



Best Practice

Evidence based information sheets for health professionals

Effectiveness of interventions for undernourished older inpatients in the hospital setting

Implications for practice

- Oral supplement interventions have been found to promote weight gain and increase lean body mass (as measured by arm muscle circumference) in elderly patients experiencing under- or malnutrition (**Grade A**)
- Ensuring that the nutritional intervention prescribed is implemented is critical to ensuring positive outcomes (**Grade B**)
- Using serum albumin and pre-albumin to monitor the effectiveness of nutrition interventions is inappropriate (**Grade A**)
- Encouraging patients to consume the foods and beverages served, assisting where necessary and actively monitoring intake are strategies known to improve intake (**Grade C**)
- Seeking input from nutrition services if they are available earlier rather than later is important (**Grade C**)
- There is a need to undertake high quality research that examines specific interventions based on nursing staff interventions and practices (**Grade B**)

Information Source

This Best Practice information sheet is based on an evidence synthesis of research published by Blackwell Publishing Asia and conducted by the Australian Centre for Evidence Based Nutrition and Dietetics.¹ The primary references are available at www.blackwell-synergy.com and to members of the Joanna Briggs Institute via the website www.joannabriggs.edu.au

Background

In health care today, undernutrition or malnutrition among elderly hospitalised patients is a widespread problem resulting in serious or adverse health outcomes. Psychosocial factors contribute to the risk of inadequate nutrition or undernourishment in older adults.² Many older patients live on fixed incomes, have reduced access to food (social isolation), have poor knowledge of nutrition, or are dependent on others (caretakers or institutions) for food preparation. They may also suffer from depression, bereavement, dementia, or alcohol use. Undernutrition is, however, generally not recognised in treating elderly patients who are in the hospital system. There is evidence to suggest that this condition delays recovery and

has the effect of lowering resistance to medical complications. Indeed, studies have demonstrated there is a link between undernutrition and lengthened hospital stay, mortality and morbidity. Malnourished older patients consult their general practitioners more frequently, are in hospital more often and for longer periods, and have higher complication and mortality rates.

Nutritional disorders in elderly patients can be caused by various intrinsic and extrinsic factors. Many acute and chronic diseases predispose older patients to malnutrition, for example diabetes, cancer, diseases of malabsorption, cardiovascular disease, renal disease, chronic obstructive pulmonary disease, and conditions linked to increased tumour necrosis factor or cachectin.

Grades of Recommendation

These Grades of Recommendation have been based upon the JBI developed 2006 *Grades of Effectiveness*³

- Grade A** Strong support that merits application
- Grade B** Moderate support that warrants consideration of application
- Grade C** Not supported

Definition of terms

For the purposes of this information sheet the following definitions were used:

ADL – activities of daily living -

AMC – arm muscle circumference – calculated from the MAC and TSF

BMI – body mass index – $wt(kg)/ht(m)^2$

LOS – length of hospital stay

MAC – mid arm circumference taken as a measurement in centimetres at the mid point between the shoulder and elbow

Oral supplement – specialised nutritional products that are taken by mouth, as opposed to those administered through the enteral or parenteral routes. They are normally in beverage form but can also be in the form of special desserts

TSF – triceps skinfold thickness taken at midpoint between shoulder and elbow

Dementia is a common cause of undernutrition, as are the adverse effects of medications, such as digoxin and some anti-depressants. In addition, dysgeusia (an impairment or dysfunction of the sense of taste) can be caused by medications (eg. antihistamines, angiotensin-converting enzyme inhibitors, lithium zinc deficiency), as well as changes in sense of smell and taste resulting from physiological aging. Inflammatory bowel disease, pancreatic insufficiency, and gluten enteropathy can cause malabsorption. Other factors that contribute to malnutrition in older patients include poor oral dentition, ill-fitting dentures, dry mouth, functional disability, and impaired vision. Less common causes are endocrine disorders (eg. thyrotoxicosis or uncontrolled diabetes mellitus).

Characteristics of studies

There were 29 studies with a total of 4021 participants, focused on older patients who were in acute and subacute hospitals, where it was anticipated that most study participants would be 65 years of age or older. Patients' characteristics included people classified as malnourished, men- or women-only groups, those who had suffered a stroke or had fractures. Eighteen studies were RCTs, 2 were pre-test/post-test design, 3 were time series, 3 were cross-over trials and 3 were non-RCT. The period from admission to discharge exceeded 3 days. Where a study occurred in a geriatric ward and the lower end of age range was outside this criterion, participants were included as the majority of patients were 65 or older. Residential aged care and short-stay admissions were excluded.

There were nine specific interventions that aimed to minimise undernutrition:

- Food service practices
- Nursing practices
- Medical practices
- Dietetic practices
- Dietitian Assistant/Nutrition Assistant/Diet Aide practices
- Occupational Therapy practices
- Speech Therapy practices
- Family/Carer practices
- Volunteer practices

Interventions ranged from 3 days to 6 months in length.

Quality of the research

The majority of studies indicated adequate follow-up of participants, i.e. more than 80% of patients. Three studies managed to meet 8 out of the 10 requirements but no studies fulfilled all appraisal requirements. The research consisted of RCT and non-RCT study designs, which

reduced the number of studies that could be randomised and blinded. However, non-RCT-based studies were justified for inclusion on the grounds that they can assist in developing a more thorough understanding of hospital practices' effectiveness in ameliorating older inpatients' under- or malnutrition.

Results of studies

The 5 categories under which the intervention results were judged as being effective are as follows:

- Oral supplements
- Enteral nutrition
- Changes to hospital menu
- Additional staff support
- Implementation of guidelines

The main findings were that significant improvements in elderly patients' nutrition status occurred with an oral supplement intervention leading to better weight status and arm muscle circumferences. The number of participants within study types varied: oral supplement interventions ranged from 20-672, enteral interventions from 206-400, and changes in hospital diet from 10-88 persons.

Oral supplements

While oral supplements did not lead to conclusive proof of improvements in serum albumin, pre-albumin, LOS and mortality outcomes, there is strong evidence that older patients' weight status and AMC improved significantly when they were administered oral supplement interventions compared to standard hospital care. This was confirmed in eight out of nine RCTs where significant increases in post-intervention weight occurred in the treatment group.

Of two studies with BMI as an outcome measure, one study reported a significant increase in the treatment group post-intervention. Regarding AMC, 8 RCTs recorded this as an outcome, of which 6 were included in the meta-analysis. These concluded that AMC showed a distinct improvement in all groups but that the improvement was greater in the intervention group at weeks 4 and 8. Oral supplements in 2 RCTs appeared to have no impact on MAC. Similarly, in 8 studies with TSF as an outcome only one RCT reported significant differences between supplement and treatment groups at week 8, with greater increases in skinfold thickness in the treatment group. Of three studies using handgrip strength as an outcome, the evidence is promising, with one study reporting a significant increase in strength for the handgrip group during the final week of the 12-week intervention. Finally, of two RCTs on prevalence of malnutrition as an outcome, one reported much greater reductions in the number of participants classified as malnourished at post-intervention in the oral supplement treatment group.

Enteral nutrition

Of the six studies that focused on enteral nutrition therapy, five provided enteral nutrition via nasogastric tubes overnight with the participants able to consume normal hospital diet during the day. The amount of energy provided via enteral feeds ranged from set values of an additional 1000 kcal to 1500kcal per day. Two studies varied the degree of supplementation depending on participants' oral intake during the day, which provided up to an additional 2888 kcal enterally per day.

Four studies reported an increased total energy intake in the intervention group compared to the controls. Of two studies which measured weight as an outcome, one RCT found a significant increase in the weight of 'very thin' treatment group compared to controls. There were no differences in other weight categories. However, this type of intervention reported only some minor or no improvements in MAC, TSF, serum albumin and pre-albumin. The efficacy of this intervention is further questioned by no recorded improvements in treatment groups' LOS, mortality, ADL over their respective control groups.

Changes to hospital menu

There were four studies that sought to improve participants' health by including either: protein and energy-enriched meals; adding natural food flavours to hospital diet; mid-afternoon snacks replacing dessert; and a high energy-dense diet. In all studies dietary intake was the outcome and all studies reported higher energy intakes as part of the treatment not all of which were significant. One of these studies measured weight gain and this proved significant in the treatment group from baseline to week 3 and from baseline to week 6 of the 6-week intervention period.

Additional staff support

In the only intervention study of this type, a healthcare assistant was able to recognise participants with reduced food intake and/or other risk factors of malnutrition. The result was this person was able to plan the care to treat the participants' risk factors and help feed them including the offering of drinks and snacks.

Implementation of nutrition screening, nutrition assessment or specific management guidelines

While there was no consensus for any of the outcome measures investigated (i.e. weight, pre-albumin, LOS, mortality, prevalence of malnutrition and ADL) in 3 non-RCT studies that examined implementation of guidelines, the guideline implementation group in each case did reveal improvements: one study indicated large increases in weight; two studies highlighted lower LOS, one of which was significant; and one study reported a significantly lower percentage of malnutrition at discharge. There was no uniformity in the practices examined between the studies.

Conclusion

Oral supplements have been shown to play an important role in minimising undernutrition or malnourishment that elderly patients may experience in the hospital setting. Interventions that lead to improvements in hospital diet and facilitate support for feeding patients at the ward level can be effective. The nurse's role in ensuring that the nutritional intervention prescribed is implemented is a critical success factor.

Table 1: Practical tips that will help increase oral supplement intake

| Action | Rationale |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ensure that any oral supplement is at an appropriate temperature | Patients find consuming supplements at inappropriate temperatures difficult. Oral supplements that are designed to be served chilled, are often difficult to consume in a room temperature environment, while other patients might find chilled supplements of any kind hard to consume. |
| Ensure that oral supplement packaging is able to be opened by the patient | Some supplements are in packaging such as cans or tetrapacks, which can be difficult to open. Some have straws, which must be used to puncture the packaging while others have sealed foil lids, requiring both hands to open. Many supplements are not consumed as a result of this. |
| Monitor intake of prescribed supplements | Active monitoring intakes in a formalised way can identify low consumption at an early stage, reducing the chance of chronically poor intakes. |
| Promote a "sip" style of supplement consumption | Patients can find consuming a large serve of a supplement difficult. Providing the supplement in smaller quantities has been shown in practice to increase intake. |
| Include supplements as part of the medication protocol | There have been many reports of successful intake of supplements when they are served as part of the medication round. |
| Encourage eating frequently | Using snacks that patients like such as local nourishing snack choices, sandwiches, milk drinks, nourishing, cakes, scones and muffins can increase protein, energy and nutrient intakes. |
| Serve a nourishing beverage after the evening meal | There is often a long gap between the evening meal and breakfast. Including a nourishing beverage as a supper can increase oral supplement intake. |

Table 1 (above) has been developed by the review authors based upon expert opinion.

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In addition this *Best Practice* information sheet has been reviewed by nominees of International Joanna Briggs Collaborating Centres in Australia, Saudi Arabia, United Kingdom and United States of America.

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This *Best Practice* information sheet presents the best available evidence on this topic. Implications for practice are made with an expectation that health professionals will utilise this evidence with consideration of their context, their client's preference and their clinical judgement.⁴