



General principles

- Frailty is best assessed annually using a validated measurement tool.
- Prescribe appropriate physical activity that includes a resistance training component.
- Screen all patients admitted to residential aged care facilities for the risk of malnutrition.
- Early involvement of a physiotherapist can be helpful.
- Early involvement of a dietitian or nutritionist can be helpful.
- Reduction in polypharmacy can be helpful.
- Engagement of a dentist can be helpful.
- Engagement of a speech therapist can be helpful when necessary for swallowing difficulties.
- Consider comorbidities that may be contributing (eg depression, cognitive impairment).

Practice points

Practice points	References	Grade
Consider assessing frailty annually using one of two broad models – frailty phenotype model and frailty index	20	Consensus-based recommendation
Avoid iatrogenic harm by having early discussion about end-of-life goals and appropriate limitation of invasive therapies	24	Consensus-based recommendation
Be vigilant and recognise complications of acute illness that are common in frailty	24	Consensus-based recommendation
Consider pharmacological and non-pharmacological strategies for the prevention of frailty and reduction of injury in the event of frailty	29, 30, 33	Consensus-based recommendation

Vitamin D supplements to maintain normal levels may be helpful for older people found to be deficient in vitamin D	30	Consensus-based recommendation
All patients admitted to a residential aged care facility should be screened for risk of malnutrition and, if at risk, referred to a dietitian	30	Consensus-based recommendation

Introduction

Frailty is a syndrome of physiological decline that occurs in later life, and is associated with vulnerability to adverse health outcomes.¹ Older people who are frail are less resilient to stressors (eg acute illness, trauma) and at an increased risk of adverse outcomes, procedural complications, falls, institutionalisation, disability and death.² Old age alone does not define frailty, and frailty is not an inevitable consequence of ageing.

Clinical context

Factors associated with increased frailty include:

- older age³
- current smoker³
- lower educational level³
- current use of post-menopausal therapy³
- not being married⁴
- depression⁵
- intellectual disability⁶
- being of Aboriginal and/or Torres Strait Islander descent⁷
- sedentary lifestyle
- undernutrition
- chronic disease
- multimorbidity
- obesity (may contribute due to pro-inflammatory state).^{8,9}

Pathophysiology

There is increasing evidence that dysregulated immune, endocrine, stress and energy response systems are important to the development of frailty. The basis of this dysregulation most likely relates to molecular changes associated with ageing, genetics and specific disease states, leading to physiological impairments and clinical frailty. Sarcopenia, or age-related loss of skeletal muscle and muscle strength, is a key component of frailty. Decline in skeletal muscle function and mass are consequences of age-related hormonal changes and changes in inflammatory pathways, including increase in inflammatory cytokines.¹⁰ Ageing people lose height and lean body mass, but gain and redistribute fat.

Endocrine

Table 1 shows the many age-related hormone changes that have been associated with frailty.¹¹

Table 1. Age-related hormone changes associated with frailty

Hormone	Level	Comment
Growth hormone	Decrease	
IGF-1	Decrease	
Dehydroepiandrosterone sulfate (DHEA-S)	Decrease	Plays a direct role in maintaining muscle mass and prevents the activation of inflammatory pathways that contribute to muscle decline
Cortisol	Increase	May impact on skeletal muscle and immune system
Sex steroids	Decrease	Evidence is mixed that lower levels of reproductive hormones contribute to frailty
25(OH) vitamin D	Decrease	

Inflammation and the immune system

There is a consistent and strong correlation between frailty and biomarkers of the innate immune system:

- Levels of pro-inflammatory interleukin (IL)-6 and C-reactive protein (CRP) are elevated in older adults.
 - IL-6 adversely affects skeletal muscle, appetite, adaptive immune system function and cognition,¹² and contributes to anaemia.¹³
- There is an association between frailty and clotting markers (factor VIII, fibrinogen and D-dimer).¹⁴
- Frail older adults are less likely to mount an adequate immune response to influenza vaccination.¹⁵

Stress responses and metabolic systems

The likelihood and extent of frailty increases as abnormal physiological processes accumulate:

- Older age leads to dysregulation of the autonomic nervous system.^{16,17}
- Age-related changes in the renin-angiotensin system and in mitochondria likely impact on sarcopenia and inflammation, both important components of frailty.¹⁸

Undernutrition

Undernutrition is associated with a deficiency of energy, protein and other nutrients, resulting in weight loss and changes in body composition; it may be difficult to assess in patients with fluid retention (eg ascites, oedema) and those who are overweight.¹⁹

Undernutrition results in:¹⁹

- reduced muscle strength
- impairment of immune function and wound healing
- slowed recovery from illness and surgery
- impaired psychosocial functioning
- poorer clinical outcomes (increased mortality, longer hospital stays, increased readmission rates).

Patients at risk of malnutrition include those with:

- chronic disease (eg dementia, chronic obstructive pulmonary disease, cancer, gastrointestinal, kidney or liver disease)
- acute illness, if food is not consumed for a day or more (consider patients who are fasting for a procedure and post-surgery)
- immobility
- frailty
- depression (refer to Part A. Mental health)
- social issues (eg low socioeconomic status, social isolation, inability to cook or shop).

In practice

Diagnosis

Consider assessing frailty annually. There are many instruments available, and two broad models of frailty have been described:²⁰

- Frailty phenotype model – hypothesised to have an underlying biological basis.
- Frailty index – cumulative deficit model.

The most commonly used tool for the phenotypic frailty is the Physical Frailty Phenotype, also known as the Fried or Hopkins tool.²¹ Instruments to assess frailty include:

- Fried frailty indicators – frailty (three or more of the below), pre-frailty (one or two of the below) and not frail (none of the below)²²
 - Unintentional weight loss (≥ 4 kg in the past year)
 - Self-reported exhaustion
 - Weakness (reduced grip strength)
 - Slow gait speed
 - Low physical activity
- [Frailty index](#) – based on the accumulation of illnesses, functional deficits, cognitive decline and social circumstances, it involves answering >20 medical and functional questions²³
- [Clinical Frailty Scale](#) – helpful scale that takes very little time
- [Edmonton Frail Scale](#)¹
- other useful simple tests with variable specificity and sensitivity²⁴
 - Slow walking speed (>5 seconds to walk 4 m)
 - [Timed up and go test](#) (>10 seconds to stand from a chair, walk 3 m, turn around, walk back to the chair and sit down again).

All patients admitted to a residential aged care facility (RACF) should be screened for risk of malnutrition and, if at risk, referred to a dietitian.²⁵ The following tools are useful in screening for malnutrition:

- [Malnutrition Screening Tool \(MST\)](#)²⁶
- [Malnutrition Universal Screening Tool \(MUST\)](#)²⁷
- [Mini Nutritional Assessment – short-form \(MNA-SF\)](#)²⁸
- [Subjective Global Assessment \(SGA\)](#).²⁹ This includes a physical assessment of lean body mass and fat mass; useful for patients with fluid retention (eg ascites, oedema) in whom body mass index (BMI) may not reflect nutritional status. To be completed by an accredited dietitian.²⁹

Management

General approach²⁴

- Early discussions should be had about end-of-life goals and appropriate limitation of invasive therapies to avoid iatrogenic harm (refer to Part A. Palliative and end-of-life care).
- Early involvement of other health professionals, including
 - physiotherapist
 - nutritionist or dietitian
 - dentist
 - speech therapist, when appropriate.
- Vigilance and early recognition and intervention of complications of acute illness that are common in frailty, such as
 - delirium (refer to Part A. Behavioural and psychological symptoms of dementia)
 - pressure injuries (refer to Part A. Dermatology)
 - falls (refer to Part A. Falls).

Non-pharmacological

Physical frailty

Interventions with some efficacy in the treatment of frailty include:³⁰

- exercise (resistance and aerobic) – consider early involvement of a physiotherapist, if possible^{31,32}
- caloric and protein support^{31,32}
- vitamin D supplements in those found to be deficient²⁵
- reduction in polypharmacy.³²

Weight loss

- Assess executive function – does the patient have capacity to plan and prepare meals?
- Is there dependency on others to eat?
- Are there difficulties with chewing and swallowing, difficulties with feeding (eg tremor)?
- Could medication side effects be a possible contributing factor?
- Is depression present?
- Are there unnecessary dietary restrictions in place (eg low salt, low fat), which make food less satisfying?
- Are financial difficulties present? (May affect quality and quantity of food intake.)

Undernutrition and malnutrition

The management of undernutrition and malnutrition depends on the degree of malnutrition. Document the patient's nutrition status and level of risk, agree to goals of nutrition support with the patient and/or carers, and monitor the intervention. An accredited dietitian is best placed to provide advice on the nutrition support required.

Consider nutrition support for older people who are malnourished; for example, those with:

- unintentional loss of >10% of body weight in the past three to six months
- a BMI <20 kg/m² and unintentional loss of >5% of body weight in the past three to six months.

Remember that not all involuntary weight loss is due to reduced food intake.

Consider nutritional support for older people who are at risk of malnutrition; for example, those who:

- have eaten little or nothing for more than five days, or are likely to eat little for the next five or more days (eg elective surgery)
- are very old (consider nutrition support earlier)
- have poor absorptive capacity, nutrient losses or increased nutritional needs.

Vitamin D supplements have been found to assist in slowing the progress of physical frailty.^{33,34} Oral nutritional supplements between meals may be helpful (if first-line strategies fail) in adding protein and calories to diet.³⁵ The American Geriatrics Society's Choosing Wisely initiative advises against the use of high-calorie supplements because of a lack of evidence, and recommends the following strategies:³⁶

- Review medications
- Optimise social supports
- Provide appealing food and feeding assistance
- Clarify patient goals and expectations
- Consider removal of dietary restrictions to improve palatability of food

Pharmacological

Physical frailty

Interventions with some efficacy in the treatment of frailty include:³⁰

- vitamin D supplements
- reduction in polypharmacy (refer to Part A. Polypharmacy).

Medication review

- Medications should be reviewed, and medications not required discontinued with care (refer to Part A. Deprescribing).
- Consider dose reduction in frail older people.
- Adjust doses for patients with renal impairment and hypoalbuminemia.
- Review anticholinergic load – [Beers Criteria](#).³⁷ Anticholinergic load is associated with voiding difficulties, cognitive decline and reduced performance on instrumental activities of daily living.³⁸
- Refer to Part A. Medication management for more information.

Weight loss

If the patient has comorbid depression, consider using mirtazapine (may increase appetite and support weight gain) or a selective serotonin reuptake inhibitor (SSRI) or serotonin-noradrenaline reuptake inhibitor (SNRI) not associated with anorexia (eg citalopram, venlafaxine). There is no evidence to support use of antidepressants for weight gain in a patient without depression.

Appetite stimulants

Not currently recommended in Australia and advised against in the US.³⁶

Osteoporosis

Refer to Part A. Osteoporosis for more information.

Testosterone

Older men (aged ≥ 65 years) have lower testosterone levels. In men who are ageing, a lower testosterone concentration predicts poorer health outcomes (eg frailty, cardiovascular events, mortality). However, randomised controlled trials have not found evidence that testosterone therapy improves cardiovascular and mortality outcomes. Supplementation in the older adult frail population is debatable, and guidelines recommend testosterone therapy for hypogonadal men only, after careful risk–benefit assessment.³⁹

Depression

The choice of treatment for patients with intact cognition will depend upon the severity, type, and chronicity of the depressive episode with antidepressants and/or psychotherapy;^{40,41} however, the evidence for use in patients with dementia is less robust (refer to Part A. Dementia).

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