Dietary advice around frailty in old age should take a holistic approach and consider the person's social supports, ability to cook and shop and to follow a care plan

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Nutrition and frailty in older adults

THERE IS GROWING RECOGNITION of the role of nutrition in frailty management. Poor nutritional status is a considered a key risk factor for frailty, with nutritional management recognised as a modifiable intervention to prevent and reverse its development. Studies show that dietetic interventions, particularly when combined with physical activity, can positively impact BMI, strength and frailty scores.[1,2]

What is frailty

Frailty in its simplest definition is an increased vulnerability to adverse outcomes. It is a syndrome which is characterised by a decline in a persons physiological reserve, leading to them being more susceptible to deterioration. It is associated with increased risk of falls, functional decline and dependence, hospitalisation, and mortality.[3]

National data from The Irish Longitudinal Study on Ageing (TILDA) shows the prevalence of physical frailty in Ireland is 15% in those aged over 65 and increases steadily with age to 46% in those aged 85 and older.[4] Although frailty is frequently associated with ageing, it can also arise in younger adults with progressive long-term conditions or who have illness or disease.

Frailty is multifactorial and can often result from a combination of factors including ageing itself, chronic disease, poor nutrition, physical inactivity, hospitalisation and social or psychological stressors. It should not however be considered an inevitable or normal part of ageing. Frailty is a transitional state, where prefrail or mild frailty can be reversed through appropriate interventions.[5,6]

Identifying frailty

In clinical practice, a number of methods can be used to identify frailty. The Fried Frailty Phenotype for example is a screening tool that defines frailty based on five physical criteria: unintentional weight loss, self-reported exhaustion, low physical activity, slow walking speed and weak grip strength. Individuals meeting three or more of these criteria are classified as frail.[7]

Other tools such as, the Cumulative Deficit Model, measures frailty by counting the number of health deficits an individual has and defines frailty based on that number of deficits.[8] Both models recognise malnutrition and unintended weight loss as key features of frailty syndrome. The most commonly used tool in routine clinical practice is the Rockwood Clinical Frailty Scale which categorises older adults by physical fitness, functional ability and vulnerability, ranging from very fit to severely frail.

A comprehensive geriatric assessment (CGA) is generally considered gold standard in the management of frailty.[9] This is a global assessment of a frail older person's medical, functional, psychological, and social needs.[10] These assessments focus on identifying possible drivers of frailty and potential reversible elements that can be targeted by an MDT to improve outcomes. Some elements of frailty, such as chronic conditions or disabilities, cannot be reversed and can only be managed. Nutrition however is an element of frailty that is particularly amenable to intervention and is a modifiable risk factor that can be addressed.[11,12]

Malnutrition, sarcopenia and frailty

Poor nutritional status is associated with the onset of frailty.[13] Recent IRSPEN data shows older people are five times more likely to develop malnutrition than younger adults.[14] The prevalence of frailty is higher among older people who are malnourished than well nourished, with one large cross-sectional study finding that malnutrition was related to an almost four-fold increase in risk of frailty among community dwelling older adults.[15]

Sarcopenia also is more common in older adults due to age-related muscle loss. Other factors such as disease, inactivity, and poor nutrition can accelerate its

development. While sarcopenia can arise in the absence of malnutrition from muscle disuse or a lack of muscle stimulation – eg. as a result of acute or progressive disease, bed rest, immobility – individuals with malnutrition have been found to have approximately three to four times the risk of developing sarcopenia than those without malnutrition.[16]

Malnutrition leads to frailty development by accelerating muscle loss (sarcopenia), impairing immune function and reducing overall resilience. While malnutrition can worsen frailty, frailty itself can also lead to the development of malnutrition. The frailty development cycle adapted from Fried et al, describes how frailty, poor nutrition and sarcopenia form a cycle where each condition worsens the other[17] (*see Figure 1*).

Initial risk factors such as ageing, chronic diseases, and social factors reduce appetite and food intake, leading to malnutrition and muscle loss (sarcopenia). This muscle loss, in turn, leads to reduced mobility, physical decline, and fatigue, which further decrease resting energy expenditure, diminish appetite, and worsen frailty.

As frailty further progresses, without adequate supports, it can become harder to maintain adequate nutrition, due to declining appetite, difficulties such as shopping and preparing adequate meals, which further accelerate physical decline and lead to a downward spiral of worsening health. This cycle helps us identify points where dietary interventions offer a critical opportunity to halt or reverse functional decline.

Embedding a validated nutritional screening tool within the overall comprehensive geriatric assessment for frail older adults is regarded as best practice. To date, no specific screening tool has been universally recommended for frailty assessments, with tools such as MNA-SF, MUST and MST commonly used in clinical practice. Screening during frailty assessment can help to determine if malnutrition has a role in an individual's frailty development and indicating when nutritional intervention is needed as part of a frailty management plan.

It is acknowledged, however, that the sensitivity of nutritional screening tools in this group may be lower compared to the general population – potentially due to different BMI cut-offs or the lack of body composition measures and requires further consideration in the future.[18]

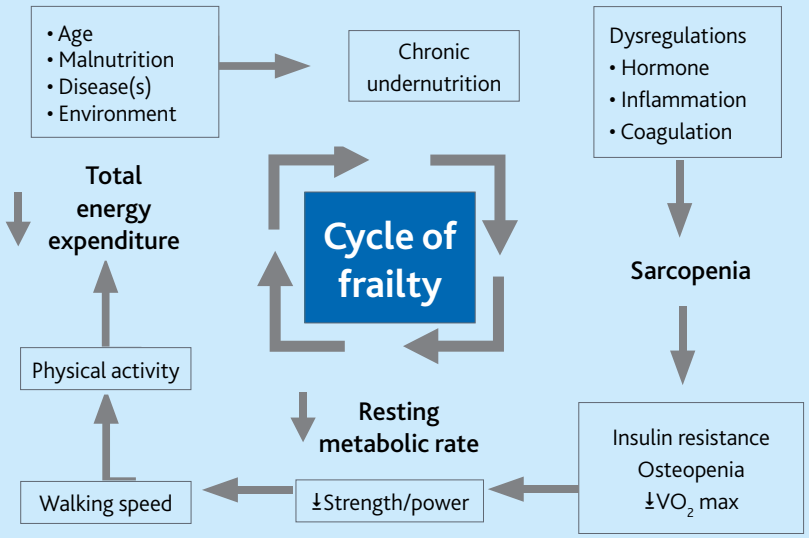
BMI and body composition in frailty

It is generally accepted that the optimal BMI range for health and reduced frailty risk is higher for older adults – generally between 24 and 30kg/m^2. This is due to a U-shaped association between all-cause mortality, with mortality risk lowest at BMI 24-31 kg/m^2 for older adults – with the suggestion that a moderately higher BMI may provide metabolic reserves during illness and prevent frailty and sarcopenia.[19]

The GLIM criteria categorises BMI < 22kg/m^2 for older adults over 70 years as low.[20] While BMI is useful as an indicator of health, it does not reflect changes in body composition that might occur with ageing. Often saropcenia can be present in the absence of low BMI or significant weight loss and in obesity, therefore measuring muscle mass and strength is as a key part of assessment in older adults with frailty. Various methods are recommended in clinical practice including using handgrip strength to screen for probable sarcopenia and incorporating measures such as calf circumference or bioelectrical impedance analysis (BIA) to assess muscle mass.

ESPEN and EWGDSOP2 have published guidance and cut offs for dietitians to use in clinical practice.[21,22] These can form a more complete assessment, identify sarcopenia and guide nutritional intervention.

Figure 1: Frailty development cycle



Reference British Geriatrics Society. End of life care in frailty. Available from: https://www.bgs.org.uk/resources/end-of-life-care-in-frailty-nutrition

Table 1: Recommended protein requirements for older adults

	Protein requirements g/kg body weight per day	Example daily protein requirements of a:	
		70kg male	55kg female
Healthy older adults	1.0-1.2g	70-84g	55-66g
Healthy older adults with acute/chronic condition	1.2-1.5	84-105g	66-83g
Older adults with severe illness/injury	>1.5g	>105g	>83g

Reference: Malnutrition pathways; A guide to managing frailty, sarcopenia and malnutrition. November 2024. Available from: https://www.malnutritionpathway.co.uk/library/frailty_tool.pdf

Nutritional interventions for frailty

Nutritional interventions for older adults with frailty and malnutrition should focus on adequate calorie and protein intake based on food fortification and nutrient dense diets, in addition to micronutrients including vitamin D.

Requirements for protein are higher for older adults, with a recommended intake of 1-1.2g/kg/day for healthy older adults, and 1.2-1.5kg/kg/day for those with established sarcopenia or frailty[23,24] (*see Figure 2*). Dietary intervention can often require specific advice to meet these requirements. For some older adults consumption of adequate protein to the levels recommended may be challenging particularly in the presence of a reduced appetite, satiety associated with consumption of high protein foods or the presence of dental issues which may lead them to avoidance of protein sources. Specific advice around spreading protein intake across the day, including a protein source at each mealtime, and including protein rich snacks are often required. When the deficit

is significant, high-protein oral nutritional supplements might be indicated to meet the recommended intake. Challenges can also arise when frailty and chronic kidney disease (CKD) co-exist. Protein requirement in this scenario is guided by the stage of the CKD and the nutritional priority for that individual – such as if the priority is renal management versus functional status/ frailty management and is based on individual assessment.[25]

ESPEN gives a guiding value for energy intake in older persons as 30kcals/kg bw/d; this value should be individually adjusted regarding nutritional status, physical activity level, disease status, and tolerance.[23] Protein requirements may at times overshadow the message for adequate calorie intake. This is particularly important as adequate protein intake without sufficient calories can leads to inefficient protein use and muscle loss.

For prevention of frailty a healthy balanced diet with adequate protein and vitamin D in combination with incorporating resistance exercise recommended. The HSE guidelines for exercise for older adults recommends that 150 minutes per week aerobic exercise be combined with muscle-strengthening activities on at least two days a week. For individuals with severe sarcopenia or frailty, treatments should combine nutritional intervention with an exercise programme including resistance exercise and a physiotherapy assessment would often be indicated for an individual programme, particularly for those with limited mobility or at risk of falls.

Other considerations

For an older person with frailty, dietary advice should also take a holistic approach and consider their social supports, their ability to cook and access shop themselves, and their level of cognition which allows them to engage and follow nutrition care plans and advice. Dietary interventions may need to include practical information on meal delivery services, easy to prepare nutritious meals and oral nutritional supplements to meet nutritional targets if indicated.

Increasing awareness that malnutrition is a risk factor for frailty is an important step to empower older adults to recognise the signs and symptoms and act early. Research has shown that older adults are often not concerned about declining appetite or weight loss and consider it to be a normal part of ageing.[26,27]

Additionally research suggests that many older adults with malnutrition were not aware or concerned about their weight loss.[26] Nutrition videos for older adults have recently been developed to provide information on signs and symptoms of malnutrition and sarcopenia and practical first line steps to address these issues early on. These provide information in short video format delivered by registered dietitians and are available on the INDI website. The content was developed by dietitians specialising in the area of older adults and are available for any dietitian or healthcare professional to use within their practice.

Resources

You can find practical first line videos on nutrition and sarcopenia and malnutrition at: **www.INDI.ie** in the 'Food facts' section under 'Healthy Ageing'.

Nutrition plays a critical role in both the treatment and prevention of frailty. Dietitians are vital in assessing nutritional status and implementing evidence-based interventions to support older adults in maintaining independence and wellbeing.

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