Malnutrition continues to be a problem, which is estimated to cost £13 billion per annum (British Association of Parenteral and Enteral Nutrition [BAPEN], 2010). The majority of those at risk of malnutrition are living in the community. When resources are limited, it is important to identify who is most at risk so that they can receive appropriate support. This article explains the malnutrition carousel, where malnutrition leads to poor health that then further increases the risk of malnutrition. It discusses the need for balanced diets to help maintain an adequate nutritional state, highlighting which disease states are likely to cause further problems — in particular, those with swallowing problems where texture-modified diets are required. Suggested solutions are also provided to help treat suspected poor nutritional intake.

**KEYWORDS:**
- Age-related malnutrition
- Weight loss
- Swallowing disorders
- Nutrition screening
- Targeted solutions

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Malnutrition can therefore become an ever-decreasing cycle of poor health leading to further poor health. BAPEN calls this the ‘malnutrition carousel’, where those at risk of malnutrition are likely to have prolonged hospital stays, need more care on discharge, continue to lose weight, and require more GP visits and hospital admissions. Therefore, it is important to make sure that nutrients needed to maintain health are provided. This is mainly achieved by eating a balanced diet. Eating also has a social aspect, where meals are used in celebratory events, with the majority gaining pleasure from eating in company. When isolation and illness are a factor, pleasure in food can be lost and lead to a less nourishing diet being eaten (Stuart, 2018).

**BACKGROUND**

Malnutrition is a well-documented problem, with three million people in the UK considered at risk (BAPEN, 2010). Those most at risk are the elderly, i.e. one in 10 over 65 year olds (Malnutrition Task Force, 2017). Isolation and illness also increase the risk of malnutrition, the consequences of which include effects on:
- Muscle function
- Immune function
- Psychological function.

This, in turn, has an impact on the ability to fight infections, maintain independence, and increases morbidity and mortality (BAPEN, 2018). The annual cost of malnutrition has been estimated to be £13 billion (BAPEN, 2010). Thus, identifying those at risk is essential so that resources can be appropriately allocated.

Maintaining nutritional status involves ensuring an equal balance between the amount of energy provided and that required by the body. If more energy is given than needed, weight gain will happen. When less energy is provided, weight loss occurs. However, having a nutritious diet is not just about concentrating on energy, it is also about making sure that all the nutrients needed for a balanced diet are provided. This includes not only macro- and micronutrients, such as protein, iron and calcium, but also vitamins and other minerals required to maintain health. While the body contains stores of some of these nutrients — and requirements vary between sexes and ages — a daily
intake is still recommended (British Nutrition Foundation, 2017).

Illness can also impact on the ability to meet nutritional needs, as it can affect appetite and also increase nutritional requirements due to the effect on metabolic rate (Ahmed and Haboubi, 2010). Treatments for illnesses might also affect food intake, or the ability to metabolise nutrients, as they may cause nausea, vomiting or diarrhoea. Some drugs and treatments will also interact with nutrients and affect absorption.

There are also some conditions, typically neurological ones, which make swallowing difficult. In such cases, a taste-modified diet may be needed. This can affect people’s quality of life and psychological wellbeing, as they are unable or unwilling to eat socially. Lack of pleasure from eating meals in a social setting can lead to isolation (Warlow et al, 2008). At such times, additional effort needs to be made to support people and ensure that they continue to meet their nutritional requirements. It is always important to help people to continue to enjoy the social aspect of eating.

IDENTIFYING THOSE AT RISK OF MALNUTRITION

The National Institute for Health and Care Excellence (NICE) recommends using a validated screening tool, particularly for those in care settings, to identify those most at risk of malnutrition (NICE, 2012). While there are a number of disease-specific nutritional screening tools, the most commonly used is the Malnutrition Universal Screening Tool (MUST).

This involves taking three steps to develop a score, and uses elements recommended by NICE.

The first step is to consider body mass index (BMI). This is a measure that compares weight and height for a given individual. The calculation divides weight (in kg) by height squared (m²). Those with a BMI of less than 18 are considered at higher risk of malnutrition. The second step is to consider unintentional weight loss. Those with more than 5% unintentional weight loss over the preceding three to six months are considered at risk of malnutrition. The third step is an acuteness score, with those who are acutely unwell, or likely to have no (or limited) nutrition for five or more days, considered at risk.

The MUST screening tool considers weight and weight change as an important factor to identifying risk of malnutrition. There is some concern that BMI is a less helpful measure for the elderly population (Cook et al, 2005), because as individuals age, there is not only a reduction in height, but also a change in muscle composition (Omran and Morley, 2000). Sarcopenia is the condition that happens in older age, which is associated with muscle loss. This change in body composition means that the contribution of muscle to total body weight will be less. For any given weight, there will therefore be a higher fat mass. This could be seen to be less beneficial and that older adults may be more suitable to have a lower body weight. However, there is evidence that having a higher BMI in the over 70 year olds does not increase mortality (Flicker et al, 2010).

**Table 1:** Possible causes of malnutrition (Schenker, 2003)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Reason for causing malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower income groups</td>
<td>Cheaper foods having a higher energy content than protein, vitamins and minerals</td>
</tr>
<tr>
<td>Isolation</td>
<td>Individuals are less likely to prepare meals if eating alone, and also miss meals or rely on snacks instead</td>
</tr>
<tr>
<td>Illness</td>
<td>Loss of appetite, malabsorption of nutrients, side-effects of treatment causing nausea, diarrhoea, constipation, vomiting</td>
</tr>
<tr>
<td>Swallowing disorders</td>
<td>Swallowing affecting available choices of food, not liking texture-modified diets, inappropriate texture modification being provided</td>
</tr>
<tr>
<td>Mental health issues</td>
<td>Loss of interest in food or erratic eating patterns</td>
</tr>
</tbody>
</table>

Weight change, particularly unintentional weight loss, is a useful measure, although at an initial visit this can be difficult to gauge if there is no weight history available. There are more subjective measures that can be used. These include seeing if clothes are looking loose, if dentures are not fitting or not being worn because they are uncomfortable, or the skin condition is deteriorating. All of these signs could indicate a recent reduction in weight. Unintentional weight loss is important to consider, even if a measured or estimated weight is within a normal range. An overweight patient who has lost weight unintentionally would still be at risk of malnutrition, as they may not be eating enough to meet requirements, or have an underlying, undiagnosed medical condition. Even for the overweight patient, unintentional weight loss has been shown to affect functional ability (Ritchie et al, 2008).

If patients are going for prolonged periods without nutritional intake, or have increased requirements, this will increase the risk of malnutrition. For example, patients with chronic obstructive pulmonary disease (COPD), where the effort required for breathing increases energy requirements (Aniwidyaningsih et al, 2008).

**POSSIBLE CAUSES OF MALNUTRITION**

If concerns of malnutrition are identified when the preliminary screening has been completed, it is then important to consider possible causes (Table 1). By identifying the cause, solutions may become evident.
Certain questions can be asked to help find out if any of these factors and/or causes are present:

- What meals have recently been eaten?
- Have the meals been the same every day?
- Is there a reliance on snacks rather than meals? This would result in a limited variety of nutrients being eaten
- Are the meals or snacks all of a soft texture to make it easier to eat? This could mean there is an undiagnosed swallowing problem (Malnutrition Task Force, 2017).

### Swallowing disorders and risk of malnutrition

There is evidence that those with swallowing disorders are at risk of malnutrition (Sura et al, 2012). People on texture-modified diets have to have a softer diet and may also require fluids to be thickened to reduce the risk of aspiration. It is well documented that those on thickened fluids often struggle to meet their hydration needs. Nursing staff often have problems with making the correct consistency of fluid, or the consistency can change over time if the drink is left without being drunk (Pownall and Taylor, 2017).

A number of situations can arise that will increase nutritional risk for people with swallowing disorders, such as:

- Having a softer diet than required
- Having more thickened fluids than required, reducing the pleasure of drinking and resulting in a risk of dehydration
- Overcooking of food to soften it, reducing its nutritional content
- Socialising becoming more difficult, as there is a need for different food to others, or people feel they are a messy eater and so avoid such situations
- Adding additional fluid to meals to help soften them, increasing the volume that is needed to meet the same nutritional intake
- Artificial feeding, which results in an avoidance of social situations.

### POSSIBLE SOLUTIONS TO MALNUTRITION

As said, it is first important to consider the cause of malnutrition. Once this has been identified, more targeted solutions can be found, including:

- Does the patient need referral to the speech and language therapist to help ensure a suitable diet consistency is provided?
- Is a review of medication required? Are any of the medications causing side-effects that could be reducing nutritional intake, and, if so, what solutions may be required? If the patient is suffering from gastrointestinal conditions, are there any medications that could help?
- Would a referral to a dentist be appropriate?
- Would a referral to social services be appropriate to help with providing meals? There are companies that provide ready-made meals which are delivered to the door, including for people requiring therapeutic meals
- What is the local support network? What family members are available and what is their health? It is often the case that elderly friends and family are supporting patients.
- Is this sufficient?
- Are there any local lunch clubs available? This could provide both meals and social contact.

### INCREASING NUTRITIONAL INTAKE

While there is evidence that sufficient energy intake is possible with additional snacks (commonly called the Food First approach), meeting protein, vitamin and mineral intake needs can be more difficult (de Groot et al, 1999). When appetite is poor, eating a large meal can be difficult. Presenting someone with a large plate of food is going to be off putting and can be counterproductive. Therefore, eating little, but often, is key. Nutritious snacks include cheese, yoghurts, milk puddings, milky drinks, fruit cake, and teacakes. However, in the author’s clinical experience, older adults can also be concerned about eating between meals and spoiling their appetite, which can make it difficult to meet their requirements.

### Fortifying foods

Foods can also be fortified to make every mouthful count more. Such techniques include adding cheese to soups or on top of mashed potato, or adding cream to soups and puddings. Milk powder can be added to milk that is then used in all drinks. Encouraging a variety of meals is beneficial to ensure a varied intake of nutrients.

### Soft foods

For those with a swallowing problem, softer texture foods are the most appropriate. Food fortification may also be more suitable for this population, as it can be added into the food in the correct consistency. If food has to be overcooked to soften it, micronutrient intake may be affected. For these patients, an over-the-counter ‘A-to-Z’ multivitamin may be required, as long as it is of a suitable consistency. If this cannot be achieved, a prescription of a suitable supplement may be necessary.

Once advice has been given, monitoring is vital. On occasions, the interventions may not be sufficient to meet the patient’s nutritional intake, and weight loss may continue. In this instance, further support will be required from the local dietetic department, which can then advise on the use of further nutritional supplementation. This is especially important if a...
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textured-modified diet is required, as there will be specific oral nutritional supplements that are more suitable. These are available via prescription, and contain a range of nutrients and have different flavours and consistencies. Local dietitians will be able to advise on the most suitable oral nutritional supplement for individual patients.

**SUMMARY**

Identification of malnutrition is essential to ensure health funds are provided to those most in need. Screening is key to this process. Once risk has been identified, it is important to understand the possible cause, and so allow for targeted solutions. However, regular monitoring is as vital as initial screening to ensure the success of any intervention.

**REFERENCES**


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**KEY POINTS**

- Malnutrition can affect muscle, immune and psychological functions.
- One in 10 over 65 year olds is at risk of malnutrition.
- Isolation and illness can impact on the enjoyment of eating and increase the risk of malnutrition.
- Targeted solutions may address physical, social and psychological causes of malnutrition.
- Fortifying foods can help to make every mouthful count.
- There are various oral nutritional supplements available via prescription, which contain a range of nutrients and have different flavours and consistencies.
- Ongoing monitoring is vital to ensure interventions have been effective.

patients with dysphagia following stroke. *British Journal of Neuroscience Nursing* 13(6): 260–8


