Institution: Queen Margaret University
Unit of Assessment: UoA 3 Allied Health Professions, Dentistry, Nursing and Pharmacy
Title of case study: Informing and improving nutritional management in vulnerable groups

1. Summary of the impact

Over the past 15 years, research within the Nutrition and Metabolism in Health and Disease Theme has provided evidence to inform policy and practice in the nutritional care of older and nutritionally-vulnerable adults. This information has been referred to by other bodies when improving guidelines for nutritional management and care in residential or community settings. Theme members have identified key changes in nutritional status and dietary needs which occur with advancing age; these observations have contributed to the development of standards associated with nutritional, food and fluid provision for the care of vulnerable groups in hospitals and care homes in Scotland and beyond.

2. Underpinning research

Since 1993, applied research in the Theme has assessed and identified nutritional status and risk, and how optimising diet can improve health and health-related quality of life in older adults and nutritionally-vulnerable patients. A survey of adults over 75 years old conducted at Queen Margaret University (1993-1996) provided data about the status of individuals living independently in Scotland (Bannerman, et al, 1997) and challenged current methods for assessing nutritional status of older adults (Bannerman, PhD thesis in collaboration with MacLennan's group at the University of Edinburgh; 1993-1996). Research on the impact of disease and nutritional care on nutrition and health related quality of life in different groups within the population (clinical and free-living) continued, some in collaboration with NHS Lothian and the University of Edinburgh. Development of strategies to monitor and assess these parameters was taken forward in clinical settings, care homes (Bannerman & McDermott, 2011) and in those receiving artificial nutrition support in primary care (Bannerman, et al, 2000). This work identified the detrimental impact of poor nutritional status on health outcomes, as-well as effects on health-related quality of life including those receiving long term artificial feeding regimens. Subsequent collaborative research carried out in Australia (Daniels, Flinders University, Adelaide from 2001 onwards) further looked at the prognostic value of field methods of nutritional assessment in older adults in terms of both morbidity (function) and mortality. Work in this area is still ongoing in QMU, for example in a project determining the relationship of levels of physical activity with dietary intake, inflammation, body composition, functional ability, fatigue and quality of life in the older adult (Jones, PhD; Theodorakopoulos, PhD). In addition, the research is part of an active collaboration with colleagues (e.g. Miller) in Australia. It also stimulated the underpinning applied research in optimising oral intake to enhance both nutritional and functional status.

Strategies to optimise dietary intakes and nutritional well-being to improve health outcomes have been researched in both community and clinical settings and have included investigation of the impact of different food forms and nutritional composition on food aesthetics, satiety, and intake. Collaboration with Davidson has expanded Davidson's work in this area and includes the recent work of Pritchard (Pritchard et al, 2013) which considered the impact of food form and energy density on appetite and subsequent food intakes, recognising the problems of those requiring texture modified diets (Bannerman & McDermott, 2011). This work shows that both provision and timing influence consumption and, hence, the likelihood of achieving optimal nutritional intake in the older adult in the residential setting. A parallel study in the acute setting confirmed these findings among elderly patients undergoing rehabilitation. Collaborations with Crotty, Daniels and Miller investigated the influence that nutritional and exercise intervention strategies can have on recovery of older adults following fractures related to falls (Miller, et al, 2006), which in turn highlighted the requirement for a change in clinical practice. Related research evaluated methods which inform clinical practice and a major outcome was that underpinning analytical models for estimating energy requirements in adults during recovery from falls may not be as accurate as previously believed (Miller, Daniels, Bannerman & Crotty, 2006). Further research developed a screening tool to identify valid assessment of key nutrients (calcium) in the older adult population to identify those at risk and allow potential early interventions to reduce the possibility of comorbidities.

Experience and expertise developed within the Theme led to a funding award from the Food Standards Agency and the Scottish Government (Davidson & Bannerman 2006 -7; 2008 updates) to develop an education and training resource aimed at improving nutritional knowledge and management in care homes for older adults. This resource was rolled out across the Care Home Learning Network in Scotland and used to assist Care Homes in implementing acceptable levels of nutritional care. This is one of the registration parameters for which they may be inspected by the Care Commission for Homes (Bannerman was lead author of the resource).

Bannerman has continued to expand her research portfolio with work in the area of coeliac disease (CD) and the gluten-free diet with epidemiological studies, including the first national study of the incidence of diagnosed paediatric CD in Scotland and the 6.5-fold rise in its incidence in the past 20 years (White et al, 2013). In conjunction with this, a further study focussed on factors affecting compliance with a gluten-free diet in adolescents, which included a hands-on workshop of cooking skills using gluten-free food.

3. References to the research

Pritchard, S., Jones, J., Davidson, HIM. Bannerman, E. Randomised trial of the impact of energy density and texture of a meal on food and energy intake, satiation, satiety appetite and palatability responses in healthy adults. *Clinical Nutrition,* doi: 10.1016/j.clnu.2013.10.014 – *In Press*.

White, LE., Merrick, V., Bannerman, E., Russell, RK., Basaude, D., Henderson, P., Wilson, DC., Gillett, PM. (2013) 'The rising incidence of celiac disease in Scotland.' *Pediatrics*, Published Online first: 9th September 2013. doi: 10.1542/peds.2012-0001.

Bannerman, E. & McDermott, K. (2011) Dietary and fluid intakes of older adults in care homes requiring a texture modified diet: the role of snacks. *Journal of the American Medical Directors Association*, 12(3):234-239.

Miller, MD., Bannerman, E., Daniels, LA., Crotty, M (2006) Lower limb fracture, cognitive impairment and risk of subsequent malnutrition: a prospective evaluation of dietary energy and protein intake on an orthopaedic ward. *European Journal of Clinical Nutrition*, 60: 853-861.

Bannerman, E., Pendlebury, J., Phillips, F., Ghosh, S. (2000) A cross-sectional & longitudinal study of health-related quality of life after percutaneous gastrostomy. *European Journal of Gastroenterology & Hepatology,*12, 1101-1109.

Bannerman, E., Reilly, JJ, MacLennan, WJ., Kirk, T., Pender, F. (1997) Evaluation of validity of British anthropometric reference data for assessing nutritional state of elderly people in Edinburgh: cross sectional study. *BMJ,* 315: 338-341.

4. Details of the impact

Theme research carried out over the last 15 years has informed and contributed to the development of both evidence-based practice guidelines, strategies, education and training to improve awareness of nutritional care of older adults and nutritionally-vulnerable groups.

Currently, there are 1290 care homes across Scotland which are required to provide care that meets the National Care Standards for Care Homes for Older People (revised 2007) and to adhere to standards regarding nutritional care and eating well that identify nutritional risk and needs and provide strategies to manage this. The Care Inspectorate (until April 2011, the Care Commission) adopted through the Care Home Learning Network procedures to ensure that minimum care standards across all care homes could be achieved. An education and training programme which supported nutrition champions in care homes across Scotland was developed by Bannerman and colleagues and implemented in collaboration with the Scottish Commission for the Regulation of Care, 2009. This provided a direct benefit to managers and staff of Care Homes in implementing systems to nutritionally support residents who receive more appropriate and individualised nutritional care. This programme enables assessment and provision of the appropriate food and fluid needs for the older adult to ensure minimal nutritional risk and was evaluated by the report

"Promoting Nutrition in Care Homes for older people". Care homes in Scotland continue to be inspected for registration on key criteria identified within the programme resource.

Our nutritional expertise in the acute (hospital) setting has provided the basis for optimising nutritional care of nutritionally-vulnerable groups and informed the development of 'Food In Hospitals: National Catering and Nutrition Specification for NHS Hospitals in Scotland' (Scottish Government, June 2008; Davidson, Scott, & Bannerman). This document has been developed to support all Scottish NHS Boards in implementing the Quality Improvement Scotland Clinical Standards for Food, Fluid and Nutritional Care in Hospitals and to drive up standards of food and fluid provision experienced by patients within hospitals. To assess compliance, all 14 NHS health boards throughout Scotland are inspected twice yearly by Health Facilities Scotland and results published.

The "Food in Hospitals" specifications have also been used to inform nutrition standards for food and fluid provision elsewhere, including by the Welsh Assembly ('All Wales Catering and Nutrition Standards for Food and Fluid Provision for Hospital Inpatients', 2011) and in New South Wales, Australia ('NSW Agency for Clinical Innovation. 2011. Nutrition Standards for Adult Inpatients in New South Wales hospitals'). Work in the area of nutritional assessment of older adults and associated health outcomes has been cited in the development of evidence-based practice guidelines for the nutritional management of malnutrition in adult patients across the continuum of care in Australia (Dietetic Association of Australia 2009). This gathered the best available evidence to formulate recommendations for use across Australia and across the spectrum of health care settings to detect malnutrition and manage it with nutritional interventions.

Beneficiaries: NHS and other hospitals in UK and abroad, elderly people in acute and residential care, residential care staff and management.

5. Sources to corroborate the impact

Bannerman E., Thomson M., Molyneux A., Hubbard C., Davidson HIM., Aitken G & Dewar B. (2008) 'Promoting Food, Fluid and Nutritional Care Provisions for Care Home Residents.' Edinburgh: Queen Margaret University (National Nutrition Education Programme for the Care Home Learning Network, Scotland). – Training package developed by Bannerman and colleagues.

Promoting Nutrition in care homes for older people (Report which evaluates the QMU training programme aimed at improving nutrition in Scotland's care homes for older people).

Food in Hospitals: National Catering and Nutrition Specification for NHS Hospitals in Scotland (Scottish Government, June 2008. Authors: Davidson, H, Scott L & Bannerman E). http://www.scotland.gov.uk/Resource/Doc/229423/0062185.pdf.

Nutrition Standards for adult inpatients in NSW hospitals http://www.aci.health.nsw.gov.au/__data/assets/pdf_file/0004/160555/ACI_Adult_Nutrition_web.pdf 'Food in Hospitals: National Catering and Nutrition Specification for NHS Hospitals in Scotland'.

Dietetic Association of Australia 2009 Nutrition & Dietetics (2009) Evidence-Based Practice Guidelines for the Nutritional Management of Malnutrition in Adult Patients Across the Continuum of Care; 66(Suppl.3):51 http://onlinelibrary.wiley.com/doi/10.1111/j.1747-0080.2009.01383.x/pdf (Guidelines to provide health care professionals with evidence-based recommendations supporting the identification and nutritional management of malnourished adults).