor Peter Williams and Professor Linda Tapsell.

My experience as a dietitian working in public hospitals for a number of years highlighted issues relating to the food choices available at meals, the choices of food and beverages at mid meals, the usage of supplements, the roles of different stakeholders, serving sizes and the amount of assistance available for feeding. My later roles, firstly as a dietitian/food service manager and then as a food service dietitian/quality and food safety manager helped to increase my awareness of the competing agendas, the roles of different hospital stakeholders and the way in which quality is measured and interpreted in hospitals today. These roles provided me with a more thorough understanding of the perspectives of food service managers and dietitians and I attributed this to experiential learning while wearing 'both hats'. Further experience and awareness about budgetary constraints, a better understanding of communication between key stakeholders, continuous quality improvement activities, menu review and food safety initiatives followed. Thus the scope of this thesis reflects my own experience in working within several hospital food service settings.

A number of student dietitians from the University of Wollongong were also involved in this research. They assisted in the data collection phases of the two hospital ward based studies (outlined in Chapters 6, 7 and 8). One of the students was a medical

doctor from overseas, who had many previous hospital experiences, while all the other students were 'new' to the hospital setting. Ethics applications were completed and the students were trained by the PhD candidate, so my influence was evident in the data analysis and interpretation.

My previous experience working in a number of roles in numerous hospitals left me with knowledge of some of the factors that impact on the dietary intakes by hospital patients. It also allowed access to a number of staff and association networks (eg. DAA and IHHC), particularly in NSW. It should be highlighted that not all my previous experiences and issues were negative in regard to the provision of hospital food services. However exposure to changes in the delivery of hospital food services, and particularly the introduction of cook chill services, a central production unit and the wastage of a range of food and beverage items did stimulate my particular interest in this research area to explore the component parts more thoroughly and ultimately prioritise a range of beneficial interventions. These experiences should be considered when reviewing this research, although maintaining objectivity was considered extremely important throughout all of the studies.

3.3 THEORETICAL BACKDROPS

3.3.1 Customer focus in health services research

This thesis draws on the notion of customer focus as a key in health services research. Patient satisfaction or dissatisfaction is a complicated phenomenon that is linked to expectations, state of health, personal characteristics, in addition to health system characteristics (Ford et al 1997). Measuring the quality of an intangible product or service, such as the quality of the medical care or the food service provided, is always challenging (Ford et al 1997, Ramirez Valdivia & Crowe 1997, Lim & Tang 2000, Torres & Guo 2004).

However in this era of customer focus and tighter resourcing it is essential that continuous quality improvement plans are in place to meet, and even exceed customer expectations. Furse et al (1994) refers to the importance of customer satisfaction in quality review and change processes, and defines customer satisfaction as, "*The measurement of one or more of a variety of customer opinions including ratings of service quality, future behavioural intention, patient self-assessment of outcome, and satisfaction*" (p16). Understanding patients' perceptions of quality and their level of satisfaction is needed to achieve this (Bolch 1999). Recent developments include not

only regularly gathering the views of service users (Wensing & Elwyn 2002, Torres & Guo 2004), but also involving them in the development and interpretation of research (e.g. survey development), otherwise the survey may only measure what the managers think is customer satisfaction (Turner & Pol 1995, Bolch 1999).

'Customer focus' suggests there is a definite need to know and understand the views of customers, who include patients and staff, in order to continue to improve services. Patients are becoming more informed about their rights and this has had an impact on their expectations of hospital services, and their right to complain and make comments. Conning et al (1997) explains a "*Shift towards consumerism in health care in recent years and the increasing importance of patient satisfaction has placed great emphasis on the need to elicit the views of users of the services we provide*" (p31).

The measurement of patient satisfaction and the need to ensure an avenue for regular patient feedback is essential in service reviews and continuous quality improvement plans to allow patients the opportunities to provide opinions to health care professionals (Wright et al 2003). Gregoire (1994) indicated that the food provided, and the way in which it is served can influence a patient's level of satisfaction with the whole hospital experience. Dreachslin et al (1999) also discusses the extreme importance of customer focus and food service satisfaction in highlighting that even though most patients usually can't critique the technical or medical aspects of their care, they usually have a view about their level of satisfaction with the food service provided (Dreachslin et al 1999).

The quantitative approach using surveys or questionnaires appears to have historically been the most common, probably due to its familiarity, ease of administration, reach, distance from the interviewee and low time costs (Conning et al 1997, Evason & Whittington 1997). However surveys or questionnaires are sometimes criticised for their concentration on 'hotel' style aspects of care, their 'blandness' and 'tendency to produce undifferentiated positive responses'. Most patient surveys don't allow an exploration of complex issues or a discussion about opportunities for further improvements, which can be a significant limitation (Evason & Whittington 1997). However well developed tools are possible and Capra et al (2005) reported on the six year development and validation of a reliable survey tool to assess the level of satisfaction with food service by acute care hospital patients in Australia.

3.3.2 Food service research in hospitals

Most hospital food service departments routinely conduct reviews of food service satisfaction, food quality, service quality, the type of food service production system used or the type of meal distribution system. As such, hospital food services usually use inpatient or post discharge surveys or questionnaires to elicit patient responses about their satisfaction with the food service provided during their stay (Bélanger & Dubé 1996, Gregoire 1997, Lau & Gregoire 1998, Bolch 1999, Lim & Tang 2000, Watters et al 2003). The focus is primarily quantitative, with the exception of possible taste testing panels for new menu items. In most hospitals, these reviews are rarely done in sufficient numbers to be collaborated with others and published.

A qualitative approach to food service review, using focus groups alone or in combination with a quantitative survey has started to become more popular (Alspach 1997, Wensing & Elwyn 2002, Fade 2003, Merkouris 2003, Abusabha & Woelfel 2003). Restricting to one paradigm can result in limited understanding and it is suggested that patient satisfaction surveys not be used as the only method of review (Fossey 2002). Fade (2003) suggests “*Quantitative and qualitative approaches are both required if we are able to get a full understanding of the issues*” (p139). The combined method provides a clearer picture and deeper understanding of people’s experiences and view (Conning et al 1997).

Patient satisfaction with hospital food services is a complex, multidimensional construct which includes technical, environmental and interpersonal factors (Dubé et al 1994, Gregoire 1994). However hospital wide surveys usually only ask a few general questions about food service, which are not enough to get detailed feedback about the technical and interpersonal aspects that are needed (Wright et al 2003).

Lafferty et al (1997) discussed the need to establish and maintain quality management programs for the systematic monitoring and evaluation of hospital food and nutrition services. It is argued that these quality management programs need to be well organised, timely and to involve a range of appropriate methods and stakeholders.

Each of the three factors: quality, costs and satisfaction are linked as is highlighted by the brief consideration regarding possible perspectives of different stakeholders. Obviously the quality of the food services will impact on the costs of providing the service, and also on the satisfaction of the customers, including patients and staff. Obviously the reverse will also occur, as changes to available services and costs will

impact on the perceived quality and satisfaction. Acknowledgement of different stakeholder opinions about aspects such as these was the basis of a combined stakeholder approach in the investigation of a contextual analysis of food services in Australian hospitals (Chapter 4). A range of different methods and stakeholders were utilised in order to examine issues from different perspectives and to 'triangulate' the analysis to review current practices, and to shape future practices and research.

3.4 FURTHER THEORETICAL CONSTRUCTS: QUALITY, QUALITY ASSURANCE AND CONTINUOUS QUALITY IMPROVEMENT

3.4.1 Quality

Quality has been defined as *"Characteristics of a product or service that bears its ability to satisfy stated or implied needs"* and *"A product or service that is free of defects"* (American Society for Quality, cited in Spears 2007, p33). Quality is essential to the success of hospital food service operations, and 'quality' may refer to food (e.g. taste, temperature, serving size, menu choice) and service components (e.g. timeliness of delivery and courteousness of the staff). These facets may also be referred to as tangible and intangible aspects.

Capra et al (2005) reported food quality as the factor that explained the highest percentage of the total variance (37%) in patient satisfaction with food services. Many other studies have shown food quality to be the strongest predictor of patient satisfaction with food services (Dubé et al 1994, Lau & Gregoire 1998, O'Hara et al 1997), while other studies have found service quality to be the best predictor (Gregoire 1997, Bélanger & Dubé 1996). Garbutt et al (2003) discussed the technical and service quality aspects of patient care and reported poor food quality and incorrect meal items as the most common food service complaints. It is usual that patients judge the quality of their health care by the quality of the service they receive. DeLuco & Cremer (1990) highlighted food quality and service as factors important to the patients' level of satisfaction with the hospital.

As far as hospital care is concerned, most people are more qualified to comment on the food service aspects of care, than their medical investigations or treatments. However, in saying this a number of aspects need consideration, including the fact that their nutritional care may be hindered by periods of nil by mouth (NBM), therapeutic test diets or necessary prescribed diets (e.g. texture modification or renal diet) which

will influence their choices and resultant views of the diet provided. Further, it will depend on what methods are used to measure quality (e.g. questionnaires, plate waste, interviews or a combination) as some hospital questionnaires only include a few food service questions and many are not validated (Wright et al 2003).

A final point that needs to be raised is the issue of who is assessing the quality of the food service provided. As already elaborated, different stakeholders may have different aspects of quality that they deem to be important. Patients not being satisfied with a menu and rating the quality poorly, doesn't have to mean that it is a poor menu or service, it may be that the food is higher in fibre and lower in fat and sodium than what the patients or staff may usually eat. Clearly such poor ratings would need further investigation, but it needs to be highlighted that patient and staff satisfaction does not necessarily equal nutritional quality. The determinants of satisfaction and quality are numerous and the interplay is a complex phenomenon, which leads to the necessary consideration of measuring quality, firstly in terms of quality assurance and then in a cyclical, more proactive form, that of continuous quality improvement.

3.4.2 Quality Assurance

"Procedure that defines and ensures maintenance of standards within prescribed tolerances for a product or service" (Thorner & Manning 1983, cited in Spears & Gregoire 2007, p36).

Quality assurance (QA) is used routinely in hospital food services and the accreditation of hospitals and is a quality tool to compare products and outcomes to pre-determined standards. Examples include: serving size audits of foods and beverages, temperature audits of hot and cold foods, microbiological review of prepared foods, staff and patient satisfaction questionnaires and menu assessment. It began in the 1970's, and although very popular, it is also a rather reactive process as it involves comparing products and procedures against accepted standards and looking for agreement and determining inconsistencies and errors that require improvement.

Recognition of appropriate standards and measuring products and services against these is central to quality assurance. It allows consideration of whether or not a standard is being met and should result in changes to practice where there are deficiencies. However, one needs to consider who sets the standards, what they mean to all involved and how often they are reviewed? Additionally, how does one deal with

changes to practice, new processes and incorporate a more proactive, team oriented approach to measuring and reviewing quality?

3.4.3 Continuous quality improvement

Continuous quality improvement (CQI) is a more recent approach to refining and improving quality and may be defined as, “*A focused management philosophy for providing leadership, structure, training, and an environment in which to improve continuously all organisational processes*” (Shands Hospital, 1992, cited in Spears & Gregoire 2007, p36). It fits with the principles of total quality management (TQM), which include: a customer focus, review of processes, team approach, long term commitment and building quality approaches into everything that is done (Spears & Gregoire 2007).

A pertinent food service example of CQI is the use of the hazard analysis and critical control point (HACCP) system for managing food safety. HACCP is a proactive, systematic method of reviewing all the physical, chemical and microbiological hazards that may be a risk at any step (from ordering of ingredients to the warewashing of cutlery and crockery) in the production of meals. Critical control points (e.g. cooking of meat) can be determined and critical limits (core cooking temperature of 70°C for at least two minutes) and corrective actions (e.g. cook to meet the critical limit or discard) can be put in place to minimise these risks. This system involves training, a team approach, management support, the empowerment of employees, thorough documentation and review of the process at every step.

It is important that the dimensions of quality being investigated are not only measured, but are reflected upon, considered from different perspectives and interpreted to assist understanding and ongoing improvement. A team approach is particularly important as it allows consideration of a number of perspectives, communication about issues and the chance to collaborate regarding the best way forward. A further challenge to researchers conducting food service research in hospital based settings is to go beyond the well known survey based methods and to embrace a range of other methodologies, including those of a qualitative nature, or a combination of both qualitative and quantitative methods may be used to investigate patient opinions and the level of satisfaction with the food services provided.

3.5 A METHODOLOGICAL DESIGN FOR THIS RESEARCH

This research aimed to study the context of food service provision in Australia and used a combination of qualitative and quantitative methods to do so. Several studies have combined focus groups with another method. While some studies refer to hospital services and community settings, there appears to be a lack of published data on combined methods in hospital food service reviews.

Abusabha and Woelfel (2003) discussed the use of a survey and focus groups to review barriers to people using a supplementary nutrition program for women, infants and children. They suggest that the combined approach is a type of 'cross-validation', where the two in conjunction may cancel out their respective weaknesses. They concluded they would have missed several important factors without the combined approach, but would not have had enough reach without the surveys.

Watters et al (2003) reviewed the perceptions of the hospital food service using focus groups with post discharge patients and nurses, and individual interviews at meal rounds with inpatients. The focus group approach was utilised to allow exploration of issues and any identified themes were utilised in the planning of the meal round interviews that followed. A qualitative approach was incorporated, as it was felt that a more structured approach may not have captured the pertinent issues.

Merkouris et al (2004) utilised a quantitative and qualitative approach to investigate patients' satisfaction with nursing care. They utilised individual face-to-face interviews that incorporated an interviewer administered questionnaire, followed by a series of open ended questions. The technical components of care received the highest ratings, while information delivery received the lowest. The open ended questions revealed their perception of the nurses as weak against organisational limitations. They concluded that the combined approach allowed a more complete understanding of their topic.

Figure 3.1 outlines the methodological framework that incorporates the five studies. Focus groups (Chapters 4 and 8) allowed a rich description of the context from numerous perspectives, while semi-structured interviews also augmented this review (Chapters 4, 7 and 8). The use of a survey (Chapter 5) allowed a number of pre-determined components to be measured and interpreted from three very different perspectives. Observations within hospital settings allowed the behavioural aspects to be explored in 'live' long stay hospital environments and to triangulate the views

expressed by other methods. Dietary intake studies, nutrition assessment and estimated energy and protein requirements allowed outcome measures to be considered, firstly in an inpatient rehabilitation setting (Chapter 6) and later during the implementation of a prioritised intervention, being a volunteer feeding assistance program (Chapter 8).

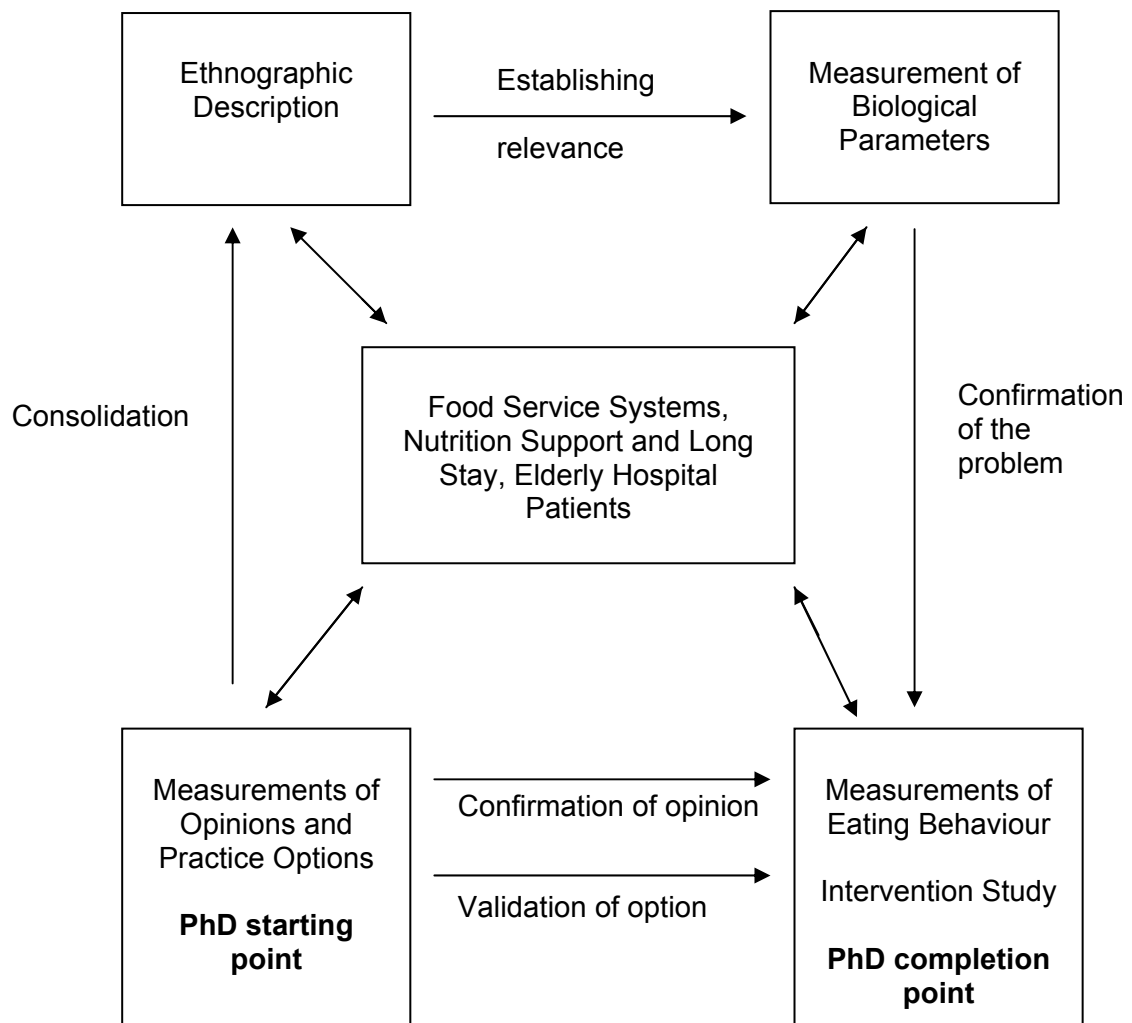


Figure 3.1: A methodological approach to context analysis in hospital food service provision

3.6 RESEARCH METHODS: QUALITATIVE AND QUANTITATIVE APPROACHES IN HEALTH SERVICE RESEARCH

Qualitative and quantitative methods both have their own inherent advantages and disadvantages. There are many qualitative and quantitative methods available to researchers and the ones that have been utilised in this research are discussed in detail. The qualitative methods used include: focus groups, interviews and

observations. The quantitative methods used include: a survey, predicting estimated daily energy and protein requirements, measuring plate waste (and resultant intakes) and nutritional assessment of patients. Each of these different methods attempted to explore the area of study so as to result in a more thorough measurement and ultimately a clearer understanding. The focus groups and interviews attempted to understand the context from a range of stakeholder perspectives, while the survey aimed to measure elements within the Australian hospital context. These methods involved social and behavioural aspects of study, while the nutritional assessment, estimated daily energy and protein requirements and the measured dietary intakes incorporated biological measures. Each of these aspects required review and reflection alone, and in association with the other aspects in order to more completely understand the relationships that impact of the provision of services and the resultant dietary intakes.

3.7 QUALITATIVE RESEARCH METHODS

Kitto et al 2008 (p243) describes the goal of qualitative research as, *“To explore the behaviour, processes of interaction, and the meanings, values and experiences of purposefully sampled individuals and groups in their natural context.”* Strauss (1990, cited in Fossey 2002, p717) similarly described qualitative research as a *“Broad umbrella term for research methodologies that describe and explain persons’ experiences, behaviours, interactions and social contexts.”*

Qualitative research is social research so it is paramount that the context being studied and the key stakeholders are clearly identified and interrelationships considered. Richards and Morse (2007) highlight two important rules regarding qualitative research. Firstly, one must consider how the question fits with the method and the data and secondly the researcher should record each step of their analysis. Similar rules should also be applied to quantitative research to allow a detailed scientific review of the topic under investigation.

Ethnographic research incorporates social and behavioural research. It can be described as, *“Investigating cultures that involves collection, description, and analysis of data to develop a theory of cultural behaviour”* (Crookes & Davies 1998, p317-318). Ethnographic accounts are very powerful at defining the stakeholders, illustrating events and interactions that constitute the study environment. They consider ‘why’ something is like it is, not just ‘what’ it is (O’Leary 2004). Ethnographic study may

include focus group accounts, interviews, observational analysis, or a combination of these within a cultural setting.

Observations are a common method used in ethnographic studies. They may be covert, whereby the participants are unaware of the study, or overt, whereby the involved parties are aware of the study. Participant observation is an informative technique used in ethnographic research methodology.

3.7.1 The role of the researcher

Because qualitative research involves a great deal of interpretation, the role of the researcher is significant. Gans (1982, cited in Grbich 1999, p125) outlines three possible roles that a researcher may take on or 'play' in observational studies. The three options are outlined using the scenario that a researcher wants to better understand the daily interactions and communication between staff and patients on a ward.

- 1. Total researcher.** This involves numerous visits to a ward area by a researcher/s for the specific purpose of conducting 'overt' research from a location within the ward environment under study. This approach was used for the study outlined in Chapter 7.

- 2. Participant-researcher/Researcher-participant.** The researcher alternates between the role of the researcher or a participant in the ward area. This is more likely to be possible if the researcher usually works in the place of study (e.g. rehabilitation dietitian observing their rehabilitation ward).

- 3. Total participant.** In this situation the researcher is completely immersed in the environment and the research is "covert" in nature. An example may include a medical researcher being placed in the ward as a "patient" to gain a more real and thorough understanding of the activities and communication on the ward.

Although it can be problematic from the ethical point of view and more time consuming, the 'total participant' approach allows the researcher to personally experience the ward under study and the interactions between the staff and patients. An extension of this approach involves the use of video recording in open ward areas to capture interactions and ward activities.

A consistent approach to record keeping is required, and this often includes a sketch of the setting or the use of digital photos to show the location of patients, staff and infrastructure within the ward. Where more than one researcher is involved, multiple data sets should be recorded at several time points so that inter-rater reliability (Newall et al 1997, Kitto et al 2008) can be reviewed and the findings discussed with the researchers during the study.

The position of the researcher, their experiences, status and relationship or networks with anyone involved in the area of study also need careful consideration. This all contributes to the context and needs to be considered in the interpretation of study findings. Questions about how the researcher views the situation compared to others also needs consideration. The influence of previous experiences must be considered as this may contribute to a 'lens effect' when interpreting findings. The importance of transparency, authenticity and criticality are essential here to improve the rigour of the research (Grbich 1999).

Other strategies utilised to address questions of rigour include triangulating with other methods, such as the use of informal interviews with patients at the completion of observations and the administration of questionnaires or focus groups. Qualitative research doesn't require a random sample because the aim of such research is to understand more about meaning and context, not to apply statistics. The sampling framework is particularly important in quantitative research and as such random sampling is often used, rather than purposeful sampling, convenience sampling or the 'snowballing' technique that is often used in qualitative research (Bowling 2002).

3.7.2 Ensuring the validity of data from qualitative research methods

Just as in quantitative research, rigorous and transparent techniques are required in qualitative research (Fade 2003). The rigour of qualitative research is enhanced by using an evaluative framework taking account of credibility, criticality, authenticity, integrity (Whittemore et al 2001, Fade 2003); triangulation (Patton 2002); respondent validation, methods of data collection and analysis, reflexivity, attention to negative cases and fair dealing (Mays & Pope 2000).

The *credibility* of research is enhanced by the use of a varied sampling strategy that involves purposive, convenience recruitment and 'snowballing' (Bowling 2002), utilising an independent and experienced transcriber (Ereaut 2002), providing a clear and transparent description of the data analysis and coding framework (Mays & Pope

2000), and involving a second coder and a review of transcripts and summaries by many participants afterwards (Bowling 2002, Fossey et al 2002). The review by actual stakeholder participants, referred to as '*respondent validation*' was recommended as a way of reducing potential errors in interpretation (Mays & Pope 2000). Previous experience and backgrounds of the researchers needed to be clearly stated to satisfy any issues related to *reflexivity* (Mays & Pope 2000, Fossey et al 2002).

Criticality was addressed by having both a primary and a secondary coder involved in the data analysis to independently review the quotations before further discussion and consensus. This was enhanced by the fact that many stakeholders also had the opportunity to review the findings and make any additional comments. *Triangulation* was built in to the study design through the use of different data sources (six different stakeholder groups) and the use of different methods (focus groups, individual interviews, questionnaires and observations) throughout this research to enhance the comprehensiveness of the research (Patton 2002). Triangulation also "*Allows the development of a comprehensive understanding of the phenomena and can ameliorate the potential bias of simply using one method*" (Kitto et al 2008, 244-245). This assists in the discovery of patterns that generate an overall impression of the research area (Mays & Pope 2000). Triangulation is a key aspect of the methodological design of this research. The complexity of the context being studied meant that triangulation was built in to each stage of the research so as to carefully explore issues from a range of perspectives, using a range of methods.

Digital recordings of all discussions and the use of exemplar quotes to illustrate the key points of each topic supported the *authenticity* of the research. The *integrity* was assured by obtaining approval from the University of Wollongong/Illawarra Area Health Service Human Research Ethics Committee for each study. The participant information sheets and consent forms clearly explained each of the study aims, in addition to highlighting that participants were free to refuse participation, or withdraw their consent at any time. Six different key stakeholder groups were involved in the stakeholder review (Chapter 4) and the summaries primarily represent the broad views of the sessions to ensure fair dealing. However, consideration of 'deviant', or differing cases was necessary to allow consideration of all the data collected, no matter how often some topics were mentioned (Mays & Pope 2000, Pope et al 2000).

3.8 SAMPLING IN QUALITATIVE AND QUANTITATIVE RESEARCH

The sampling process needs further consideration at this point, in particular considering the differing needs of qualitative and quantitative methods. The sampling process involves the following elements: defining the population, determining the sample size and putting in place an appropriate sampling strategy (O'Leary 2004). Representativeness is especially important for quantitative studies utilising such methods as a randomised control trial or questionnaire. The ability to generalise the findings is often very relevant, which requires both a representative and appropriate sample. Questions about the size of the sample and the power of the study are common, however this is not the case when using qualitative methods such as observations or focus group because capturing the details about a situation or topic are more important. In these situations a single issue may be of sufficient importance to be included in the findings, and 'saturation' is the determinant that halts data collection, not a prescribed sample size (Krueger & Casey 2000).

3.8.1 Random (or probability) sampling

Random samples are used when one needs to obtain a sample that is representative of a given population. Random sampling is an important process to eliminate researcher bias and to allow statistical estimates of representativeness. O'Leary (2004) defines random sampling as, "*Each element in a population has an equal chance of selection*" (p106).

The nature of sampling for qualitative research is somewhat different. The goal is more about obtaining rich detail about a topic, consideration of perspectives or experiences and a better understanding rather than look at the representativeness and generalisability. The sample being representative is not as imperative and the researcher may not define the population initially, and they may not even know who the entire population is at the beginning of the study. They often need to start collecting data in the study in order to better understand the array of issues and the population that they are studying (Krueger & Casey 2000, Walter 2006, Richards & Morse 2007).

3.8.2 Purposeful sampling

"Judgement sampling that involves the conscious decision by the researcher of certain subjects or elements to include in the study" (Crookes & Davies 2004, p232). Purposeful or 'handpicked' sampling allows one to include people who are aware of, or involved with the topic of interest (Krueger & Casey 2000).

Purposeful sampling was initially used in the stakeholder study (Chapter 4), followed by snowball sampling so that others were contacted based on referral from some of the earlier participants. A combination of purposeful and convenience sampling were used in the two hospital based dietary intake studies (Chapters 6, 7 and 8). Ward types were targeted due to their long length of stay and average age of patients (purposeful sampling), while available patients in particular rooms (convenience sampling) who gave consent to participate were enrolled into the studies.

3.8.3 Snowball sampling

“The selection of subjects by means of nominations or referrals from earlier subjects” (Crookes & Davies 2004, p235). This method is sometimes used with populations that are not easily identified or accessed, and involves building a sample through referrals from others (O’Leary 2004).

3.8.4 Convenience (or accidental) sampling

“Available subjects are simply entered into the study until the desired sample size is reached” (Crookes & Davies 2004, p224). This sampling strategy is usually viewed as the least representative method as it is likely to include participants that live or work together (Grbich 1999, Walter 2006). However the ‘real world’ nature of the rehabilitation ward based studies outlined in Chapters 6, 7 and 8 rendered this method and purposeful sampling necessary.

The national survey (Chapter 5) involved a comparative sampling strategy that was confirmed with a consultant statistician. A random sample was not utilised because all eligible public and private Australian hospitals were included in the sample. Exclusion criteria included those hospitals that did not have an adult medical ward as part of their structure (e.g. paediatric hospitals, day surgery hospitals).

3.9 QUANTITATIVE RESEARCH METHODS

Quantitative research methods collect quantifiable data that may then be analysed statistically to deduce positions and relationships.

3.9.1 The validity of questionnaires

Questionnaires are an instrument used to collect anonymous, short answers about a particular topic from a sample of individuals to assist a researcher in better understanding a population or topic (Monsen 2003). The validity of questionnaires is

determined in a number of ways to check that they do in fact measure what they intend too. The face validity involves inviting professionals either individually, or in a focus group, to review the draft questionnaire and make a professional judgement about the ability of the questions to measure what is intended. The content validity may be ensured by conducting an extensive literature review on the topic and/or by consulting appropriate professionals to determine that the major topics have been included (Crookes & Davies 2004).

Criterion validity involves measuring the questionnaire against a normative, accepted standard and as such illustrates the use of a socially determined comparison (Peat 2001). Who determines the 'truth' and from what perspective do they come from? The answers to these questions certainly impact on the form of validity testing and warrant consideration in the interpretation phase. Criterion validity is particularly useful for questionnaire tools that will provide a total score (e.g. self esteem score).

Construct validity refers to how well a questionnaire will provide data that supports a theory and how well it will correlate with other instruments that support that particular theory (Monsen 2003). This is most appropriate when developing an alternate questionnaire to one in existence (e.g. quality of life questionnaire, nutrition assessment score using subjective global assessment (SGA)).

Test-retest analysis is also required to test the reliability of a questionnaire, or its ability to provide a consistent result when completed by the same person under similar conditions (Crookes & Davies 2004). Pilot studies are also important to test such aspects as the language used, the order of the questions, available responses in the case of closed questions and the time to complete the questionnaire. Ideally, the first round review of any draft questionnaire is completed in front of the researcher so that they may view reaction to particular questions, note any body language and follow up in a timely manner. The piloting phase also allows face validity and content validity to be explored, in addition to an initial literature review. A number of pilot studies may be required before a questionnaire tool is ready to implement.

Three versions of a web based questionnaire were used to review food service practices in Australian hospitals, to prioritise barriers to adequate dietary intakes and to prioritise interventions (Chapter 5). This method allowed consolidation of the key issues with larger numbers of people who reflected the key stakeholders in the original stakeholder analysis.

Quantitative methods were also used to study estimated daily energy and protein requirements, weighing standard meals and plate waste (Chapters 6 and 8) and to determine nutritional status (Chapter 6). These aspects were important to better understand the required dietary targets for the study participants, to investigate their current nutritional status, to approximate their dietary intakes and to compare them to their estimated daily requirements.

3.9.2 Predicting estimated daily energy and protein requirements

There is no 'ideal' prediction equation available to estimate daily energy requirements (Reeves & Capra 2003). While indirect calorimetry is considered the 'gold standard' when measuring energy expenditure (Boullata et al 2007), this wasn't possible for the patients being studied. They were primarily over 65 years and recovering in a hospital based rehabilitation setting most often from fractures or a neurological injury. As an accurate height measure was often unavailable, the Schofield equation (Schofield 1985) was utilised to calculate the estimated daily requirements for all patients. This is also the equation used in the estimation of daily energy requirements in the Nutrient Reference Values for Australians (NHMRC 2005).

Given the tendency for the Schofield equation to overestimate (Reeves & Capra 2003), the age of the patients and their reduced activity levels, the estimated energy and protein requirements were determined using conservative activity and injury factors and a protein requirement of 1.1-1.2g/kg/day, which was in line with the amounts recommended by the Council of Europe (2002). The level of activity used was based on observations, while the injury factor and protein requirements considered the medical condition of each individual patient. The estimated amounts of energy and protein required were compared to the amounts ordered and consumed by the patients (Chapter 6) and the estimated amounts required were compared to the estimated amounts eaten (Chapter 8).

3.9.3 Weighing standard meals and plate waste

Measuring the plate waste, and resultant dietary intakes by patients can be done in a variety of ways. Many studies in the scientific literature discuss determining plate waste by visual estimation, which may now also use digital photography to compare meal plates pre and post meal time. Most of these studies still assign a percentage scale that is compared when assessing the amount that has been consumed (ie. All, 75%, 50%, 25%, None) (Kowanko et al 2001, Kandiah et al 2006, Nowson et al 2003). While this method is readily used it is suggested that one needs to be very clear how the

plate looked before the meal (regarding the serve sizes) in order to make a fair comparison, and thus digital cameras are often now used as part of this method.

Another aspect that requires careful thought relates to whether this method involves estimating for the entire plate, or portions of each item. Obviously, estimating for the whole plate diminishes the completeness of the data as it would not be evident which types of foods were consumed, and thus the judgement regarding the nutritional components consumed.

On the other hand, a number of researchers employ the use of mobile scales when bulk trolleys are used so that they may weigh each food component as it is added to each meal tray, and then weigh each component afterwards (Wilson et al 2000, Hartwell & Edwards 2003a). This method may be complex to set up given the timing and numbers of staff involved in food service delivery, however it is ideal if the researchers work directly in the area being studied as these aspects can be managed more completely and thus an accurate before and after weight obtained for each item on the tray, for each patient.

One must also consider the possible influence that conducting a study about dietary intakes has on the dietary intakes. Chapters 6 and 8 outline two studies where plate waste was used to determine intakes. While all weights were done in rooms away of the view of the patients, the fact that the patients and staff knew the researchers were interested in what patients were eating may have had an influence on the findings. However they present a summary of what patients were consuming at those times in a number of different ward locations.

The current research attempted to obtain duplicate 'spare' meals for each meal option to weigh as the starting point for each meal, so that the amount left could be subtracted from each menu item for each patient. The fact that 'spare' meals were not regularly available meant that standard serve sizes needed to be utilised as the starting point. This strategy relies on the compliance of the food service assistants to the plating standards. However it can be argued that requesting 'spares' for the studies may also have influenced what went on the plate as the staff would know that the plate was being reviewed and may be more particular than usual. Consideration was certainly given to how closely the 'spares' that were obtained matched the standard serve sizes and Chapter 6 outlines the findings.

3.9.4 Determining nutritional status

It is important to be able to monitor nutritional status over time to review the effectiveness of nutritional treatments for long stay patients. There are a multitude of tools that are available to assess the nutritional status of an individual (Banks et al 2007). The current research primarily focuses on patients over 65 years and was conducted within hospital wards where dietitians visited. As many patients had already had a nutrition assessment conducted and as many dietitians in Australia utilise Subjective Global Assessment (SGA) for patients aged under 65 years and the Mini Nutrition Assessment (MNA) for those 65 years and over, the current research reports nutrition assessment based on these two methods, as outlined in Chapter 2.

3.10 METHODS USED IN THIS RESEARCH

Health services research has traditionally had a quantitative focus. Questionnaires are often utilised to obtain feedback about patient experiences. Dietary intakes, anthropometrics, hand grip strength, biochemical data and nutrition assessment are routinely used in clinical dietetics research, while quantitative outcomes are regularly reported in medical research, many of which are randomised controlled trials (RCT).

The current research involves developing an understanding of the views of key stakeholders, investigating the activities of 'live' hospital rehabilitation settings, measuring intakes and planning priority interventions. It is evident that a number of methodologies, both quantitative and qualitative, in tandem with a continuous quality improvement approach were required to investigate the multitude of factors that influence the dietary intakes of long stay elderly hospital patients. Table 3.1 summarises the methodologies and methods used in this research, along with the corresponding chapters in this thesis.

Table 3.1 A summary of the methodology and methods used in this research

Methodology	Methods	Chapter Number
Qualitative	Focus groups	4 & 8
	Semi-structured interviews	4 & 7
	Observations	7 & 8
Quantitative	Questionnaire	5, 7 & 8
	Estimated daily energy and protein requirements	6 & 8
	Weighed plate waste and estimated dietary intakes	6 & 8
	Determination of nutritional status	6

Descriptions of focus groups, semi-structured interviews, observations and questionnaires follow in this section, along with considerations and the advantages and disadvantages of each. Detailed methods regarding the estimation of daily energy and protein requirements, weighed plate waste and resultant dietary intake estimations have been explained in the methods section of each of the corresponding chapters. The determination of nutritional status via the use of the SGA, PG-SGA and the MNA was discussed in Chapter 2: Literature Review and the SGA and MNA have been briefly summarised in the methods section of Chapter 6.

3.10.1 Focus groups

Focus groups are extensively used in market research and they intend to mimic a more usual social interaction where participants discuss topics, raise issues and ideas that they see as important. They are considered a fresh, open approach to explore a range of perspectives and to consider the most relevant language, particularly when little is known about a topic (Forbes et al 1997). A focus group usually consists of five to eight participants and is facilitated by a skilled moderator who raises points of discussion to the group and encourages interaction without stating their view during the open-ended interview. Questions are usually ‘funnelled’ from general to more specific, and focus groups are usually recorded and then transcribed verbatim for later analysis. Careful planning of groups is essential, particularly with regard to the sampling procedures, environment, seating and setting of the broad questions (Grbich 1999, Ford et al 1997, Krueger & Casey 2000, Patton 2002).

The advantages of focus groups include that they allow open-ended questions and a deeper investigation of participants' responses (Dreachslin et al 1999), they elicit more complete and honest responses (Evason & Whittington 1997) and are '*rich in data*' (Grbich 1999). Other benefits include the ability to probe and seek further clarification of a point, the possible use of interpreters with a group of non English speaking people and the ability to discuss a topic with specific groups.

Focus groups investigate attitudes and perceptions and may also be used to test concepts of ideas via the interaction and discussion between a group of people (Krueger & Casey 2000). They can also be used to test topics for questions in an accompanying survey or to further expand and explore the categorised findings from a completed survey and literature review (Conning et al 1997, Ford et al 1997, Bolch 1999). The first study in the current research utilised focus groups to explore the opinions of stakeholders prior to preparing the questions for a later national survey. The use of focus group methodology allowed the knowledge from the literature review to be expanded, the addition of an Australian perspective and the ability to explore views in depth. It is argued that the resultant survey tool is more appropriate for the intended participants as similar stakeholder groups had taken part in the preliminary focus groups study that allowed a better understanding of stakeholder views and the findings to be utilised in the development of the eventual questionnaire.

The disadvantages of focus groups may include small numbers that are often involved, the sample of participants may not be representative and that the participants may not be independent of each other (Evason & Whittington 1997). They have been described as, "*Complex, often complicated mosaics of history, experience, motivation, and interests*" (Hollander 2004, p631). They can be very time intensive, require a skilled facilitator and can be subject to questions of rigor, authenticity, integrity and credibility. However many of these disadvantages can also apply to surveys, if they are not planned and analysed well (Fade 1997, Whittemore et al 2001).

Focus groups are often utilised to scope a topic of interest and obtain a range of opinions. The data obtained may be categorised, analysed and written up, or the findings may be further investigated using an additional methodology. Focus groups were utilised as the primary method to investigate stakeholder opinions about food services (Chapter 4).

3.10.2 Semi-Structured Interviews

Interviews are also a popular method for conducting qualitative research. They may be conducted face-to-face or over the phone, and they may be structured, with many specific questions, or semi-structured, with many open ended questions or in-depth with only a few questions that are discussed in great detail.

Good interviewers are trained, utilise reflective listening, summarise well and 'control' the interview. Consideration also needs to be given to the following areas: Is there a common language between interviewer and interviewees? What about any differences in areas such as status, education, gender etc? How are these aspects likely to influence the data collection and interpretation? (Grbich 1999, Crookes & Davies 2004).

Advantages of interviews include the ability to clarify responses and obtain more information at the time of discussion (compared to a self administered questionnaire), they may be recorded and later transcribed so the focus is on the communication (rather than note taking) and allows one to gain detailed information about a perspective or understanding of a particular topic or issue (Grbich 1999).

Disadvantages include that the interviewee may not feel comfortable in this formal type setting, they may also say things to please the interviewer, they are time intensive for the interviewer and the interviewee.

Interviews and focus groups can both be used in a research setting (as they were with the stakeholders in Chapter 4), however it is important that their similarities and differences be considered when interpreting the results. Focus groups involve several individuals who are asked to discuss a particular topic in a very open format. As such, some individuals may feel more comfortable with the group atmosphere, than in an individual interview and may be more likely to speak. In contrast, some participants may feel very inhibited speaking in a group setting and may find it difficult to get their point across. Part of the role of the facilitator is to moderate the discussion and attempt to involve the 'quieter' members of the group without alienating them further.

Interviews are often more prescriptive in the questions, and the specific order in which they are asked. There is no discussion with other participants that may contribute to the array of responses and topics that are likely to be covered in a focus group. There are advantages and disadvantages of each of these qualitative methods, namely that focus

groups may involve a more timely collection of information, that may include a broader array of opinions, but may not allow some participants to discuss points in the detail that they may wish (Grbich 1999, Patton 2002, Crookes & Davies 2004).

The reasons cited for the four interviews (in addition to the 17 focus groups) that were conducted in chapter 4 was because the times and or locations of the focus groups didn't suit the participants in three cases, and because only one person arrived for a planned focus group, in the other case.

The question guide utilised for the focus groups (Figure 4.1) was also followed in the four interviews. Each session was introduced, recorded, transcribed and analysed in the same way. The key difference was that the interview format meant that the interviewer had to ask a larger quantity of the available questions, while in contrast the focus group technique meant that the discussion of one topic often involved discussion of another one or two topics. The idea behind the focus groups utilised with key stakeholders (Chapter 4) and several feeding assistance volunteers (Chapter 8) was to obtain a broad range of themes to describe perceptions or views of food services in NSW and the volunteer feeding assistance program. They weren't being used to only determine numbers of responses to closed questions, thus it was viewed that the use of these combined methods was acceptable to the research questions being investigated.

3.10.3 Observations

The advantages of observational research include that the researcher is able to view the environment under study which allows the collection of first order data, rather than only conducting a survey or interview with people on the topic, which results in second order data. Observers are able to see what occurs and follow up on events at a later stage. This may involve a questionnaire or interview with patients or staff (Grbich 1999).

The disadvantages of observational techniques include: small numbers are studied at any one time, patients and staff may not feel comfortable with the observational process, some participants may change their behaviour when they know they are being observed and it may take time to gain the trust and confidence of the participants being observed, the findings are not from a random sample and may not be generalisable. As with any methodology, a number of considerations need to be made before conducting observational research. These include: appropriate training for all researchers, a pilot

study to test processes and tools, consideration and testing of inter-rater reliability to ensure that observations will be consistent throughout as well as consideration regarding the researcher's background, experiences and perspectives so as to articulate a transparent account of the study and to position the findings in context (Grbich 1999, Crookes & Davies 2004).

The studies outlined in chapters 7 and 8 utilised overt observations and one of the settings was a ward within the previous workplace of the PhD candidate. A larger, more detailed ethnographic account was initially to have been prepared for Chapter 7 and 8 in this research, however the information collected primarily related to issues at meal times and as such was written up from the perspective of dietary intakes by patients, but also considered the interruptions (both positive and negative) at meal times.

3.10.4 Questionnaires

The advantages of surveys include: the collection of responses from large numbers at low cost, their anonymity, they can be completed when the respondent is ready and they can incorporate some open as well as closed questions. Other advantages include: large numbers can allow statistical tests to be conducted, they can be repeated in the future to indicate trends and they can be used to benchmark with like organisations or services (Conning et al 1997, Walter 2006). However one does need to be careful in interpreting the results of questionnaires as different people may place different value on such a measurement tool, which will influence the findings

The disadvantages of surveys include: the need for a careful design to avoid misleading questions, they require careful planning and review regarding validity, they are a 'snapshot' in time, they are limited to people who can read, write and see and they may be unsuitable for complex topics as further discussion isn't readily available. Their lack of flexibility, the fact that they aren't always completed and the need to clarify patient's comments or remarks are also potential disadvantages (Evason & Whittington 1997, Ford et al 1997).

The study outlined in Chapter 5 involved two pilot studies, one with the original version of the questionnaire and another revising the changes made and the proposed web format. This review involved the participant receiving the letter, web address and log in code so that the entire process could be tested.

The current research outlines the development, implementation and findings of a national food service survey that is reported on in Chapter 5. Face validity and content validity were the primary forms of validity testing conducted as there was no overall score generated and 'like' questionnaires were not available for comparison. The content validity of the study outlined in Chapter 5 was further enhanced by the preliminary stakeholder focus groups that investigated views and items that should be included in a national questionnaire.

3.11 CONCLUSION

A variety of methods were required in this research so as to investigate the complex interplay between: nutrition and food service systems, stakeholders in these systems and adequate nutritional intakes of patients. A methodological framework was developed to direct this research which involved a contextual analysis of the influence of food service systems on dietary intakes of long stay elderly hospital patients (Figure 3.1).

Chapter 4 outlines the first study of the thesis which involved determining the views of stakeholders utilising focus groups and semi-structured interviews. The broad findings from this study were then incorporated into the development and implementation of the national survey, outlined in chapter 5 so as to quantify and prioritise key barriers and opportunities to support dietary intakes. Chapter 6 outlines a rehabilitation ward based study that allowed estimated daily energy and protein requirements to be calculated and dietary intakes estimated within a case study context. Overt observations were also conducted in order to better understand current behaviours and practice regarding mealtimes in Australian hospitals (Chapter 7). Chapter 8 summarises a pilot study of an intervention in the form of a volunteer feeding assistance program.

To enhance methodological rigour and understanding of this interwoven study context, the findings of the stakeholder study (Chapter 4) were confirmed with participants, while the national survey (Chapter 5) was also another opportunity to triangulate methods. The studies in Chapters 6, 7 and 8 were triangulated with questionnaires and observations by some participants (patients and staff in Chapter 7; staff and volunteers in Chapter 8).

CHAPTER 4 STAKEHOLDERS VIEWS ABOUT THE KEY ISSUES AFFECTING THE QUALITY OF FOODSERVICE FOR LONG STAY PATIENTS¹

4.1 INTRODUCTION

The ageing Australian population and the increased need for health care services have influenced many changes to food service systems in an attempt to make them cost effective. These changes have included the increasing use of cook-chill systems in health services (Mibey & Williams 2002). Many other factors have influenced the variety of, and access to food and beverages available on hospital menus today, including: financial considerations, food safety initiatives, a shortage of nurses (Kowanko et al 1999, Chang et al 2003), changes to food service delivery systems (Mibey & Williams 2002, McClelland & Williams 2003) and the changing roles of nurses regarding food service and patient care at meal times (Carr & Mitchell 1991, Kowanko 1997, Kelly 1999).

There are numerous challenges to the provision of hospital food services, which also need to consider increased consumer expectations and quality focus (Lau & Gregoire 1998). The risk of patient malnutrition is also a significant issue, with some patients already malnourished, or 'at risk' on admission. especially for long-stay rehabilitation patients (Zador & Truswell 1987, Green 1999, Beck et al 2001a, Lazarus & Hamlyn 2005).

¹A significant portion of this chapter has been published in the following peer reviewed journal article:

Walton K, Williams PG, Tapsell L (2006a). What do stakeholders consider the key issues affecting the quality of food service provision for long stay patients? *Journal of Foodservice*; 17(5/6): 212-225.

KW and PW designed the study, while KW and PW interpreted the data and all three authors contributed to the manuscript.

The key findings have been peer reviewed and presented by KW at the 23rd National Dietitians Association of Australia (DAA), and by PW at the 18th International Congress of Nutrition, with the abstracts being included in the following publications:

Walton KL, Williams P & Tapsell LC (2005). Rehabilitation inpatients are not meeting nutritional needs. *In Dietitians Association of Australia : 23rd National Conference : Embracing Diversity, Programs and Abstracts*; Dietitians Association of Australia: Australia: 162.

Walton KL, Williams P & Tapsell LC (2005). Improving the food intakes of long stay inpatients. *In SAJCN : Annals of Nutrition and Metabolism : Abstracts : 18th International Congress of Nutrition*; S Karger, Medical and Scientific Publishers: 289

Research has also indicated that many food service managers are not satisfied with recent food service changes (Mibey & Williams 2002). Another study reported that the change to plated food service systems and the reduced availability of food items being available in ward kitchens meant that much nursing control had been removed from main meal and snack times (Wilson & Lecko 2005). Nurses have also been found to refer to competing agendas, difficulty in prioritising nutrition above other demands, lack of staff, time issues, budget cuts, and inadequate training on nutrition as potential issues that can also influence the feeding assistance and monitoring of intakes by nurses (Kowanko 1997, Chang et al 2003). Less qualified staff are often assigned to feed and assist patients, which may further devalue the importance of meal times and patient feeding (Dickinson et al 2005).

Approaches to research about the views and perceptions of health service provision can vary, and may include focus groups, surveys and interviews. Used alone or in combination with a quantitative survey, focus groups have started to become a more popular approach to customer service review (Alspach 1997, Wensing & Elwyn 2002, Abusabha & Woelfel 2003, Merkouris et al 2003).

The aims of this study were:

1. To elicit the opinions and attitudes of a sample of dietitians, nutrition assistants, patients, nurses, food service assistants and food service managers regarding the current provision of food service in New South Wales hospitals.
2. To identify key issues that could be examined in a nationwide survey quantifying barriers to effective food service provision for long stay patients and identifying practical solutions.

4.2 METHODS

4.2.1 Study participants

This study utilised focus groups and semi-structured individual interviews to elicit the views of six different stakeholder groups about hospital food service provision. While it may have been ideal to conduct separate groups for each stakeholder type (Wallace 2005), the nature of many existing hospital networks meant that some of the groups contained a mix of stakeholders. Generally groups consisted of one type of stakeholder only, but for logistical reasons a few mixed groups were included (e.g. Group 13: three dietitians and one nutrition assistant; Group 15: seven food service assistants, one nutrition assistant and one food service manager).

A number of different recruitment methods were utilised to invite people to participate in a study about their opinions and attitudes regarding food service provision to long stay hospital patients. Hospital staff were contacted via presentations at established meetings of dietitians, food service staff, nurses and nutrition assistants, as well as key contacts with dietitians and food service managers, flyers at food service conferences and the 'snowballing technique' (Patton 2002). Invitations for patients to participate were extended by nursing staff. Some participants preferred to be individually interviewed for reasons of convenience or privacy. Participants received no reward for their involvement.

4.2.2 Participant profile

Seventeen focus groups and four individual interviews were conducted between September 2003 and December 2004, which included 19 nurses, 14 patients, 20 dietitians, 11 nutrition assistants, 13 food service managers, 18 food service assistants and three other health care staff (quality manager, social worker and an information technology manager). The ninety-eight participants included 20 males and 78 females, with the propensity of women considered appropriate since they make up the majority of the stakeholder groups involved.

4.2.3 Conduct of focus groups and individual interviews

The focus groups were conducted by the same moderator, who was also the PhD candidate, at fifteen locations within metropolitan and regional areas of eastern NSW. All participants provided written consent and all discussions were digitally recorded. All sessions began with the key question, *"What do you think about the meal service in hospitals today?"* In most cases this led to a lengthy open ended discussion about a

range of food service topics. Where required, a set of standard questions (Figure 1) was referred to so as to encourage discussion and the consideration of a range of topics. Questions were introduced utilising an open question format to invite discussion without providing an opinion from the moderator (Krueger & Casey 2000). The moderator invited any further discussion about topics, reflected key points and invited less vocal participants to comment at various times.

What do you think about the meal service in hospitals?
What do you think about the menu choices? (e.g.: variety, choices, range of culturally specific dishes)
What about the accuracy of meal orders?
What do you think about the way choices are offered and selected? (e.g.: bulk versus plated, time ahead of meal)
What about the serving sizes?
What about packaging and patient access?
What about assistance with feeding?
What about meal service times?
Location of eating meals? (e.g.: dining room versus bedside)
What about meal quality? (e.g.: taste, temperature and appearance)
What sort of meals would you expect in hospital? What sort of meals would you like in hospital?
What about special diet requirements?
What about food safety initiatives?
What about monitoring? (e.g.: intake and wastage)
Any communication issues?
How are any problems resolved?
What are the top 3 priorities?

Figure 4.1: Standard questions available to the moderator

When it was evident that a point had been exhausted the moderator would ask about another topic. On several occasions the moderator needed to clarify a point, or ask for some additional information when the group discussion progressed without further questioning and covered a range of topics. Each session ran for approximately forty-five minutes. At the completion of each session, participants were asked if they had any further comments and were thanked for their participation. They were offered the

option of receiving the transcript and a summary of findings at a later time so they could review and clarify any points.

4.2.4 Data analysis

All focus groups and individual interviews were digitally recorded on two portable minidisk recorders. All sessions were typed verbatim by the one independent, experienced transcriber (Ms Lyn Politis), with any details identifying individual participants or workplaces removed. Codes were used to identify the individuals and sites involved in each transcript. The PhD candidate is an accredited practising dietitian who has had previous experience conducting focus groups while working as a quality manager and food service dietitian in the Illawarra Area Health Service. She moderated all discussions and did the primary coding. The supervising author and secondary coder is a Fellow of the Dietitians Association of Australia and a former hospital food service manager.

The accuracy of the transcriptions were checked by reviewing several digital recordings against the typed transcripts. QSR Nvivo 2.0™ qualitative analysis software (1999-2002, Melbourne) was used to categorise all of the quotes from each of the transcripts. Each individual transcript was coded in turn and a combination of content and thematic analysis was used to look for patterns in the data and to match each quotation to the most relevant topic (Rice & Ezzy 1999, Patton 2002).

Qualitative analysis was initially conducted by the primary author. The initial coding framework was based around previous experience in the research area, the literature review and standard questions format. The coding framework reached 43 topics during the coding process so as not to limit the generation of ideas (Pope et al 2000). The assigned quotations and topics were then reviewed by the secondary coder. Any discrepancy in a topic or quotation allocation was discussed and a consensus reached before any changes were made. This process refined the topic number to 37, as six topics were able to be grouped and/or deleted. These 37 topics were collectively grouped under five broad themes. Both positive and negative aspects of each topic were considered (e.g. some participants viewed portion sizes as too small, while others thought them to be adequate). Exemplar quotes for each topic were independently selected by the primary coder and the secondary coder to illustrate the key study findings. A copy of the session transcript and summary of the themes were forwarded to those participants who could be contacted after the study so they had the

opportunity to review and add any further comments. No significant changes were recommended by the few participants who provided feedback.

4.2.5 Quality assurance

The rigour of the research was upheld by following an evaluative framework that considered credibility, criticality, authenticity, integrity, triangulation, respondent validation, methods of data collection and analysis, reflexivity, attention to negative cases and fair dealing. This framework was thoroughly discussed in this thesis in Chapter 3: Methodology.

4.2.6 Ethics

This research was approved by the University of Wollongong/Illawarra Area Health Service Human Research Ethics Committee in early 2003.

4.3 RESULTS

4.3.1 Key themes

Five key themes and 37 topics were identified, with an exemplar quote highlighted in Table 4.1 for those scoring more than ten separate mentions. The five key themes were: food service, menu, medical condition, ward environment and management. Each of these themes had numerous topics that were component parts. Food service was the largest of them with 17 separate topics directly contributing to this theme, while all had interrelated topics.

The most frequently discussed topics (in descending order) were: portion size, preparation to eat and feeding assistance, menu variety, packaging and food service system, with the first two topics being referred to in every discussion session. Saturation was reached after eight sessions, with no new topics identified in sessions nine to twenty-one (Figure 4.2). However, additional details and quotations about previously identified issues were obtained in the later sessions.

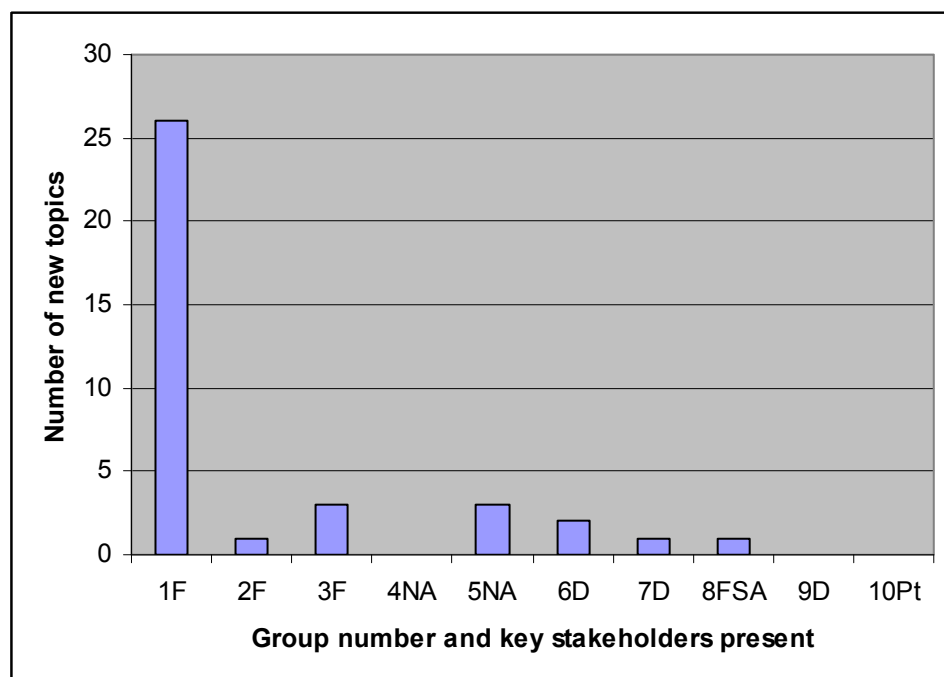


Figure 4.2: Number of new topics discussed at each session

Legend: F: Food service manager, NA: Nutrition assistant, D: Dietitian, FSA: Food service assistant and Pt: Patient

Table 4.1- Key themes, topics and exemplar quotes

Key Theme and Topics (Number of sessions topic was discussed)	Exemplar quote for topics discussed in more than ten sessions (Key stakeholder type)
Key Theme: 1 Food Service	
1.1 Portion size (n=21)	<i>'Yes. Some of the oldies are put off by having large plates of food put in front of them. If they have something small they'll tend to eat it'</i> (Food Service Assistant)
1.2 Packaging (n=19)	<i>'I cannot for the life of me open, I'm alright with the butter, but when it comes to the jams and the honey and all that, the juices they have to open that for me. It's ridiculous that you can't open them because mostly this hospital is full of old people'</i> (Patient)
1.3 Food service system (n=18)	<i>'Obviously a menu is planned according to what retherms most effectively and that limits your variety and that you do have a lot of wet dishes'</i> (Dietitian) <i>'With cook-fresh we always felt we were rushing every meal time to get things done but with cold plating you can plate whatever time of the day you want and we've got more choice on'</i> (Food Service Manager)
1.4 Meal times (n=17)	<i>'I think it should [the evening meal] be later but at the same time maybe you should be looking at a more substantial snack if it's going to be later or you have something more substantial after your meal'</i> (Dietitian)
1.5 Meal accuracy (n=15)	<i>'Patients are disappointed if they don't get what they ordered. Sometimes they order other items just in case they don't get what they really want'</i> (Dietitian)
1.6 Temperature (n=14)	<i>'I think technologically we really come a long way and it's better'</i> (Food Service Manager)
1.7 Mid meals (n=14)	<i>'And having high energy snacks for mid meals. I think that's another thing that's cut with budgets. Tea and coffee with biscuits isn't really terribly nutritious'</i> (Dietitian)
1.8 Wastage (n=12)	<i>'With elderly clients we do see in hospitals, is they get very upset with the wastage and if you do give them the ward size meals instead of an appropriate size for them, they do get very upset that they're wasting food and they're wasting money'</i> (Food Service Assistant)
1.9 Customisation (n=11)	<i>'And it's not about food quality, its about the flexibility that we don't have in it'</i> and <i>'Basically the inflexibility and not being able to provide individuals with foods that they request at the time when they are really ill and the other thing related to that is a lot of a small number of our patients are long term and that can become an issue in actually meeting their nutrition needs if they don't like the food or don't find it because it's repetitive'</i> (Dietitian)

Key Theme and Topics (Number of sessions topic was discussed)	Exemplar quote for topics discussed in more than ten sessions (Key stakeholder type)
Key Theme: 1 Food Service continued	
1.10 Presentation (n=11)	<i>'I'm thinking of texture modified meals more so. They're the ones that I find least attractive. And they're the people that need to eat them the most' (Dietitian)</i>
1.11 Extras (n=11)	<i>'They cut down the extras list. When I first started here there used to be a big variety of different [extra foods available], they've cut it down to just about hardly anything' (Nutrition Assistant)</i>
1.12 Taste (n=9)	<i>'This is a minor thing but condiments. I think they go a long way in improving taste. They complain about the blandness of the meals but if they had tomato sauce and Barbie sauce and dressings they might improve their intake' (Dietitian)</i>
1.13 Smell (n=7)	<i>'Yes it has an affect on the whole atmosphere of the hospital doesn't it. And that's been my experience in private hospitals which are relatively small. The smell of the food just affects the whole hospital. It can lift spirits of the patients. It's true, the smell of the bacon, the smell of the bread, it's a huge positive thing' (Nurse)</i>
1.14 Texture (n=7)	<i>'In aged care they do want their veggies well cooked. And it's not the way I would eat them at home. Because I like mine just steamed. But if we didn't do it like that for them, we'd have so many complaints. So we have to cater for the' (Food Service Assistant)</i>
1.15 Fortification (n=6)	<i>'Also we've got the ability to add protein or anything, powder or things, to build up to high energy and things like that' (Nurse)</i>
1.16 Time allowed to eat (n=6)	<i>'The meal times themselves are acceptable to me. What is not acceptable to me is the fact that, particularly nursing staff have meal breaks at the same time the food is served' (Dietitian)</i>
1.17 Availability (n=4)	<i>'At a lot of places I've worked that has been an issue. They're always at the end of the plating line, food runs out and they never get the choices that they've asked for' (Food Service Assistant)</i>
Key Theme: 2 Menu	
2.1 Menu variety (n=19)	<i>'They come through in the morning and ask what you'd like for breakfast, lunch and tea. And you've got a choice of picking what you like. Not just thrown in front of you and say that's it. You get to choose what you want to eat' (Patient)</i>
2.2 Special diets (n=17)	<i>'And the choices, making sure there's enough choices for the range of diets especially those high need individuals select from the main menu' (Dietitian)</i>

Key Theme and Topics (Number of sessions topic was discussed)	Exemplar quote for topics discussed in more than ten sessions (Key stakeholder type)
Key Theme: 2 Menu continued	
2.3 Menu selection methods (n=16)	<i>'Yeah, I think in a way and in my experience is quite limited but often we have this menu and then you put in these diet codes and rather than giving them options, rather than just chopping things off, you combine a few diet codes and suddenly the person's got one choice and that's it'</i> (Dietitian)
2.4 Food preferences (n=16)	<i>'We have a prevalence of wet dishes in the hospital. I know that that's not (my) favourite. I'd prefer fish, eat, chicken that I have at home'</i> (Food Service Assistant)
Key Theme: 3 Medical condition	
2.5 Culture (n=12)	<i>'I've noticed with a lot of the patients that are Greek or Italian the family brings in tea at night for them like spaghettis or lasagnes'</i> (Nurse)
2.6 Diet changes (n=6)	<i>'And if we say to the food service staff, always check, I know myself sometimes it's almost impossible to find a nurse. And that must be incredibly frustrating and time consuming for them as well'</i> (Dietitian)
2.7 Foods brought in (n=4)	<i>'I know while food safety is a big issues I'm terrified of the day they say no you can't bring anything in because when they do we're going to have an even bigger problem in terms of keeping people eating and nourished'</i> (Dietitian)
3.1 Length of stay (n=10)	<i>'The cycle is based on the length of stay. I know that [hospital X] has 1 week. It's geared to the very acute'</i> (Dietitian)
3.2 Nutrition requirements (n=6)	<i>'But it's the intake. We're missing the whole point. We don't know what they eat. Particularly those that are at risk. What's the point of giving them a menu anyway. We might feel good in our heart but we don't know what they've eaten. They might be quite malnourished and we're really not catching up to that until something happened'</i> (Food Service Manager)
3.3 Appetite (n=3)	<i>'Maternity love our food. They thinks it's beautiful, wonderful everything. Then you go into a ward where they just don't have an appetite and it's not that they don't like the food it's just that they're not well enough to eat it or there isn't someone in attendance to feed them'</i> (Food Service Assistant)
Key Theme: 4 Ward environment	
4.1 Preparation to eat and feeding assistance (n=21)	<i>'The poor patient can't sit there and eat it because she can't open it or he can't open it and the nursing staff are busy showering or bathing somebody else, that meal is just going to sit there until the next hour'</i> (Nurse)

Key Theme and Topics (Number of sessions topic was discussed)	Exemplar quote for topics discussed in more than ten sessions (Key stakeholder type)
Key Theme: 4 Ward environment continued	
4.2 Monitoring (n=13)	<i>'And no one on that ward notices that that person hasn't eaten. To me that's very much a state of what's happening. It used to be for example a nurses responsibility to feed the patients. That's been eroded with their professionalism' (Dietitian)</i>
4.3 Dining Environment (n=11)	<i>'I think that has great advantages from the perspective of nursing being able to access people and supervise and support especially for rehab' (Dietitian)</i>
4.4 Socialisation (n=4)	<i>'But I think the change is it used to be seen as part of the therapeutic process of care [that's right] and we've now just determined that food is just something that sustains you [we have to provide], but that's your whole process of socialisation around food and preparation of food and consumption of food' (Nurse)</i>
Key Theme: 5 Management	
5.1 Patient & staff feedback (n=18)	<i>'I know that from our survey perspectives that we get back that they're expectations are higher than they ever used to be' (Food Service Manager)</i>
5.2 Budget (n=16)	<i>'I guess as things get more rigid because of cost, the ability to make changes at short notice is really limited in the ability to cater for individual requirements diminished in some way' (Dietitian)</i>
5.3 Food safety (n=13)	<i>'The NSW Health document it sort of says to avoid all of these foods because of Listeria, and then it acknowledges that by doing this they don't want to precipitate the issue of malnutrition so use your discretion (Dietitian)</i>
5.4 Communication (n=9)	<i>'I think we're fortunate that we're in a small hospital.....imagine working in a big hospital where there is even less communication..... we're in a small hospital where we're fresh cook and everyone knows one another and we all get on well in the kitchen' (Food Service Assistant)</i>
5.5 Supplements (n=6)	<i>'I think the limited number of choices or timing or whatever it is, it's just difficult. Which is why we rely a lot on supplements and things like that because the menu just can't meet those specific needs of those patients' (Dietitian)</i>
5.6 Improvements (n=3)	<i>'I guess we're in a position to define what the ideal service would be and in a worse position to deliver that ideal service. We know more about what we want and what we want to provide but we're less able to actually do that' (Dietitian)</i>

4.4 DISCUSSION

4.4.1 The food service system

The food service system determines the types and amounts of menu choices offered to patients. Decisions on menu choices may be influenced by what retherms well in a cook-chill or cook-freeze system, and how much time there is to prepare food in a cook-fresh system. While more options may be available with cook-chill and cook-freeze systems, some types of dishes may be limited (e.g. grills, fried dishes and boiled eggs) due to their poorer quality after reheating (Light & Walker 1990).

Participants generally reported a better perception of the cook-fresh system and identified better levels of flexibility, or customisation, with a working kitchen still available to prepare items at short notice for very ill patients or for those on special diets. Many staff lamented the loss of their production facilities when they became receival kitchens, as they perceived a decline in the level of customer service. Conversely, cook-fresh operations were sometimes viewed as more staggered in their daily activities, such that meal times were a rush. It would appear that this system sometimes limits the evening meal options to mainly 'light meals' (perhaps one hot main, soup, sandwiches and desserts) because cooks are not always retained for the afternoon shift. This finding is supported by other research that reported 81% of NSW hospitals using a cook-chill system, compared with 47.5% using a cook-fresh system ($P < 0.01$), offered more than one hot choice at the evening meal (McClelland & Williams 2003).

Bulk trolleys are rarely used to serve meals in Australian hospitals (Mibey & Williams 2002) but several groups discussed the advantages and disadvantages of bulk hot service and selection, versus plated systems. For example, one dietitian noted, *'I've seen the bulk in action at the maternity ward and it means that you get a greater variety of choice. You can sort of more or less choose what you feel like on the day rather than having to decide the day before what you want to eat. That's a good option'*.

Some stakeholders identified the lack of hot, bulk food services as a potential influence on actual intakes and wastage, which is supported by other research (Shatenstein & Ferland 2000, Wilson et al 2001). The type of food service system used was also linked to many of the other topics identified, including the texture, presentation and smell of the food, as one nurse indicated, *'I think we can also present it a lot better. Cook-chill is definitely no inspirational food'*.

4.4.2 Portion sizes offered

The portion size of meals was discussed by participants in every session. The comments varied depending on the size and the type of food service system, the options currently available and the main types of patients in their hospitals. Some commented that there was sometimes not a choice of size, and that there should be; others thought the standard portion was too large, while some thought they were too small at times. One dietitian noted, *'There is not enough flexibility. We've got the cook-chill service system so our trays are very limited and our plates are one standard size so there's no flexibility. We can't have large size serves or small size serves so and it's limited on what we can fit on the trays so, yeah, they're sort of good for some people but not for others'*.

Many referred to the need for a small option, particularly for elderly patients who can be overwhelmed by well meaning staff providing larger portions. It was regularly noted that older patients don't like waste. However others referred to the needs of young patients and maternity patients who often have large appetites and may not be satisfied by a standard portion. It was commonly agreed that a choice of portion size, the availability of extras, and the fortification of normal meal items was required to meet patient needs.

4.4.3 Food and beverage packaging

Many menu items are now in a pre-packaged format for numerous reasons, including quality improvement, portion control, budget and food safety. Previous research has indicated that the average meal tray may contain between five and 19 items at each meal depending on what the patient selects (Wilton et al 2004). This certainly adds to the challenge of food access, particularly for elderly and disabled patients. One food service assistant noted, *'I consider myself fairly dexterous and able bodied and some of those straws in the packets, they're not easy to get out at all. So when you have aged people with compromised vision and dexterity and coordination, it's shocking'*. It also increases the time that may be required by staff to open packages before assisting patients with setting up and feeding. The level of packaging may also impact on the presentation of the tray and amount of waste generated.

4.4.4 The menu

A key issue for many was the nutritional adequacy and number of choices available on the menu, particularly for long stay patients and patients requiring therapeutic diets.

The trend within Australian hospitals has been to offer a combined menu that has options that cater to most therapeutic diets (Mibey & Williams 2002).

Many dietitian participants were concerned that patients on a combination of therapeutic diets may have minimal choice offered to them, as one stated, *'I think the general menu and the way it's structured at the moment meets the needs of, you know, those short stay people fine. I don't think there's any issues with how they manage but it's these more complicated, more complex people with major nutritional issues that I always find it very difficult'*.

Many food service managers, dietitians, food service, nursing and nutrition assistant staff felt that menus do not cater in the same way that they used to, even for patients on full diets. The limited options for condiments, between meal snacks and hot breakfasts were highlighted, such as this comment by a dietitian, *'I guess the longer cycle you have the more costly it is with different ingredients that you have to store and then training people to cook the different dishes and then having the diet variations on the menu. So I think also menu cycle length has been reduced. So there's not the variety there used to be'*.

Some felt variety was reduced mainly due to budgetary constraints and the fact that food service is treated as a 'hotel service', rather than being acknowledged as part of holistic medical care, issues which has previously been highlighted by numerous researchers (Kowanko 1997, Council of Europe 2002). More than twenty years ago Wood et al (1985) discussed the perceived low priority of nutrition in medical care and highlighted the need to improve attitudes and managerial support so as to improve the nutrition intakes of patients. As one nurse put it, *'We seem to have an attitude that this food service is basically not core business therefore we should not be putting money into it if it's not making money, and I think that's a tragedy. It's a change since I started nursing in the ethos of running a hospital'*.

This issue also links with the consideration of menu selection methods which forms a component of the broad menu theme. There has been a significant change to shorter menu cycles (less than 14 days) and an increased use of bedside computerised menu entry systems, although most menus are still paper based (Mibey & Williams 2002, McClelland & Williams 2003, Patch et al 2003).

4.4.5 The patient's medical condition

Consideration of individual nutrition requirements is closely related to the discussion about screening and assessment of high risk patients to ensure that their nutritional needs are met. Monitoring is a related topic that was also identified by the stakeholders. Only when it is identified that patients aren't eating adequately can individual strategies be put in place to enhance their intakes (Sydner & Fjellström 2005, Gibbs-Ward & Keller 2005).

4.4.6 Nutrition requirements

Patients on therapeutic diets need careful consideration to ensure that menu variety is adequate to meet their requirements. Issues of customisation, menu variety, monitoring and fortification are all closely related to the aim of meeting nutrition requirements. One food service manager commented that she was concerned about intakes of patients consuming special diets, *'Particularly the speech pathology patients because that comes into your elderly. Regularly, nothing is touched, nothing at all. Which is a huge cost to all these tetra packs and goodness knows what else. So we've got to address it and try and do it better by whatever means it takes'*.

Wright et al (2005) recently reported significantly smaller intakes of energy and protein by older patients requiring texture modified diets, compared to those on normal textured diets.

4.4.7 Preparation to eat and feeding assistance

Older patients often need more assistance and encouragement with meals, particularly as more items are pre-packaged. This is happening at a time when registered nurses are busier than ever and the role of feeding is sometimes delegated to other staff (Kowanko et al 1999, Chang et al 2003), as can be seen from the comments of dietitians and nutrition assistants, *'The bottom line is that it is an assistant nursing function rather than a nursing function. That's how they do it in nursing homes. Because the trained nurse is basically glued to the drug trolley'* (Dietitian).

'I think it's a fairly universal problem. When working as a nutrition assistant I didn't feel that my morning was complete until I had gone around and buttered several toasts and you know open sugar and made cups of tea for patients and you just follow the meal trolley around and assist the nursing staff in that regard' (Nutrition Assistant).

'Making foods easier for people to eat is a major thing, whether it's from actually sitting a person close enough for them to reach it, whether it's opened for them, with the patient sitting upright, if they need feeding assistance' (Dietitian).

This issue was raised during every session and all stakeholder types viewed it as an issue of key importance to improve the dietary intakes of patients. Some participants, including some of the patients felt this service was adequately offered, while many felt it was an area of priority for ongoing improvement, which ideally would be partnered with efficient monitoring procedures.

Some stakeholders, such as this dietitian, talked of the possibility of patients eating in dining rooms and the value of greater socialisation and a more usual eating environment, *'It's a very social event. A lot of people actually seem to eat quite well when they're sitting there talking and picking, rather than sitting in a hospital environment. It's not like sitting in a bed'*. This area is complex to research, but there is some evidence suggesting a dining room environment and the consequent social interaction can improve dietary intakes (Edwards & Hartwell 2004).

4.4.8 Obtaining feedback from patients and staff

Obtaining regular patient and staff feedback is imperative to understanding how the food service unit is performing. Stakeholders talked of conducting surveys, speaking with patients about their perceptions about different food service types, as well as possible influences on quality; however there was recognition of a need to improve quality improvement processes, as can be seen in this comment from a dietitian, *'I think the frustration from a diet tech perspective is that the wards ring us when it's really an issue of likes and dislikes, or you know the patient's not happy with the quality of his food. I can't change it, I can't fix it and I certainly offer the facility to pass on their complaints. Most patients don't take that up which is frustrating because I don't think from a food service perspective you can improve it unless you know'*.

4.4.9 Key stakeholder differences

The differing opinions of some stakeholders about topics were found to be related to the differences in their experience and backgrounds, such as: whether they had experienced cook-fresh or cook-chill food service systems, if their hospital had fortified food options, and how good the patient and staff communication networks were at their workplace. Many common themes ran throughout the sessions, however some of the topics were particularly an issue for certain stakeholder groups.

4.4.9.1 Patients

The patients were generally happy with most aspects of the food service. Their main negative comments were regarding the level of packaging and the texture of some meats and vegetables within some facilities. They did not have as many complaints as other stakeholders. On average they were also older than the other stakeholders, and it may be that older patients are less likely to complain than younger staff working in the facilities.

4.4.9.2 Nurses

Key issues for nurses related to the perceived lack of menu variety in some settings, negative opinions about the cook-chill system, the amount of packaging, and the taste, texture and lack of aroma with some food service systems.

4.4.9.3 Food service managers and food service assistants

These staff were especially worried about the wastage of nutritional supplements and the influence of their tightened budgets on actual patient intakes. This was related to their genuine concern for the inadequate feeding assistance available, lack of monitoring of actual patient intakes and limited menu options available.

4.4.9.4 Dietitians and nutrition assistants

Issues of special concern for these nutrition staff related to the inability to meet some special dietary needs, a lack of customisation, inadequate variety, lack of feeding assistance, and the increased use of packaged products. They were keen for food fortification to be routinely utilised and extra menu choices to be available for long stay patients and those with complex dietary needs.

4.4.9.5 Previous findings regarding satisfaction with hospital food services

The findings of this study were consistent with those of other researchers who have explored satisfaction with hospital food services, particularly regarding the quality and technical aspects for patients. However, the issues regarding packaging appear to have only been reported recently (Watters et al 2003, Yoxall et al 2007). Most studies primarily relate to the perceptions of inpatients and nurses. The current study represents the views and attitudes of six key stakeholder groups, thus many of the current findings consider many broader topics and are not always as complimentary as some of the studies reporting only patients' views.

DeLuco & Cremer (1990) reviewed the perceptions of dietary services and hospital food via telephone interviews with a sample of 223 adult patients in Ohio. The majority of participants reported the hospital meals as nutritious (94%), appearing and tasting fresh, the cold foods were a suitable temperature, and there were enough menu options to choose a healthy and fulfilling meal (82%). Fewer participants (61%) thought the meals tasted good, were appropriately hot, looked and smelt good and were suitably tender, while seasoning of meals was viewed as adequate by only 32% of participants.

Dubè et al (1994) and Lau & Gregoire (1998) reported on questionnaires with inpatients regarding ratings of food service quality in Canadian and USA hospitals. Food quality was the best predictor of the overall satisfaction of inpatients but other issues such as interpersonal care aspects of meal delivery (e.g. courtesy and assistance with meal tray), customisation and the attitude of the staff who deliver the meals were also important.

Watters et al (2003) reviewed the perceptions of an American hospital foodservice via focus groups with post discharge patients and nurses, and individual interviews at meal rounds with inpatients. The findings indicated that patients were more satisfied with the food services than the nurses. While food quality was identified as the priority issue, service was also important. Satisfaction with portion size varied, as did choices available and appropriateness of foods offered. The nurses highlighted issues relating to the tray layout, waiting times for replacement meals, containers that were often difficult to open and the lack of extra food items available at all times in ward areas.

This research applied focus group methodology to a sample of stakeholders in the hospital system of New South Wales, Australia. The barriers to nutrient intakes by long stay hospital patients are many and varied. However key issues for further consideration regarding interventions relate to portion size, preparation to eat and feeding assistance, menu variety, packaging and food service system. Several of these issues are inter-related (e.g. food service system, portion size and packaging) as outlined in Table 4.1.

4.4.10 Limitations

The general level of agreement on key issues uncovered in this qualitative study and those in the published literature indicates that it is likely that the key findings are relevant and able to be generalised to other parts of Australia, and perhaps

internationally. However, it should also be highlighted that the size, budget and the structure of food, nutrition and nursing services can also influence the dietary intakes of patients. While some sites identified practices that are successful, it is important that hospital size and organisational factors are always considered when considering interventions to address barriers.

The range of participants involved in this study allowed for a comprehensive understanding of the current food services provided to patients, and a full discussion on priority interventions. These findings lend themselves well to testing in a wider sphere via quantitative means in the national survey that follows and the results of this study were used to develop the national survey that follows.

4.5 CONCLUSION

The use of 17 focus groups and four individual interviews enabled the identification of thirty seven topics and five broad themes regarding food service provision in NSW hospitals. While there was much agreement about the topics and key themes, some stakeholders had specific concerns and some topics had both positive and negative perspectives. The perspective often depended on the food service system used and the size of the facility. It was evident that there are many possible barriers to dietary intakes and some possible solutions were readily identified. These findings were used to develop a national survey to quantify barriers and prioritise practical solutions. Chapter 5 discusses the development, implementation and findings of the national survey of dietitians, food service managers and nurse unit managers.

CHAPTER 5 A WEB BASED SURVEY OF BARRIERS AND OPPORTUNITIES TO SUPPORT NUTRITION PROVISION TO LONG STAY PATIENTS IN AUSTRALIAN HOSPITALS²

5.1 INTRODUCTION

Chapter 4 outlined a qualitative study, utilising focus groups and individual interviews to broadly determine the views and opinions of six key stakeholder groups (patients, nurses, food service managers, food service assistants, dietitians and nutrition assistants) regarding all aspects of food service provision in NSW hospitals. Ninety-eight participants took part and five key themes were determined (the food service system, menu variety, preparation to eat/feeding assistance, packaging and serve size) regarding impacts on dietary intakes by long stay hospital patients. The scientific literature and the findings from this study were used to develop the questionnaire utilised in this national quantitative survey of the barriers and opportunities to support adequate nutritional support for long stay hospital patients.

The literature review and the findings of the stakeholder focus groups and interviews allowed a detailed summary of the current practices in hospitals today regarding the provision of food service, as well as consideration of the barriers and opportunities to improve dietary intakes by long stay patients. A broad and detailed compilation of these issues was important to allow a thorough understanding of the complexity of issues influencing intakes. However in order to progress forward and consider priority interventions it was necessary to invite further feedback from stakeholders. The findings from the literature review, focus groups and interviews were utilised to construct a national questionnaire for dietitians, food service managers and nurse unit managers working in wards with long stay, aged care patients to allow further consideration of the issues, quantification of the findings and additional opportunities for triangulation of methods.

²The key findings have been peer reviewed and presented by KW in 2006 at the 24th National Dietitians Association of Australia (DAA) Conference and the American Dietetics Association (ADA) Food & Nutrition Conference and Expo (FNCE) , with the abstract being published in the following journals:

Walton KL, Williams P & Tapsell LC (2006b). A web based survey of barriers and opportunities to support nutrition provision to long stay patients in Australian hospitals. *Nutrition and Dietetics*; 63 (Suppl. 1): 12.

Walton KL, Williams P & Tapsell LC (2006c). A web based survey of barriers and opportunities to support nutrition provision to long stay patients in Australian hospitals. *Journal of the American Dietetic Association*; 106 (8) (Suppl. 2): A-11.

There is much evidence that the malnutrition observed in the hospitalised elderly is able to be both prevented and treated (Cowan et al 2003, Dickinson et al 2005). There are numerous barriers to adequate dietary intakes in hospital, including: the patients' appetite, length of stay, menu variety, serve size, diet type, ability to self feed and level of packaging (Vivanti et al 2008). However the influence of additional nourishing snack options, food fortification (Gall et al 1998, Barton et al 2000a, Kondrup et al 2002) and nutritional supplements in improving dietary intakes have been studied (Larsson et al 1990, Potter et al 1998, Nolan 1999, Roberts et al 2003, Schenker 2003). These interventions can positively impact on dietary intakes, however it is important to remember that just as there are multiple barriers to dietary intakes, there are also numerous opportunities for intervention to attempt to better meet the needs of individuals. The availability of a number of feasible strategies would be ideal as some interventions would be better suited to certain settings and individuals.

The aims of this study were:

1. To explore current practices regarding food service provision in Australian hospitals.
2. To determine the key barriers to adequate dietary intakes.
3. To determine the most practical and feasible priorities for ongoing improvements to food service provision.
4. To provide evidence to support recommendations and priorities for future intervention studies.

5.2 METHODS

5.2.1 Study participants

As this study followed the focus group study outlined in Chapter 4, three of the original stakeholder groups (dietitians, food service managers and nurse unit managers) were involved in this survey, each of whom were working in a public or private hospital within Australia.

5.2.2 Study design

The Australian Hospitals Directory (2005) was used to determine the maximum number of hospitals (public and private) that could be involved in the survey. There were 1297 hospitals listed (748 public and 549 private). In consultation with a statistician, a comparative sampling framework was used to invite all eligible hospitals which met the inclusion criteria (outlined in 5.2.3 Inclusion and exclusion criteria) to participate. A dietitian, food service manager and nurse unit manager from each of the 670 eligible hospitals were individually invited to participate. Dietitians and nurse unit managers who were working on a rehabilitation or aged care ward were specifically targeted. If these wards were not present at any hospital, then those staff who worked on a medical or other long stay ward were invited to participate.

Address details (but not the individual contact names for stakeholders) were obtained from the Australian Hospitals Directory (2005). A letter of invitation (including web address and log in code for the online version of the questionnaire), and a participant information sheet were directly mailed to the food service manager at each hospital during mid 2005. The corresponding information for the nurse unit manager was mailed to the director of nursing, along with a letter outlining the study and asking the director of nursing to forward the information on to the most appropriate nurse unit manager. A similar process was followed in contacting the dietitian at each hospital, with the initial correspondence being sent to the dietitian in charge. A paper version of the questionnaire was also offered for those who didn't have access to the internet at work, or those who preferred to use a paper version.

Three versions of the questionnaire

Three versions of the questionnaire (one for each of the three stakeholder groups) were developed from the available scientific literature and the findings of the stakeholder study (Chapter 4). A copy of each of the combined questionnaire is included in Appendix 1, which indicates the questions that were specific to each

stakeholder as well as the core questions. Each version of the questionnaire had the same core questions, however some profession specific questions [(ie. food service system (food service managers), nutrition assessment (dietitians) and foods brought in from outside (nurses)] were incorporated into the three individual versions. Questions were included to determine an overview of the food service systems and nutrition services utilised so as to better understand the context when considering the responses.

Development of the web based version of the questionnaires

A web designer (Mr Greg Abernethy) from the Centre of Education Development and Interactive Resources (CEDIR), at the University of Wollongong was consulted to develop a web based version of each of the paper questionnaires and to host the website. He also managed the direct transfer of the data received online to a series of Microsoft Office Excel (2003) spreadsheets that were constructed for each of the three questionnaires. The responses for all paper versions were entered manually into the spreadsheets by the PhD candidate so that all responses were able to be collated and revised together.

The web, and paper based questionnaires were coded so that participants could only complete the questionnaire once and so that the researcher knew which participants had completed the questionnaire so as to determine requirements for reminder letters. The codes were also used for data analyses (ie. number of hospital beds represented by the participants who took part).

Pilot testing the questionnaires

The initial paper versions of each of the questionnaires were pilot tested by eight volunteers (four dietitians, two food service managers and two nurse unit managers). Some grammatical changes, modifications to the order of some questions and changes to response options were made as a result, while preliminary information about the time taken to complete the questionnaires was also obtained.

The paper versions were modified and the web versions were developed, incorporating the suggested changes. The web format meant there were additional changes to the format of some questions and the responses that were seen by the participants (ie. drop down boxes). The web version wouldn't allow participants to proceed to the next question until they had given a response for the previous question, however it did allow participants to save their responses and come back to the online questionnaire at

another time to complete. The web version of each of the three questionnaires were also piloted by several dietitians, food service managers and nurses, with several changes being made to the wording, instructions and logos as a result.

5.2.3 Inclusion and exclusion criteria

As longer stay, elderly patients were the topic of this research, the focus was essentially on rehabilitation and aged care wards within hospitals. However not all hospitals had such wards, and it is well known that medical wards often have many long stay, elderly patients admitted. The following hospital types were excluded: day only, maternity, paediatrics, psychiatric, palliative care, dental, eye and endoscopy and those with no medical ward. Hospitals with less than 20 beds were also excluded for logistical reasons as they were not likely to have a dietitian and due to the small numbers of staff, it was possible that respondents would have discussed the survey with each other. Therefore all 670 hospitals (public and private) that were 20 beds or larger and had a medical ward were considered eligible to be included in the study.

5.2.4 Data analysis

Preliminary data analysis

The total numbers of responses to each question were determined for each stakeholder version of the questionnaire. Some questions allowed multiple options to be selected (ie. *“Who is primarily responsible for ensuring patients have access to their meals?” You may tick **more than one** if required*) which means that not all percentages add up to 100 for those style questions. Responses to many questions were also summarised in terms of hospital size (ie: ≤ 100 or >100 beds for later comparisons and statistical analyses). Mean values and ranges were calculated wherever appropriate (ie. average time allowed for each main meal).

Determining the priority order for barriers, interventions and determining the mean feasibility ratings for each intervention

The key questions were related to barriers to dietary intakes and priority interventions. The question regarding barriers required the participants to highlight and rank their top 10 barriers from a list of 20, where one was the most important barrier and 10 was the least important barrier. Participants were asked to highlight their top 10 intervention priorities (in no particular order) and were asked to provide a feasibility rating for each (where 1=very easy, 2=somewhat easy, 3=possible, 4=somewhat difficult and 5=very difficult). Therefore the number of responses for each of the 20 options was calculated

for each stakeholder group so that the top 10 barriers and top 10 priorities for each stakeholder group could be determined.

Weighting the data relative to the responses from the stakeholder groups

The top 10 barriers and 10 priority interventions were firstly determined separately for each of the three stakeholder groups. This was done by totalling the number of times that each option was selected and applying a factor to account for the importance of order. For example, the number of times that an option, such as 'limited variety' was rated as '1' (most important) was multiplied by 10. Conversely, the number of times it was rated as '10' (least important) was multiplied by one. Simple addition then allowed a cumulative total for each response option for each stakeholder group to be determined, which was the resultant raw, unweighted data.

Ultimately a cumulative summary of the 10 most important barriers and 10 most important priorities that represented the three stakeholder groups was required. However, as the number of responses from each stakeholder type varied somewhat, a statistician was consulted regarding the determination of the 10 barriers and 10 priority interventions that represented all three stakeholders responses. The combined top 10 barriers, and combined top 10 priority interventions were determined firstly determined using the raw, unweighted data that were obtained from the results of each stakeholder questionnaire. The mean feasibility rating was calculated for each priority intervention, in addition to the rating for each stakeholder group for each of the 20 priorities.

Weightings were then applied (Figure 5.1) as advised by the statistician so as to take into account the varied numbers of stakeholders who responded. The weightings were calculated as follows:

<u>No. of hospitals</u>	X	<u>Total responses</u>
No. of participants in stakeholder group		Maximum No. of responses
For Dietitians:		$615/92 \times 218/1845 = 0.789$
For Food Service Managers:		$615/58 \times 218/1845 = 1.25$
For Nurse Unit Managers:		$615/68 \times 218/1845 = 1.067$

Figure 5.1: Calculation of the weightings applied to the stakeholder responses

Statistical analyses

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS Version 15 for Windows, 2006, SPSS Inc., Chicago, IL). Chi Square analyses were conducted to determine any statistically significant differences between categorical data (ie: food service system and hospital size (≤ 100 or > 100 beds)). The Fisher's Exact Test was used where more than one cell within a 2 x 2 table had an expected count of less than five. The P value was set at < 0.05 and all tests were two tailed.

5.2.5 Ethics

Ethics approval was obtained from the University of Wollongong/Illawarra Area Health Service Human Research Ethics Committee in 2005. A letter of introduction was sent by mail to each potential participant, as well as a participant information sheet. Completion of the questionnaire was viewed as consent being given (Capra et al 2005), although participants were free to ask to have their responses removed at a later date. The ethics approval allowed one reminder letter to be sent after the closing date given for responses, and reminder letters were sent to 500 potential participants.

5.3 RESULTS

5.3.1 Characteristics of participants

Two hundred and eighteen participants from 184 hospitals took part in the survey. Seventy-seven percent of the hospitals were public (68% of the invited sample) and 23% were private (32% of the invited sample). The participants included 92 (42%) Dietitians (Diet), 58 (27%) Food Service Managers (FSM) and 68 (31%) Nurse Unit Managers (NUM). Eighty percent of participants completed their questionnaire on the web and 20% utilised the paper version.

5.3.2 Response rate

Fifty-five of the original 670 hospitals were unable to take part in the survey as they had either amalgamated, closed, changed address (unopened letters returned) or they notified the researcher that they didn't routinely see long stay, elderly patients. The revised number of hospitals that could take part was 615 (from 670), and the revised number of possible participants was 1845 (from 2010). These revised figures were used in the weighting calculations to determine the overall stakeholder barriers and priorities, and in the calculation of the response rate.

Table 5.1 summarises the numbers and percentages of each stakeholder type that took part in the survey, as well as the percentage of each stakeholder type that was from each of the two hospital sizes. It is evident that there was a higher proportion of responses from the dietitians and nurse unit managers at the hospitals with >100 beds.

Table 5.1: Respondents (number and percentage by stakeholder group)

Bed numbers	Diet	FSM	NUM	Total
≤100 beds	36 39%	30 52%	28 41%	94 38% Diet 32% FSM 30% NUM
>100 beds	56 61%	28 48%	40 59%	124 45% Diet 23% FSM 32% NUM
Total	92	58	68	218

The response rate calculated as a proportion of invitations was 11.8%. However 41.9% of hospital beds (32,685 from a possible 78,000) were covered by the current survey. Responses from two or three stakeholders from the same hospital were not common, as indicated by the result of only 218 participants being involved from 184 hospitals. The proportion of hospitals participating as a portion of the number of invitations sent was: 20.7% (84/405) of the bed hospitals with ≤ 100 beds, and 47.6% (100/210) of the hospitals with > 100 beds.

Of the 184 hospitals that participated, 84 were ≤ 100 beds, representing 45.7% of the participant hospitals, while the hospitals with > 100 beds included the remaining 100 hospitals, representing 54.3%. The hospitals sampled from the Australian Hospitals Directory (2005) included 67% ≤ 100 beds and 33% > 100 beds. The higher proportion of the larger hospitals participating in the study assists in explaining why the percentage of beds (41.9%) covered by the survey was much higher than the original response rate (11.8%).

5.3.3 Current practices regarding food service provision in Australian hospitals

Food service system

Table 5.2 indicates that cook fresh was the most frequent food service system used, particularly for those hospitals with less than 100 beds. Overall 50% of hospitals that responded operated a cook fresh system, while 31% were cook chill and 17.2% used a combination of systems. Findings from a 2001 NSW food service survey by Mibey and Williams (2002) are included for comparison.

Table 5.2: The food service system operated by hospital size compared with the results from a 2001 NSW survey

Food service system	This national survey conducted in 2005				Mibey & Williams survey in 2001		
	Percentage of hospitals with ≤ 100 beds (n=29)	Percentage of hospitals with >100 beds (n=29)	Total (n=58)	Total in NSW (n=21)	The % of hospitals with <100 beds (n=47)	The % of hospitals with ≥ 100 beds (n=46)	Total (n=93)
Cook fresh	65.5	34.5	50.0 ^{*#}	38.0	76.6	28.8	53.8
Cook chill	17.3	44.9	31.0	47.7	19.1	62.3	41.7
Frozen	0	3.4	1.7	0	N/A	N/A	N/A
Combination	17.2	17.2	17.2	14.3	4.3	8.9	4.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Legend: *A Chi square analysis between hospital size (≤ 100 or >100 beds) and cook fresh vs all other systems (cook chill, frozen and combination) had a statistically significant P value of 0.018.

[#]A further Chi square analysis between hospital size and cook fresh vs cook chill also had a statistically significant result, with a P value of 0.014.

Plating

Approximately 93% of all hospitals plated meals in a central location, while 7% used decentralised plating and there was no difference based on hospital size. The 2001 survey results were 89.3% centralised and 10.7% decentralised (Mibey and Williams 2002).

Menu selections

A paper menu is still used in more than 88% of Australian hospitals in this survey, as shown in Table 5.3. A combination of paper menus and the use of palm pilots were used in some of the hospitals with >100 beds. As expected a Fisher's Exact test comparing hospital size and paper menu selection vs all others (palm pilot and combination) indicated no significant difference ($P=0.402$).

Table 5.3: Menu selection method by hospital size

Menu selection method	Percentage of hospitals with ≤ 100 beds (n=30)	Percentage of hospitals with >100 beds (n=28)
Paper	93.4	85.7
Palm pilot	3.3	0
Combination	0	10.7
Other	3.3	3.6
Total	100.0	100.0

Menu cycle length

Table 5.4 reveals that one and two week menu cycle were equally common menu cycle lengths for the larger hospitals that responded, while a four week cycle, closely followed by a two week menu cycle were more common for the hospitals with ≤ 100 beds. Data from a 2001 NSW food service survey were also included for later comparison. A Chi square test provided a non significant result when comparing hospital size vs cycle length of one vs four weeks ($P=0.094$). Fisher's Exact Tests also indicated no significant difference between one and two weeks ($P=0.259$), or one and three week menu cycle lengths and hospital size ($P=0.145$).

Table 5.4: Menu cycle length by hospital size compared with the results of a 2001 NSW survey

Menu cycle length	This national survey conducted in 2005			Mibey & Williams survey in 2001	
	Percentage of hospitals with ≤100 beds (n=30)	Percentage of hospitals with >100 beds (n=26)*	Total (n=56)	Total in NSW (n=19)	Total (n=82)
Up to 7 days	5.4	14.3	19.7	31.5	16.2
8-14 days	17.9	16.0	34.0	31.5	50.6
15-20 days	0	1.8	1.8	0	4.9
3 weeks	8.9	3.6	12.5	21.0	16.0
4 weeks	21.4	10.7	32.2	16.0	12.3
Total %	53.6	46.4	100.0	100.0	100.0

Legend: *Two >100 bed hospitals did not complete this question

Patients selecting their own choices

Dietitians (57.5%) and NUM (70.5%) both indicated that the majority of patients were involved in their own menu selection as indicated in Table 5.5. Some patients were not involved (2.5% according to dietitians and 1.5% according to nurses), primarily due to an inability to communicate or the lack of choice afforded by texture modified diets at many hospitals.

Table 5.5: Stakeholder views about patients selecting their own menu choices

Stakeholder group	% Responding Yes	% Responding No	% Responding Some	% Responding Don't Know	Total
Dietitians (n=85)	57.5	2.5	34.0	6.0	100.0
Nurse Unit Managers (n=64)	70.5	1.5	28.0	0	100.0

Adequate choice for special dietary, religious and/or cultural needs

Figure 5.2 indicates that FSM felt that special dietary, religious and cultural needs were met much more often than the NUM, and particularly the dietitians. Chi square tests indicated statistically significant differences between the views of the dietitians and the food service managers ($P=0.000$), and between the nurse unit managers and food service managers ($P=0.001$) regarding the adequacy of choices available for patients on special diets.

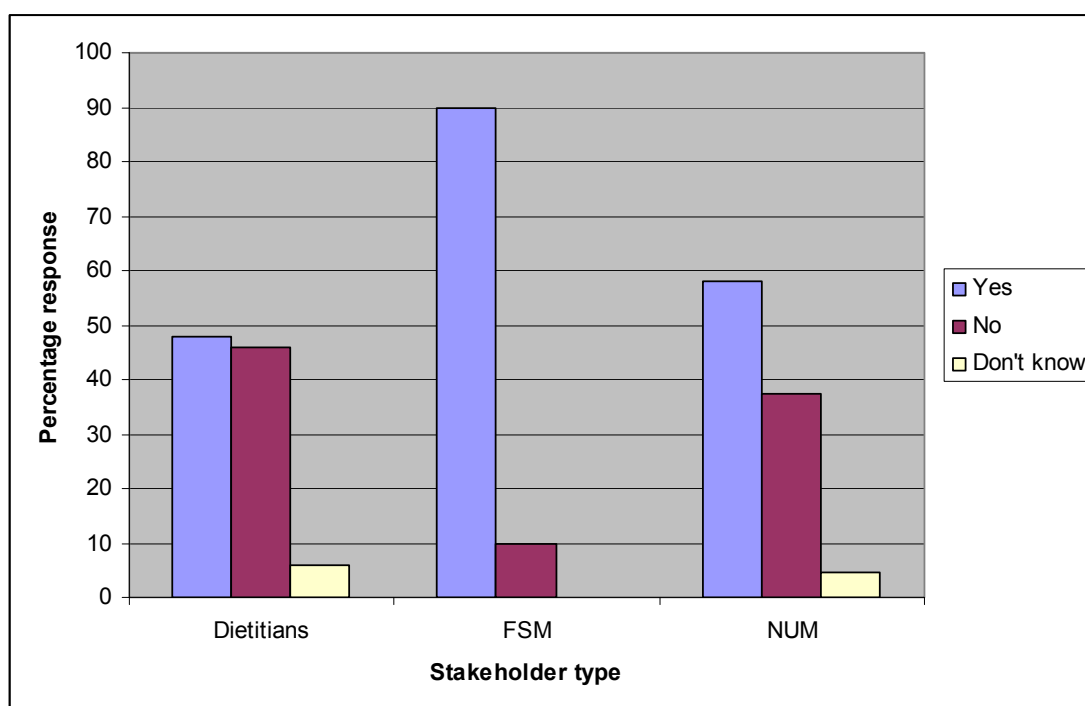


Figure 5.2: Stakeholder views about the adequacy of choices available for special dietary, religious or cultural needs

Assessment of patients regarding their nutrition requirements

Sixty percent of dietitians (48/80) believed that patients were adequately assessed regarding their needs, while 87.5% of nurse unit managers (56/64) responded positively to this question as indicated in Figure 5.3. A Chi square test indicated a statistically significant difference ($P=0.001$) between the views of the dietitians and nurse unit managers regarding the adequacy of assessment of nutritional requirements for individual patients.

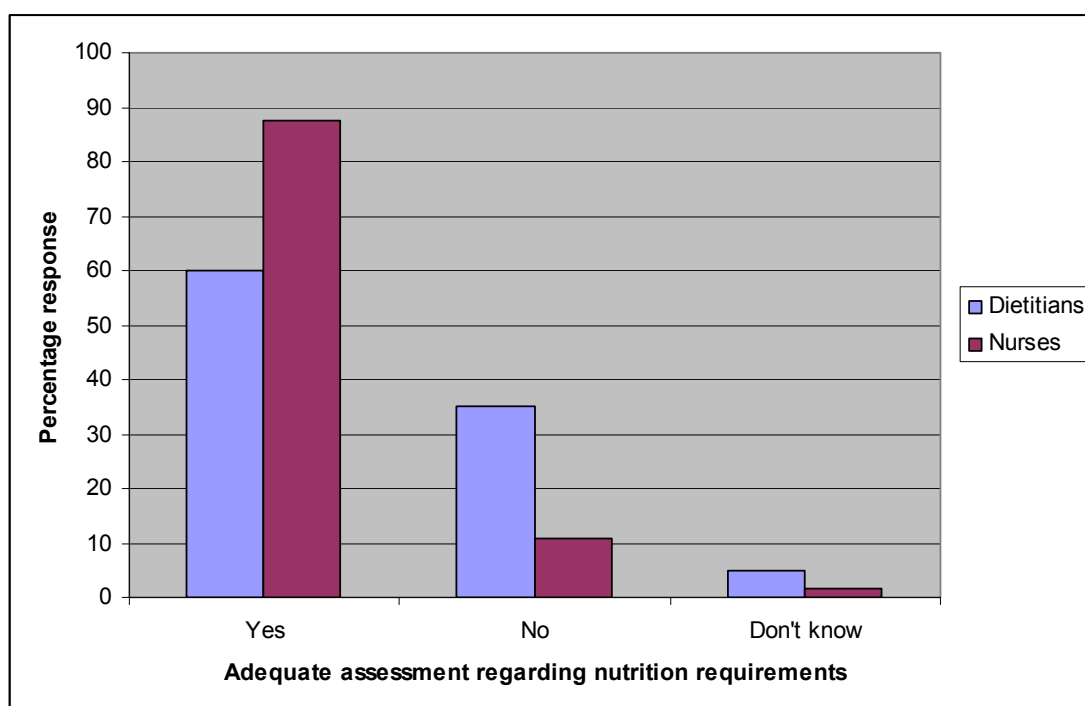


Figure 5.3: Dietitians and nurse unit managers views about the adequacy of assessment regarding nutrition requirements

Serving sizes

There was no significant difference between the stakeholder groups regarding their views of the adequacy of the serving sizes offered, with 87.6% of dietitians, 96% of food service managers and 92.5% of nurse unit managers agreeing that they were adequate. They also agreed that small serves were available when required (94% of dietitians, 88% of nurse unit managers and 95% of food service managers).

Deciding if long stay patients require extra meal and snack options

Dietitians and registered nurses (RN) were thought to be the staff most likely to arrange additional meal or snack options for long stay patients. Although all three stakeholders

also mentioned that nutrition assistants, enrolled nurses and food service assistants could play a role in communicating and advocating regarding extras for such patients.

Seventy-six percent of dietitians, 67% of NUM and 78% of FSM felt that additional main meal options were able to be offered to long stay patients. Similar responses were obtained regarding additional snack options, with 79.5% of dietitians, 58% of NUM and 68% of FSM agreeing that they were available.

Snack options available on a full, and a high protein/high energy (HPHE) diet

Some hospitals had options pre-breakfast, however tea/coffee, sometimes milk, and plain biscuits were common at morning tea, afternoon tea and supper. Interestingly, 40% of dietitians and 46% of FSM reported that fruit was also available at these times and 37% of dietitians and 47.5% of FSM stated that a baked item was available. Patients on HPHE diets appeared to have regular options of high protein (HP) milk, HP commercial supplements, yoghurt or dairy dessert, cheese and biscuits or a HP pudding. The HP commercial supplement was mentioned most often (87% of the dietitians and 71% of the FSM).

Delivering meals

Patient meals were most often delivered by a food service assistant (88%), followed by ward assistants (5%) and nurses (2%), while 5% of respondents didn't know who regularly delivered the meals! There was no significant association between the staff member who distributed meals and the hospital size.

Assisting patients to access their meals

There was uniform agreement about the responsibility for setting patients up to access their meals and to open packaging when required as shown in Figure 5.4 by the positions that were rated as one and two by the three stakeholder groups. The dietitians ranked the enrolled nurses (EN) (87%), then the registered nurses (RN) (85%), while the nurse unit managers ranked the RNs and ENs together (91%), and the FSM ranked the EN (74.5%), followed by the RN (72%) and also estimated that approximately 41.8% of patients required some form of assistance with food and/or beverage packaging.

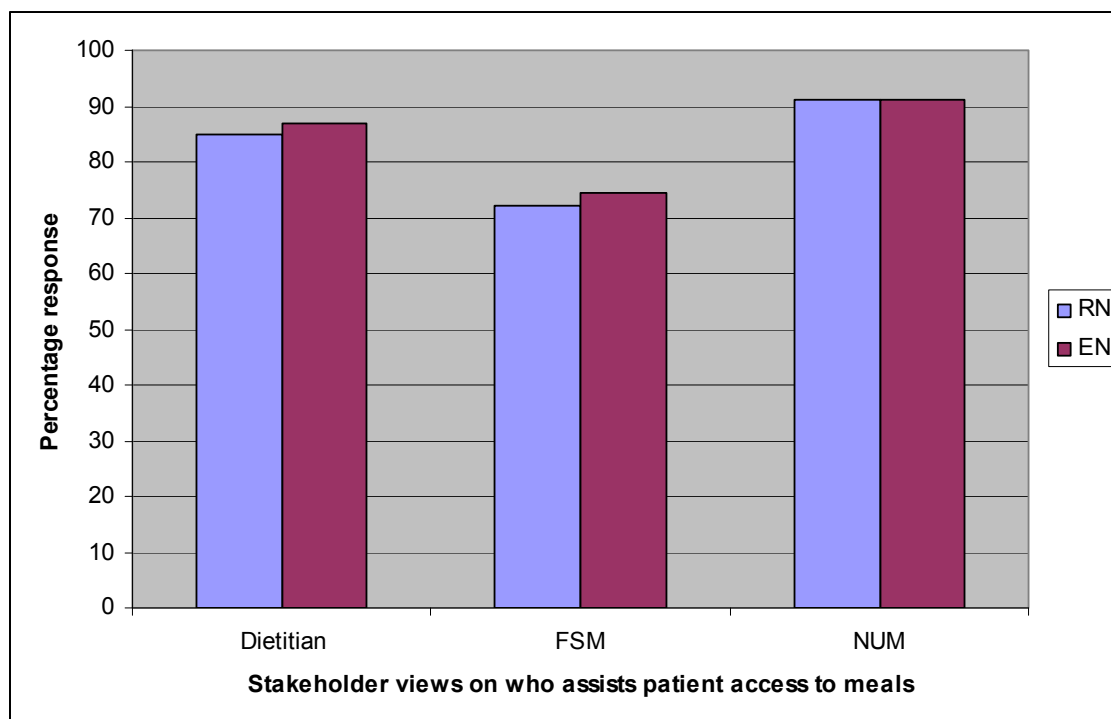


Figure 5.4: Stakeholders opinions about who assists patient access to meals

Feeding patients

Figure 5.5 highlights that all three stakeholder groups indicated that RNs and ENs are the two staff groups most responsible for assisting patients that are unable to feed themselves.

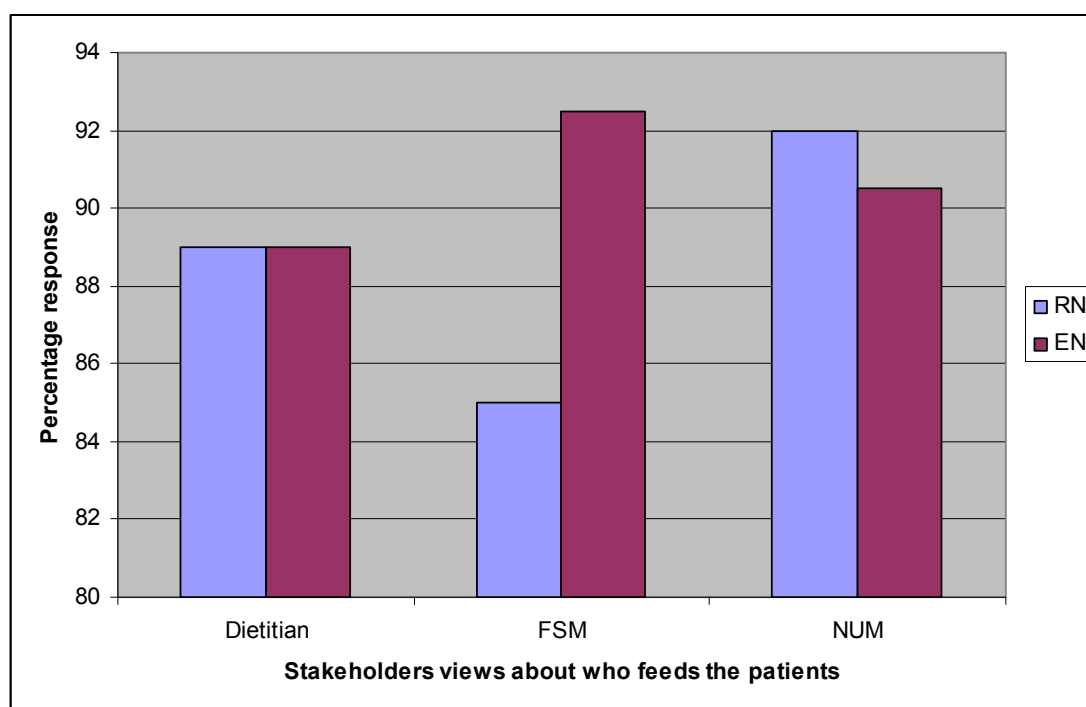


Figure 5.5: Stakeholders views about who feeds the patients

Time available for set up for meals, assistance and feeding

The mean time available for each main meal was very similar when comparing the responses from the nurse unit managers (39.4 minutes, SD:±11.5) and the food service managers (41.0 minutes, SD:±11.2). The responses ranged from 15 minutes to 'as long as required' for NUM and from 20 minutes to 'as long as required' for FSM.

Surprisingly, almost all nurses (98.5%) felt that they had adequate time to assist and feed patients that require it, although they did report the need to divide their time between several patients at busy times, or when there were numerous patients on the ward requiring assistance with set up or feeding. This finding may relate to the fact that 55% of dietitians reported that some form of non-nursing feeding assistance was available, such as visitors and food service assistants. Only one nurse (1.5%) said there was inadequate time to perform these duties.

Eating environment

Eating meals in bed or at the bedside is more common than eating in a communal dining room according to nurses and food service managers (Table 5.6). The 'Other' option frequently referred to bed or bedside, could vary depending on the condition of the patient, and on seven occasions included lunch (and sometimes dinner) being eaten in a dining room and breakfast being consumed in the bedroom. Interestingly, food service managers felt that a much larger proportion of patients ate their meals in bed.

Table 5.6: Nurse unit managers and food service managers views about the location that hospital meals are consumed

Stakeholder group	% Eating in bed	% Eating at the bedside	% Eating in a dining room	% Other	Total
NUM (n=66)	15.0	33.5	35.0	16.5	100.0
FSM (n=40)	52.5	17.5	20.0	10.0	100.0

Monitoring of dietary intakes

Recording of dietary intakes for patients not eating well was reported by 94.5% of dietitians (85/90), and 95.5% of NUM (61/64). These two stakeholders were also in agreement (70% Diet; 69% NUM) that nurses would most often conduct this duty by recording intakes on food charts, while the usefulness of the records was rated by the

dietitians as follows: 26.7% very useful (24/90), 46.7% useful (42/90), 7.8% undecided 7/90, 16.7% limited use (15/90) and 2.2% useless (2/90). The reasons for limitations included that the food charts were not always complete and that they were not always completed at the time of the meal so they were not always accurate or up to date.

Extra items available on the ward between meals and foods brought in from outside

Nurses regularly reported (86.5%: 58/67) that additional items were available on the ward for patients when required. Approximately 73% (49/67) reported that long stay patients often had food and beverage items brought in for them, with the most popular items being: chocolates and lollies (79%: 53/67), fruit (70%: 47/67), soft drinks (67%: 45/67), main meals (53.5%: 36/67) and desserts (40%: 27/67).

Food fortification

A number of hospitals offered nutritionally fortified versions of some foods and beverages, particularly some forms of soup, mashed potato, milk and juice. The most common food fortificants were protein powder, skim milk powder, glucose polymers and cream. Table 5.7 shows the frequency of fortified foods being offered at hospitals ≤ 100 beds, and >100 beds. A Chi square analysis indicated no significant difference ($P=0.726$) between hospital size and frequency of fortified options being offered.

Table 5.7: Food fortification and hospital size

Response	Percentage of hospitals with ≤ 100 beds (n=48)	Percentage of hospitals with >100 beds (n=64)
Yes	83.0	87.5
No	17.0	12.5
Total	100.0	100.0

Non nursing feeding and trained non-nursing assistance

Fifty-five percent of dietitians and 59.5% of FSM reported that some non nursing feeding assistance was provided, most often in the form of food service assistants and visitors. Dietitians (14.5%) and FSM (21.5%) indicated that trained, non nursing staff were much less likely to be available to assist with feeding at meals and only one site mentioned a volunteer feeding assistance program. Unfortunately minimal responses

were received from nurses regarding these questions and as such the findings relate to the dietitians and food service managers only.

5.3.4 Barriers to adequate dietary intakes

Table 5.8 summarises the top 10 barriers to dietary intakes identified by each stakeholder group and the combined totals using both the raw, unweighted data and the weighted data. The combined stakeholders list included the same top 10 barriers, whether the data was unweighted or weighted, with only the order of barriers two to four being changed as a result of the weighting application. There were six barriers that were common to all three stakeholder groups, these being:

- Lack of choice due to a special diet
- Boredom due to length of stay
- Lack of feeding assistance
- Limited variety
- Packaging difficult to open
- Lack of meal set up assistance

There were also several barriers that appeared in the top 10 lists for at least two of the stakeholder groups. Dietitians and food service managers had the following barriers in common:

- Limited nutritional assessment
- Communication between staff

Food service managers and nurse unit managers had no additional barriers in common, while dietitians and nurse unit managers had the following barriers in common:

- Lack of flexibility of food service
- Taste of food

5.3.5 Priority interventions and the feasibility of their implementation

Table 5.9 summarises the top 10 priority interventions in each stakeholder group and the combined totals using both the raw, unweighted data and the weighted data. It is also evident that the combined stakeholders list included the same top 10 priority interventions, whether the data was unweighted or weighted, with only the order of priorities two to five being changed as a result of the weighting application. There were five priorities that were common to all three stakeholder groups, these being:

- Food fortification
- Assistance with packaging
- Nutrition assessment of all patients
- Adequate monitoring of intakes
- Adequate flexibility of menu choices

There were also several priorities that appeared in the top 10 lists for at least two of the stakeholder groups. Dietitians and food service managers had the following priorities in common:

- Additional feeding assistance by nurses
- Non nursing feeding assistant available at meals
- Additional assistance to set up for meals

Food service managers and nurse unit managers had no additional priorities in common, while dietitians and nurse unit managers had the following priorities in common:

- More nourishing between meal snacks
- Improved variety of menu options

It is interesting to note that the list from the nurse unit managers did not include the three priorities related to the ward environment and nursing roles that were included by the dietitians and the food service managers. Likewise, it is worth noting that the food service managers didn't rate the additional nourishing snacks and menu variety options any higher.

Table 5.8: The top 10 barriers (raw, unweighted and weighted data) for each stakeholder group and combined stakeholder totals

Barrier Number	Dietitians	Raw No.	Wt. No.	Food Service Managers	Raw No.	Wt. No.	Nurse Unit Managers	Raw No.	Wt. No.	Combined Stakeholder Totals	Raw No.	Wt. No.
1	Lack of feeding assistance	837	660.4	Boredom due to length of stay	359	448.8	Limited variety	585	624.2	Lack of choice due to special diet	1482	1434.6
2	Lack of flexibility of food service	758	598.1	Lack of feeding assistance	350	437.5	Lack of choice due to special diet	548	584.7	Boredom due to length of stay	1456	1431
3	Lack of choice due to special diet	689	543.6	Lack of meal set up assistance	330	412.5	Packaging difficult to open	543	579.4	Lack of feeding assistance	1456	1384.9
4	Boredom due to length of stay	677	534.2	Communication between staff & patients	291	363.8	Lack of flexibility of food service	498	531.4	Limited variety	1451	1395.5
5	Limited variety	675	532.6	Limited nutritional assessment	255	318.8	Boredom due to length of stay	420	448.1	Lack of flexibility of food service	1408	1319.4
6	Lack of meal set up assistance	613	483.7	Lack of choice due to special diet	245	306.3	Taste of food	415	442.8	Packaging difficult to open	1271	1250.1
7	Packaging difficult to open	519	409.5	Limited monitoring of intakes	227	283.8	Lack of culturally appropriate food	317	338.2	Lack of meal set up assistance	1222	1193.9
8	Limited nutritional assessment	501	395.3	Communication between staff	220	275	Lack of meal set up assistance	279	297.7	Limited nutritional assessment	994	968
9	Taste of food	470	370.8	Packaging difficult to open	209	261.3	Lack of feeding assistance	269	287	Taste of food	965	913.6
10	Communication between staff	387	305.3	Limited variety	191	238.8	Temperature of food	256	273.2	Communication between staff & patients	881	887.1

Legend: Raw No. are the unweighted totals for each barrier, while Wt. No. refers to the values after the weightings are applied. A complete description of this method is available in 5.2.4 (Data Analysis).

Table 5.9: The top 10 priorities (raw unweighted and weighted data) for each stakeholder group and combined stakeholder totals

Priority Number	Dietitians	Raw No.	Wt. No.	Food Service Managers	Raw No.	Wt. No.	Nurse Unit Managers	Raw No.	Wt. No.	Combined	Raw No.	Wt. No.
1	Food fortification	119	93.9	Additional feeding assistance by nurses	53	66.3	Assistance with packaging	47	50.1	Food fortification	202	190.9
2	Additional feeding assistance by nurses	112	88.4	Adequate monitoring intakes	53	66.3	Improved variety of menu options	45	48	Assistance with packaging	188	180.3
3	Non nursing feeding assistant available at meals	106	83.6	Nutrition assessment of all patients	52	65	Adequate flexibility of menu choices	40	42.7	Additional feeding assistance by nurses	188	179.2
4	Assistance with packaging	100	78.9	Non nursing feeding assistant available at meal	49	61.3	Food fortification	37	39.5	Non nursing feeding assistant available at meal	179	170.5
5	Nutrition assessment of all patients	90	71	Food fortification	48	57.5	More nourishing between meal snacks	37	39.5	Nutrition assessment of all patients	176	172.3.5
6	Adequate flexibility of menu choices	84	66.3	Assistance with packaging	41	51.3	Improved taste of meals	37	39.5	Adequate monitoring intakes	161	159.8
7	More nourishing between meal snacks	81	63.9	Additional assistance to set up for meals	35	43.8	Nutrition assessment of all patients	34	36.3	Adequate flexibility of menu choices	157	150.2
8	Adequate monitoring intakes	78	61.5	Adequate flexibility of menu choices	33	41.3	Additional culturally appropriate meals	33	35.2	More nourishing between meal snacks	145	137.1
9	Improved variety of menu options	73	57.6	Serve size options	31	38.8	Adequate monitoring intakes	30	32	Improved variety of menu options	136	128.1
10	Additional assistance to set up for meals	66	52.1	More information about food choices	31	38.8	Additional foods from home	28	29.9	Additional assistance to set up for meals	128	134.6

Legend: Raw No. are the unweighted totals for each priority, while Wt. No. refers to the values after the weightings are applied. A complete description of this method is in Figure 5.1.

In determining priority interventions it was important to consider the perceived feasibility of each intervention. Table 5.10 provides the mean feasibility, in addition to the rating for each stakeholder group for each of the 20 priority options ranked in order from most feasible to the least feasible option. The top ten cumulative priorities for the three stakeholders (from Table 5.9) are indicated by the use of blue coloured text. Food fortification, the highest rated intervention was also rated favourably regarding ease of implementation, closely followed by packaging assistance and more nourishing between meal snacks. However interventions related to such priorities as additional feeding assistance, improved menu variety, nutrition assessment and flexibility of the menu were perceived as harder to implement, although on average none of these options were rated as 'somewhat difficult' or 'very difficult'.

Table 5.10: Feasibility rating for each priority intervention and stakeholder group

Priority intervention	Mean feasibility rating	Dietitian rating	FSM rating	NUM rating
Serve size options (small offered)	1.7	2	1.7	1.3
Food fortification	2.3	2.4	2	2.4
More information on menu choices	2.3	2.3	2.4	2.3
Packaging assistance	2.5	2.4	3	2.7
Adequate time allowed	2.5	2.5	2.1	2.8
Improved communication staff & patients	2.7	2.7	2.5	3
More nourishing between meal snacks	2.7	2.6	3	2.5
Additional foods brought from home	2.8	2.6	3.3	2.9
Improved communication between staff	2.8	2.7	3	2.7
Improved layout and appearance of meal tray	2.9	3	3.3	2.7
Adequate monitoring of intakes	3.0	3.2	3	2.6
Additional assistance to set up for meals	3.0	2.7	3.2	3.3
Additional feeding assistance by nurses	3.2	3.6	3.2	3.3
Improved taste	3.2	3.3	3.1	3.2
Additional culturally appropriate dishes	3.2	3.6	2.4	3.1
Dining room	3.3	3.2	3.4	3.3
Adequate flexibility of menu choices	3.3	3.5	3.1	2.9
Improved variety of menu options	3.3	3.4	3.2	3.3
Nutrition assessment of all patients	3.5	3.8	3.5	3.2
Non nursing assistant available at meals	3.6	3.7	3.3	3.5

Legend: 1=very easy, 2=somewhat easy, 3=possible, 4=somewhat difficult, 5=very difficult
 The blue text indicates the top ten cumulative priorities for the three stakeholders

5.4 DISCUSSION

5.4.1 Current practices regarding food service provision in Australian hospitals

The current survey indicates that the cook fresh food service system was still the most common food service system in Australian hospitals in 2005, with 50% of the FSM indicating this system. There was a significant difference in its use in hospitals with 100 beds or less and those hospitals larger than 100 beds. A cook chill system was used in 17.3% of the smaller hospitals and 44.9% of the hospitals with greater than 100 beds. Overall 31% of FSM indicated the cook chill system was being used, however a further 17.2% indicated a combined approach and 1.7% were using a frozen system, which suggests an increase in cook chill and cook freeze operations in recent years. Mibey & Williams (2002) surveyed food service managers in NSW hospitals in 2001 and reported 41.7% using a cook chill system, while only 4.5% were then using a combination of methods. A major change since then is that the use of a combination of systems has increased, and this was particularly so in the smaller hospitals, with 17.25% using a combination and 17.2% of larger hospitals, compared to 4.3% and 8.9% respectively in 2001. The increased reach of central production units (CPU's) is likely to have been of influence here as a number of smaller hospital sites are now purchasing their main menu items in bulk from CPUs and then retherming and plating on site. A relevant example is the Central Production Unit at Port Kembla Hospital that provides a bulk food service to 15 sites in the South Eastern Sydney Illawarra Area Health Service, many sites in the Southern Area Health Service and provides plated meals for Port Kembla Hospital.

There were some differences across the states and territories in the use of food service systems and unfortunately the small number of responses preclude analysing the data this way. Thus in comparing results to those of Mibey and Williams (2002), some of the differences may have been due to the national approach of the current survey. In considering the NSW only data, it was very apparent that the overall usage of cook fresh production has decreased dramatically (53.8% in 2001 and 38% in 2005), while cook chill has increased (41.7% in 2001, to 47.7% in 2005), as has a combination approach (4.5% in 2001 and 17.3% in 2005).

Plating location

The plating location was still predominantly centralised, with 93% of food service managers indicating this in the current study vs 89% in the 2001 survey (Mibey and Williams 2002). While some have introduced bulk delivery carts for some specific wards, including the Princess Alexandra Hospital, Brisbane (Wilkinson et al 2003), a high rate of centralised plating was expected given the impetus for food services to streamline production and plating so as to maximise plating efficiency and contain costs.

Some sites were using bulk delivery carts in at least some wards where choice at point of service and a choice of serving size are particularly relevant and the number of therapeutic diets is limited. Kelly (1999) reported the benefits of decentralised plating on the intakes of patients in medical wards, while Wilkinson et al (2003) reported the success of a bistro style bulk ward service with aged care patients at a Queensland hospital. The benefits of a decentralised ward plating system have also been demonstrated with renal patients as dietary intakes improved when the nurses assumed the role of 'food service assistant' and plated the meals at the ward level (Marson et al 2003). Finally, Carr & Mitchell (1991) explored a centralised and a decentralised plating system with stroke patients and found that the involvement of nurses in the ward plating process was superior. *"It is possible, therefore, that a meal delivery system designed to free nurses from the 'non-nursing' duty of serving food may have an adverse effect on their involvement in other aspects of mealtimes"* (Carr & Mitchell 1991, p19).

Menu ordering

It appears that most hospitals still use a paper menu to collect meal orders. A combination of palm pilot and paper menus were being used in 10.7% of the larger hospitals. It was expected that more of the larger sites would have been using the CBORD® computerised food management systems. However the survey didn't specifically ask about the use of CBORD® Food management Systems, rather it asked about the format in which menu choices were communicated and collected. A personal communication with Kirsty Maunder, (Dietitian from CBORD®) indicated that the system is used in 123 hospitals, which are mainly in NSW, with one each in Queensland, Western Australia and South Australia, and a few in Victoria. Only 16 of these sites used a spoken menu via the use of a bedside menu entry (BME) or palm pilot system.

The remainder print the menus and distribute, before entering codes to enable the automatic generation of tallies, labels, meal delivery reports and tray tickets for meal plating which assists in explaining the higher than expected use of paper menus (K Maunder 2008, Personal communications on 27th March and 10th September).

Menu cycle length

The information regarding menu cycle length was of interest because there was an increase in the number of hospitals offering menus of cycle length of one week or less (particularly in the larger hospitals) and reductions in the proportion using longer menu cycles. This was expected as there have been numerous changes to hospital menu lengths in recent years in order to streamline production, limit human resources and consumables in a bid to save costs (Lazarus & Hamlyn 2005, Vivanti & Banks 2007).

The surprising finding is that the proportion of hospitals utilising a four week menu cycle had increased. However it must be noted that five of the six larger hospitals using a four week menu cycle were in Victoria, with the other one in NSW. The twelve smaller sites using four week menus consisted of two in NSW, one in Queensland (a private site), four in Victoria and five in South Australia. The fact that the 2001 survey was conducted in NSW only makes this comparison difficult as it seems that there is a tendency for longer menu cycles at some hospitals in South Australia and Victoria. Interpretation of this menu cycle information should be taken with caution as it is evident that the two data sources are different, and a further, larger review of NSW specific sites would be required to provide a fair comparison. In considering the NSW only data, it should be noted that significantly large increases were apparent in the usage of the weekly menu cycle lengths, while there has been a large reduction in the usage of 8-14 days cycles and some small increases in three week and four week menu cycles.

Meal deliveries, eating location, extras and feeding assistance

Meals are still predominantly delivered by food service assistants and it appears that patients usually eat in their bed or at the bedside. It is interesting to note that food service managers felt that 52.5% of patients ate in their beds, while only 15% of nurse unit managers agreed. This may reflect the perception of food service managers regarding what patients are doing, as presumably nurse unit managers have regular contact with patients at meals. It may also reflect the differences between hospitals in

the survey, as not every food service manager and nurse unit manager responded. There was considerable variation in the availability of a dining room on wards, which is unfortunate because socialisation with others at meals between patients who are well enough to do so has been shown to be very positive (Edwards & Hartwell 2004, Wright et al 2006). The practice of patients consuming their meals in bed is far from ideal given the potential issues related to poor positioning, safe swallowing and access to their meals.

A further point was the fact that almost all nurses felt they had time to assist and feed patients requiring it. They did report the need to divide their time between patients during a meal and perhaps this is a reason that they didn't view this as a key barrier. The other two stakeholders did see this as a barrier as they felt further assistance and feeding was required. The time available for meals was rated similarly between the nurse unit managers and food service managers, at about 40 minutes, which is likely to be adequate for patients to eat in an unhurried manner.

Nurses were largely happy with the extra items available for patients on the ward. All stakeholders were fairly happy with the serve size options available and it was apparent that food fortification was already used in some form (particularly soups and mashed potato) in a large proportion of the hospitals represented.

There was some disparity with regard to the views about the adequacy of special diet options (religious and cultural), with the food service managers being more satisfied than the nurse unit managers and dietitians. There was general agreement about the primary role of dietitians or registered nurses in planning additional items for long stay patients. The registered nurses and enrolled nurses were viewed by all three stakeholders as the staff most likely to help patients access their meals, while they were also regarded as the staff members who had a role in assisting feeding those patients who needed it and to monitor their intakes.

Clearly different stakeholders have some differing opinions about the amount of choice offered and the availability of feeding assistance and monitoring. Each of the stakeholders have different roles which involve communication with patients and each other regarding food and nutrition. Their point of reference differs and this may be reflected in some of their views, with the nurse unit managers most likely to see what

the patient eats at meals and what other events may impact on this. These food service, nutrition and feeding topics set the context for the following discussion regarding the barriers and priority interventions to improve dietary intakes by long stay, elderly patients in Australian hospitals.

5.4.2 Barriers to adequate dietary intakes

The top ten barriers for the three stakeholder groups were the same irrespective of the weighting being applied, with only the order of several items within the top ten changing. It was reassuring to see that all three stakeholder groups individually agreed on six key barriers, these being: lack of choice due to a special diet, boredom due to length of stay, limited variety, lack of feeding assistance, packaging difficult to open and lack of meal set up assistance. The first three issues relate to a lack of customisation of hospital food services today as was outlined in Chapter 4, while the last three barriers relate to a lack of time by food service and nursing staff, although this wasn't highlighted as an issue by the nurse unit managers. This was an unexpected finding as several researchers have identified the negative influence of a lack of nutrition knowledge by nurses, competing agendas, lack of involvement in food service at the ward level and a reduced workforce on the nutritional intakes of patients (Kowanko 1997, Kowanko et al 1999). The ageing nature of the hospital patient population means they are more likely to require additional assistance and encouragement with meals, particularly with all the packaged 'clinical' style items that they are not likely to be familiar with or satisfied with (Vivanti et al 2008).

The dietitians identified additional barriers in common with both the food service managers (limited nutrition assessment and communication between staff) and the nurse unit managers (lack of flexibility of the food service and the taste of the food), while the food service managers and nurse unit managers had no additional barriers or priorities in common with each other. This in itself is a relevant finding, but how should it be interpreted and what does it mean? Does it mean that the dietitians are in a more pivotal liaison role between the other two stakeholders and thus share certain views? Alternately does it indicate deeper historical issues concerning roles and respect, the all too familiar issues of 'clinical' services vs 'hotel' services? Either way, it seems that substantial work is required to build communication between all parties that will ultimately benefit the patients. The support of strong, influential clinicians will be

required to assist in raising the profile of food services as an essential part of clinical care.

5.4.3 Priority interventions and the feasibility of their implementation

As was the case with the barriers, the cumulative total of the top ten intervention priorities were common across the three stakeholder groups whether or not the weighting was applied. All three stakeholder groups individually agreed on five priorities, these being: food fortification, assistance with packaging, nutrition assessment of all patients, adequate monitoring of intakes and adequate flexibility of menu choices.

Of particular note here were the additional priorities in common between the dietitians and the food service managers (additional feeding assistance by nurses, non nursing feeding assistant available at meals and additional assistance to set up for meals) and between the dietitians and the nurse unit managers (more nourishing between meal snacks and an improved variety of menu options. The first three items concern the ward environment and nurse unit managers, while the last two concern food service managers. This may be because they know more about their respective areas and may not recognise problems there, as opposed to other stakeholders who are not directly responsible coming in and seeing them more easily. It could be their perception, or their not wanting to think about problems that could be related to their department? These comments were consistent with some of the comments reported in Chapter 4, for example:

'The poor patient can't sit there and eat it because she can't open it or he can't open it and the nursing staff are busy showering or bathing somebody else, that meal is just going to sit there until the next hour' (Nurse)

'But I think the change is it used to be seen as part of the therapeutic process of care [that's right [and we've now just determined that food is just something that sustains you [we have to provide], but that's your whole process of socialisation around food and preparation of food and consumption of food' (Nurse)

We have a prevalence of wet dishes in the hospital. I know that that's not (my) favourite. I'd prefer fish, eat, chicken that I have at home' (Food Service Assistant)

The key priorities also required consideration regarding their feasibility in today's busy, and fiscally controlled hospitals.

Food fortification

Food fortification was the combined priority that was seen as the most feasible (mean ranking of 2.3), and more than 80% of larger hospitals were already using this in some form (most often mashed potato and soups fortified with protein powder, glucose polymers and margarine). This intervention has been reported favourably in the literature (Gall et al 1998, Barton et al 2000a). This strategy has also been expanded to cover texture modified diets (Kennewell & Kokkinakos 2007) and items such as porridge. This approach is extremely valuable because it can increase the intakes of small eaters, however it is still reliant on other identified priorities such as feeding assistance and assistance with packaging to successfully 'make every mouthful count'.

Packaging

The amount of packaging used to enclose the many food and beverage items is a source of frustration for many patients who have difficulty opening them to eat their meals. Vivanti et al (2008) reported that 49% of patients surveyed in two Queensland teaching hospitals had difficulty with these packages. Their use appears to be on the rise, and as well as the difficulty in opening them, the packaging can also adversely affect the visual appeal of the meal and negatively impact on food consumption.

Many patients are frail and already have poor appetites and the challenges of accessing food can further hinder dietary intakes. This priority had a feasibility of 2.5, suggesting it would be relatively easy to address, although it was unclear who would take responsibility for implementation. The increased use of these items makes this a particularly important consideration. The large amount of packaging, which may include up to 19 items on a tray, requires a planned approach as to who will take responsibility to ensure that all patients can access their meals (Wilton et al 2004).

Trained volunteers have assumed this role in one aged care ward at Sutherland Hospital, South of Sydney. Patients requiring assistance are referred by senior nursing staff and the volunteers ensure that all items are opened so that they may start their meal in a timely manner. A pilot evaluation of this program has been outlined in Chapter 8 of this thesis (Walton et al 2008). Further research is required to investigate

what types of packaging (if any) patients find easiest to open so that discussions can take place between food services, occupational therapists and the manufacturers to make openings more user friendly and to include these requirements in future tender specification documents for hospitals.

Nutrition assessment and monitoring of intakes

Nutrition assessment of all patients (feasibility rating of 3.5) and monitoring of intakes (feasibility rating of 3) would be harder to implement. Nutrition assessment is conducted by dietitians, but requires patients to be flagged as 'at risk' by other staff members and referred appropriately. Assessing all patients would be difficult given current resources and not all patients would require assessment. A first step is the instigation of systematic screening programs at admission by doctors, or nurses or nutrition assistants, so that 'at risk' patients can be highlighted and importantly then referred for timely nutritional assessment and appropriate nutrition support. The real cost of not screening and intervening in a timely manner needs further consideration, in terms of such outcomes as complications, length of stay and mortality.

Monitoring of intakes is important to understanding what is being eaten by patients who are identified 'at risk' and who are receiving a HPHE diet. Clearly the multiple roles of nurses at meal times make this duty somewhat inaccurate, and often incomplete. Further strategies are required to conduct this important duty in a more efficient manner. Food service staff see what is left on the tray when they collect them, but have limited time to complete this task. They often have useful feedback for the nurses, nutrition assistants and dietitians which could be communicated in a consistent manner if this was seen as an important role within patient care and their views were welcomed by all staff. Other options may include lunch rounds by dietitians, or nutrition assistants or the involvement of volunteers. Clearly, however this is resolved it will include multiple types of staff and will rely on respect for different roles by all and open communication amongst all concerned.

Adequate flexibility of menu choices & improved variety of menu options

"The menu forms the heart of any food service operation" (Kennewell & Kokkinakos 2001, p37). Three of the identified barriers (lack of choice due to a special diet, boredom due to length of stay and limited variety) would be addressed if this priority (perceived mean feasibility rating of 3.3.) could be implemented. Other research

supports the view that customisation is an important determinant of overall patient satisfaction with the food services provided (Dubè et al 1994), along with food quality, temperature, variety, presentation and staff attitude (DeLuco & Cremer 1990, O'Hara et al 1997, Lau & Gregoire 1998).

As the menu is a central control mechanism in the food service setting, any improvements to its flexibility will impact on the range of items stocked and made available, the food costs, communication between nutrition, food services, nursing and patients regarding options available (Spears & Gregoire 2007). Ultimately a more customer focused, flexible food service system with an improved range and availability of extra nourishing options, particularly for long stay patients will require an elevation of the status of food services from 'hotel services' to a service that supports clinicians and patients (Allison 2003). Such a position may also require additional resourcing. A recent Special Commission of Inquiry into acute services in NSW Hospitals has been told 51% of patients at Royal North Shore Hospital were malnourished, and that these patients stay nearly twice the length of time that the well nourished patients do. The impact of budgets and cost savings on food services were summarised by Rhonda Matthews (Dietitian), *"Because it's been divorced from clinical care and it's being seen very much as a business unit... we can lose sight of the fact that it's patient's we're dealing with. It's not an airline"* (Matthews 2008, cited in Wallace 2008, [p2 of 2]).

Future studies are certainly warranted to investigate the cost effectiveness of further fortified foods and a more flexible menu and more extensive nourishing extras on dietary intakes, nutritional status, patient satisfaction and resultant LOS. Commercial nutrition supplements were not included in this study. However it was apparent from the literature and other studies (Chapter 6) that their use is widespread within hospitals as a means to add additional protein and energy for patients who require a HPHE diet. They can serve as an important intervention if used appropriately, however there is a common perception that they are often overused, not consistently monitored and thus quite often wasted. This was certainly indicated by stakeholders in Chapter 4 and in the findings presented from a dietary intakes study within rehabilitation wards that is outlined in Chapter 6.

It is time to look at other options instead of relying so heavily on supplements to meet the requirements of patients that require additional energy, macronutrients and

micronutrients than is provided by a 'full' or 'standard' ward diet. Budget allocation varies for these items, which can be a source of frustration and dispute. Where the budget lies with food service they may be hesitant to be seen spending money on luxury style foods such as chocolate biscuits, crisps or chocolate, even know there are many patients who would greatly benefit from the caloric content of these items. However if the food service department holds the budget for supplements then there may be more chance of incorporating some of these HPHE food based supplements and decreasing the use of some commercial supplements by better targeting and monitoring of these items. If the dietetics department holds the supplements budget then any more money spent on HPHE foods by food services would be problematic as it transfers costs to the already constrained food service budget. To spend more on HPHE foods and reduce supplements would actually look worse for food services. Their position is already tenuous and their relations with dietetics at times strained. Clearly communication and a unified departmental approach would be essential in order for the finance department and hospital management to see the implications of such a positive step and the ultimate cost savings for the hospital.

More nourishing snacks

This priority (feasibility rating of 2.7) aligns with the literature that indicates that many patients find meals too large and less appealing (Barton et al 2000b, Vivanti et al 2008). Items such as chocolate, cheese and biscuits, high energy cakes, commercial style dairy desserts and sandwiches could be incorporated into menus. Obviously these items have a cost, as do commercial supplements that are routinely used to top up protein and energy intakes, as is outlined in Chapter 6. Rypkema et al (2004) reported on the cost related feasibility and effectiveness of a targeted, early intervention to provide appropriate supplements to elderly patients after careful screening using the MNA, as well as dysphagia and hydration screening. A longer term trial is likely to be necessary to examine the cost-effectiveness of this strategy by investigating nutritional status, intakes and patient tolerance in an Australian setting. Evidence of their benefits may mean that financial managers enhance food service budgets somewhat to allow them to increase the HPHE options.

Additional feeding assistance by nurses, by trained non-nurses and additional meal set up assistance

These priorities were ranked more highly by the dietitians and food service managers, than the nurse unit managers. The overall view of the nurse unit managers who participated in the survey was that they could get around to see their patients and assist where required in most instances. This is in contrast to the findings of many others researchers who suggest that busy nurses have little time to encourage and assist those that need it (Kowanko et al 1999, Xia & McCutcheon 2006). Therefore this was a surprising finding, particularly as these issues were identified by all stakeholder types in the focus group study outlined in Chapter 4. One can only postulate that this sample of nurse unit managers felt that their nurses could accommodate the needs of their patients regarding feeding assistance and meal set up, albeit that they had to spread their time between several patients during a meal time.

These three potential strategies were also viewed as more difficult to implement, probably in part due to staff shortages, competing agendas and meal times. A multidisciplinary team approach is required to address these issues. Implementation of a 'protected meal times' would assist in addressing these three issues because meal times would be prioritised and nursing staff would be available to assist with setting up, feeding and monitoring. The possible role for trained volunteers in assisting with feeding assistance, opening of packages and monitoring also requires further review. A pilot study of this nature is outlined in Chapter 8.

5.4.4 Limitations

Although the survey response rate was small, it did include responses from hospitals that incorporated almost half of all hospital beds in Australia. Although the sampling design included equal numbers of each stakeholder group, there were more responses from dietitians than from food service managers or nurse unit managers. The presentation of the barriers and priority intervention findings in a raw, unweighted form and a weighted form takes account of the differing numbers of responses from each stakeholder group.

Hospitals smaller than 20 beds were not included for logistical reasons, however the fact that 450 hospitals (of the 670 invited) were less than 100 beds should have provided a flavour for the issues likely to also influence the smaller sites.

The web version of the questionnaire largely worked well. However 20% of respondents couldn't access the internet at work and required a paper version of the questionnaire. This meant that some questions were missed by some of these respondents. The last two questions were missed by many nurse unit managers who did the online version. In retrospect this section should have been modified to make it more user friendly as these last questions followed the two most difficult questions regarding the barriers and priority interventions. Additionally, several of the terms were similar within the list of barriers, and also within the list of priorities, which made it hard, and very time consuming for some to complete the rankings (eg. limited menu variety and boredom due to length of stay). More thorough initial reliability testing and factor analysis may have meant that some of the options could have been combined and the lists reduced in length.

Patient centred issues such as cognitive impairment, chronic pain and swallowing disorders were not included in the survey because they can not be modified by nutrition and food services directly.

5.5 CONCLUSION

It is evident that there have been a number of changes to the way hospital food services are delivered in recent years, namely the increase in cook chill production and the reduction in menu cycle length. There is agreement between the stakeholders regarding many key barriers and priority interventions to improve dietary intakes by long stay patients. It seems that limited variety, boredom due to LOS, large amounts of packaging and a lack of feeding and set up assistance are particular barriers that warrant further consideration.

Priority interventions relate to these and include the application of food fortification wherever possible, additional assistance with packaging, meal set up and feeding in a timely manner when required, improved menu variety, more nourishing between meal snacks and an increased use of nutritional assessment.

Clearly there are numerous barriers to intakes by hospital patients, and there are a variety of priority interventions as no one intervention will fix all the ills with the provision of hospital food for each individual patient. The requirements will also vary depending on such characteristics as the patient demographics, food service system and hospital size. However hospital food and nutrition services require an urgent risk management strategy as malnutrition is on the increase (Wright et al 2006b).

“The opportunity is there to start selling nutrition as a patient safety issue and raising awareness in terms of clinical risk” (Lecko 2007, cited in Vere-Jones 2007, p8).

CHAPTER 6 NUTRITIONAL INTAKES OF REHABILITATION INPATIENTS³

6.1 INTRODUCTION

Chapters 4 and 5 have allowed a broad, descriptive investigation of the issues and opinions, along with a quantitative summary regarding barriers and opportunities to improve dietary intakes. Key stakeholders have had the opportunity to voice their opinions about current practices regarding hospital food service in terms of what occurs at their hospital, what is done well and what needs to be done better. An opportunity to measure actual dietary intakes, to consider and confirm the issues influencing the ultimate consumers of the service, the patients, was necessary prior to implementing improvement strategies. An ethnographic study, incorporating overt observations, weighed dietary intakes, and interviews with patients and nurses in aged care rehabilitation wards was conducted and is outlined in Chapters 6 and 7.

Information about the nutritional status of older, rehabilitation patients is limited but several studies estimate the rate of malnutrition to be between 29-63% (Finestone et al 1996, Thomas et al 2002, Neumann et al 2005). The figures vary due to the assessment method used and the type of patients studied.

Dietary intake in hospital is complex and can be influenced by numerous factors including: the appetite of the patient, their health status, interest in food, appearance of meals, degree of flexibility of the hospital food service, texture modified or restricted therapeutic diet, amount of packaging, assistance required with eating, lack of acceptance of some of the foods provided (Green 1999, Isaksson 1982, Stephen et al 1997) differences between some patients' and staff concerns about mealtimes and the

³A significant portion of this chapter has been published in the following peer reviewed journal article:

Walton, KL, Williams P, Tapsell LC & Batterham M (2007). Rehabilitation inpatients are not meeting their energy and protein needs. *e-SPEN the European e-Journal of Clinical Nutrition and Metabolism*;2(6):120 - e126.

KW and PW designed the study, while KW, PW and MB interpreted the data and all four authors contributed to the manuscript.

The key findings have been peer reviewed and presented by KW at the 23rd National Dietitians Association of Australia (DAA) Conference, with the abstract being included in the following publication:

Walton KL, Williams P & Tapsell LC (2005). Rehabilitation inpatients are not meeting nutritional needs. *Dietitians Association of Australia : 23rd National Conference : Embracing Diversity, Programs and Abstracts*; Dietitians Association of Australia: Australia: 162.

lack of training in, and the low priority given to nutrition by some doctors and nurses (Kowanko 1997).

Sullivan et al (1999) reported that 20% of older hospitalised patients consume less than 50% of their estimated requirements and another recent pilot study with 346 patients in the USA found that patients with a longer LOS and/or altered textured diets had more plate waste (Kandiah et al 2006).

There appears to also be a lack of published scientific research that combines observational research about the factors that influence food intakes positively and negatively in hospitals, while also documenting dietary intakes. This chapter reports on the adequacy of energy and protein provision and patient dietary intakes, while the time taken with meals and positive and negative interruptions to meal times are reported separately in Chapter 7 of this thesis.

The aims of this study were:

1. To calculate the estimated daily energy and protein requirements, and compare these with the provision of foods ordered and consumed by patients.
2. To calculate the contribution of supplements to intakes.
3. To identify opportunities for interventions to improve the nutritional care of long stay inpatients.

6.2 METHODS

6.2.1 Study population

Thirty inpatients were recruited from three rehabilitation wards in the Illawarra region of New South Wales (NSW), Australia. The hospitals included one private and two public, with varying food service systems (both cook fresh and cook chill) and menu ordering procedures (using paper menus and palm pilots).

6.2.2 Study design

The study involved two day visits during each data collection period. The PhD candidate, was assisted by a team of four student dietitians who worked as research assistants. Convenience sampling was utilised with the Nurse Unit Manager (NUM) or delegate inviting patients within a shared room of four to five beds to take part in the study. The study was explained, and written consent was obtained by the PhD candidate. Three separate visits were made to the first site, two visits to the second and one to the third, which totalled 12 days of data collection. An additional one day pilot study was also conducted prior to the first data collection period. This allowed a trial of all procedures and forms and onsite training for the research assistants.

6.2.3 Inclusion and exclusion criteria

Inclusion criteria included any patient within a shared room in the rehabilitation ward who gave consent. Exclusion criteria included anyone less than 18 years old, or those who were nil by mouth, or receiving enteral or parenteral nutrition.

6.2.4 Determining estimated daily energy and protein requirements

Quantitative data were collected about each patient from the medical records by the PhD candidate. Data on weight, height, body mass index (BMI), diet type, age, reason for admission, nutrition assessment (from the medical notes if conducted) and meal orders from the tray ticket or menu slip were recorded. This was used to determine each individual's estimated daily requirements for energy and protein, in addition to describing the study population.

6.2.5 Determining nutritional status

Where available, the details about the assessment of nutritional status were obtained from the medical record. These assessments reflected the clinical assessments made

by the usual ward dietitians who work in the study locations. Nutrition assessment (SGA for those under 65 years and MNA for those 65 years and over) was conducted by the student researchers on eight patients for whom assessment hadn't been formally undertaken and documented in the medical notes.

6.2.6 Weighing standard meals and plate waste to estimate intakes

One set of electronic scales (CAS Smart Weighing Scale SW-1; accurate to ± 1 g) were used to determine all food and beverage weights. Their accuracy was reviewed before each use by checking the mass of two known standard weights. A copy of the standard serve sizes of each food and beverage item was provided by each of the hospital food service departments. Duplicate samples of each meal and beverage option were requested so they could provide baseline information about weights and be compared to the standard serve size information. After the meal trays were collected by the food service assistants, the foods and beverages left on them were weighed to determine the amounts eaten at each meal, and compared to the standard serve sizes. Many snack and beverage items were commercially packaged with known weights. Intakes of between-meal snacks provided by the hospital and visitors were estimated by observations and questions asked of the patients on the last afternoon of each data collection period.

6.2.7 Data analysis

Determining estimated daily energy and protein requirements

Estimated daily energy and protein requirements were calculated for each patient using the Schofield equation, as recommended in Australia and the Recommended Dietary Intakes (RDI's) for protein (NHMRC 2005). Estimated energy and protein requirements were determined using a mean activity factor of 1.3 (range of 1.2-1.4), a mean injury factor of 1.2 (range of 1-1.5) and a mean protein requirement of 1.1g/kg/day (range of 1-1.3), which is in line with the amounts recommended by the Council of Europe (2002). The level of activity used was based on observations, while the injury factor and protein requirements considered the medical condition of each individual patient. The estimated amounts of energy and protein required were compared to the amounts ordered and consumed by the patients.

Estimates by the ward dietitian of daily energy and protein requirements were also available at two of the three settings, but given the possible variation in methods used,

the single set of the values determined by the chief investigator were used for comparison.

Estimating the amounts of energy and protein consumed

FoodWorks (Professional Edition) nutrient analysis software (Version 4, 1998-2003, Xyris Software Pty Ltd, Highgate Hill, Australia) was utilised to calculate the estimated energy and protein content of the food ordered and consumed for each patient. Where available, actual nutrient analyses of recipes were entered into FoodWorks.

Costing the supplements and calculating cost per 500kJ energy and 5g protein

The unit price for a number of common food based (eg, cheese and biscuits) and commercial supplements (eg, *Resource Plus*) were obtained from an Area Health Service within the study. The unit cost, in addition to the amount of energy (kJ), protein (g), fat (g) and carbohydrate (g) provided per serve was determined. The cost for each item to provide 500kJ energy and 5g of protein was also calculated.

Statistical analyses

Dietary intakes by patients

A power calculation (where $P=0.05$ and the power is 90%) showed that 13 patients would be sufficient to detect a deficit of 1000kJ (SD of 1000kJ) energy and 10g (SD of 10g) protein, between actual and required intakes. Means and standard deviations were calculated for the data set of the estimated requirements, amounts ordered and amounts consumed. The Shapiro-Wilk test of normality was also used. Paired samples t-tests were used for parametric data and Wilcoxon Signed Rank tests were used for the non-parametric data. Bivariate correlation (using Spearman's rho) was used to determine the strength of relationship between LOS vs age, LOS vs energy intakes and age vs energy intakes. The Statistical Package for the Social Sciences was used for all statistical analyses (SPSS Version 15 for Windows, 2006, SPSS Inc., Chicago, IL).

6.2.8 Ethics

Ethics approval for the study was obtained from the University of Wollongong and Illawarra Area Health Service Human Research Ethics Committee in 2004. Written consent was obtained from patients or their next of kin where the patient was cognitively unable to provide informed consent. Verbal consent was obtained from staff and visitors.

6.3 RESULTS

6.3.1. Characteristics of the patients

Table 6.1 summarises the patient characteristics. The patients (16 female, 14 male) had an average age of 79.2 ± 11.9 years (with three patients younger than 65 years) and a mean length of stay of 52.8 ± 32.6 days (range 33-133 days). Thirteen patients had a BMI less than 24kg/m^2 , which is below the healthy range recommended for older patients (Beck & Ovesen 1998). Fractures were the most common reason for admission (33%) and high protein high energy (HPHE) diets (60%) were the most common diets ordered. As would be expected in this age group, texture modified diets (47%) also were common, as were multiple diet modifications. There was a medium strength, negative relationship between the length of stay and energy intakes of the patients ($r=-0.380$, $n=30$, $p<0.05$).

Table 6.1: Reasons for admission, diet type and nutritional status

Variable	No.	Percentage (%)
Males	14	47
Females	16	53
Reason for admission		
- CVA	7	23
- Fracture	10	33
- Skeletal surgery	4	13
- Brain haemorrhage	2	7
- Fall	2	7
- Miscellaneous	5	17
Diet type		
- Full/Diabetes	12	40
- Puree/Minced/Thick HPHE	4	13
- Soft HPHE	10	34
- HPHE	4	13
Nutrition Assessment		
- Malnourished	11	37
- At Risk	12	40
- Nourished	7	23
Weight (kg)		
- Range	42-123	
- Mean	68.9	
- SD	16.2	
BMI (kg/m^2)		
- <24	13	43
- 24-29	14	47
- 29+	3	10

Legend: CVA: cerebrovascular accident, HPHE: high protein high energy

Given the high mean age, the SGA was used for only 10% patients and the MNA was utilised for the remainder. Thirty-seven percent of the patients were found to be

malnourished, while 40% were certainly 'at risk' and 23% appeared to be 'nourished' as indicated in Table 6.1.

The reliability of standard portion sizes was evaluated by weighing a range of standard food and beverage items. The serving sizes of the items available were usually within 10% of the stated standard serve size, but there were some variations, with main protein dishes approximately 3% larger, soups 14% smaller and in house dairy desserts 9% smaller.

6.3.2 Dietary intakes

Although the amounts of energy and protein ordered were adequate, significantly less was consumed on average, than was required or ordered ($p < 0.05$). Table 6.2 outlines the means and standard deviations of the estimated amounts of protein and energy required, ordered and consumed.

Only seven patients (2 well nourished, 3 at risk and 2 malnourished) met their individual estimated energy requirements and eight (2 well nourished, 2 at risk and 4 malnourished) met their estimated daily protein requirements, with a further three patients consuming above 97.5% of their estimated daily protein requirements.

Table 6.2: Mean estimated daily amounts of protein and energy ordered, required and consumed

Category	Protein (g/day) n=30	Energy (kJ/day) n=30
Ordered (mean +SD)	95 (± 32)	10103 (± 2686)
Required (mean +SD)	76 (± 8)	8380 (± 907)
Consumed (mean +SD)	67 (± 25)	7029 (± 2233)
Ordered vs Required (mean, p value)	19 (0.008*)	1723 (0.001 *)
Ordered vs Consumed (mean, p value)	28 (0.000 *)	3074 (0.000 *)
Consumed vs Required (mean, p value)	9 (0.046 #)	1351 (0.003 #)

Legend: * Wilcoxon Signed Rank test and # Paired samples t-test

Table 6.3 indicates the contribution of energy and protein at various meal times. A large proportion of energy (28%) was provided by the snacks (morning tea, afternoon tea and supper), but the largest amount consumed was at breakfast (29%). The largest

protein provision was at lunch, followed by dinner, with the mean consumption mirroring these provisions.

Table 6.3: Mean energy and protein at each meal time: amounts provided and consumed

Meal time	Energy (kJ)		Protein (g)	
	Ordered n=30	Consumed n=30	Ordered n=30	Consumed n=30
Breakfast	2670	2039	20.1	15.5
Lunch	2434	1736	29.2	21.1
Dinner	2292	1687	27.5	20.4
Snacks	2889	1717	19.5	11.2

The mean contribution of macronutrients to energy was 17% protein, 31% fat and 52% carbohydrate for the foods and beverages ordered and consumed. On average the mass of foods and beverages provided each day was 3009g, and the wastage was approximately 27% (by weight). The snacks had the largest amount of wastage on average (mean of 40% of energy and 43% of protein from snacks was not consumed).

6.3.3 Supplement usage

Thirteen patients were receiving high protein, high energy supplements in the form of commercial drinks and puddings. Table 6.4 indicates that while only 43% of these supplements were consumed, they did contribute over 20% of the energy and protein intakes of the supplemented patients.

Table 6.4: High protein, high energy supplement usage

Supplements	Energy	Protein
Mean amounts provided	3627kJ	33.4g
Mean amounts consumed	1532kJ	14.8g
Proportion of amount provided	42%	44%
Contribution to total intakes	21.5%	20.6%

Table 6.5 summarises the costs, and contribution of energy (kJ), protein (g), fat (g), and carbohydrate (g) per serve size indicated for several commonly used hospital supplements, in addition to the costs per 5g of protein and per 500kJ of energy for each item.

Table 6.5: Characteristics of a range of regular food based, and commercial supplements

Item	Serve size	Cost (\$)	Energy (kJ)	Protein (g)	Fat (g)	Carbohydrate (g)	Cost per 5g of protein (\$)	Cost per 500kJ of energy (\$)
Food based supplements								
Biscuits & cheese	30g	0.35	545	5.84	9.14	6.09	0.30	0.32
Regular yoghurt	135g	0.36	410	6.35	4.59	6.35	0.28	0.44
Plain chocolate	50g	1.17	1078	4.15	13.7	31	1.40	0.54
Chocolate iced cake	50g	0.55	836	2.95	10.2	24.7	0.93	0.33
½ egg sandwich	70g	0.17	702	6.54	9.13	14.5	0.13	0.12
Commercial supplements								
Breaka flavoured milk	250ml	0.70	853	8	9.3	22	0.44	0.41
Sustagen tetra pack	250ml	1.60	1050	12.5	3.7	41.2	0.64	0.76
Ensure Plus tetra pack	200ml	0.90	1263	12.5	9.84	40.4	0.36	0.36
Ensure pudding	113g	1.60	711	4	5	27	2.00	1.13
Two Cal tetra pack	237ml	1.40	1984	19.8	21.1	51.8	0.36	0.35

Table 6.6 indicates the numbers and types of supplements that were used at each of the hospitals, as well as the associated costs for the amounts consumed and the amounts wasted. Hospital one provided the majority of the supplements (80.2%), while the second hospital provided some and hospital three was not providing any to the patients involved in the study. Although it should be noted that while items such as cheese and biscuits were only provided for patients on a specific therapeutic diet (ie. HPHE) at hospitals one and two, they were available to anyone, at any mid meal at hospital three and thus they have been included as supplements for this study. Interestingly, hospital two, and particularly hospital three (a private hospital) provided a variety of nourishing mid meal options (eg, scone with jam and cream, homemade

Table 6.6: The total number of supplements (and percentage contribution) provided at the hospitals

Hospital	<i>Resource Plus</i>	<i>Breaka</i>	<i>Sustagen</i>	<i>Resource thick beverage</i>	<i>Ensure pudding</i>	Lemonade	Cheese & biscuits	Yoghurt	Total
1	14	23	6	5	14	1	12	3	80.2%
2	1	2	-	6	-	-	3	-	13.5%
3	-	-	-	-	-	-	6	-	6.3%
Total	15	25	6	11	14	1	21	3	
%contribution	(15.6%)	(26.0%)	(6.3%)	(11.5%)	(14.6%)	(1.0%)	(21.9%)	(3.1%)	100.0%
Amount & % actually consumed	2/15 13.3%	8.5/25 34.0%	0.5/6 8.3%	9/11 81.8%	5/14 35.7%	0/1 0	20/21 95.2%	3/3 100.0%	96

muffin, toasted cheese and tomato), even for patients on full diets, in contrast to the usual tea/coffee and plain biscuits.

The percentage contribution figures indicate that the *Breaka* flavoured milk (26%) was the supplementary drink used most often, followed by *Resource Plus* (15.6%). Cheese and biscuits (21.9%) were the food supplementary option used most often. The most popularly consumed items at mid meals included yoghurt (100%) and cheese and biscuits (95.2%). Although commonly provided as a mid meal supplement for patients on a HPHE diet, only 34% of the *Breaka* flavoured milks were actually consumed. It was noted that some patients received three mid meal supplements per day, in addition to some being provided at main meals also.

The approximate total cost calculated for all 96 items was \$83.71. The percentage of supplements consumed (43%) equates to approximately \$35.99 worth of supplements, while \$47.72 (57%) was wasted.

6.4 DISCUSSION

6.4.1 Energy and protein required, ordered and consumed

While adequate amounts of energy and protein were provided, most patients did not consume their estimated daily requirements. The average intake recorded in this study (73% of all foods and beverages provided) is similar to that reported previously in the literature. Kondrup et al (2002) reported that the average food intake by the hospitalised elderly was less than 75% of the amount required.

Energy and protein intakes were spread across the day in three meals and three snacks, suggesting that all meals have a role to play in offering choices and opportunities for nourishing options. Many patients received a hot breakfast, and had the opportunity for an additional high protein choice from regular style foods items (e.g. scrambled eggs). The findings of this study support other studies that have found hot breakfasts are an important strategy for increasing patient food intake (Coote & Williams 1993). Supplements, which often consisted of milk-based drinks and puddings, had the largest amount of wastage (57%). The findings highlight the need for greater choices at mid meals or snack times, targeting nourishing snacks more appropriately and monitoring their intakes by patients. Several hospitals in Queensland have reported success with mid meal 'snack trolleys' where patients can choose from a range of options (including options such as yoghurt, cheese, biscuits and chocolate) at the time of consumption if their diet type allows (M Suter 2007, personal communication 1st November, M Hoyle 2008, personal communication 12 August).

As stated previously, the issues that influence dietary intakes by the hospitalised elderly are many and complex. It is important that adequate choices and amounts are presented at various times during the day to encourage intake. It is also imperative that a supportive, encouraging environment that assists access, dietary intakes and monitoring is available. The fact that many doctors and nurses have no formal training in the detection or management of malnutrition, or in the prescription of nutritional supplements is cause for concern (Nightingale et al 1996, Schenker 2003), and it is time that medical and nursing schools addressed these deficiencies by mandating formal theoretical and practical training in the screening and assessment of malnutrition. This is further compounded by the fact that hospital food services are usually viewed as non-clinical and have very strict budgets which can influence the mode of service, choices offered, snacks available and time allowed for meals (Vivanti et al 2008). Support from Divisions of Medicine and Surgery regarding the essential

importance of hospital food services and their role as a 'clinical' service would enhance arguments for better funding of food services.

6.4.2 Supplement usage

While only 43% of supplements ordered were consumed on average, they did contribute significantly to the intakes of the supplemented patients. This provides further evidence that HPHE diets and supplements only partly address the problems of inadequate intakes by elderly hospitalised patients. Clearly adequate amounts of foods and beverages were provided, however a plethora of reasons inhibited their intakes, including the amounts offered, palatability, flavour fatigue, appetite, packaging, access issues, not being regular style foods, too much food, served at room temperature, no serving equipment or inadequate assistance (Gall et al 1998, Barton et al 2000a/b and 2000b, Schenker 2003).

A rethink of the types of options routinely available and the way they are offered to patients is required as the majority of the HPHE drinks and puddings were wasted (91.7% of *Sustagen* to 64.3% of *Ensure* Pudding). In contrast 95.2% of the cheese and biscuits offered and 100% of the yoghurts offered were consumed. Economic considerations are also required and the cost of these two items are considerably low (35 cents and 36 cents respectively), although their serve sizes are also smaller, when you consider that the commercial HP drinks start at 70c per unit served. In considering these food based items on cost per 5g protein and cost per 500kJ, they are comparable with the *Ensure Plus* tetra pack and the *Two Cal* tetra pack.

There is certainly a role for commercial supplements however at times they are used at mid meals to transform a diet from 'full' or 'standard' to 'HPHE'. Such diets are not HPHE if the patients aren't consuming the supplements. Their use needs closer monitoring to review tolerance and consumption patterns, as patients could certainly benefit from another form of nourishing snack if they are not consuming the amount of supplements provided. Choice at point of service may also be of benefit for patients on HPHE diets so that they may choose from a HPHE mid meal trolley that could include such items as: cheese and biscuits, yoghurt, commercial supplements and chocolate. They would be able to make a selection of a nourishing option based on their appetite at the time. This system has been used successfully in several wards of the Royal Brisbane and Women's Hospital and Townsville Hospital, in Queensland, Australia (M Suter 2007, personal communication 1st November 2007 and M Hoyle 2008, personal communication 12th August).

Larsson et al (1990) reported a great benefit from supplements used prophylactically, to prevent deterioration in patients 'at risk' of malnutrition. They investigated the influence of nutrition supplements on the clinical outcome of 501 geriatric patients given either a standard diet (9196kJ) or a standard diet supplemented with an additional 1672kJ. Nutritional status was determined on admission, eight weeks and 26 weeks and 41% of those initially malnourished (28% of the total) were no longer so after intervention.

6.4.3 Nutrition status, reasons for admission and diet type

Nutritional status can be defined as a 'dynamic state', with no single or standard way of measuring (Schenker 2003). The rate of malnutrition reported in this study (37%) and the rate of those 'at risk' (40%) is certainly in line with other studies in this area (McWhirter & Pennington 1994, Beck et al 2001a, Middleton et al 2001, Neumann et al 2005), highlighting the seriousness of this issue and the need to identify it early so as to assist by putting appropriate intervention strategies in place. Three of the patients were younger than 65 years (two males aged 39 and 59 years and one female aged 61 years), but even when their data were removed from the statistical analyses significant differences remained regarding intakes vs requirements for both the energy and the protein results.

Only three-quarters of the patients in the current study had a formal nutrition assessment conducted and documented during their admission. There is a need for ongoing nutritional surveillance of long stay inpatients (Hall et al 2000). Malnourished patients need effective dietetic treatments and close monitoring, as do those who are determined to be 'at risk' of malnutrition as this second group needs to be carefully monitored to try to prevent the transition to malnutrition (Schenker 2003).

The reason for admission and type of diet required also impacts on the amounts of food and beverages consumed, and the nutritional status of the patient. One-third of the patients were admitted with fractures so it is no surprise that a large proportion of patients (60%) were receiving HPHE diets to provide additional nutritional support to assist with wound healing and meet rehabilitation demands. Cerebrovascular accidents were the second highest reason for admission (23%), which accounts for the large number of texture modified diets (47%), and also contributed to the large amount of HPHE supplemented diets. Wright et al (2005) investigated the intakes of 25 older patients on normal textured diets and 30 older patients on texture modified diets. They reported that patients in the texture modified group had a significantly lower intake of

energy (3877kJ vs 6115kJ, $p < 0.0001$) and protein (40g vs 60g, $p < 0.003$) compared to those on a normal diet. Kandiah et al (2006) reviewed the plate wastage of 346 patients at lunch over four days and demonstrated a relationship between LOS and increased plate waste, and also texture modified diets and increased waste.

6.4.4 Strategies to improve dietary intakes

The potential for texture modified diets, and the conditions resulting in their prescription to negatively influence intakes should never be underestimated (Wright et al 2005, Germain et al 2006). Fortification with additional energy and protein is advantageous, as is the addition of nourishing supplements. However, reduced appetites and resultant intakes should always be considered and thus the need for monitoring of amounts consumed and surveillance of nutritional status for long stay patients is particularly relevant.

Nutritional treatment for malnutrition in the elderly can positively influence body composition, muscular strength for some, in addition to well-being and immune function (Akner & Cederholm 2001). Oral nutritional supplements and food fortification can certainly positively influence dietary intakes, however it is important to tailor them to meet the needs of individual patients. Given the multitude of issues that can influence intakes, successful treatment relies not only on timely nutrition screening and assessment, but also on finding priority, practical intervention strategies that can be monitored so as to maximise intakes by patients.

Clearly there will never be a 'one size fits all' intervention to optimise dietary intakes, just as increasing nutrient provisions in no way guarantees improved intakes. An ongoing concerted effort is necessary on the part of all involved in patient care, from nutritional screening and assessment, menu and food provision, feeding assistance to inpatients and monitoring, particularly for aged and/or long stay patients.

Ovesen (2004) mentioned the need for governments to plan a national approach to nutrition and food goals in hospitals. The European Nutrition for Health Alliance (2006) also highlighted the need for malnutrition to be elevated on the agenda for politicians. It is argued that raising the issue of malnutrition in the community and hospitals on the political agenda would also be of extreme relevance in Australia, so long as key health professionals were represented in formulating the resultant recommendations. The Dietitians Association of Australia (DAA) certainly has malnutrition prioritised as one of its topics for advocacy (Dietitians Association of Australia 2008).

6.4.5 Limitations

One of the limitations of the study was the small sample size but the significant results indicate that this did not impact on the conclusions drawn. Nematy et al (2006) also used a relatively small sample of 25 subjects in a study of elderly patients requiring nutritional support. A second limitation was the fact that food intake data was only collected from breakfast to supper each day, so that snacks outside these hours may have been missed. However, questions were asked about any overnight consumption, as well as the food and beverage items brought in, so that estimates could be made of such items.

Subtracting the weighed plate waste from the standard serve size information for food and beverage items in order to calculate the amounts consumed for each meal component is another limitation. Although weighing each item before service would be the ideal method for practical reasons this method was not able to be adopted (Frost et al 1991, Wilson et al 2000, Hartwell & Edwards 2003a). However measurement of a sample of standard serves indicated that this is not likely to have affected the findings significantly; even if all patients had received larger serves than the standard amounts and eaten 10% more than calculated, the average intake would still not have met the conservatively estimated requirements.

The fact that this was an overt study may have influenced some behaviours and resultant intakes, however more than one day was included at each site to attempt to minimise this bias. At least two patients required assistance with packaging at times and the researchers provided assistance when asked, which would have positively influenced some intakes in this study.

Nutritional assessments were conducted by a variety of practitioners as part of normal hospital care practice. Where this had not been undertaken (eight patients) the researchers conducted the assessments. This may have introduced inconsistency into the nutrition assessment categories, but the proportions of patients found to be at risk, or malnourished were similar to those reported in other rehabilitation populations (Beck et al 2001a).

6.5 CONCLUSION

This study has highlighted the complexities of assisting older, long stay patients to improve their nutrient intakes. While adequate amounts of energy and protein were provided, very few patients met their estimated daily requirements. Supplements were often utilised to provide additional nutrients, and while they contributed approximately one-fifth of the energy and protein to those receiving them (n=13), large amounts were wasted (~57%). This highlights the need for other strategies to assist, and the importance of targeting supplements to enhance effectiveness and maintain budgets. Clearly there needs to be a range of strategies available for use, with the accompanying nutrition policy and training of staff to support these. While not exhaustive, other strategies may include: fortifying regular type foods with additional protein and calories, offering smaller, fortified meals with more nourishing regular food style snacks, targeting supplements appropriately and using supplements as a sip feed on the medication chart (an option that would also assist in raising their importance), additional feeding and access assistance, regular screening, referring 'at risk' patients for dietetic review, regular review of diet type and necessity and point of service food options where possible. Raising the importance of nutrition support as a key part of the medical treatment plan also requires ongoing vigilant effort particularly as food service budgets are contained and the population ages.

CHAPTER 7 AN ETHNOGRAPHIC ANALYSIS OF MEALTIMES IN AGED CARE REHABILITATION

7.1 INTRODUCTION

This study was conducted concurrently with the study just outlined in Chapter 6, which estimated requirements and intakes of energy and protein for long stay rehabilitation patients. The ward activities and routines that occurred at mealtimes, and the time taken with meals were also investigated. The study assists in better understanding the extent of the problems in practice, as well as the practices that encourage dietary intakes.

Deutekom et al (1991) utilised an observational study to measure hospital plate waste producing situations. Loss of appetite, environmental factors and interruptions at meal times were all contributors to poor intakes. It was recommended that the best conditions for meals included appropriate social interaction and peace and quiet from all other procedures and treatments at mealtimes. That description sounds a lot like what we know today as 'protected mealtimes', which are utilised in some English hospitals (Murray 2006).

Two day-rooms within two wards of a geriatric hospital were the setting for an observational and intervention study investigating the social behaviour of patients at mealtimes (Davies & Snaith 1980). When patients were seated side by side, social interaction with others was difficult, however sitting together at a table enhanced communication between patients and between staff and patients. A 'patient oriented' approach was encouraged and a broader consideration of the term 'treatment' recommended.

It must also be remembered that being in hospital is an unfamiliar experience for most people. Patients are in different surroundings, with different people around, varied treatments and they don't have control over their meal preparation or the choices available. Patients are likely to be unwell, anxious and more dependent on others; all of which are factors that can influence dietary intakes (Holmes 1999, Hartwell & Edwards 2003b). Hospital routines are often fairly rigid and may seem more 'service' oriented than 'patient' oriented, with certain routines at certain times. This can certainly influence intakes, and set routines may well suit the organisation and its staff, more than they suit individual patients (Murray 2006).

"For many patients meal times are an event to look forward to yet, in many cases, hospital staff appear to regard these simply as another task that must be completed." (Allison 1999, cited in Holmes 1999, p176).

Schenker (2003) highlights issues such as inadequate staffing and the urgency of competing tasks as barriers to dietary intakes. Patients don't always eat well, may have difficulty reaching their meal tray, don't always receive enough assistance at mealtimes, may have suboptimal social interaction and should be encouraged so as to assist their intakes. Interruptions to meals, inadequate staffing, more urgent tasks and a lack of knowledge about nutrition are also barriers to intakes (Kayser Jones & Schell 1997a, Jordan et al 2003).

Xia and McCutcheon (2006) reviewed the dietary intakes of 48 hospitalised older patients on two medical ward areas in a South Australian hospital. An observational instrument and semi-structured interviews, conducted with patients and nurses found that 57.4% of patients had difficulty eating, with the reasons including difficulty in opening food (54.5%) and using cutlery (36.4%). The majority of the patients had several issues influencing their eating ability and the most frequent nursing assistance required was to open the food (78.3%). The mean time taken to start meals was 8.4 minutes, and the mean time taken to eat was 21.1 minutes. Most of the patients also thought that the meals were too big. Social interaction was limited, with many patients eating in silence.

In the study by Xia and McCutcheon (2006), nurses were busy with a range of other activities at mealtimes, including medication rounds, documenting in the medical notes, having their own meal breaks. Examples of interruptions to meals included: doctors rounds, medication rounds, patients being asked about their bowel habit and having urine bottles placed on their tray tables! Although the nurses did assist patients with food and beverage items, it was not always timely and as such some items were not attempted. The nurses felt there were not enough staff available at the mealtimes, and that changing their meal breaks would be beneficial. It seemed that the nurses also had difficulty raising the priority of nutrition above other priorities, which is a recurring theme throughout this research.

The aims of this study were:

1. To observe the ward activities that occur at meal times within aged care rehabilitation wards.
2. To determine the time taken to start meals, and the time taken to complete them.
3. To describe the activities that have a positive influence on dietary intakes and also to describe those that have a negative influence on dietary intakes.
4. To discuss recommendations that would make the ward environment more conducive to eating at mealtimes.

7.2 METHODS

7.2.1 Study population, Study Design, Inclusion/Exclusion criteria and Ethics

The study design and the ethics requirements were thoroughly outlined in Chapter 6. A further two methods (observations and questionnaires with patients and staff) that were pertinent to the observational component of this study are outlined here.

7.2.2 Observations at mealtimes

Primarily an ethnographic study, this research was conducted at different times in rehabilitation wards within three different hospitals in order to better understand the mealtime activities and their influences on intakes. The three sites were visited at varying times over a three month period during late 2004 and overt observations commenced prior to the breakfast service (between 7-7.30am) and were concluded after the supper service (between 7-8pm) each day. All staff and patients being observed were aware of the study in advance and visitors were approached so that they were aware of the presence of the researchers.

Four to five patients were observed at once in a shared room and a maximum of three researchers were present at any one time. They each included observations in four to six hour shifts and tried to be discreet by sitting outside the room wherever possible. However the design of some wards meant they needed to sit inside the room or else they would not have been able to observe anything. Visits were conducted over a two day period to try to reduce observation bias and the patients and staff became more used to the presence of the researchers. A total researcher approach was used, as none of the researchers worked within the ward and observation was the purpose of their presence (Gans 1982, cited in Grbich 1999).

A pilot study was conducted at the first hospital to trial the study design, the observation forms and weighing procedures, as well as to provide training for the researchers. Once written consent was obtained from participating patients within a shared room, a schematic diagram was produced that included the room layout, diet types required by the patients and coding form (Appendix 2) to indicate the patient code and diet type of each patient in the room being observed at each site. This assisted the PhD candidate and the four student dietitian researchers by providing consistent codes for reference to patients in the written observation recordings.

A standard Daily Ward Observations Form (Appendix 3) was developed and used by the observers for each patient they were observing. The form included details such as: hospital code, patient code, date, name of the observer, a column to record the time and another larger column to record the corresponding activity (eg. 7.30am breakfast tray delivered, 7.35am patient starts eating, 8.00am patient finished). This format allowed the time taken to start meals and the time taken to complete meals to be recorded, as well as the time when meals were collected to be noted, which allowed consideration as to whether the patients were finished at that time. Clearly more detailed observational accounts regarding activities were also required, and as such all activities were included on the recording sheet (eg. 8.25am: patient goes to the physiotherapy gym; 12.30pm: patient having difficulty feeding alone). A Completion Guidelines for Daily Ward Observations Form (Appendix 4) accompanied the Daily Ward Observations Form so that observers were aware of the details to record. These observation and recording methods include similar factors to those outlined by Hartwell et al (2003b).

The portion of the daily observation forms collected by each researcher were typed up by them. Each researcher's section of the observation sheet was then combined for each individual patient for each of the two day periods. Combined observation sheets were then reviewed in order to better understand the study context, to extract key observations, highlight those interruptions that were positive in nature and those that were negative, as well as to later determine the meal timings.

The involvement of five separate researchers and three locations meant considerations regarding inter-rater reliability were particularly important. A maximum of three researchers were responsible for the observations in any ward. Therefore a lunch meal was observed by all three researchers on at least one occasion within each two day study period. The separate observations and timings were compared and discussed to ensure consistency between researchers and locations.

7.2.3 Questionnaire and semi-structured interviews with staff and patients

A questionnaire was developed by the researchers that could be completed with patients and nurses using a semi-structured interview to clarify aspects of care, service delivery and their appetite. Interviews were conducted with nurses and patients that agreed to take part. The interviews were used to incorporate commentary from the participants to clarify that the observations were accurate. Therefore, so as not to

introduce bias, they were not conducted until the last afternoon or evening of each of the two day study sessions. Figure 7.1 summarises the questions that were available to the researchers when interviewing staff and patients.

Questions for Nurses

How well do you think the food service system meets the needs of long stay patients?

Does the current level of staffing allow patients to be assisted in a timely manner?

Are patients able to access extra snacks and drinks between meals if required?

What are the stimulants that encourage intakes?

What are the barriers to intakes?

Is there enough time to identify patients that need assistance with meals?

Any suggestions for improvements?

Questions for Patients

How do you find the meals in hospital?

How are you eating? How is your appetite?

What do you think about the choices that are available?

Do you need any assistance with eating?

If needed, what kind of assistance would you like?

Do you think the nursing staff are easily available during meals?

Do you prefer to eat in the dining room or the bedroom?

Do you like to communicate with others, such as patients and nursing staff during meal times?

Are you ever interrupted during your meals?

Are you given enough time to eat what you want from each meal?

How is the serving size?

How is the taste?

How do you feel about the between meal snacks? Do you eat them? Is there anything else you would prefer?

Do your family or visitors bring in foods or drinks for you? How much of these do you eat?

Can you suggest two ways that the meal service can be improved?

Figure 7.1: Standard questions available to the researchers

7.2.4 Photography

Being an ethnographic study, the compilation of a series of photos indicated that the settings were important. Digital photography was used to illustrate the layout of the dining rooms and shared room environment. Packaged food and beverage items were also photographed after the study to illustrate the multitude of package types for food and beverage items that are provided in hospitals.

7.2.5 Data analysis

Observations

The observations were reviewed and then summarised within key topics, and later, into overarching themes using QSR Nvivo 2.0™ qualitative analysis software (1999-2002, Melbourne). Exemplar observations were chosen for each of the topics. The number of interruptions and type of interruptions were also determined. These were further categorised into interruptions that were perceived to have a positive influence on dietary intakes and interruptions that were perceived to have a negative intake on dietary intakes.

Questionnaires with staff and patients

The interview responses were tallied and the key findings were summarised.

Meal timings

The time that the meal was left, the time that each patient started their meal and the time that each patient completed each meal, each day was recorded. This allowed the time taken to start meals and the time taken to complete meals to be determined.

Statistical analyses

Means and standard deviations were calculated for the time taken to commence the main meals (breakfast, lunch and dinner), as well as the time taken to consume them. A combined meals value was also calculated for the time taken to commence the meals and the time taken to consume the meals. The median and range were also calculated for the time taken to start each meal and the time taken to eat in order to allow a more complete interpretation of the findings. The Shapiro-Wilk test of normality was used and Wilcoxon Signed Rank tests were used to compare the mean values regarding meal times because all the data were non-parametric. All statistical analyses were completed using the Statistical Package for the Social Sciences (SPSS Version 15 for Windows, 2006, SPSS Inc., Chicago, IL)

7.3 RESULTS

7.3.1 Observations at mealtimes

The large volume of observations were summarised into four key themes: eating location, assistance at meals, negative interruptions and positive interruptions, which incorporated 16 topics. Table 7.1 indicates these findings and at least one exemplar observation for each topic.

Table 7.1- Key themes, topics and exemplar observations

Key Theme and Topics	Exemplar observation for each topic
Key Theme: 1 Eating location	
Bedside	<i>"Sitting out of bed. There is no conversation in the room, apart from patient 3 talking with the researcher, after she says hello"</i>
Bed	<i>"Breakfast tray arrives. Patient sits on side of bed to eat breakfast, with tray table in front. Nurse assisting with patients' eating position and tray."</i>
Dining room	<i>"Patient is now sitting out at the dining table with other patients and their visitors. The television is off, but the music is still playing. Nurse gives patient a bib for dinner"</i> <i>"Although the patient still seems to be having trouble eating, her intake is much better. Smiles at times when others are talking"</i>
Key Theme: 2 Assistance at meals	
Nursing assistance	<i>"Lunch is delivered. The tray is delivered by a nurse, who says hello, moves the tray table closer, takes off the lids, butters bread and puts the straws into drink`s"</i>
Food service assistance	<i>"Food Service Assistant adjusts the tray table and moves it closer to patient 2, who is sitting out in a chair with a bib on. She assists patient to open his milk container before leaving the room. She and he discuss the difficulty of opening some packages"</i>
Other assistance	<i>"Relative of another patient is assisting the patient with eating (cutting up food)"</i>
Key Theme: 3 Positive interruptions	
Socialising	<i>"This patient also promotes social interaction with other patents which facilitates consumption in other patients"</i> <i>"The patient is sitting at the dining table, talking with patients 1 and 3. The television is on."</i>
Visitors	<i>"Daughter has arrived and is assisting with eating, opening food items, for example salt and pepper."</i>

Key Theme and Topics	Exemplar observation for each topic
Key Theme: 3 Positive interruptions continued	
Allied Health Rounds	<p><i>"Dietitian enters the room and sees how each of the patients are going with their meal. She asks each patient about their meal. She encourages the patient to finish his Resource Plus [liquid nutritional supplement] after lunch."</i></p> <p><i>"Physiotherapist arrives, however discovers that the patient is still eating and decides to come back later to collect the patient for physio."</i></p> <p><i>'Physiotherapist is waiting in the dining area for a patient... Patient's 1 and 2 discuss their breakfast with the Physiotherapist and a researcher.'</i></p>
Key Theme: 4 Negative interruptions	
Medication rounds	<p><i>"The medication nurse is making rounds and taking blood when the morning tea is being served"</i></p> <p><i>"Some interruption by the medication sister at meal times"</i></p>
X-ray appointments	<i>"Lunch has just arrived and stretcher transfer has arrived to take patient off to an x-ray"</i>
Food and beverage packaging	<p><i>"Starts to prepare cereal (stabs box with a knife) and realises that his spoon is missing"</i></p> <p><i>"Patient appears to need much assistance with set up and opening items"</i></p>
Medical rounds	<i>"She is seated, when the lunch meal is sat in front of her. She begins immediately. Requests a glass of milk instead of tea/coffee and receives it. Doctor asks "how are you going?" She explains she still feels some pain. Doctor consult whilst still eating meal. He explains the x-rays and explains that everything will be fine."</i>
Allied Health rounds	<i>"Lunch is delivered... Patient doesn't need assistance and commences straight away. Physiotherapist visits patient and talks with him about home exercises and walking for about a minute.....Occupational Therapist visits to confirm that his wife is picking up equipment for home. He has little more of the meal."</i>
Bathroom	<i>"Patient is still in the bathroom. Food Service Assistant delivers tray to where she usually eats"..... "Patient still not back for breakfast"</i>
Sleeping	<i>"Morning tea trolley..... Patient is asleep and the new juice still sits on her bedside table.....Patient still asleep in bed."</i>

7.3.2 Interviews with staff and patients

Eleven patients, ten nurses and one doctor agreed to take part in the semi-structured individual interviews that were based on the questionnaire framework in Figure 7.1.

Nurses rated the ability of the current food service system to meet the needs of long stay patients as follows: 20% 'fair', 20% 'good' and 60% 'very good'. However there were some concerns over the influence of the current level of staffing in allowing patients to be identified as needing assistance with meals, with 56% of nurses stating 'there was enough time', 33% stating that 'there was usually enough time' and 11% stating that 'there was not enough time'. When asked if there was enough time to assist patients in a timely manner, 50% reported it was 'adequate', 25% felt it was 'mostly adequate' and 25% felt it 'wasn't adequate'. All nurses reported that extra snacks and drinks were available for patients between meals, although 20% of nurses stated that the availability of such items was not always communicated to patients.

Nurses felt that patients being unwell, having a poor appetite, the high level of packaging, presentation of the meals and the eating environment were all potential barriers to dietary intakes. The patients' appetite, eating environment (particularly the availability of a dining room), health status, the taste of the meal, appearance of the meal and their activity level were viewed as potential stimulants that would encourage dietary intakes.

The patients were mostly positive regarding the hospital meals. However 60% of patients felt the meals were too large, and of those that rated the size well, 75% of them had been ordered a small meal already. While only 22% of the patients felt that they needed assistance with eating, a follow up question about any assistance required indicated that 44% of the patients actually needed assistance to open food and beverage packaging. They were asked to comment on whether the nursing staff were available during meal times, with the following results: 33% said 'yes', 33% said 'usually' and 33% said 'no'. Opinions were mixed about where they liked to consume their meals, depending on whether they preferred privacy, required assistance with feeding or liked to chat with others at meals. Sixty percent of patients preferred to eat in their room, while 40% of patients preferred to use a dining room when available.

Most patients (70%) indicated that they were given enough time with their meals, however the observations indicated that on three occasions patients didn't have enough time to eat what they wanted from their meal. When asked what foods and

beverages were brought in by family, it appeared that treats such as cake and chocolates were the most common items. One lady had her favourite china coffee cup brought in each day with a thermos made up with her usual brand of coffee, which was particularly important to her. When asked about ideas for improvements, the patients mentioned such items as: easier to open packaging, softer vegetables and meats, and an improved temperature and taste of some meal items.

7.3.3 Positive and negative interruptions to dietary intakes

It was important to distinguish between positive and negative interruptions on dietary intakes from the range of observed activities and timings. Table 7.2 summarises the positive influences on dietary intakes by patients.

Table 7.2: Observed interruptions that were perceived to have a positive influence on dietary intakes during 154 meals observed

Activity at meal time	Breakfast (n=55 patient meals)	Lunch (n=49 patient meals)	Dinner (n=50 patient meals)
Visitors	0	6.1%	38.0%
Additional food provided by Doctor	0	4.1%	0
Dietitian	0	10.2%	0
Nutrition Assistant	14.5%	2.0%	0

Table 7.3 indicates the negative activities and the associated meal at which they occurred. It is evident that difficulty in opening food and beverage packaging was the largest negative influence at each main meal, while inappropriate tray and/or patient position was next highest barrier, impacting on all three main meals. Medication rounds at the breakfast meal were also a regular interruption, as were x-rays being scheduled at lunch time, which occurred on three occasions and influenced meal intakes of three separate patients.

Table 7.3: Observed interruptions that were perceived to have a negative influence on dietary intakes during 154 meals observed

Activity at meal time	Breakfast (n=55)	Lunch (n=49)	Dinner (n=50)
Medication round	34.5%	16.3%	14.0%
Tray &/or patient position inappropriate	21.8%	18.4%	16.0%
Packaging hard to open	40.0%	32.7%	34.0%
Asleep	1.8%	2.0%	0
In the shower	11.0%	0	0
Asked about a shower	7.3%	0	0
Taken to x-ray	0	6.1%	0
Physiotherapist visiting	14.5%	4.1%	0
Occupational Therapist visiting	1.8%	2.0%	0
Doctor visiting	0	8.2%	0

Table 7.4 indicates the range of people that provided assistance to patients with their meals at two of the three hospitals. The food service assistance was usually at the start of the meal, with all other types of assistance being provided at any time of the meal. The third hospital had a dining room where each course was served 'restaurant style' to each patient that went to the dining room, so these interactions were not included, as

it was already apparent that the food service staff provided very specific assistance to all patients in the dining room. All lids were removed and all patients ate at dining tables of four to six patients, within a larger setting that included up to 30 patients.

Table 7.4 Number of occasions that mealtime assistance was provided from a range of sources

Source of Assistance	Breakfast (n=44)	Lunch (n=39)	Dinner (n=39)
Nursing staff	23	21	17
Food Service staff	7	5	2
Visitors	0	2	6
Researchers	4	3	0
Another patient	1	2	0

Specific data were not available for five patients on one day for lunch and dinner, which resulted in the lower number of patients observed (n=44 at breakfast and 39 each at lunch and dinner). Three of the 22 patients required no assistance at meal times, with one patient actually providing assistance to other patients when required. Several patients needed more than one type of assistance at meals (e.g. three nursing assists and one food service assist at a breakfast meal) for one patient.

7.3.4 Time taken with meals

Table 7.5 indicates that breakfast, followed by dinner were the main meals with the most variation in the time taken to start the meal. There was a statistically significant difference between the time taken to start breakfast and the time taken to start lunch ($P=0.040$). The range of time taken to start breakfast was large (0-36 minutes), however the median time to commence was only one minute, compared to no delay for lunch and dinner.

Table 7.5: Time to start meals and the time taken to eat the meals

Meal		Time to start meal (minutes)	Time to eat meal (minutes)
Breakfast (n=55)	Mean (\pm SD)	4.5 \pm 7.9*	21.4 \pm 9.7
	Median	1.0	20.0
	Range	0- 36	5- 46
Lunch (n=49)	Mean (\pm SD)	1.8 \pm 3.5	23.5 \pm 10.7
	Median	0.0	21.0
	Range	0- 9	3- 51
Dinner (n=50)	Mean (\pm SD)	1.8 \pm 3.5	21.8 \pm 10
	Median	0.0	20.0
	Range	0- 17	3- 55
Combined Meals (n=154)	Mean (\pm SD)	2.8 \pm 5.7	22.2 \pm 10.1
	Median	0.0	20.0
	Range	0- 36	3- 51

Legend: * Significant difference ($P=0.040$) in the time to start breakfast vs time to start lunch

The mean, median and range of time taken to eat each of the three main meals were very similar and there were no significant differences between the three meal times but a significant proportion (18%) had a delay at breakfast of greater than the mean 8.4 minutes outlined by Xia and McCutcheon (2006). Not all the Daily Ward Observation Forms contained all of the desired timing information as is evidenced by the fact that 55 records were available for breakfast, only 49 for lunch and 50 for dinner, when 60 should have been available for each meal.

7.3.5 Eating location

Figure 7.2 indicates a typical shared hospital room layout. Patients sometimes ate in bed, but more often sat in the chairs beside their beds and utilised the tray table to eat their meals. This was particularly the case at the hospital that did not have a dining room available at the time of the study. These rooms were fairly quiet at meal times, as not much socialisation was observed between patients or staff.



Figure 7.2: A shared hospital room

Figure 7.3 reveals the layout of the dining room at the private hospital in the study. It was located down the corridor from the wards, right next to the kitchen. It was a very well lit room that was well utilised at meal times. The meals were served course by course to each patient by the food service assistants as if they were in a restaurant, all lids were removed and there was minimal packaging. The dining room was abuzz with conversation whenever it was observed.



Figure 7.3: A hospital dining room

Figure 7.4 shows another dining room that was situated within a rehabilitation ward. Meal trays were delivered to the patients sitting at the table and a nurse, and sometimes the ward clerk would spend some time at each meal checking that patients had their meals and were able to start their meal. The nurses and ward clerk would usually talk briefly with the patients. Many of the items were commercially packaged so access was problematic for some patients, particularly later in the meal as they tried to access such items as desserts and some drinks. This dining room was less formal, and with the exception of the level of packaged goods and institutional style crockery, it had a more homely atmosphere with regard to the television in the corner, the timber cabinets, pictures in frames and the flowers.



Figure 7.4: Another hospital dining room

Figure 7.5 indicates that the bedside was the most common location for consuming meals at each time of the day. Only two of the three sites had a dining room available, and they were utilised frequently at lunch (42.9% of all patients) and dinner in the evening (30% of all patients).

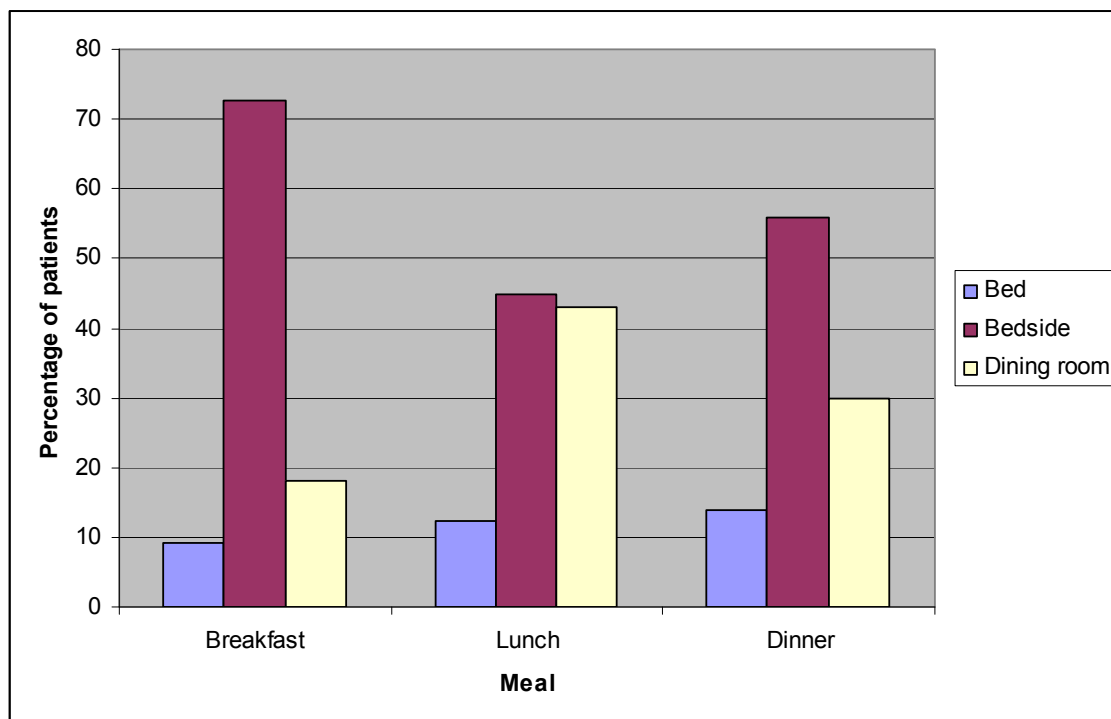


Figure 7.5: Percentage of patients using different dining locations for each main meal at all three hospitals

Figure 7.6 summarises the dining locations for each main meal at the two hospitals that had a dining room available. The bedside was still the most popular location for the breakfast meal, although when available the dining room was the location of choice at dinner time, and particularly so for the lunch meal.

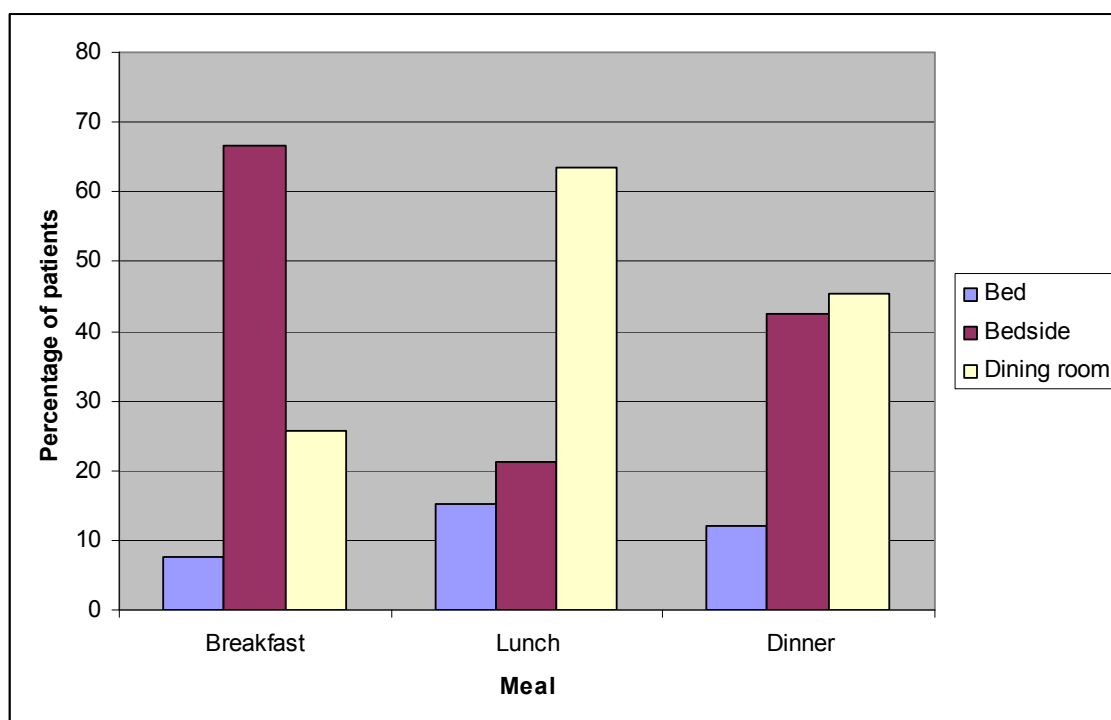


Figure 7.6: Percentage of patients using different dining locations for each main meal at the two hospitals with a dining room

7.3.6 Food and beverage packaging

Figures 7.7 to 7.16 show the range of packaged foods and beverages that were available to patients. The high level of commercial packaging was particularly evident at the two public hospitals. The breakfast meal usually included the most items, often including juice, cereal, milk, sugar, milk portion for hot drinks, coffee, bread, margarine or butter and spreads all in separate packages requiring opening. The private hospital included a much greater proportion of home made mid meal snacks (e.g. scone with jam and cream served on a plate), decanted items (e.g. milk for cereal in a jug and juice already in a glass).



Figure 7.7 Interwoven plastic lid



Figure 7.8 Tetra pack and push in or foil tab opening and plastic sealed straw



Figure 7.9 Loose plastic lid



Figure 7.10 Cardboard box with sealed plastic bag inside



Figure 7.11 Plastic seam



Figure 7.12 Pull back foil or plastic seal



Figure 7.13 Squeeze top

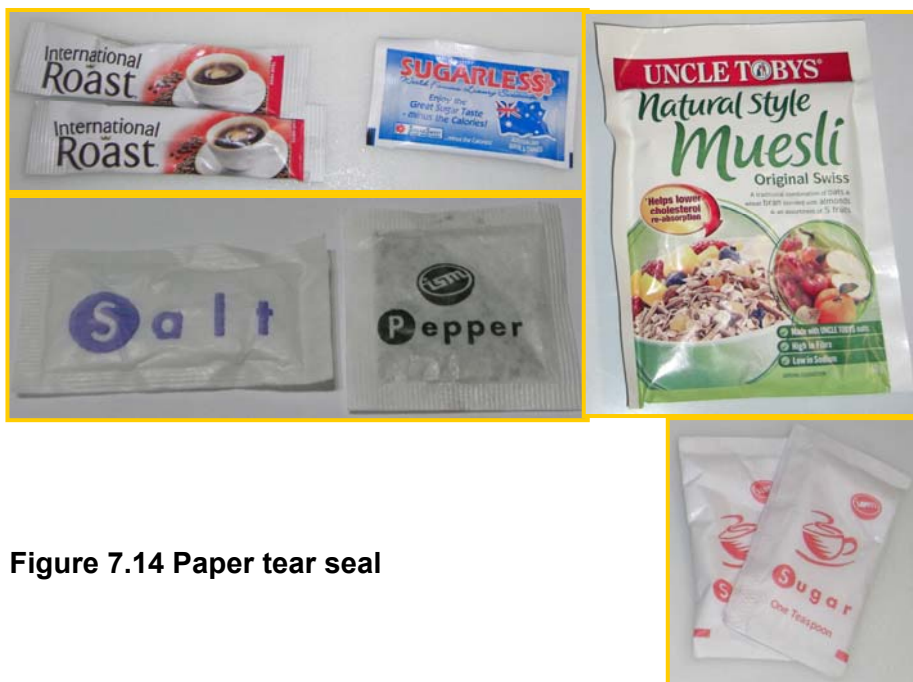


Figure 7.14 Paper tear seal



Figure 7.15 Screw top lid



Figure 7.16 Ring pull

7.4 DISCUSSION

This ethnographic study aimed to explore the range of activities that occur at mealtimes in aged care rehabilitation settings so as to better understand their potential influences and to develop strategies for ongoing feeding improvements. Overt observations, including timing of all activities and interviews with staff and patients contributed to this contextual analysis of the activities that occur during mealtimes.

7.4.1 Observations at mealtimes and interviews with staff and patients

The observations were categorised into four broad themes: eating location, assistance at meals, positive interruptions and negative interruptions. Sixteen topics were evident which covered a number of potential positive and negative influences on dietary intakes. The interviews also reflected a number of these findings.

Eating location

The primary eating location was the bedside, however when available a dining room was very popular for mobile patients at lunch and tea time. A dining room setting allows the opportunity for more social interaction at meals, which is favourable and usual when one is consuming meals (Edwards & Hartwell 2004). Mealtimes are also a good time to encourage social engagement and assistance with meals. While the exact impact on intakes was not able to be compared to the level of socialisation in this study, due to the numerous factors involved, several studies have been encouraging in this regard. Edwards & Hartwell (2004) reported significant improvements in energy and carbohydrate intakes at the lunch meal when patients had positive social interaction. Wright et al (2006b) studied the intakes of 48 acute care elderly patients at lunch and reported higher energy intakes, compared to a control group, when patients consumed their lunch meals in a supervised dining room.

Improved socialisation between patients and staff was certainly observed in the dining room settings at the two hospitals which had a dining room available. One hospital had a small area as part of the ward, while another had a large purpose built dining room away from the ward. The private hospital in the current study provided patients with their meals one course at a time, compared to the more usual service of a tray with all meal components at one time. The meals had all covers removed and plates from earlier courses were cleared as they were finished with. Anecdotally the dietary intakes in the dining room at that site seemed higher than the other hospital with a dining room, however the available data is difficult to interpret objectively due to the small sample

size, the differences in mobility and diagnoses between the two hospital sites, as well as the food service system (cook fresh vs cook chill) and menu differences.

The public hospital with a dining room had a younger patient (39 years old) who was noted to impact positively on the eating environment. He talked and laughed with other patients, assisted when required with meal items, moved chairs closer and assisted in clearing away meal trays. McGlone et al (1995) highlighted the importance of talking with patients and appropriate social interaction at mealtimes. While the quantitative impact of this young man's presence can't be determined, it was noted that the interactions with other patients were encouraging. Several observations summarise his presence:

"The patient is sitting at the dining table, talking with patients 1 and 3".

"Assists many patients with tray position, packaging and drinks".

Assistance at meals

While assistance was available to many patients at meals, it was apparent that more was actually required.

"Patient has received dinner and is trying to eat meal at her tray table, while sitting in the chair. Appears to be having trouble eating dinner, may need assistance (could be waiting for a nurse)"

The involvement of the researchers, visitors and one patient at times in providing additional assistance was evident from the observations. The nurses also expressed some concerns about the limited time available to assist patients with accessing meals and feeding. Wilson et al (2000) estimated that up to 89% of patients rely on hospital food services to sustain them and Allison et al (2000) highlighted that, *"More attention should be paid to help with eating on the wards, particularly among the elderly and disabled"* (p55).

Assistance by visitors certainly made a positive contribution at the lunch and dinner meals in the current study.

"Daughter not present at lunch today. Assistance is being provided to cut food by enrolled nurse".

Older patients may be frail, may not be as manually dexterous and they may have arthritis, all of which can impact on their ability to open items. Additionally, meal trays often have so many items on them and tray tables are often cluttered, increasing the difficulty in locating items, opening them and handling the lids and packaging. The degree of food and beverage packaging at two hospital sites was an issue at main meals and mid meals during the current study. Packaging seems to be used more and more for a number of reasons, including: longer shelf life of items, portion control, consistency, budget and food safety; however the ease of opening is often tested with young people. Rehabilitation is ideally about making patients stronger and more independent, however the high use of difficult packaging can make many patients feel more dependent (Tiivel & Davidson 2002). Issues related to limited meal set up assistance, feeding assistance and high levels of packaging were not unique to this study. They have certainly been highlighted by others (McGlone et al 1995, Tsang 2008, Vivanti et al 2008), as well as during the stakeholder study (Chapter 4) and the national survey (Chapter 5).

Encouragement, assistance with packaging, actual feeding, socialisation and providing a favourite food were all observed at various times. Observations indicated improved intakes when patients ate together in a dining room. One doctor was particularly attuned to the importance of nutrition and she provided additional hot sausages on the day of a staff barbeque for those around the dining table who could consume them.

Negative interruptions

Several ward routines had a negative impact on mealtimes. A number of these were particularly notable at breakfast, including showering during breakfast, medication rounds and some allied health staff arriving to start therapy. Although the allied health staff did wait for the patients and socialise with them while they had their breakfast, the impact of their early presence is not entirely known. Lunch time meals were sometimes interrupted by medical rounds, allied health reviews and x-rays. The Royal College of Physicians (2002) actually recommended that x-rays not be scheduled at mealtimes to ensure that meals were not interrupted. The dinner meal was the meal least interrupted regarding medical procedures, although some patients still had medication rounds at this time.

Although schedules are required in hospital so that all required tasks are completed, it needs to be highlighted and regularly communicated that mealtimes are also a critical part of patient care and that they should not be a time when a number of other tasks

can also be completed. Edwards and Nash (1999) highlighted the issues that staff have in distinguishing the importance of meals, as they feel they often 'interfere' with their routines. Holmes (1998) reported that 11-27% of meals may be missed by interruptions, illness or due to the food quality. It is felt that food service would benefit from a customer focused orientation, rather than a product based format.

A policy of 'Protected mealtimes' has been introduced in a number of NHS hospitals in England in recent years so as to quarantine a time for meals when all other medical activities are not able to be conducted (Murray 2006). This strategy clearly requires agreement from the many hospital stakeholders, but true implementation of this strategy certainly raises the profile of food and nutrition, and would be highly beneficial in Australian hospitals.

Positive interruptions

Some interruptions to patient meals were viewed as positive as they are encouraging of food intakes, such as: visitors, nurses assisting patients and extra food and beverage items being provided. Several visitors brought in chocolates, sweets and cakes for patients, which would likely improve their intakes of energy in hospital. Visitors seemed to have a positive impact and were usually encouraging of intakes, with assistance also given with accessing food and feeding.

The nurses could also be very positive in their approach to mealtimes, as were some of the ward clerks. Several nurses were observed talking with patients about their meals and encouraging intakes when required.

"Nurse comes in and gives her a bib saying, Dinner is on its way"

Other interruptions at mealtimes included the nutrition assistant taking meal orders during breakfast and the dietitian sometimes doing lunch time meal rounds to see what patients were eating, as well as to ask about their appetite and choices. Some stakeholders may argue that these interactions still interrupted patients and may be viewed negatively. However, from a dietetics perspective, at least these interactions were about food and nutrition and would be about encouraging choices and intakes. The dietitians and nutrition assistants were also observed assisting patients with accessing some meal items at mealtimes. Matthews et al (2007) recommended an improved dietetic presence at mealtimes so as to allow dietitians to better monitor intakes of their patients and to improve their profile.

7.4.2 Time taken with meals

The average time taken to start the meals was similar between meals, with the exception of the breakfast meal. The main difference at this meal related to the fact that patients were often showering at that time and consequently approximately 11% of patients were late for their breakfast meal. This would certainly impact on the quality of a hot breakfast and also potentially influences the time remaining to eat before the meal tray is collected. Another interruption, which was most notable at the breakfast meal was the medication round, with 34.5% of patients affected.

The time taken to consume the main meals was not significantly different. While all but three patients (out of 30 patients) had finished eating at the time of tray collection, it certainly didn't mean that they had completed all their meal. Xia and McCutcheon (2006) reported a similar average time to consume meals: 21.1 minutes (compared to 22.2 minutes in this research), while the average time to start meals in their study was somewhat higher at 8.4 minutes (2.8 minutes in this research). While the mean time taken to start in the current study was much lower, eleven percent of patients did take longer than the 8.4 minutes (mean for all meals) reported by Xia and McCutcheon (2006), and this was particularly noticeable at breakfast where 18% of patients in the current study took longer. These differences may also be related to the different study populations being compared (rehabilitation wards in the current study and medical wards in the study by Xia and McCutcheon 2006).

7.4.3 Limitations

A number of limitations need to be considered regarding this study. Firstly the patients were a purposive sample of patients that were present in a shared room of four to five patients at the time of the study. However repeat visits at three different hospitals, resulted in 30 patients being involved which was viewed as appropriate for an ethnographic case study.

Overt observations were utilised which meant that patients, staff and visitors were all aware of the observations and may have changed their behaviours accordingly. Repeat observation days were incorporated as a means to minimise this potential bias. Five researchers being involved in the study could also influence the consistency of the details recorded. However the PhD candidate trained the other four researchers in consistent observation techniques and developed standard recording forms and instructions which should have assisted in more consistent recording. She was also

involved in observations at each site on each day and also coordinated the inter-rater reliability testing at one lunch meal during each two day test period.

Unfortunately some details were not available for certain patients at some meals and thus the time taken to start meals, the time taken to consume meals and the total number of patients included in the review of meal activities didn't total 60, as they ideally would have. However this study is primarily ethnographic in nature and as such the detail about particular events and a rich understanding about the activities in the ward and interactions between patients and others are of more importance than the number of times that certain events occurred.

External validity and transferability may be questioned, however the study aimed to explore a broad range of long stay, aged care rehabilitation settings, and as such included three wards from three different hospitals, one of which was a private hospital.

Some patients required assistance with their meals when staff were not present and the researchers provided such assistance which would have positively influenced dietary intakes. Assistance was also provided at some meals by a young male patient who also assisted and socialised with the other patients, particularly the ladies. These interactions became an important component of this ethnographic case study and as such were incorporated into the results.

The semi-structured interviews were voluntary and thus only 11 patients, 10 nurses and one doctor took part. Therefore the findings do not reflect the views of all the patients or staff, and may represent those more able to communicate, and perhaps those in a better state of health, in the case of the patients. The questionnaire framework used to conduct the interviews was not validated, however the aim was to 'triangulate' the methods utilised so as to clarify the findings from the observations and timings by checking with the participants close to the end of the study period.

7.4.4 Recommendations

The findings from the current study and the dietary intake results presented in Chapter 6 indicate that patients were provided with adequate amounts of energy and protein. The fact that waste was approximately 27%, indicates that the solution to address this is not just to give more food or supplements. The reasons for waste are numerous and complex, thus it is important that a number of priority interventions are considered to ultimately improve dietary intakes, without drastically increasing costs. There is much

concern among dietitians about nutrients and in providing ideal menus that meet healthy menu requirements. However, further consideration is required regarding what this translates to in food terms, what patients are actually eating and how relevant these recommendations are to an elderly, long stay patient who needs as many HPHE options as they can manage. Allison et al (2000) talked about these concepts in saying, *“Excellent food could be produced, but unless it was delivered and served in appropriate manner, it was unlikely to be eaten”* and *“A systematic approach to patient care, with initial screening and decision making, followed by appropriate menus and help with eating normal food”* (Allison et al 2000a, p55-56).

This study has enabled triangulation of the methods, observations of the behaviours of several key stakeholders and clarification about the extent of the problem of sub-optimal dietary intakes by long stay elderly hospital patients, as well as consideration of key strategies for improvements. Recommendations for improvements include:

1. Adequate staff are required to assist patients who require help not only with feeding, but with the position of their chair and/or tray table and the opening of any packaging. Review and assistance is required throughout the meal as patients make their way through the courses and may need assistance with dessert and drink items. This may require changes to routines, and staff meal breaks to accommodate.
2. The concept of ‘protected mealtimes’ should be investigated and implemented. Consistent mealtimes are necessary, as would be universal support from all stakeholders so that all other activities (e.g. medication rounds, x-rays, cleaning, doctors rounds) could be kept separate from mealtimes so that patients can focus on eating and so that nurses are readily available to assist and monitor.
3. Utilise a dining room wherever possible and encourage social interaction as part of the rehabilitation process.
4. More accurate monitoring of actual dietary intakes and communication about the findings. Protected mealtimes and a raised profile regarding treatment with food as an important part of clinical care would assist here, but further training and extensive consultation would also be required.
5. Review of the necessity for the current level of food and beverage packaging. Further studies are required to investigate the types of packaging that are less difficult

to open, if there are any. The impact of this issue needs to be made clear to finance and procurement/purchasing departments so that brands with preferred options can be considered, and ultimately the preferred types of packaging would be written into specifications for future tender documents. The volume of portion control items purchased by hospitals should certainly carry some weight with regard to companies revisiting their style of packaging to maintain their supply to hospitals.

7.5 CONCLUSION

This ethnographic study of three aged care rehabilitation wards has highlighted a number of hospital activities that may impact positively and a number of activities that may impact negatively on dietary intakes of long stay patients. The level of food and beverage packaging, a lack of feeding assistance at times, medication rounds (particularly at breakfast) and x-ray appointments were key potential barriers to dietary intakes. Positive influences included the presence of visitors, adequate set up and feeding assistance, socialisation at meals and more 'homely' user-friendly presentation of meals (e.g. decanted juice in a glass). It seems most appropriate that mealtimes be 'protected' in Australia, as they are in some hospitals in England. Rescheduling of nursing and medical activities should be investigated so that a higher priority can be given to feeding assistance, encouragement and monitoring of intakes during entire mealtimes. Clearly more research is required regarding more appropriate food and beverage packaging and the influence of additional feeding assistance, meal set up assistance and encouragement. Chapter 8 addresses a number of these issues in evaluating the impact of an existing volunteer feeding assistance program for elderly hospital patients.

CHAPTER 8 IMPROVING DIETARY INTAKES OF ELDERLY PATIENTS⁴

8.1 INTRODUCTION

This thesis has outlined a plethora of barriers to the dietary intakes of hospital patients and also numerous opportunities for improvements. To be successful the priority interventions need to be feasible in practice, in terms of the availability of human resources, budget, infrastructure and time. The need for additional feeding assistance (nursing and non-nursing), assistance in setting up with meals, assistance to open food and beverage packaging and socialisation are issues that have been highlighted regularly throughout this research. This chapter considers the pilot evaluation of an existing volunteer feeding assistance program to further investigate this as a possible option in hospitals where there is a solid volunteer base, nursing and management support.

Provision of food and beverages is traditionally the role of nurses (Kowanko et al 1999). While nurses may view the nutritional care of patients as an important aspect of their job, increased time pressures and competing tasks may mean that they are not able to prioritise feeding above other duties, such as the distribution of medicines at mealtimes (Kowanko et al 1999, Dickinson et al 2005). Most research in this area has reported common themes of time restraints and staff shortages. Attention by nurses and other staff to patient mealtimes can have a positive affect on patient eating habits (Dickinson et al 2005, Kayser-Jones & Schell 1997b, Chang et al 2003).

Hickson et al (2004) investigated the impact of employing a health care assistant to assist acute care elderly patients (>65 years) with two meals per day, five days per

⁴A significant portion of this chapter has been published in the following peer reviewed journal article:

Walton K, Williams P, Bracks J, Zhang Q, Pond L, Smoothy R, Tapsell L, Batterham M and Vari L (2008). A volunteer feeding assistance program can improve dietary intakes of elderly patients. *Appetite*;51(2):244-248.

KW, PW, JB and LV were responsible for the design of the study. QZ, LP, RS and JB were responsible for the data collection, while QZ, LP, RS, KW, PW and MB were responsible for the data analysis and interpretation. All authors made contributions to the manuscript.

The key findings have been peer reviewed and presented by KW at the 25th National Dietitians Association of Australia (DAA) conference, with the abstract being published in the following journal:

Walton KL, Bracks J, Zhang Q, Pond L, Smoothy R, Williams P & Tapsell LC (2007). A volunteer feeding assistance program improves dietary intakes of elderly patients. *In Nutrition & Dietetics*; Blackwell: Carlton: S46.

week. There was no difference in nutritional status, length of stay, grip strength or mortality, but food intakes were increased in the intervention group and follow up in a longer care setting was recommended.

A recent national survey of Australian dietitians, food service managers and rehabilitation nurse unit managers (outlined in Chapter 5) identified many possible barriers to adequate dietary intakes for long stay patients, as well as many priorities for intervention. Significant barriers included: a lack of feeding assistance, difficulty with food and beverage packaging and setting up for meals. Key priorities for intervention included: food fortification, additional nursing assistance with feeding, as well as additional non-nursing assistance with feeding (Walton et al 2006a/b).

Adequate protein and energy intakes are essential to improve nutritional status, muscle strength, immune function, mobility and wound healing in the frail elderly. Inadequate intakes result in catabolism of muscle mass for energy and a downward and dangerous spiral in nutritional status.

The hospital in which this pilot study was conducted is a 333 bed community hospital located in Sydney, New South Wales. It introduced a volunteer feeding assistance program to a 28 bed aged care ward in June 2005. The program had been developed over three years by the dietitian in charge and volunteer coordinator, with the support of the executive director and the management and development team. Patients were referred by the Clinical Care Coordinator (CCC) or Nurse Unit Manager (NUM) if they required any of the following interventions: assistance with feeding, opening packages, encouragement and/or social support at mealtimes. Currently there are twenty-five trained volunteers who are available to assist patients at lunch time, each weekday. Typically about three volunteers are available most weekdays, with eight to ten patients being referred each weekday.

The volunteers usually have about 45 minutes to assist two to three patients with their lunch meal. Not all the patients require actual feeding so the volunteers may also assist with meal tray set up, opening packages, encouragement and conversation at mealtimes. Volunteers complete a form for each patient that outlines what assistance was provided and approximately how much of the meal was eaten. These volunteers are specifically recruited and trained for this feeding assistance program and are advised to encourage the high protein, high energy components of the meal first. Their duties are clearly outlined, as are when they must call for nursing assistance (e.g.

changing the patients' position, putting in dentures, swallowing difficulties). This study was planned as the first formal evaluation of this program.

The aims of this study were:

1. To determine if patient energy and protein intakes increased at the lunch meal and over the whole day on the days when the volunteers were present.
2. To compare the average daily energy and protein intakes to the average estimated daily requirements.
3. To obtain the opinions of nurses and volunteers regarding patient feeding and the volunteer program.

8.2 METHODS

8.2.1 Study design

A convenience sample of nine elderly inpatients (three male, six female) from an aged care ward were studied. Data were collected in August 2006 and involved two weekdays (Thursday and Friday) and the following two weekend days for each patient. Overt observations were made of the volunteers (during lunch on weekdays only), patients and staff at each main meal. Leftover food was weighed and demographic details for each patient were obtained from the medical records. Patients were asked about their mid meal intakes and appetite, while nurses and volunteers answered survey questions regarding the program. The NUM and CCC referred patients to the volunteer feeding assistance program as was the usual practice. They also explained the study, and obtained written consent from the patients' (or their next of kin) who agreed to be part of the study.

8.2.2 Determining estimated daily energy and protein requirements

The dietitian in charge obtained quantitative data from the medical records of those patients whom four day data was collected. Data on diet type, age, the reason for admission, weight and height (when available) were obtained, and meal orders from the tray ticket or menu slip were recorded. This information was used to determine each patient's estimated daily requirements for protein and energy, as well as to describe the study population.

8.2.3 Weighing standard meals and plate waste to estimate dietary intakes

The method for weighing plate waste and estimating dietary intakes of energy and protein was identical to the method outlined in Chapter 6. The only difference in this study was that estimates the mid meal foods and beverages were not reliable because the focus was on the main meals and thus they were not included in the food intake analysis so that the daily intake data reflects only the foods consumed at the three main meals.

8.2.4 Observations of mealtimes

Observations were recorded at each main meal and focused on when and how the food was served, the time before patients started to eat, the time patients took to eat, the assistance provided, any socialisation aspects and any interruptions during mealtimes.

8.2.5 Questionnaires and focus groups with nurses and volunteers

Nurses and volunteers were invited to complete an open-ended questionnaire on their opinions about the feeding assistance program and opportunities for improvements. A total of 13 nurses completed questionnaires, while 10 questionnaires were returned by volunteers, with another four preferring to discuss the questions and their responses in a focus group.

8.2.6 Data analysis

Determining estimated daily energy and protein requirements

Estimated daily energy and protein requirements were calculated for each patient using the Schofield equation as recommended in Australia and the recommended dietary intakes for protein (NMRC 2005). Estimated energy and protein requirements were typically determined using an activity factor of 1.2, an injury factor of 1.2 and a protein requirement of 1.2g/kg/day.

Estimating the amounts of energy and protein consumed

FoodWorks (Professional Edition) nutrient analysis software (Version 4, 1998-2003, Xyris Software Pty Ltd, Highgate Hill, Queensland, Australia) was utilised to calculate the estimated energy and protein content of the foods consumed. Wherever available the actual nutrient analyses of hospital recipes were entered into FoodWorks.

Statistical analyses

Means and standard deviations were calculated for estimated requirements and amounts consumed. The Shapiro-Wilk test of normality was used and paired samples t-tests were used for comparison as all data being analysed were normally distributed. All statistical analyses were completed using the Statistical Package for the Social Sciences (SPSS Version 15 for Windows, 2006, SPSS Inc., Chicago, IL).

8.2.7 Ethics

Ethics approval for the study was obtained from the University of Wollongong and Illawarra Area Health Service Human Research Ethics Committee in 2005, and the South Eastern Sydney and Illawarra Area Health Service (Southern Section) Human Research Ethics Committee in 2006. Written consent was obtained from patients or their next of kin where the patient was cognitively unable to provide informed consent. Verbal consent was obtained from volunteers, staff and visitors.

8.3 RESULTS

8.3.1 Characteristics of the patients

The nine patients had an average age of 89 ± 4.6 years and a mean length of stay of 29.3 ± 12.3 days (range 9-46 days), compared with the hospital average of 5.7 days. The most common causes of admission were limb injury and dementia, with most patients being transferred from a medical or surgical ward into the aged transition care ward close to discharge to home, hostel or nursing home.

8.3.2 Protein and energy intakes with, and without volunteers

Significantly more protein was consumed at weekday lunches (10.1g; $p < 0.05$) and more energy (439kJ; $p = 0.072$) was consumed when the volunteers were present (Table 8.1). The daily protein intake was significantly larger (10.7g; $p < 0.05$) when volunteers were assisting, but the average daily energy intake was not significantly increased.

Table 8.1: Average lunch and total daily energy and protein intakes, with and without volunteers assisting

Category	Energy (kJ) n=9	Protein (g) n=9
Lunch with volunteers		
Mean (\pm SD)	1700 (± 897)	25.3 (± 15.8)
Lunch without volunteers		
Mean (\pm SD)	1261 (± 772)	15.2 (± 12.3)
Lunch		
Difference (\pm SD)	439 (± 848)	10.1 (± 15.7)
P value	0.072*	0.015*
Whole day with volunteers		
Mean (\pm SD)	4018 (± 1244)	50.5 (± 20.3)
Whole day without volunteers		
Mean (\pm SD)	3784 (± 1800)	39.8 (± 21.1)
Whole day		
Difference (\pm SD)	236 (± 1022)	10.7 (± 10.4)
P value	0.509*	0.015*

Legend: * Paired samples t-test

Table 8.2 shows that there was no significant difference between the intakes of energy and protein between weekday (WD) and weekend (WE) days at the breakfast or dinner meals in the evening. Importantly, patients were not eating significantly less energy or protein at the breakfast or evening meal in response to the higher lunch intakes

Table 8.2: Average breakfast and dinner energy and protein intakes, with and without volunteers assisting

Category	Energy (kJ) n=9	Protein (g) n=9
Breakfast with volunteers		
Mean (\pm SD)	1151 \pm 515kJ	9.7 \pm 5.02g
Breakfast without volunteers		
Mean (\pm SD)	1071 \pm 485kJ	8.8 \pm 5.60g
Breakfast		
Difference (\pm SD)	80	0.9
P value	P=0.619	P = 0.630
Dinner with volunteers		
Mean (\pm SD)	1167 \pm 411kJ	15.5 \pm 8.26 g
Dinner without volunteers		
Mean (\pm SD)	1452 \pm 682 kJ	15.8 \pm 8.35 g
Dinner		
Difference (\pm SD)	285	0.3
P value	P = 0.142	P = 0.834

Legend: * Paired samples t-test

The average estimated daily energy and protein requirements were 7348kJ and 71.1g protein. No individual patient met their estimated daily energy requirement, although one patient met their daily protein requirement and another consumed >97% of the estimated daily protein requirement, but only when the volunteers were present. The deficit in energy and protein intakes is certainly more than would be explained simply by the exclusion of the mid meals, indicating a significant issue to be addressed. The percentage of energy requirements met was marginally higher when the volunteers were present, although intakes were only just above half the daily requirements in both situations (Table 8.3). The amount of the protein requirement consumed was improved by approximately 15% ($p < 0.05$) when the volunteers were present.

Table 8.3: Mean percentage of average estimated daily requirements met with and without volunteers assisting

	Intake as a % energy requirement n=9	Intake as a % protein requirement n=9
Whole day with volunteers	54.7	71.0
Whole day without volunteers	51.5	56.0
Difference	3.2	15.0
P value	0.478*	0.020*

Legend: * Paired samples t-test

8.3.3 The role of volunteers

The volunteers were observed doing numerous tasks at the mealtimes, including: opening food and beverage packets, removing lids, making drinks, opening supplements, moving the meal tray closer, rearranging the meal tray, feeding patients, encouraging/prompting intake, providing social support and conversation at the meal, as well as providing written feedback for the nurses.



Figure 8.1: Volunteer feeding assistance at lunch time

Figure 8.1 shows an example of the individual attention that is provided by the trained volunteers in feeding patients who require this (Note: both the patient and the volunteer gave consent to the Volunteer Coordinator before being photographed).

A total of fourteen responses were received from volunteers. Most (76%) felt that there was enough time to assist and feed patients. Opening packages was identified as an important role to assist and encourage dietary intakes. Twelve of the volunteers felt that company at mealtimes positively influenced the patient dietary intakes.

8.3.4 Nursing opinions

Thirteen nurses completed the questionnaire. All of the nurses surveyed reported the volunteer feeding assistance program to be of value on the ward. In addition, 54% of them expressed concern about a lack of time or staffing resources at mealtimes and a desire for the volunteer program to be extended to other meals. The most commonly stated reasons were that patients required assistance with feeding, setting up of meals and prompting to eat.

8.4 DISCUSSION

8.4.1 The positive influence of additional assistance

The problem of malnutrition in elderly patients is common, but is also complex and can be difficult to address. Addressing issues such as packaging, preparation to eat and feeding assistance have certainly been highlighted amongst suitable interventions (Schenker 2003, Walton et al 2006b). This pilot study has shown that a volunteer feeding assistance program can improve protein intakes in longer stay, aged care hospital patients. The higher intakes of energy at lunch with volunteers was approaching statistical significance but a larger study is needed to evaluate this impact more thoroughly.

The results are consistent with those of Kayser-Jones & Schell (1997a) who investigated nursing home residents and found residents and their trays were poorly positioned at mealtimes, and that nurses were busy, sometimes trying to feed as many as 15 patients each. At mealtimes when a specialist restorative nurses aide took her time with each patient and fed only two to three patients, they seemed to appreciate the time she took with them and consumed more (Kayser-Jones & Schell 1997b). This is similar to the current study which utilised trained volunteers in this role.

The positive outcomes of this pilot study contrast to those from a study by Hickson et al (2004). However there were a number of differences including: the current intervention was targeted at patients identified as 'at risk', rather than to all patients; the feeding assistance was provided by volunteers who were only present for the lunch meal; the patients were also long-stay patients rather than acute patients and dietary intake of energy and protein was a primary outcome in the current study, not clinical end points such as grip strength, mortality and nutritional status. These two studies indicate that there is the need for a larger, longer term feeding assistance study that would assess dietary intakes and also nutritional status for long stay, elderly patients in a hospital setting.

8.4.2 The opinions of the nurses and volunteers

The feedback from the nursing staff and volunteers certainly showed strong support for the program. The nurses were appreciative of the assistance at the lunch meal and were keen to see the program expanded. The volunteers appeared very satisfied with their role and the success of the program in assisting the patients with an important part of their care.

This study also addresses several of the barriers to nutrient intakes outlined by the Council of Europe (2002). These include cooperation between different types of staff (volunteers were also included in the present study) and the involvement of the hospital management in the planning and implementation of the program.

Care would be needed in extrapolating such a program to different settings. Some hospitals or aged care facilities would not be supportive of such a program as they may see it as taking nursing positions, while others may not have the volunteer base to support this strategy. It is however one other strategy that may be considered within the 'toolbox' of interventions to assist dietary intakes.

8.4.3 Limitations

There were several limitations with this study. It utilised a small convenience sample and weighed intakes were only obtained for the three main meals each day. However the primary focus of the study was the influence on intakes at lunch and at the other main meals when volunteers assisted with weekday lunches. Further, as duplicate meals were not available for every option, intakes by patients were estimated by comparing the weight of food waste to standard portion sizes which would have introduced some error. Obtaining the weight of each item before service would have been the preferred method (Hartwell & Edwards 2003a, Wilson et al 2000), however for practical reasons this was not able to be conducted in this pilot study.

The fact that this was an overt study may also have influenced some behaviours and resultant intakes, however measuring two days with and without volunteers attempted to minimise this bias. Furthermore, other factors that might have influenced intakes (such as patterns of care or number of visitors) were not considered in detail in this study.

Future longer term studies should also consider other cofounders such as dementia, undiagnosed swallowing problems, positioning for feeding and the impact of polypharmacy to evaluate such interventions. Collection of additional data including: demography, medical diagnoses, functional status and impairments, cognitive status, length of stay and complications would be beneficial. The involvement of a health economist would also be advantageous to determine and compare the costs of hospital care associated with malnutrition and complications versus the provision of more nourishing and customised nutritional care to vulnerable patients.

8.5 CONCLUSION

This pilot study suggests that intakes of protein can be significantly improved at lunch and over the whole day when the feeding assistance volunteers are present. There was a trend to improved intakes of energy, both over the day, and at lunch when the volunteers were present. Given the ageing population and the increased demands on nurses, there may be potential to expand such a program to other wards or meals. However further study involving a larger sample size is certainly indicated. Potential expansion to other wards or meals would also need careful consideration regarding the availability of volunteers, particularly at the evening dinner meal, and the perceived impact on nursing jobs by some. However a volunteer feeding assistance program is certainly an intervention strategy worthy of further consideration in the battle to optimise intakes of older, longer stay hospitalised patients.

CHAPTER 9 SUMMARY AND CONCLUSIONS

9.1 SUMMARY OF THIS RESEARCH

This research aimed to explore the complex interplay between nutrition and food service systems within Australian hospitals, while considering the roles and communication between the stakeholders involved and the dietary intakes by elderly, long stay patients. A broad qualitative approach was initially used to gather a wide range of views of key stakeholders regarding current practices with regard to food and nutrition service provision in Australian hospitals. Documentation of the processes and practices that are barriers to dietary intakes for long stay elderly patients followed, as did the compilation of priority interventions. Important themes that emerged as related to the provision of hospital food services were:

- Food service
- Menu
- Medical condition
- Ward environment
- Management

These themes formed the basis of the questions within the national survey that was offered to dietitians, food service managers and nurse unit managers working in long stay ward areas of public and private hospitals. This important study allowed clarification and prioritisation of key issues.

Key barriers to intakes that were agreed upon by all three stakeholder groups were:

- Lack of choice due to special diet
- Boredom due to length of stay
- Lack of feeding assistance
- Limited variety
- Packaging difficult to open
- Lack of meal set up assistance

Key intervention priorities identified by all three stakeholder groups were:

- Food fortification
- Assistance with packaging
- Nutrition assessment of all patients
- Adequate monitoring of food intakes
- Adequate flexibility of menu choices

The fact that dietitians and food service managers identified several common barriers (limited nutritional assessment and communication between staff), as did dietitians and nurse unit managers (lack of flexibility of food service and taste of food) is a relevant finding. Dietitians and food service managers also identified the same additional key intervention priorities (additional feeding assistance by nurses, non nursing feeding assistant available at meals and additional assistance to set up for meals), as did dietitians and nurse unit managers (more nourishing between meal snacks and an improved variety of menu options). It would appear that dietitians are in a strategic liaison position between the other two stakeholder groups and they will need to continue to focus on sound communication and advocacy strategies so as to assist others in realising the complexities involved in improving dietary intakes. There is no one single solution to address patients' poor dietary intakes, but rather a multidisciplinary approach with numerous available strategies.

Biological, behavioural and social influences needed careful consideration as the business of eating is a complex construct. Everyone has a view on what influences intakes and what hospital food should be like, or should not be like. Views often vary about where patients eat, what they eat, the cost of the interventions and which interventions will best optimise poor intakes. The observational and weighed plate waste studies allowed a first hand investigation of 'two days in the life of an aged care rehabilitation ward' in three different settings. Energy and protein intakes were suboptimal for the majority of patients and there was particularly high wastage of commercial supplements (57%). Negative interruptions to meals included such occurrences as medication rounds, x-rays, meal tray and/or patient positioned poorly, and food and beverage packaging difficult to open. Positive interruptions included visitors assisting and encouraging, socialisation with other patients and visits from health staff that encouraged intakes and assisted with meals.

The degree of food and beverage packaging provided, as well as issues with meal set up and feeding assistance were mentioned and observed consistently. These issues were considered in the pilot evaluation of a volunteer feeding assistance program. The study found statistically significant improvements in protein intakes, and an ongoing trend to increased energy intakes with an intervention that targeted patients 'at risk' and utilised trained volunteers to focus on meal access, socialisation, encouragement and feeding assistance when required.

The studies referred to above utilised a variety of methods and allowed the research topic to be considered from a number of perspectives. As such triangulation was a key component of the research methodology. The research focused on investigating nutrition and food service provision using a continuous quality improvement framework while primarily involving key staff groups that work with food. It should be noted that the success of interventions would likely benefit from the successful building of networks with physicians, the nursing executive and financial managers.

9.2 SIGNIFICANCE OF THE RESEARCH

The effectiveness of communication can vary between stakeholders and clearly there are barriers between some stakeholders (particularly nursing and food service, dietetics and foodservice). A sense of morale and perceived importance in the hospital hierarchy appears to have an impact on the roles played, options available and services provided. Food services are one department that traditionally appear to have been poorly respected. They have been relegated to 'hotel services' and this can impact negatively on the ultimate service provided. Communication can greatly influence the degree of service provided, the extent of feedback between patients and staff, feedback about meals and monitoring of services. The degree of knowledge about the importance of nutrition and ones ability to prioritise sufficiently will also influence the service provided. Insufficient nutrition training means that nurses and medical staff may lack the required knowledge and may not value nutrition as highly as they should (Perry 1997, Kowanko et al 1999, Kopelman 2004).

This research has allowed a cumulative and coordinated investigation into nutrition and food service provision in an Australian health care context. It has resulted in a more thorough understanding of the current practices, networks, behaviours and motivators that will ultimately influence dietary intakes. The benefits of enhancing the energy and protein content of 'normal' food (food fortification) has certainly been evidenced, as has the importance of small, though frequent nourishing snacks for small appetites.

Edwards and Hartwell (2004) summarised this by saying that there are, *“No substitutes for the adequate provision of ‘normal’ food”* (p323).

While these are important interventions, a ‘toolbox’ of possible strategies needs to be available to improve the manner in which food services are provided. There is no one intervention that will improve dietary intakes for all concerned because so many factors have an impact on the volume of food consumed. An ageing population makes advocacy for an expanded range of interventions timely because of the potential to positively influence quality of life, rates of malnutrition, recovery time and hospital costs.

“Malnutrition is not an inevitable side effect of ageing, but many changes associated with the process of ageing can promote malnutrition” (Landi et al 1999, cited in Hickson 2006, p4)

It is pertinent to mention that many of the issues outlined in this research are not new. In fact, many of these problems have been acknowledged since the 1970’s (Butterworth 1974, Bistran et al 1976), but still they remain. This research has contributed to the understanding of the complex web; that is the environment surrounding food service provision and dietary intakes in Australian hospitals. Importantly it provides clear direction about feasible intervention strategies and research priorities for the future. The findings serve as further evidence that hospital food and nutrition provision needs to be taken more seriously and needs the support and alliances of physicians, financial managers and the nursing executive to support *‘Food as medicine’*.

9.3 LIMITATIONS AND FUTURE RESEARCH

This research was a planned set of studies within a PhD program, so it does not cover all related topics, locations or stakeholders. Much of the research was conducted in the Wollongong and Sydney regions of New South Wales, with the exception of the national survey of dietitians, food service managers and nurse unit managers. Therefore the generalisability of the findings requires consideration, although this would be the case for any research of this nature because of the many factors such as differences in hospital size, food service system, meal distribution system and menu.

Key staff members involved with daily provision of food and nutrition were the focus of this research. It is important to note that another important perspective requires further

coordinated research and publication, that of the patients themselves. While this research involved patients in the initial broad stakeholder review and ward based reviews, it needs to be acknowledged that the position of the staff members was the main focus of the current research. Future research should expand on this area by gathering a more informed patient perspective.

The response rate for the national survey with stakeholders was certainly lower than expected. However the fact that a larger proportion of teaching hospitals responded, when compared to hospitals between 20-100 beds meant that 42% of hospital beds across the country were represented.

The evaluation of the volunteer feeding assistance intervention only contained nine subjects and is therefore considered a pilot study. While a statistically significant result was achieved for increasing protein intakes, it was not adequately powered to detect a significant difference regarding energy intakes. It is certainly recommended that a larger scale follow up study be conducted.

While interventions such as the provision of supplements and food fortification have been the basis of significant research, they would still benefit from longer term studies that would allow nutritional status and cost effectiveness outcomes to also be assessed. Many other priorities identified in this thesis would benefit from studies in hospital settings to investigate possible impacts and the publication of these findings may have a further impact. Several issues are relevant to the research that is required, for example: that the length of stay is often too short to do serial measures of nutrition assessment, there is no agreed gold standard for nutritional assessment that is consistent and timely or sensitive enough to detect changes over a few weeks, and the true costs of food based interventions need careful consideration to ensure that all the relevant comparisons are accounted for. Therefore specific health outcomes (particularly nutritional status) are often not measured and estimated dietary intakes are more usual. This research is required to inform best practice and there are certainly many further opportunities to expand the knowledge on optimal strategies to improve dietary intakes of long stay elderly patients.

Consideration may need to be given to conducting some interventions in nursing home settings where length of stay is longer which would enable longer term review of changes in nutritional status. It is acknowledged that hospitals and nursing homes have

similarities and differences, however it may be a reasonable option when considering length of stay and repeat measures of nutritional status.

Clearly, potential interventions need to be researched and their impact on hospital environments needs to be published. Proof of cost effectiveness would also be extremely beneficial so as to be able to justify any up front costs, or changed practices related to interventions. Further research recommendations include:

- Cost effectiveness studies of providing regular nourishing foods as snacks vs commercial supplements
- Research examining the influence of different packaging types on access to foods and beverages, and resultant dietary intakes
- Reviews of the effects of providing nourishing snacks on actual intakes, and also on longer term health outcomes
- Cost effectiveness studies of 'point of service' meal service vs 'plated meal service'
- Ethnographic accounts of the patients' perspectives regarding the adequacy and appropriateness of nutrition and food service provision.
- Larger reviews of volunteer feeding assistance programs and
- Research examining the cost effectiveness and outcomes related to a targeted intervention where paid staff have the specific role of providing feeding assistance within an aged care rehabilitation setting.

9.4 PRIORITY RECOMMENDATIONS

Just as there are numerous barriers to adequate dietary intakes, there are also many interventions that should be seen as priorities. Certain interventions will suit some settings better than others, as variables such as the level of staffing, ward layout, type of ward, food service system, budget and kitchen location will all influence the likely success of intervention strategies. To this end, stakeholders in this thesis were asked to rank their top ten priorities and indicate a feasibility rating for each priority they

chose. Food fortification, in the form of enriched versions of existing items was already a fairly widespread strategy using items such as soups and mashed potato. This was rated as the most feasible intervention. However there is certainly more scope to increase the number of hospitals fortifying foods and also to increase the number of foods that are fortified (e.g. texture modified meals and desserts).

Additional feeding assistance was another identified priority intervention, however it was not found to be highly feasible in the research reported here (Rating of 3.2/10 for additional nursing assistance and 3.6/10 for a non nursing assistant available at meals). Issues related to the shortage of nurses, extra tasks and difficulties in recruiting, training and retaining volunteers were highlighted.

The extensive literature review and studies outlined in this thesis have resulted in a number of recommendations for further investigation in practice. These are grouped below under topic headings that correspond to the key priorities outlined by the stakeholders. Clearly a number of these could also be implemented together to optimise outcomes, and different options may be required for different patients (e.g. better nutrition screening on admission, adequate assessment and nutritional support, additional feeding assistance and monitoring of intakes). A concerted effort is required to consider the patient's individual needs and expectations in this process and how this will fit within the hospital service delivery. This will involve a change in paradigm as hospitals are traditionally very routine and service oriented institutions (Allison 2003, Hartwell & Edwards 2003b). Priority recommendations from this thesis are:

Adequate flexibility of menu choices within the food service system

- The use of ward based 'bulk' food delivery carts should be considered wherever possible to enhance serve size options, choice available at point of service and assist with further communication between patients, food service and nursing staff.
- The ability of the food service system to 'customise' options may be considered, particularly for long stay patients. This would also include the availability of a suitable 'extras' list for long stay patients
- The layout and appearance of the meal tray should be addressed. Options to make the meal and service equipment look more aesthetically pleasing, customer focused and inviting would be beneficial.

Food fortification, nourishing snacks and supplements

- The fortification of regular foods should be considered wherever possible with additional protein and energy so that every mouthful provides maximum nutrition. This is of particular assistance to patients with small appetites.
- The use of more regular food supplements (e.g. chocolate, cakes, commercial dairy desserts, cheese & biscuits) as more frequent nourishing snacks between meals for patients 'at risk' would be beneficial. Frequent, small meals allowing choice at point of service are particularly useful strategies to encourage small appetites.
- A review of the usage of supplements would ensure that they are targeted and monitored appropriately. A review of intakes and better strategies to monitor wastage is required, as well as the source and amount of budget for these items. Other nourishing options such as cheese and biscuits and cakes should also be considered to break the monotony of regular beverage based supplements. Where possible the use of a 'point of service' trolley to deliver these items would be ideal as the patient can have more control over their choices and can factor in their current appetite.

Assistance with food and beverage packaging

- A review of the necessity for the current level of food and beverage packaging in hospitals would be informative. A follow on study from this thesis is underway to investigate the types of packaging that are used in hospitals, and to determine if any types are less difficult to open. This study involves dietitians and occupational therapists observing how inpatients access packaging, assessing the time taken to open items, the causes of difficulties and compensatory mechanisms used. The impact of packaging needs to be made clear to finance and procurement/purchasing departments so that brands with preferred options can be considered, and ultimately the preferred types of packages can be written into specifications for future tender documents. Communicating the outcomes of the planned research and reviewing the buying power of hospitals may lead to better packaging in future.
- The ageing population is growing and changes are needed to assist this segment of the total population as they contribute largely to hospital admissions. Discussions with food service managers and manufacturers are

required to review openings on packages and make tabs or handles larger at least. In the short term, it needs to be highlighted that assistance will regularly be needed to access these items.

Feeding assistance, socialisation and monitoring

- Health services need to ensure that adequate staff are available to assist patients who require help not only with feeding, but with the position of their chair, tray table and opening of packets. This assistance is required throughout the meal as patients may need assistance accessing a later nutritionally important part of their meal (e.g. opening a dessert or supplement).
- It is worth investigating the option of expanding volunteer services and/or paid designated staff members providing feeding assistance, encouragement and monitoring of 'at risk' patients. Such roles may be assumed by retired volunteers, as well as trainee nurses, currently employed or additional nurses.
- The benefits of training volunteers or encouraging staff to assist with a regular function of opening packets, encouraging patients, monitoring intakes and socialising with them at mealtimes needs to be considered.
- The utilisation of a dining room wherever possible and the encouragement of its use as part of the rehabilitation process may assist socialisation during meals. It is likely to have a positive impact on dietary intakes, and allows another opportunity for additional assistance and support.
- Better procedures need to be implemented for monitoring dietary intakes by patients in the form of food charts. The dietetic support and presence at lunch meals needs to be increased.

Food as medicine, advocacy, nutrition assessment and communication

- It is time to recognise the significance of '*Food as medicine*' and elevate its status as a priority in holistic patient care. Improved communication between all staff is needed with recognition of the importance of food and nutrition. More respect needs to be shown for those staff preparing, delivering and collecting meals. Across discipline communication will be required to boost the profile of food and nutrition and enable further communication and monitoring.

- Doctors and nurses would benefit from expanded knowledge and skills regarding the critical role of nutrition in patient recovery. The incorporation of further nutrition components during their training would be a good starting point. Incorporating routine nutrition screening of all patients and timely referral to the dietitian where nutrition assessment is indicated.
- Further education is required for meal delivery staff regarding the role of nutrition and the importance of their role and communication with others. There appears to be very entrenched cultural issues on both sides that may take considerable time to deal with.
- Plan for an implementation of 'protected mealtimes' needs to be underway. This would mean that mealtimes are elevated as a priority and patients could attempt their meals without other interruptions such as medication rounds, doctors rounds or x-rays. This would require consistent mealtimes, will be very challenging and will take considerable efforts to obtain agreement from all stakeholders.
- Appropriate diagnostic related group coding for patients with malnutrition needs to be applied so that hospitals are reimbursed appropriately.
- A routine and well communicated nutrition screening strategy is required for all patients on admission to hospital, as well as timely referrals to a dietitian for those requiring assessment. A policy regarding re-screening long stay patients (e.g. after seven days) is also required.
- A review of ward related activities is required to address staff breaks and to ensure that there are adequate staff members available to assist with meals.
- The role of multidisciplinary teams needs consideration to review patients and discuss complete care.

Clearly there are numerous barriers to patients achieving adequate dietary intakes, and there needs to be a 'toolbox' of interventions to assist individuals in different situations. Additional possible interventions include: adequate flexibility of menu choices, various serve size options and an improved variety of menu options. A number of these interventions will come with a significant cost, and advocacy will be essential to elevate

the profile of food services in the hospital environment. It will take time to change the culture in hospitals with respect to food services, however aspects that will assist include considering the 'real' costs of malnutrition, thoroughly investigating the impact of food waste and how the dollars could be better spent on nutrition and food services.

Team based research that also involves medical specialists and nurses will also assist in making progress. Longer term studies are required to measure nutrition related outcomes from a variety of interventions. Cost effectiveness studies should address interventions such as supplements vs nourishing snacks and also the influence of food fortification vs supplements. Improvements to the knowledge of medical and nursing staff regarding the benefits of optimal nutrition is desperately required, as are improvements to monitoring and feedback, mutual respect for roles and opportunities to enhance communication between all staff in a timely manner. It will only become more critical that these priority interventions are further explored and better understood with an ageing population and with it the increased demand for health services.

This thesis has exposed the context of feeding elderly patients in long stay hospital settings from a nutritional and organisational perspective. The setting is a complex web, but there are many opportunities for improving outcomes through better communication, designated screening, nutrition assessment and referral protocols, as well a review of the roles and priorities of nutrition and food service provision in hospitals today. Collaborative positive changes within, and between hospitals can facilitate improved dietary intakes and *"Make every mouthful count"*.

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Appendix 1:**National Questionnaire provided to Dietitians, Food Service Managers and Nurse Unit Managers**

Code:

**QUESTIONNAIRE****FOOD SERVICE PROVISION IN AUSTRALIAN HOSPITALS**

Please contact:

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with any enquiries, or to return completed questionnaires



Instructions for completing the questionnaire

- Thank you for taking part in this questionnaire about food services to patients in Australian hospitals.
- This questionnaire will ask about current practices in your work place, and about your opinion regarding continuous quality improvements.
- The **primary focus** of this questionnaire is on **long stay hospital inpatients** (particularly aged care rehabilitation). Please consider this in your responses to the questions.
- There are 9 sections to the questionnaire which should take approximately 20 minutes to complete.
- Please tick (✓) the box that corresponds with your answer to each question.
- Please add any additional comments where appropriate.

About the person completing the questionnaire

Are you a? (**ALL**)

- ☐ Dietitian/Food Service Manager/Nurse Unit Manager
- ☐ Other (Please specify)

About the hospital (**NUM only**)

Number of inpatient hospital beds? _____

- ☐ Don't know

Number of rehabilitation beds? _____

- ☐ Don't know

About the production system

Is the food service production system? (**FSM only**)

- ☐ Cook-fresh system (on site)
- ☐ Bulk hot food system (from another site)
- ☐ Cook chill food system
- ☐ Frozen food system
- ☐ Combination of the above (Please explain)

- ☐ Other system (Please explain)

- ☐ Don't know

About the plating systemIs the food service plating system? **(FSM only)**

- ☐ Centralised (i.e. Patient meals are plated in a central kitchen)
- ☐ Decentralised (i.e. Patient meals are plated in several wards, or kitchens)
- ☐ Don't know

About the distribution of meal traysWho distributes the meal trays to patients? **(FSM only)**

- ☐ Food service assistant
- ☐ Nurse
- ☐ Wards person
- ☐ Ward assistant
- ☐ Other (Please explain) _____
- ☐ Don't know

About the menuDo patients select their own menu choices? **(ALL)**

- ☐ Yes
- ☐ No
If No, then who does? _____
- ☐ Some (Please explain) _____
- ☐ Don't know

How are menu selections made? **(ALL)**

- ☐ Paper menu
- ☐ Palm pilot/bedside menu computer entry
- ☐ Combination of the above (Please explain) _____
- ☐ Other (Please explain) _____
- ☐ Don't know

Are patients adequately assessed regarding their nutritional needs? **(NUM and DIET only)**

- ☐ Yes
- ☐ No
- ☐ Don't know

Any further comments?

Do you think there are adequate choices available for patients with special dietary, religious and/or cultural needs? **(ALL)**

- ☐ Yes
- ☐ No
- ☐ Don't know

Any further comments?

What percentage of long stay patients have food items brought in by family or friends regularly? **(NUM only)**

(Place an **X** on the line below that represents your answer)

0 _____ 20 _____ 40 _____ 60 _____ 80 _____ 100

☐ Don't know

What types of foods and beverages are brought in? **(NUM only)**

(You may tick **more than one** if required)

☐ Fruit

☐ Chocolates/lollies/crisps

☐ Main meals

☐ Desserts

☐ Soft drinks

☐ Other (Please explain) _____

Serving sizes

Do you think the serving sizes are adequate? **(ALL)**

☐ Yes

☐ No

If No, do you have an opportunity to make comments?

☐ Yes

☐ No

☐ Don't know

Any further comments?

Are small serve size options available? **(ALL)**

☐ Yes

☐ No

☐ Don't know

Any further comments?

Mid meal options and extras

Full diet: What **between meal snack/mid meal** options are available for patients? Please tick the boxes that correspond with the choices offered **(ALL)**

Mid Meal Snack	Pre breakfast	Morning tea	Afternoon tea	Supper
Juice				
Cordial				
Tea/coffee				
Milo				
Milk				
Plain biscuits				
Fruit				
Baked item (eg cake)				

High protein/high energy diet: What **between meal snack/mid meal** options are available for patients? Please tick the boxes that correspond with the choices offered (**ALL**)

Mid Meal Snack	Pre breakfast	Morning tea	Afternoon tea	Supper
Juice				
Commercial high protein juice				
Cordial				
Tea/coffee				
Milo				
Milk				
High protein milk				
Commercial high protein supplement				
Yoghurt/Dairy dessert				
Plain biscuits				
Cheese & biscuits				
Baked item (eg cake)				
Fruit				
Commercial high protein pudding				

Serving sizes (FSM only)

Please state the standard serving size for each of the following items

Food/fluid item	Serve size (g)
Breakfast	
Egg dish	
Other hot dish:	
Cheese	
Milk/other dairy	
Hot cereal	
Lunch/Tea	
Soup	
Roast meat	
Casserole	
Other high protein main	
Vegetarian option	
Potato	
Rice or pasta	
Free vegetable (e.g. carrots, beans)	
Salad with protein	
Side salad	
Milk (glass or carton)	
Milk (for hot drinks)	
Yoghurt	
Mousse	
Icecream	
Pudding	
Custard	
Cake	
Canned fruit	
Fresh fruit	
Fruit juice	
Cereal	
Bread	
Roll	
Margarine/Butter	
Cheese	

How many times per day are the following generic items offered as part of a main meal on the full menu? **(FSM only)**

Meat or fish or chicken	_____ times per day
Vegetarian option	_____ times per day
Milk	_____ times per day
Yoghurt	_____ times per day
Cheese	_____ times per day
Starchy vegetable (eg. potato)	_____ times per day
Rice or pasta	_____ times per day
Free vegetable (eg. carrots, beans)	_____ times per day
Fruit (fresh or canned)	_____ times per day
Bread	_____ times per day
Cereal	_____ times per day
Margarine/butter	_____ times per day

Mid meal options and extras

Who is responsible for identifying long stay patients needing extra or alternative food/beverage items? **(ALL)**

(You may **tick more than one** if required)

- ☐ Registered nurse
- ☐ Enrolled nurse
- ☐ Food service assistant
- ☐ Nutrition assistant/Diet aide
- ☐ Dietitian
- ☐ Wardsperson
- ☐ Ward clerk
- ☐ Other (Please explain)

☐ Don't know

Any further comments?

Can extra **main** meal items (not on the standard menu) be ordered for long stay patients? **(ALL)**

- ☐ Yes
If yes, what items are available?

☐ No

☐ Don't know

Any further comments?

Can extra **between meal snack items/mid meals** (not on the standard menu) be ordered for long stay patients? **(ALL)**

- ☐ Yes
If yes, what items are available?

If yes, how is it decided which patients are long stay and may require extra options?

- ☐ No
☐ Don't know
Any further comments?

Do you have access to food/beverage items when required for patients outside meal and snack times? **(NUM only)**

- ☐ Yes
☐ No
☐ Don't know

Any further comments? _____

Consumption of meals, assistance and monitoring

Where do patients usually consume their meals? **(NUM and FSM only)**

- ☐ In bed
☐ Bedside
☐ Dining room
☐ Other (Please explain) _____

How long do patients have to consume their main meals? **(NUM and FSM only)**

Breakfast _____ minutes

Lunch _____ minutes

Tea _____ minutes

Consumption of meals, assistance and monitoring (ALL)

Who is primarily responsible for ensuring patients have access to their meals (e.g. opening packages, moving the tray table closer)?

(You may **tick more than one** if required)

- ☐ Registered nurse
- ☐ Enrolled nurse
- ☐ Food service assistant
- ☐ Nutrition assistant/Diet aide
- ☐ Wardsperson
- ☐ Ward clerk
- ☐ Patient
- ☐ Other (Please explain)

- ☐ Don't know

Any further comments?

Approximately what percentage of patients need help (eg. opening packages, moving the tray table closer) to access their meals?

(NUM and FSM only)

(Place an **X** on the line below that represents your answer)

0 _____ 20 _____ 40 _____ 60 _____ 80 _____ 100

- ☐ Don't know

Who is responsible for feeding patients who require this? **(ALL)**

(You may **tick more than one** if required)

- ☐ Registered nurse
- ☐ Enrolled nurse
- ☐ Food service assistant
- ☐ Nutrition assistant/Diet aide
- ☐ Wardsperson
- ☐ Ward clerk
- ☐ Combination of the above (Please explain)

- ☐ Other (Please explain)

- ☐ Don't know

Any further comments?

Approximately what percentage of patients require feeding assistance?
(NUM only)

(Place an **X** on the line below that represents your answer)

0 _____ 20 _____ 40 _____ 60 _____ 80 _____ 100

☐ Don't know

Are food intakes monitored regularly for patients who are identified as not eating well? (NUM and DIET only)

☐ Yes

If yes, how is this done and by whom?

- ☐ Nurse records on a food chart
- ☐ Nurse records in the medical notes
- ☐ Food service assistant records on menu
- ☐ Nutrition assistant/Diet aide records on food chart
- ☐ Dietitian records on food chart
- ☐ Dietitian records in medical notes
- ☐ Other (Please explain)

If yes, how would you rate the usefulness of the recorded information?

- ☐ Very useful
- ☐ Useful
- ☐ Undecided
- ☐ Limited use
- ☐ Useless

☐ No

☐ Don't know

Approximately what percentage of patients require their food intakes to be monitored on a food chart? (NUM and DIET only)

(Place an **X** on the line below that represents your answer)

0 _____ 20 _____ 40 _____ 60 _____ 80 _____ 100

☐ Don't know

Is there adequate time to assist with setting up, feeding and monitoring when required? (NUM and DIET only)

☐ Yes

☐ No

☐ Don't know

Any further comments?

Prioritising the barriers to adequate food intakes and planning ongoing improvements

The following list summarises 20 barriers that were identified during focus groups with 98 key stakeholders.

From this list of 20 items, please select the 10 most important barriers, and then rank them from **1** to **10** (with **1** being the **most important**, and **10** being the **least important**) as **barriers** to adequate nutrition for long stay patients. (**ALL**)

- ☐ Menu selection method (eg. paper or computer)
- ☐ Limited variety of food offered
- ☐ Lack of choice due to a special diet
- ☐ Lack of flexibility of the food service system
- ☐ Communication issues between staff and patients
- ☐ Communication issues between staff
- ☐ Limited nutritional assessment
- ☐ Lack of culturally appropriate foods
- ☐ Lack of assistance in setting up patients' for meals
- ☐ Unsuitable eating environment
- ☐ Inappropriate serve size
- ☐ Packaging difficult to open
- ☐ Too little time allowed to eat
- ☐ Lack of feeding assistance
- ☐ Taste of the food
- ☐ Temperature of the food
- ☐ Some food items not available due to food safety policy
- ☐ Appearance and layout of the meal tray
- ☐ Boredom with meals due to length of stay
- ☐ Limited monitoring of intakes

Food fortification

Are any foods or beverages currently fortified to make them higher in protein and/or energy?
(FSM and DIET only)

☐ Yes

If yes, what items are fortified

(Tick **any** of the items that are fortified)?

- ☐ Soup
- ☐ Mashed potato
- ☐ Texture modified meat dishes
- ☐ Milk
- ☐ Juice
- ☐ Others (Please explain)

If yes, what is used to fortify the food/beverage items

(Tick **any** of the items that are used)?

- ☐ Skim milk powder
- ☐ Full cream milk powder
- ☐ Commercial protein powder
- ☐ Cream
- ☐ Enriched infant rice cereal (eg: *Farex*)
- ☐ Glucose polymer
- ☐ Others (Please explain)

☐ No

☐ Don't know

Any further comments?

Opening packages and feeding assistance

Do you currently utilise any non-nursing staff to help patients gain access to meals (eg. Open packages)? (**ALL**)

☐ Yes

☐ No

☐ Don't know

Any further comments?

Opening packages and feeding assistance

Do you currently utilise any trained, non-nursing staff to provide feeding assistance? (**ALL**)

☐ Yes

☐ No

☐ Don't know

Any further comments?

9. Any further comments about any aspect of hospital food services? (ALL)

Would you like a copy of the survey results? If so, please email your name and contact details.

Thank you for the time taken to participate in this questionnaire

Appendix 2:

Room layout, Diet types and Coding for Observational Study

Date: _____ Hospital: _____

Observers: _____

Patient code
Diet type

Patient code
Diet type

Patient code
Diet type

Patient code
Diet type

Patient code
Diet type

Diet types and codes:

Stg 1	Puree meals
Stg 2	Finely minced meals
Stg 3	Diced meals
XSoft	Minced meat, with finely diced vegetables
Soft	Soft textured foods
HPHE	High protein, high energy
DIAB	Diabetic
Nectar/Honey	Thickened fluids
FR	Fluid restriction

Appendix 3: Daily Ward Observations

Date: _____ Hospital: _____ Inpatient code: _____

Name of observer: _____

[illegible]

Appendix 4:

Completion Guidelines for Daily Ward Observations Form

The following items should be considered when completing the observation sheets for each day:

Routine for meal choice collection, time of day and time taken?

Routine for meal delivery and time taken to set up the meal?

Did they get what they ordered?

Time that each meal is collected? Is anything left with the inpatient?

\
Time that the meal is left with each inpatient?

Any assistance that is provided to inpatients?

Amount of food that is eaten?

What happened before and after meals?

Social interaction at meal times: with whom, how long, about?

When is the inpatient at the rehabilitation gym?

When are they asleep?

When are medical rounds? When are pill rounds?

When do allied health staff visit, how long?

When do visitors arrive and for how long?

Does any food get brought in for inpatients? If so, what types of items? Are they eaten and when?