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Campus

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Nutrition Essentials: Frailty

**Malnutrition and sarcopenia
in frail older adults**



Frailty in older adults

Frailty is a medical syndrome characterized by diminished strength, endurance, and reduced physiological function that increases an individual's vulnerability for developing increased dependency or death.¹

Frailty is a result of the interplay of various factors such as inactivity, malnutrition and sarcopenia, which are common in older adults.²



Malnutrition and its consequences

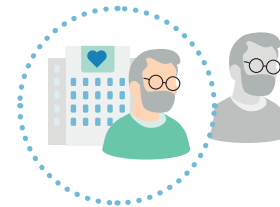
Malnutrition can affect everyone, but is especially common in older adults.³

Those at risk of malnutrition include:

~1 in 3 older people
living independently*³



~1 in 2 older people
in care homes³



The clinical consequences of malnutrition can be severe

Increased risk of falls⁴

Impaired psychosocial
functioning⁴

Poorer clinical outcomes
(e.g. higher mortality)⁵

Reduced muscle strength⁴

Slower recovery from
illness and surgery⁵

Frailty⁶

*31.9% of community-living elderly people were identified to be at risk of malnutrition; [†]52.4% of men and 53.7% of women in nursing homes were identified to be at risk of malnutrition.

Economic burden of malnutrition

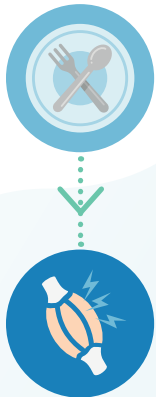


The costs of health and social care are three times greater for a malnourished individual than for a non-malnourished individual.⁷

Malnutrition generates an excess of £23.5 billion per annum in health and social care costs in the UK.⁷

Malnutrition can lead to sarcopenia

Sarcopenia is characterized by progressive and generalized loss of skeletal muscle mass and function, resulting in reduced physical performance.²



Patients with **malnutrition** had approximately **three to four times** the risk of developing **sarcopenia** than those without malnutrition.⁸

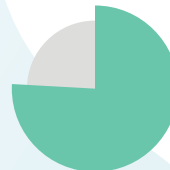
Prevalence of sarcopenia in older adults



Up to **13%** in community⁹



Up to **37%** in hospitals¹⁰



Up to **76%** in rehabilitation^{11,12}



Prevalence and causes of sarcopenia

With age, factors such as **nutrition and physical exercise** become less effective in stimulating muscle protein synthesis.¹³



This process is known as **anabolic resistance** and results in muscle mass loss¹³

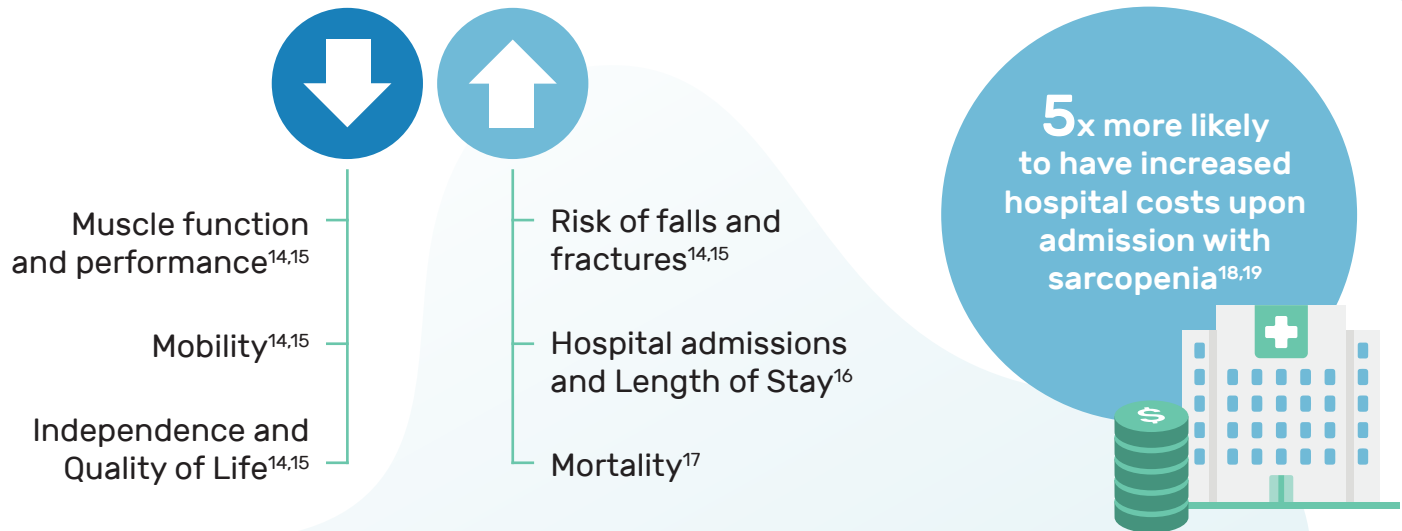


This weakened response to anabolic stimuli (nutrition and physical exercise) is worsened by **malnutrition** and **disease**²



Impact of sarcopenia

Left untreated, sarcopenia can affect muscle function, independence and quality of life.¹⁴



Frailty, malnutrition and sarcopenia

Studies have examined the prevalence of frailty, malnutrition and sarcopenia in various populations.

Publication	Population	Findings
Faxén-Irving G et al. 2021 ²⁰ (The OPEN study)	Adults >75 years of age in nursing homes	68% presented at least one condition among frailty, malnutrition and sarcopenia
Ligthart-Melis et al. 2020 ¹⁰	Hospitalized older adults	Half of hospitalized older adults suffered from at least two conditions among frailty, malnutrition and sarcopenia
Verlaan S et al. 2017 ²¹	Community-dwelling older adults	Malnutrition prevalence in this group was 2.3% , while frailty prevalence was 19.1%



If not diagnosed and left unmanaged, frailty can result in adverse consequences such as decline in physical function, reduced quality of life, and poor health outcomes such as disability and hospital admissions.²

Hip fracture patients are one of the most nutritionally vulnerable older patient cohorts

Impaired nutritional intake **directly correlates** with malnutrition and muscle loss. **High prevalence** of muscle loss & sarcopenia has been reported in up to 74% of men and 68% of women with hip fracture³⁴

Changes in **muscle mass, strength, and function** before and after hip fracture are **key determinants** of the level of disability and associated in the years following³⁴



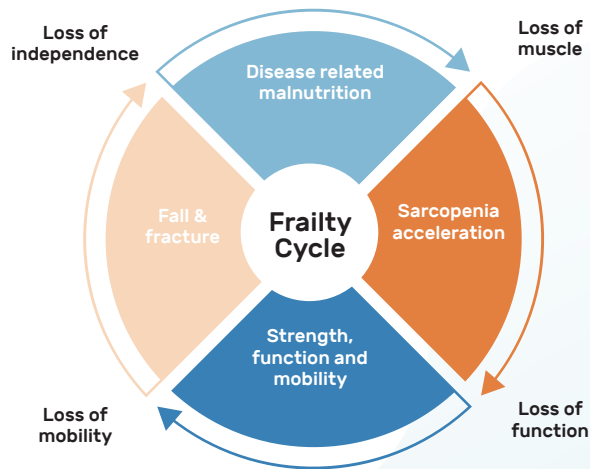
73%
With malnutrition
(risk)³³



Up to **74%**
Muscle loss/
sarcopenia in hip
fracture³⁴

The cycle of frailty is accelerated when malnutrition and sarcopenia are not assertively treated

This physical impairment will lead to recurrent falls, accelerating frailty and dependency³⁴



If malnutrition and related muscle loss are not managed effectively during the recovery after a hip fracture, sarcopenia & functional decline will accelerate

Hip fracture can have a severe impact on patients' lives:

- Less than **50%** of survivors return to pre-injury function levels³⁴
- **20%** of older adults who lived at home before a hip fracture can no longer live independently afterward³⁴

Following discharge from hip fracture there is ongoing muscle loss, directly impacting on mobility³⁴

Screen for frailty, malnutrition and sarcopenia in older patients

Frailty

The Royal College of Physicians and the French Society of Geriatrics and Gerontology advocated screening for frailty in older persons.¹

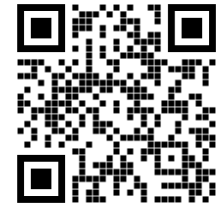
Simple rapid screening tests that allow physicians to screen for frailty have been verified such as the 5-question FRAIL scale, and the Canadian Study of Health and Aging (CSHA) Clinical Frailty Scale.¹



Malnutrition

The BAPEN 'Malnutrition Universal Screening Tool' (MUST) is a validated screening tool for identification of malnutrition.

Recently, the Global Leadership Initiative on Malnutrition (GLIM) published a framework for diagnosing malnutrition in adults patients based on global consensus.



FRAIL, Fatigue, Resistance, Ambulation, Illnesses, & Loss of Weight.

Sarcopenia

Muscle strength, physical performance, and muscle mass can be determined through various tests such as the chair-stand test, 400-meter walk, or bio-electrical impedance.²

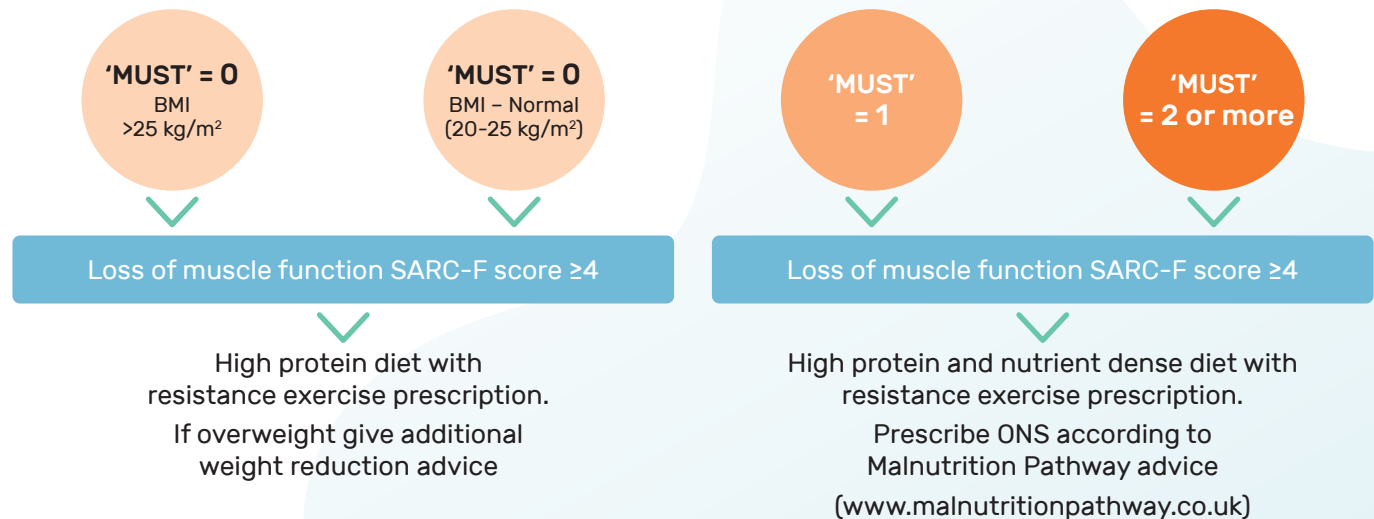
In community settings where a more pragmatic approach is required, the 5-question SARC-F questionnaire can be used to determine the likelihood of sarcopenia.

If the results suggest sarcopenia is likely (i.e. SARC-F score ≥ 4), this should be followed by simple strength measurements, such as hand-grip strength and the sit to stand test.^{2,22}



Management of malnutrition and sarcopenia in frail, older adults

The results of malnutrition and sarcopenia screening tests can be used to inform physical and nutritional interventions.²³



BMI, Body Mass Index; MUST, Malnutrition Universal Screening Tool; ONS, oral nutritional supplements; SARC-F, Strength, Assistance in walking, Rise from a chair, Climb stairs, Falls.

The role of nutrition in frailty

Protein

Adequate protein intakes are essential to maintain muscle mass and promote muscle synthesis.^{24,25} Older adults with acute/chronic conditions or severe illness/injury require more protein than healthy older adults.²⁵

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

It is estimated that **1 in 4 older adults between 65 to 74 years of age did not meet their protein requirements.**²⁶

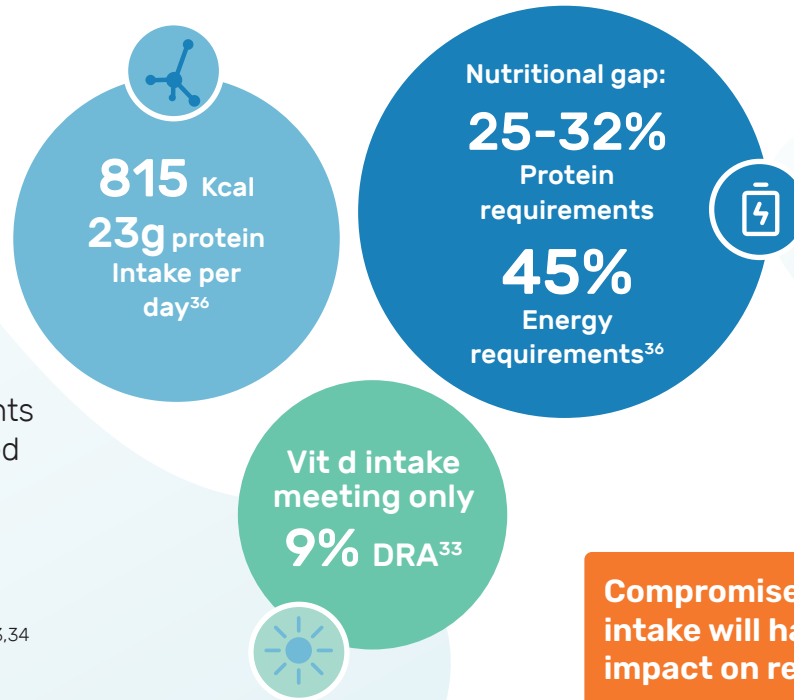
Vitamin D

Vitamin D deficiency is common in older adults.²⁷ According to expert consensus, there is evidence to support the use of Vitamin D supplementation in frail, older adults.¹

Leucine

Leucine supplementation is also recommended to overcome anabolic resistance to muscle protein synthesis associated with ageing.²⁸

Hip fracture patients have severely impaired nutritional intake



Heightened requirements on top of disease related anorexia results in impaired dietary intake; specifically, **calorie**, **protein**, **leucine** and **vitamin D deficiency**^{33,34}

Compromised nutritional intake will have a direct impact on recovery

Specialized nutrition solutions can help your patients meet their nutritional requirements

Various expert groups have recommended protein intake and exercise for optimal muscle function in older adults.^{25,29} However, when nutritional deficit is significant, dietary advice may not be enough to adequately increase intake, particularly in the presence of poor appetite.



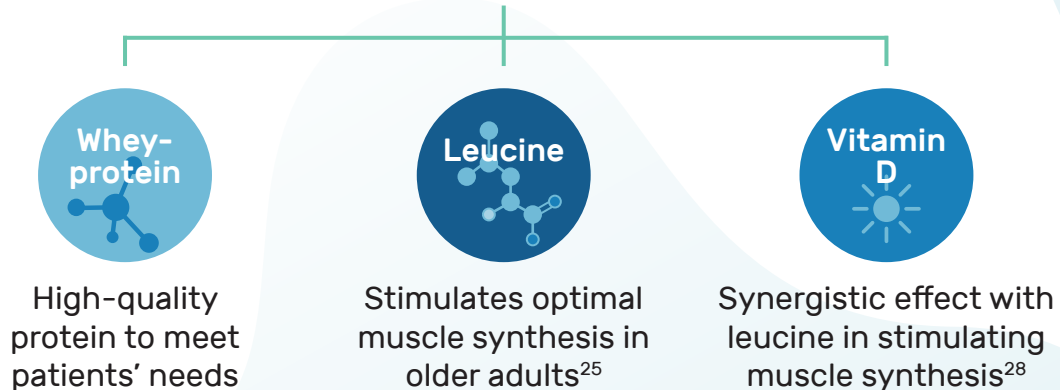
European Society for Clinical Nutrition and Metabolism (ESPEN) guidelines on clinical nutrition and hydration in geriatrics recommend oral nutritional supplements (ONS) for the prevention and treatment of malnutrition.³⁰

Muscle-targeted ONS



Muscle-targeted ONS is a specialized nutritional solution that has been reviewed to be effective in increasing muscle mass and strength, as well as physical performance in patients with sarcopenia.²⁸

The muscle-targeted ONS that was examined was formulated with:



Benefits of ONS: The OPEN study

The OPEN study was a randomized controlled trial investigating the effects of physical exercise together with ONS in nursing home residents.³¹

Study design:³¹



Sweden



Nursing home residents aged ≥75 years


Intervention group



n = 52

Physical exercise
+ ONS


Control group



n = 50

Standard care



intervention

ONS, oral nutritional supplements.

Benefits of ONS: The OPEN study

Prevalence of malnutrition, sarcopenia and frailty in the OPEN study cohort (n = 102)²⁰

Sarcopenia
29%

Malnutrition
17%

Frailty
13%



68%
presented at least
one of the three
conditions

Patients in the ONS and physical exercise group with high-adherence ($\geq 40\%$ compliance) to the intervention demonstrated **improved clinical outcomes** compared with the control group.³¹



**Reduced
malnutrition risk**

Improvement in
Mini-Nutritional Assessment
– Short Form score
 $p = 0.02$



**Increased
body weight**

Increase in body weight: 2.8 kg
 $p = 0.02$

Increase in BMI: 1.06 kg/m²
 $p = 0.002$



**Improved body
composition**

Increase in Fat Free Mass: 2.12 kg
 $p = 0.007$

Benefits of ONS: The IRIS study

Another randomized controlled trial studied the use of muscle-targeted ONS together with individualized exercise programs for recovery in older adults with sarcopenia.³²

Study design:³²



Older adults
aged ≥ 65 years



Diagnosed
with
sarcopenia



Admitted to a
rehabilitation
facility

Intervention group

n = 64

Individualized
rehabilitation program +
muscle-targeted ONS

Control group

n = 63

Individualized
rehabilitation program
+ isocaloric ONS

4 to 8
weeks

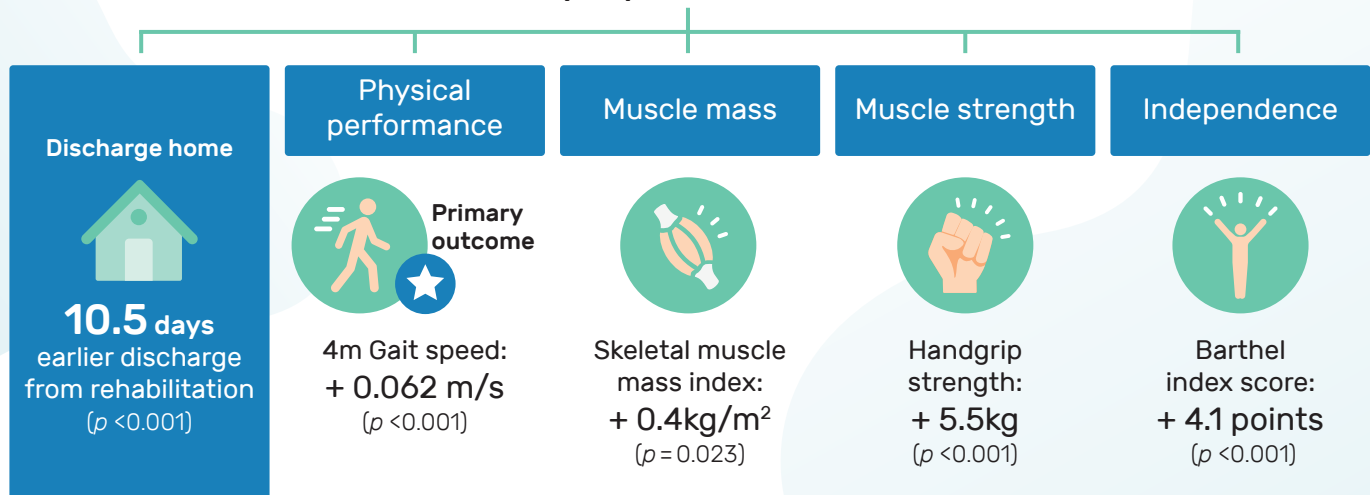
intervention

ONS, oral nutritional supplements.

Benefits of ONS: The IRIS study

Muscle-targeted ONS and exercise demonstrated improvement in physical performance and independence, resulting in significant reduction in rehabilitation time.³²

Key improvements:^{*32}

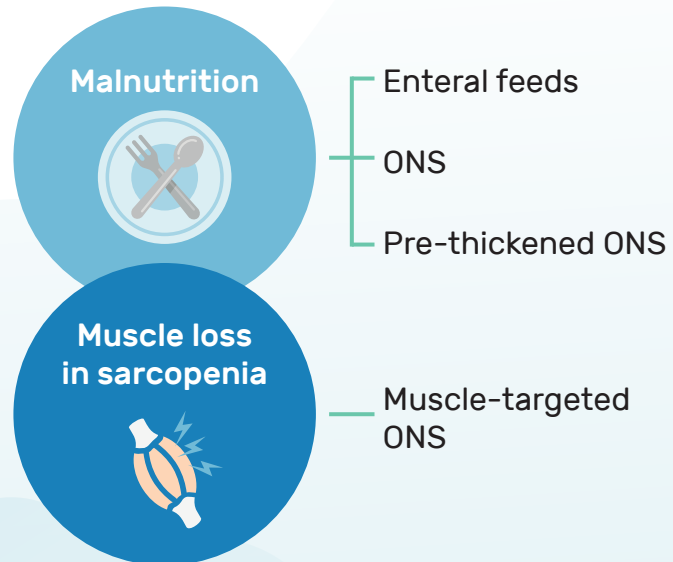


*Values represent between group difference in favor of the intervention group.
ONS, oral nutritional supplements.

Conclusion

Studies demonstrate that **muscle-targeted ONS** containing **whey, leucine** and **vitamin D** increase energy, protein and micronutrient intake and reduce complications and mortality in malnourished patients.²⁸

Address key nutritional challenges with **specialized nutritional solutions** to support your patients with **malnutrition** and **muscle loss in frailty**.



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Early Life Nutrition

- Simply Biotics
- Simply Lipids
- Nutrition Essentials: Faltering Growth
- Nutrition Essentials: Iron Deficiency
- Nutrition Essentials: C-section Delivery



Adult Nutrition

- Nutrition Essentials: Frailty
- Nutrition Essentials: Oncology
- Nutrition Essentials: Stroke

