Nutrition care practices in hospital wards: Results from the Nutrition Care Day Survey 2010

Ekta Agarwal, The University of Queensland
Maree Ferguson, University of Queensland
Merrilyn Banks, The University of Queensland, Australia
Marijka J Batterham, University of Wollongong
Judith Bauer, The University of Queensland, et al.
Title: Nutrition care practices in hospital wards: Results from the Nutrition Care Day Survey 2010

Ekta Agarwal¹, Maree Ferguson¹,², Merrilyn Banks¹,³, Marijka Batterham⁴, Judith Bauer¹, Sandra Capra¹, Elisabeth Isenring¹,²

¹The University of Queensland, Brisbane, QLD 4072, Australia
²Princess Alexandra Hospital, Brisbane, QLD 4102, Australia
³Royal Brisbane and Women’s Hospital, Brisbane, QLD 4029, Australia
⁴The University of Wollongong, Wollongong, NSW 2522, Australia

Short title: Nutrition care practices in hospital wards

List of abbreviations:

ADA EAL: American Dietetic Association Evidence Analysis Library ®
ANCDS – Australasian Nutrition Care Day Survey
Aus – Australia
AuSPEN – Australasian Society of Parenteral and Enteral Nutrition
HPE – High Protein Energy Diet
MST – Malnutrition Screening Tool
MUST – Malnutrition Universal Screening Tool
NCCAC: National Collaborating Centre for Acute Care
NHMRC: National Health and Medical Research Council
NRS-2002 – Nutrition Risk Screening-2002 tool
ONS – Oral Nutritional Supplement
Address for Correspondence:

Mrs Ekta Agarwal
PhD Candidate,
School of Human Movement Studies
The University of Queensland
St Lucia
Queensland 4072
Australia
Contact Number: + 61 422 851650
Email address: e.agarwal@uq.edu.au
Abstract

Background and Aim: This paper describes nutrition care practices in acute care hospitals across Australia and New Zealand.

Methods: A survey on nutrition care practices in Australian and New Zealand hospitals was completed by Directors of dietetics departments of 56 hospitals that participated in the Australasian Nutrition Care Day Survey 2010.

Results: Overall 370 wards representing various specialities participated in the study. Nutrition risk screening was conducted in 64% (n= 234) of the wards. Seventy nine percent (n=185) of these wards reported using the Malnutrition Screening Tool, 16% using the Malnutrition Universal Screening Tool (n= 37), and 5% using local tools (n= 12).

Nutrition risk rescreening was conducted in 14% (n= 53) of the wards. More than half the wards referred patients at nutrition risk to dietitians and commenced a nutrition intervention protocol. Feeding assistance was provided in 89% of the wards. “Protected” meal times were implemented in 5% of the wards.

Conclusion: A large number of acute care hospital wards in Australia and New Zealand do not comply with evidence-based practice guidelines for nutritional management of malnourished patients. This study also provides recommendations for practice.

(184 words)

Keywords: Nutrition risk, malnutrition, screening, dietary interventions, evidence-based guidelines, Australasian Nutrition Care Day Survey
**Introduction**

The Australasian Nutrition Care Day Survey (ANCDS) reported a 30% malnutrition prevalence rate in acute care patients in hospitals across Australia and New Zealand [1].

While patients are often admitted to hospital with existing malnutrition [1, 2], the deterioration of their nutritional status during hospitalisation is not uncommon. Malnutrition is associated with adverse outcomes such as higher complications rates, impaired wound healing, increased length of hospital stay, higher readmission rates, increased morbidity and mortality, and increased health care costs [3]. Given its high prevalence and associated repercussions, early identification of malnutrition (or nutritional risk) is undisputable [4].

Nutrition screening, a rapid and simple procedure, can help detect patients who are at nutritional risk or have existing nutritional problems [5]. A variety of screening tools [6-10] have been validated and endorsed by nutrition care guidelines in different countries [11-13]. However, the extent of the integration of nutritional screening within nutrition care in hospitals across Australia and New Zealand is unclear. While there is no published information about nutrition screening practices in New Zealand, a nutrition screening survey was conducted in 1995 [14] and repeated in 2008 [15] within Australian hospitals.

In 1995, responses from dietitians representing 124 hospitals indicated that only 3% (n= 4) of the hospitals conducted nutrition screening [14]. In 2008, responses from 68 hospitals indicated that 78% (n= 53) of the hospitals had adopted screening as routine practice [15], although the results may not have been reflective of the total population.

In 2009, the Dietitians Association of Australia published “Evidence Based Practice Guidelines for the Nutritional Management in Adult Patients across the Continuum of Care” [11]. In addition to recommending nutrition screening, these guidelines also endorsed practices such as dietary counselling, fortification of food, oral nutritional supplements,
tube feeding, parenteral nutrition, and the provision of feeding assistance at meal times as part of standardised nutrition care for acute patients [11]. It remains unknown if these guidelines have been implemented in hospitals across Australia or New Zealand. Evidence regarding the compliance with these practices within New Zealand hospitals is also lacking. The present study is a part of the larger ANCDS and aims to describe nutrition care practices in acute care wards of participating hospitals. The paper also compares current practices with various evidence-based nutrition care practice guidelines (Appendix 1).
Methods

The ANCDS was a multisite cross-sectional survey. Members of the Australasian Society of Parenteral and Enteral Nutrition (AuSPEN), and Dietitians Association of Australia (DAA) Interest Groups participated in the study. Site representatives from each participating hospital were provided with details regarding the study methodology. Wards where:

- malnutrition prevalence was likely to be low (e.g. Maternity and Obstetric);
- patient burden for participation was likely to be high or patients were critically ill (e.g. Paediatric, Mental health (including eating disorders), Intensive Care Units, High Dependency Units, Emergency Departments);
- nutrition screening and assessment are not routinely performed (Outpatient Departments);

were excluded from the study. Non-acute care wards (such as Rehabilitation and sub-acute wards) were also excluded.

Directors of Nutrition and Dietetics Departments of participating hospitals were requested to complete a questionnaire for each participating ward from their hospital for this study.

Information collected in the questionnaire included:

- Ward speciality
- Number of beds
- Protocols regarding:
  - Weighing patients,
  - Nutrition screening and rescreening,
  - Management of patients with nutritional risk,
  - “Protected” meal times (periods when all non-urgent clinical ward-based activities are ceased to allow for patients to eat meals without interruptions and for staff to offer assistance to improve patients’ nutritional intake [16]),
Feeding assistance (a variety of activities such as adjusting the bed-table to allow easier access to the meal, helping patients sit comfortably, opening food containers, helping patients with using cutlery, providing verbal encouragement, cutting the meals, pouring drinks into cups, providing a more social atmosphere, and physically feeding the patients [17]).

Ethical approval was provided by the Medical Research Ethics Committee of The University of Queensland. Approval was also obtained from local Human Research Ethics Committees of participating hospitals.

**Statistical Analyses**

All statistical analyses were performed with software package PASW Statistics Gradpack 18 (SPSS Inc., USA). Frequency and percentage was used to describe categorical variables (ward speciality; protocols related to weighing patients, “protected” meal times, feeding assistance, nutrition screening, nutrition rescreening, type of screening tool used, dietary interventions for patients identified as at risk of malnutrition).

Bivariate analyses of categorical variables were undertaken using Chi-square tests. Exact tests (using Monte Carlo method) were used when the minimum cell frequency assumption was violated. Comparisons of medians were performed using non-parametric tests (Mann-Whitney U Test). P-values less than 0.05 (two tailed) were considered statistically significant.
Results

1. Demographics: A total of 370 wards from 56 hospitals participated in the study (Australia: 287 wards from 42 hospitals; New Zealand: 83 wards from 14 hospitals) (Table 1). Wards from eight main specialities (Medical, Surgical, Oncology, Neurology, Orthopaedics, Renal/Urology, Gastroenterology, and Cardiology/Respiratory) participated in the study with ward sizes ranging from 7 – 54 beds.

2. Protocols

Weighing patients: Patients’ weights at the time of admission were recorded in 32% (n= 117) of the wards. More than half the wards (n= 204, 55%) weighed patients only when requested. Although the remaining wards did not record patient weights at the time of hospital admission, they did so on a daily (n= 12, 3%), weekly (n= 18, 5%), biweekly (n= 8, 2%), or pre-surgery (n= 10, 3%) basis. A significant difference in protocols for weighing patients according to ward speciality was observed ($\chi^2$, p<0.01, df= 88). Oncology wards had the highest reports of weighing patients on admission (n= 12, 46%). The practice of weighing patients when requested was most commonly reported for orthopaedic (n= 24, 77%), gastroenterology (n= 8, 62%), other (n= 14, 61%), surgical (n= 47, 58%) and medical wards (n= 58, 57%).

Nutrition screening and rescreening practices: Nutrition screening was routinely performed in 64% (n= 234) of all wards. Intra-hospital variations in nutrition screening practices were reported in 114 participating wards from 12 hospitals. Less than half of these wards (n= 54, 47%) implemented nutrition screening. When wards were evaluated regarding protocols for both weighing and nutrition screening, the results were as follows:
• One-third of the wards (n= 120, 33%) conducted nutrition screening and recorded patient weights at some stage during their admission;

• 114 wards (31%) only conducted nutrition screening and recorded weights if a request was made;

• 46 wards (12%) only weighed patients at some stage during admission and did not conduct nutrition screening;

• 90 wards (24%) conducted neither routine weighing nor nutrition screening for their patients.

Nutrition rescreening was routinely performed in 14% (n= 53) of the wards on a weekly (n= 48), fortnightly (n= 3) or monthly (n= 2) basis. Nutrition rescreening was conducted ad hoc (n= 42, 11%), when requested (n= 23, 6%) or never in 252 wards (68%).

Although no significant differences were found in screening and/or rescreening practices amongst ward specialities, these practices were significantly different amongst regions (p < 0.001) (Table 1). Significant differences were also noticed when comparisons were made between regions regarding protocols for both- weighing and nutritional screening (p< 0.001) (Table 1).

Nutrition Screening Tools: A majority of the wards that conducted nutrition screening, used the Malnutrition Screening Tool (MST) (n= 185, 79%). The remaining wards used either the Malnutrition Universal Screening Tool (MUST) (n= 37, 16%), Nutrition Risk Screening Tool (NRS-2002) (n= 3, 1%), or other local screening tools (n= 9, 4%).

Wards from within four hospitals varied in their choice of tool (Table 2).

Management of patients with nutrition risk: Table 3 summarises the management of patients with nutrition risk in wards where nutrition screening was performed (n= 234).
In wards where nutrition screening was not performed (n= 136) and patients were referred for management of their nutritional status:

- More than three-quarters of the wards referred patients to dietitians and commenced a nutrition intervention protocol such as high protein-energy diets, oral nutritional supplements, and/ or food charts (n= 106, 78%);
- The remaining wards did nothing (n= 30, 22%).

There were no significant differences in the nutrition interventions between ward specialties (p > 0.01).

**Feeding assistance:** The availability of feeding assistance for patients was reported for 331 (90%) of the wards. Nursing staff (n= 320 wards, 97%), family members (n= 277 wards, 84%), and health care assistants (n= 57 wards, 17%) most commonly were reported as providing this assistance.

**“Protected” mealtimes:** “Protected” mealtimes were implemented in 5% (n= 18) of the wards.
This paper reports an overall poor level of adherence to the recommended guidelines for weighing, screening and rescreening patients during their hospital admission. Appendix 1 summarises the guidelines for optimum nutrition care for hospitalised patients [5, 11, 18].

### Weighing, nutrition screening and rescreening of patients, nutrition screening tools:

Patients’ body weight and recent weight history are the most easily obtainable indices of nutritional assessment [19]. Body weight recorded at the time of hospital admission can also be useful in determining patients’ medication dosage, hydration level and recent weight history. Since recent weight history is a more reliable indicator of nutritional status [20] it is often included in nutrition screening tools [6, 8-10]. Nutrition risk screening, at the time of hospital admission, is advocated by nutrition care guidelines in many countries [11-13]. Prospective cohort studies provide a good level of evidence for implementing nutrition risk screening programs in acute care wards (Appendix 1). In agreement with the ANCDS, a large European study (conducted in over 1200 acute care wards in 325 hospitals) found inter-region differences in nutrition screening practices [21] supporting our conclusion that evidence-based recommendations do not always translate into practice. Approximately one-quarter of all wards in the ANCDS did not conduct nutrition risk screening or record patient weights during hospital admission. The absence of any form of surveillance of nutrition risk in patients could potentially lead to patients at risk of malnutrition going undiagnosed and perhaps untreated in these wards.

Previous studies have suggested that for the successful implementation of nutrition screening it is important to communicate the value of nutrition screening and screening tools, and provide training to staff members to enhance their competency with the use of the tools [22-25]. The ANCDS found inter- and intra-hospital inconsistencies not only in screening practices but also with the choice of nutrition screening tools. By implementing a
standardised nutrition screening program using one validated tool across wards within each hospital the importance of nutrition screening will be highlighted along with facilitating staff training and competency with the tool and consistency in practice. In contrast to the European study that found the use of local screening tools to be prevalent [21], the ANCDS found a more consistent approach with the MST being the most commonly used tool in Australasia, perhaps because the tool was developed in Australia. Since local screening tools generally have not undergone validity testing, it is recommended that local tools be substituted with those that have demonstrated reliability, and validity in various clinical settings, and are capable of being administered by a range of hospital personnel. A range of guidelines endorse the use of a number of validated and reliable nutrition screening tools [11-13, 18] (Appendix 1) which can be adopted by wards that either currently use local tools or do not conduct nutrition screening for their patients.

Management of patients with nutrition risk: The ANCDS has previously reported that half of the malnourished participants not receive additional nutritional support on the day of the survey, and they also consumed ≤ 50% of the food offered [1]. The study did not investigate if participants had been previously diagnosed for malnutrition and/or were under dietetic supervision. However, it is likely that nutritional interventions are largely preceded by nutrition screening and assessment, the absence of which may leave patients undiagnosed and therefore untreated. Nutrition risk screening increases the likelihood of commencement of nutritional interventions and therefore should be implemented in acute care wards.

A recent review that evaluated no intervention versus the effectiveness of interventions (such as dietary advice with or without nutritional supplements) in the management of malnutrition concluded that nutritional interventions were effective in improving weight, body composition and grip strength in comparison to no intervention [26]. A satisfactory
level of evidence is available in current literature to support positive outcomes associated with dietary counselling provided by a dietitian, and prescription of individualised nutritional support in acute care patients (Appendix 1) [11]. There is also an excellent body of evidence to support the use of oral nutritional supplements in improving several outcomes in acute care patients (Appendix 1) [11, 26]. A majority of wards in the present study referred patients at nutrition risk to dietitians, who could then conduct a comprehensive nutritional assessment and make suitable recommendations. The strength of the recommendations in nutrition care guidelines (Appendix 1) should substantiate the rationale for implementing a nutrition intervention pathway for wards that do not screen patients for nutrition risk and/or do not implement a nutrition intervention for patients at risk of malnutrition.

**Feeding assistance:** The present study found that nursing staff were the main providers of feeding assistance. Although the extent of feeding assistance provided by nursing staff was not evaluated in this study, there is a satisfactory level of evidence to indicate that provision of feeding support may improve several outcomes (Appendix 1) [11]. Nursing staff have traditionally provided this assistance to patients in hospitals. However, a qualitative metasynthesis by Jefferies et al (2011) found that over the years, nursing focus has inadvertently shifted from providing nutrition support towards managing specialised or high priority tasks during mealtimes [27]. Other studies have found that interruption at mealtimes, routine duties, clashes with their own meal breaks, and time constraints do not allow nursing staff to provide the required feeding assistance to patients [17, 28, 29]. Perhaps additional support, such as volunteers, carers and family members, can be trained to assist with feeding patients, especially when there are no complicating factors that can compromise patient safety [27].
“Protected mealtimes”: Although the Dietitians Association of Australia [11] and the Council of Europe [30] endorse the implementation of “protected” mealtimes as a method of nutrition intervention in malnourished patients, evidence to support its use is lacking in current literature and may explain why it is not often used.

The present paper aimed to provide a snapshot of existing nutrition care in acute care wards in Australian and New Zealand hospitals. Previous reports have highlighted barriers to implementing optimum nutrition care practices in acute care hospital wards due to factors such as increasing patient age [22], presence of delirium, dementia, depression or severe illness [22], nurses’ lack of training and/or competency with nutrition screening tools [24, 25]. Previous studies have also reported prioritisation of patients’ medical needs by hospital staff [31], nursing staff’s poor understanding and knowledge about the nutrition care process [31], shortage of nursing staff [31], poor interdisciplinary communication [31], competing priorities preventing nursing staff from providing feeding assistance [17, 31], frequent mealtime interruptions by medical, nursing, and others, [17] as organisational factors that have been an impediment to implementing nutrition interventions in hospital patients. Perhaps nursing and dietetics departments need to collaborate towards resolving these barriers and implementing the guidelines into practice by:

- Establishing a multidisciplinary nutrition care committee that advocates the implementation of nutrition care guidelines;
- Ensuring nursing staff receive ongoing education and support regarding the importance of nutrition screening and rescreening from dietetics staff members;
- Standardising the use of one validated nutrition screening tool across all wards within a hospital to improve nursing staff’s experience, competency and confidence with its use;
- Implementing the use of a standardised nutrition care pathway in every ward;
• Conducting regular audits to assess compliance with the guidelines.

Limitations
Due to the voluntary nature of participation (and therefore possibly greater interest in understanding and/or modifying existing nutrition care practices) these results represent a best case scenario of nutrition care practice. The information gathered was not directly observed but it is likely that the Directors of Dietetic departments consulted with ward dietitians on the specific details to gain deeper understanding. Approximately 20% of acute care hospitals from Australia [32]; and 38% of acute care hospitals from New Zealand [33] (with >60 beds) participated in this study. Although this may not represent a majority of acute care hospitals, the ANCDS is the largest study to evaluate nutrition care practices at a ward-level from a variety of acute care specialities within this region.

Strengths and Significance
This study is significant for enrolling a wide variety of ward specialities to provide an insight into various aspects of nutrition care for acute care patients across Australia and New Zealand. Since the results have been compared with current evidence-based practice guidelines for the management of patients at nutritional risk, these data provide dietetics department managers across Australia and New Zealand hospitals with the opportunity to evaluate their practice and build on it to design and implement nutrition care protocols to maximise beneficial patient outcomes.
**Conclusion**

This is the first multicentre study to evaluate nutrition risk screening and nutrition care practices in hospitals across Australia and New Zealand. Results from this study confirm that hospital wards are either largely non-compliant with or vary greatly with evidence-based recommendations related to nutrition screening, intervention, and choice of nutrition screening tools. Results from this study provide a starting point for further research regarding barriers and enablers to various nutrition care practices in acute care hospitals across Australia and New Zealand. There is a substantial body of evidence that demonstrates the positive effects of nutritional interventions on patient outcomes (Appendix 1) [11, 26]. Therefore, it is important that nutrition interventions commenced in hospitals are continued post-discharge and followed up by community-based nutrition services. Perhaps future studies could also evaluate the effect and availability of, and patient-compliance with, such community-based nutrition interventions in Australia and New Zealand.

**Conflict of Interest:** None of the authors have a conflict of interest to declare.

**Statement of Authorship:** The project was done as part of the PhD study by EA and was supervised by EI, MF, and MBanks. The project was planned and designed by EA, EI, MF, and MBanks. The project was coordinated; data was acquired, analysed and interpreted by EA. Statistical advice was provided by MBatterham. The original manuscript was written
by EA, and then all authors participated in editing and final revisions. All authors have read and approved the final manuscript.

Acknowledgements: The authors would like to thank (1) Participating sites for their time and effort in collecting the data for this study; (2) AuSPEN for its support in organising the webinars for training dietitians involved with data collection; and the small research grant awarded to Ekta Agarwal in 2010; (3) Members of the AuSPEN Steering Committee for their valuable feedback on the project plan in the initial stages of the project; (4) Queensland Health for funding Queensland hospitals to recruit additional dietitians for aiding with data collection.
Table 1: Weighing, nutrition screening and rescreening practices in 287 acute care wards in 42 Australian and 83 acute care wards in 14 New Zealand hospitals

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of wards (Number of hospitals)</th>
<th>Nutrition Screening</th>
<th>Nutrition Rescreening</th>
<th>Nutrition Screening and Weighing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Not performed at admission</td>
<td>Performed at admission</td>
<td>Not performed&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Queensland</td>
<td>93 (14)</td>
<td>5 (5%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>88 (95%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>54 (58%)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>New South Wales</td>
<td>64 (8)</td>
<td>8 (12%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>56 (88%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>64 (100%)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Victoria</td>
<td>59 (12)</td>
<td>13 (22%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>46 (78%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>52 (88%)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>South Australia</td>
<td>34 (2)</td>
<td>31 (91%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3 (9%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>33 (97%)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Western Australia</td>
<td>26 (3)</td>
<td>18 (69%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>8 (31%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>26 (100%)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Tasmania</td>
<td>8 (2)</td>
<td>8 (100%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0&lt;sup&gt;c&lt;/sup&gt;</td>
<td>8 (100%)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>3 (1)</td>
<td>0&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3 (100%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1 (33%)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>New Zealand</td>
<td>83 (14)</td>
<td>53 (64%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>30 (36%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>79 (95%)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>OVERALL</td>
<td>370 (56)</td>
<td>136 (36%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>234 (64%)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>317 (86%)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> “Not performed” includes rescreening conducted on request, ad hoc, or not performed
<sup>b</sup> “Regularly” includes screening done on a weekly, fortnightly, or monthly basis
<sup>c</sup> Chi-square test (Exact tests) (p < 0.001)
Table 2: Inter-ward variations in choice of nutrition screening tools in five participating hospitals

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Number of participating wards</th>
<th>Number of wards as per choice of nutrition screening tool</th>
<th>Number of wards not performing nutrition screening</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MST</td>
<td>NRS-2002</td>
<td>Other</td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>13</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>8</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>8</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

Hospital A, B, C, D: De-identified hospitals

Table 3: Description of protocols for the management of patients at nutritional risk or malnourished in wards where nutrition screening was performed (n= 234)

<table>
<thead>
<tr>
<th>Frequency of implementing protocol</th>
<th>Protocol Description</th>
<th>Wards n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implemented Routinely</td>
<td>Dietitian referral only</td>
<td>78 (33%)</td>
</tr>
<tr>
<td></td>
<td>Dietitian referral + HPE diet</td>
<td>24 (11%)</td>
</tr>
<tr>
<td></td>
<td>Dietitian referral + Food chart</td>
<td>10 (4%)</td>
</tr>
<tr>
<td></td>
<td>Dietitian referral + HPE Diet + Food Chart</td>
<td>9 (4%)</td>
</tr>
<tr>
<td></td>
<td>Dietitian referral + ONS</td>
<td>8 (3%)</td>
</tr>
<tr>
<td></td>
<td>Dietitian referral + ONS + Food Chart</td>
<td>7 (3%)</td>
</tr>
<tr>
<td></td>
<td>Dietitian referral + ONS + HPE Diet</td>
<td>6 (3%)</td>
</tr>
<tr>
<td></td>
<td>Nothing is done</td>
<td>8 (3%)</td>
</tr>
<tr>
<td>Implemented Ad Hoc</td>
<td>Dietitian referral only</td>
<td>60 (26%)</td>
</tr>
<tr>
<td></td>
<td>Dietitian referral + HPE diet</td>
<td>12 (5%)</td>
</tr>
<tr>
<td></td>
<td>Dietitian referral + HPE Diet + Food Chart</td>
<td>9 (4%)</td>
</tr>
<tr>
<td></td>
<td>Dietitian referral + HPE Diet + ONS</td>
<td>3 (1%)</td>
</tr>
</tbody>
</table>

HPE: High Protein-Energy; ONS: Oral Nutritional supplements
**Appendix 1: Evidence-based guidelines and the level of evidence for nutritional management of patients in the acute care setting (American Dietetic Association Evidence Analysis Library (ADA EAL); National Collaborating Centre for Acute Care 2006 (NCCAC); Watterson, Fraser et al. 2009):**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Evidence Based Statement</th>
<th>Grade (NHMRC[11])</th>
<th>Grade (NCCAC)</th>
<th>Grade (ADA EAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrition screening</td>
<td>i. Screening for malnutrition and the risk for malnutrition should be carried out by healthcare professionals with appropriate skills and training.</td>
<td>-</td>
<td>D (GPP)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>ii. All hospital inpatients on admission should be screening. Screening should be repeated weekly for inpatients.</td>
<td>-</td>
<td>D (GPP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii. Screening should assess BMI, percentage unintentional weight loss and should also consider the time over which nutrient intake has been unintentionally reduced and/or the likelihood of future impaired nutrient intake.</td>
<td>-</td>
<td>D (GPP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iv. Implementation of a nutrition risk screening program:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Improves the identification of individuals at risk of malnutrition;</td>
<td>B</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Facilitates timely and appropriate referral for nutrition</td>
<td>B</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Nutrition screening tools</td>
<td>Valid nutrition risk screening tools include:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i. MST</td>
<td>B</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii. MUST</td>
<td>B</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii. NRS-2002</td>
<td>B</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>Nutrition Interventions</td>
<td>i. Dietary counselling by a dietitian may improve outcomes such as:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Weight status and physical function</td>
<td>C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>b. Weight status and body composition</td>
<td>C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>ii. Oral Nutritional Supplements may improve outcomes such as:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Weight status, body composition, complications, pressure ulcers, life expectancy (evidence of an effect)</td>
<td>A</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>b. Energy and protein intake, global nutritional status, mood</td>
<td>A</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>iii. Individually prescribed nutritional support (including high energy diets ± ONS) may improve outcomes including:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


a. Energy intake and wound healing  
   b. Weight status and nutritional biochemistry  
   iv. Feeding assistance may improve outcomes including energy intake, body composition, life expectancy and use of antibiotics  
   v. “Protected” Mealtimes

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Energy intake and wound healing</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>b. Weight status and nutritional biochemistry</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>iv. Feeding assistance may improve outcomes including energy intake, body composition, life expectancy and use of antibiotics</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>v. “Protected” Mealtimes</td>
<td>No evidence located</td>
<td></td>
</tr>
</tbody>
</table>

NHMRC: National Health and Medical Research Council; NCCAC: National Collaborating Centre for Acute Care; ADA EAL: American Dietetic Association Evidence Analysis Library®, BMI: Body Mass Index; Aus: Australia; MST: Malnutrition Screening Tool; MUST: Malnutrition Universal Screening Tool; NRS-2002: Nutrition Risk Screening-2002; ONS: Oral Nutritional Supplements

NHMRC: Grade A: Excellent level of evidence; Grade B: Good level of evidence; C: Satisfactory level of evidence
NCCAC: Grade D (GPP): A good practice point (GPP) is a recommendation for best practice based on the experience of the Guideline Development Group
ADA EAL: Grade I: Good strength of the evidence; Grade II: Fair strength of the evidence
REFERENCES


