

Identification and management of frailty in the primary care setting

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Frailty is a dynamic state of heightened vulnerability to stressors. It is a multidimensional syndrome that places individuals at risk for adverse health outcomes, including falls, disability, admission to hospital and death.¹ The prevalence of frailty rises with advancing age, from 16% in people older than 65 years to rates as high as 52% in those older than 85 years.² It is associated with many comorbidities and is more common among women³ and individuals with lower socioeconomic status.⁴ Frailty is not an inevitable part of aging, although it is noted frequently during a person's last year of life.⁵ However, frailty is a challenge for modern geriatric medicine⁶ and for health services, because it is associated with unnecessary hospital admissions and visits to emergency departments,⁷ leading to substantial costs for health care and a negative effect on quality of life.⁸

Observational evidence suggests that frailty involves a slowly progressive functional deterioration over five to 10 years⁹ during which there are many opportunities for early recognition and intervention. Improved knowledge and practical case finding strategies would allow clinicians to provide better support for their patients who are living with or who are at risk of frailty better and, therefore, at increased risk of declining health and loss of independence.

We review the utility of validated instruments for case finding and identifying frailty components, as well as evidence for interventions to prevent or reverse frailty (Box 1) and consider the application of this evidence in the nonspecialist setting.

Box 1: Evidence used in this review.

This review was informed by clinical experience, best practice guidelines and literature review. We searched PubMed using combinations of the following terms: “frail elderly,” “frailty,” “identification,” “screening,” “assessment,” “management,” “interventions,” “guidelines,” “consensus,” “definition” and “natural history.” In addition, we reviewed relevant papers retrieved from the reference lists of selected articles. We limited our search to articles published in English since 2001, when two seminal papers by Fried and colleagues¹⁰ and Rockwood and colleagues¹¹ were published. We included 78 articles that were most relevant to the goals of this review, with emphasis placed on more recent publications. We focused on consensus statements, best practice guidelines, systematic reviews, meta-analyses, scoping reviews, randomized controlled trials and evidence relevant to the Canadian context.

KEY POINTS

- Frailty is a state of increased vulnerability to negative health outcomes that manifest as a multidimensional syndrome; it has gained recognition as a priority for health care systems.
- The impacts of frailty warrant an upstream, proactive, holistic, interprofessional primary care approach to its identification, assessment and management.
- Identifying frailty at an earlier stage can be challenging and is best complemented with the use of valid, reliable tools that are also feasible in the busy primary care setting.
- Multicomponent interventions for management of frailty should be based on the patient's health needs, priorities and level of frailty, with involvement of various team members.
- An effective multicomponent approach may include care and support planning, physical activity, dietary interventions, structured medication reviews and strengthening social networks.

What are the many dimensions of frailty?

A recent scoping review tackled the previous lack of consensus on a single view of frailty and offered a working definition that provides clinicians with a pragmatic understanding of the complex and multidimensional nature of frailty as having psychological, cognitive and social aspects in addition to physical characteristics.¹² Understanding that frailty involves complex interactions between biopsychosocial factors¹³ will require that clinicians shift from a traditional disease-based approach to a multidimensional model.

Physical frailty is well-defined and characterized by reduced physiologic function. Based on the frailty phenotype model,¹⁰ its features include unintentional weight loss, self-reported exhaustion, weakness, slow walking speed and low physical activity. This model is anchored in a physiologic model that postulates dysregulated energy metabolism, and both cellular and molecular mechanisms, as summarized elsewhere.¹⁴ Here, physical frailty is defined as an important medical syndrome that is clinically meaningful and distinct from disability.¹⁵

Other aspects of frailty that substantially affect a person's well-being and independence have not been explored extensively.¹⁶ Psychological frailty involves a loss of resilience in cognitive, mood and motivational components.¹⁷ Cognitive frailty has been recognized recently as a distinct clinical concept of simultaneous physical frailty and cognitive impairment in the absence of concurrent dementia.^{18,19} In this context, cognitive impairment appears to be related to physical causes and has the potential for reversibility.¹⁸ Even social frailty, defined as the loss of social resources and behaviours that are important for an individual's social needs,²⁰ may be placed within the frailty construct.

In its 2015 report on healthy aging, the World Health Organization proposed the concept of "intrinsic capacity" as a way to define healthy aging in functional rather than disease-based terms.²¹ Like multidimensional frailty, intrinsic capacity captures physical, cognitive, psychological and sensory domains. Resilience, sometimes considered to be the opposite of frailty, would then represent, in functional terms, the dynamic interaction between intrinsic capacity and the social domain, with its external resources or stressors. The framing of frailty and intrinsic capacity are in fact complementary. Seeking to maintain patients' intrinsic capacity, strengthening their resilience and mitigating frailty may be the main role of the primary care physician who is caring for patients at risk of frailty.

Why does frailty matter?

Frailty is common in the last year of life; it is more common than other disease-oriented patterns such as organ failure, dementia and cancer.⁵ Furthermore, it has an incremental effect on survival, institutionalization and other adverse outcomes among patients admitted to intensive care,²² undergoing cardiac surgery,²³ and diagnosed with cancer²⁴ or heart failure.²⁵ It consumes substantial health and social care resources driven by inpatient, pharmaceutical²⁶ and long-term care²⁷ costs. Given its negative effect on individuals and their families, society and the health care system, and considering that the number of older Canadians is rising,²⁸ frailty presents a serious public health concern, in particular because it is usually recognized after its onset.²⁹ Therefore, primary care physicians and generalists require the tools to be able to identify and address frailty in everyday practice.³⁰

Early recognition of frailty in primary care can help shape appropriate care processes that are tailored to the needs of older adults living with frailty,³¹ and prompt conversations with patients about their goals, preferences and priorities for care as might happen on diagnosis of a life-limiting illness.^{26,32} Such conversations can offer patients choices in line with their objective level of frailty and mitigate against age discrimination for older adults who are not frail.¹ For example, this may mean exploring less invasive options, or anticipating or mitigating potential adverse events while proceeding with treatment.

When and how should frailty be identified?

Any consultation between an older adult and health care providers represents an opportunity to identify frailty and recognize

care needs as outlined in 2014 guidance from the British Geriatrics Society.³³ Given that earlier stages of frailty can be difficult for clinicians to differentiate from normal aging, valid and acceptable tools may be used to augment clinical impression. Despite the complexity of frailty and the inherent challenges in developing and validating an acceptable frailty instrument, many good candidate measures have emerged.

A systematic review of diagnostic accuracy of simple instruments for identifying frailty in community-dwelling older adults identified several clinician-oriented case finding tools with good diagnostic accuracy that go beyond chronological age or sex.³⁴ However, settings and populations seem to influence instrument performance. A recent study that compared 35 published frailty scales found marked heterogeneity in frailty classification and prevalence.³⁵ In a busy primary care setting, besides validity and reliability, other factors such as ease of use (based on time, training and equipment) and need for added resources for tool administration (Table 1) may affect a practitioner's choice of frailty measures. Some of the common tools used in clinical practice are judgment-based tools (e.g., the Clinical Frailty Scale), physical performance tools (e.g., Gait Speed), patient questionnaires (e.g., Program of Research to Integrate the Services for the Maintenance of Autonomy [PRISMA-7]), the electronic Frailty Index and multidimensional measures (e.g., Edmonton Frail Scale).

The British Geriatrics Society recommends that clinicians use the PRISMA-7 questionnaire, Gait Speed (4-metre walk) test and timed-up-and-go test as simple measures.³³ In the diagnostic accuracy review,³⁴ the PRISMA-7 questionnaire, timed-up-and-go test and the Gait Speed test were shown to have high sensitivity (83%, 93% and 99%, respectively) but low specificity (83%, 62% and 64%, respectively). Low specificity increases the risk of false-positive results and questions the value of using these simple tools in patients identified through case finding who are not subsequently assessed carefully to confirm frailty or its components. An 2012 systematic review⁴⁷ recommended the Tilburg Frailty Indicator and the Survey of Health, Aging and Retirement in Europe Frailty Instrument (SHARE-FI) as potential suitable tools for identifying frailty among adults who are 50 years of age or older in the primary care setting, despite the limitations of the tools and need for large validation studies in this setting.

A 2011 systematic review⁴⁸ identified the Frailty Index as the most suitable instrument to be used as an evaluative outcome measure in frailty research. Although the Frailty Index has shown good criterion and construct validity,⁴⁵ it is more commonly used in research settings than in clinical practice because the amount of information required to calculate the score appears daunting to those without training in geriatric medicine.⁴⁹ However, this could be overcome by using readily available information in electronic medical records. Constructing an electronic Frailty Index is a practical, time-efficient, valid and sensitive way to target older adults at risk of frailty.⁴³ This approach has been implemented in the United Kingdom⁵⁰ as a successful strategy for identifying point-of-care frailty in primary care; however, this type of system is not in place in Canada at this time.

Some of the available multidimensional tools can be used for both case finding and component definition (i.e., exploring the

components of frailty such as cognitive ability, multimorbidity, functional status and mobility, polypharmacy, social supports, continence and mood). An example of a tool that was created in Canada is the Edmonton Frail Scale. This scale does not require specialized equipment and can be done in less than 10 minutes by any trained practitioner.

The spectrum of fitness and frailty in a primary care population makes it challenging to apply screening systematically based on an arbitrary age cut point. Not only might this be needlessly resource intensive, but it might also be objectionable to many older adults who are not frail. Therefore, if risk factors for frailty are present (e.g., advanced age, functional compromise,

Table 1 (part 1 of 2): Selected frailty measures for the primary care setting

Tool	Type	Components examined	Frailty scoring system	Psychometric properties	Time to complete, min	Tool administered by
Clinical Frailty Scale	Judgment based	Visual chart of nine pictures covering the frailty spectrum, with corresponding explanation text.	Nine grades of frailty from 1 (very fit) to 9 (terminally ill). A score of 5 or more indicates frailty.	Predictive validity and reliability ³⁶	< 5	Physicians or practice nurses
Gait Speed	Performance based	Patient is asked to walk from one place to another at usual speed. Distance considered ranges from 2.4 to 6 m.	A walking speed of < 0.8 m/s identifies patients at high risk of frailty.	Diagnostic test accuracy ³⁴	< 5	Physicians or practice nurses
Timed-up-and-go test	Performance based	The test measures the time taken to stand up from a chair, walk a distance of 3 m, turn, walk back and sit down.	A time of > 10 s identifies patients at risk of frailty.	Diagnostic test accuracy ³⁷	< 5	Physicians or practice nurses
FRAIL	Questionnaire	Five items with yes/no answers: <ul style="list-style-type: none"> • Fatigue • Resistance (ability to climb up one flight of stairs) • Ambulation (ability to walk one block) • Illness (> 5 comorbidities) • Loss of weight (> 5%) 	Frailty: three or more components present Prefrailty: one to two components present Robust: zero components present	Convergent and predictive validity ³⁸	< 5	Physicians, practice nurses, or patients or their family members
Groningen Frailty Indicator	Questionnaire	Fifteen-item clinician-administered questionnaire concerning four domains: physical, social, psychological and cognitive.	Frailty: scores > 4	Construct validity ³⁹	15	Physicians or practice nurses
PRISMA-7	Questionnaire	Seven-item self-completed questionnaire with yes or no answers that covers ADL limitations, age (> 85 yr) and sex	Frailty: three or more components present	Diagnostic test accuracy ³⁴	< 5	Self-administered
Tilburg Frailty Indicator	Questionnaire	Contains two parts: 10 questions on determinants of frailty and diseases (Part A) and 15 questions on components of frailty in three domains (i.e., physical, psychologic and social frailty) (Part B)	A score of 5 or more indicates frailty.	Reliability, construct, predictive and concurrent types of validity ⁴⁰	< 15	Self-administered
Frailty phenotype	Mixed (questionnaire and performance based)	Five items with yes or no answers: <ul style="list-style-type: none"> • Weight loss over the past year (≥ 4.5 kg unintentionally) • Slow walking speed • Low grip strength • Exhaustion (two self-reported questions) • Low physical activity 	Frailty: three or more components present Prefrailty: one or two components present Robust: no components present	Concurrent and predictive validity ¹⁰	15–20	Physicians or practice nurses

Table 1 (part 2 of 2): Selected frailty measures for the primary care setting

Tool	Type	Components examined	Frailty scoring system	Psychometric properties	Time to complete, min	Tool administered by
SHARE Frailty Instrument (SHARE-FI)	Mixed (questionnaire and performance based)	Includes five variables: exhaustion, weight loss, weakness (as assessed by handgrip strength using a dynamometer), slowness and low activity	Web-based calculator distinguishes three categories: nonfrail, prefrail and frail	Construct and predictive validity ⁴¹	< 10	Nonphysicians (e.g., nurses, allied health professionals)
Study of Osteoporotic Fractures	Mixed (Questionnaire and performance based)	Three items with yes or no answers: <ul style="list-style-type: none"> • Weight loss (> 5% intentional/unintentional) • Exhaustion (Do you feel full of energy?) • Inability to rise from a chair five times without using arms 	Frailty: one or more components present Prefrailty: one component present Robust: No components present	Predictive validity ⁴²	< 5	Physicians or practice nurses
Electronic Frailty Index	Data set	As per the Frailty Index below, with variables obtained from primary care electronic medical records	Severe frailty: a score of > 0.36 Frailty: a score of 0.24–0.36 Mild frailty: a score of 0.12–0.24 Fit: a score of ≤ 0.12	Predictive validity ⁴³	< 5 (if automated)	Automatically computed from the electronic medical records*
Frailty Index	Data set	Any 30 or more health deficits (variables) that increase in prevalence with age but do not plateau with age. Variables should be multidimensional, including ADLs/IADLs, comorbidities, mood, cognition and nutritional status.	Frailty is measured on a continuum, although > 0.25 is often selected to define frailty. ⁴⁴	Criterion and construct validity ⁴⁵	20–30	Mostly administered by researchers; further use in clinical practice needs to be explored
Edmonton Frail Scale	Multidimensional	Nine items: cognition, health (two items), admission to hospital, social support, nutrition, mood, function and continence	Frailty: score > 7	Construct validity and reliability ⁴⁶	< 10	Physicians or practice nurses

Note: ADL = activities of daily living, IADL = instrumental activities of daily living, PRISMA-7 = Program of Research to Integrate the Services for the Maintenance of Autonomy, SHARE = Survey of Health, Aging and Retirement in Europe.

*The Electronic Frailty Index is easy to use once it is automated in the electronic medical records; however, if done manually, it requires time and training.

polypharmacy, poor nutrition, weight loss, or medical and psychiatric comorbidities),⁵¹ clinicians could apply a rapid case finding test first, such as the Clinical Frailty Scale, Gait Speed or PRISMA-7. This approach respects the busy nature of primary care practice and forms the foundation for a more intensive approach that can better discriminate frailty components and severity (e.g., by using a multidimensional measure such as Edmonton Frail Scale).

Based on the complexity and severity of frailty uncovered by these tools, primary health care teams can design targeted interventions to address the components of frailty (e.g., fall risk reduction or structured medication review) or determine whether referral to a specialist in geriatric medicine for a more in-depth frailty assessment (i.e., comprehensive geriatric assessment) is warranted.

How can frailty be managed?

Primary care clinicians and teams are not likely to engage in frailty case finding or use multidimensional tools unless they can offer useful evidence-based recommendations to their patients. However, evidence for interventions that can prevent, delay and treat frailty remains limited.

From a population perspective, preventing or delaying onset of frailty would be most beneficial. A recent systematic review examined interventions to prevent prefrailty and progression of frailty in older adults but did not find a clearly effective population-based strategy.⁵² Current strategies either target individuals who are frail within a mixed population or try to ensure

that care protocols are appropriately tailored in a population with a high prevalence. Research is ongoing in this area in the form of a comprehensive review of more than 200 randomized controlled trials (RCTs), which is funded by the Canadian Frailty Network, to develop a set of standardized core data elements and common outcomes in frailty research.⁵³

Until more sound evidence is available, we suggest implementing a person-centred approach in all individuals who live with frailty. Individuals identified as frail or at high risk of frailty should be advised, according to individual circumstances, on care and support planning, exercise, nutrition, medication reviews and the need to strengthen social networks. The multidimensional and heterogeneous nature of frailty necessitates therapeutic approaches that have multiple components,⁵⁴ ideally accomplished through a collaborative and interdisciplinary approach in the community, and precisely oriented to the component needs and circumstances of the individual who is frail. We suggest that those with severe frailty or challenging geriatric syndromes be referred for assessment by an appropriate geriatric specialist (Box 2).

Supportive care

Care and support planning can be delivered in many ways: in general, it involves a discussion among patients, family members and health care providers as equals. Topics that are discussed include the goals and priorities of the patients and caregivers, required supports, self-management, preferences for end-of-life care and other aspects relevant to the needs of a particular patient and their family members.⁵⁵ A good example is the Palliative and Therapeutic Harmonization Program (PATH), which is a consultative resource by which multidimensional frailty criteria can be employed to inform appropriate future care planning.⁵⁶

Interventions involving physical activity

A recent scoping review of studies of interventions to prevent or reduce the level of frailty in community-dwelling older adults showed that interventions involving physical activity (including those involving strength, balance, coordination, flexibility and aerobic exercise) and prehabilitation (i.e., physical therapy in combination with exercise and modifications to the home before a planned intervention) mostly reduced the number of frailty markers present and, consequently, the prevalence of frailty.¹² Several systematic reviews and meta-analyses have shown that multicomponent interventions, with physical activity as one of the components, can reverse frailty,⁵⁷ improve physical function and performance of activities of daily living,⁵⁸ decrease falls and improve gait, balance and strength performance.⁵⁹ A recent RCT also showed that physical activity had positive effects on cognition, emotional and social networking.⁶⁰ Despite this strong evidence behind physical activity, proposed by some authors as a “lifelong physiologic supplement” in frailty prevention and management,⁶¹ more research is needed to outline the optimal program in terms of its components, duration and setting.⁵⁷

Nutritional support

Malnutrition and frailty were shown to be strongly associated in a 2017 systematic review.⁶² Although none of the included studies were prospective in nature, increased protein intake and

Box 2: Building frailty into the workflow of primary care

- Select a frailty case finding tool and start using it in your practice.
- Use frailty status to open a personalized discussion with the patient about advanced care planning.
- Build the capacity of your primary care team members and local resources and programs to customize their approach based on identified components of frailty, supplemented by use of a multidimensional tool.
- Implement a multicomponent approach to care that includes attention to exercise, nutrition, medications and social networks in the care of all individuals who live with frailty.
- Define and act on triggers that require the aid of geriatrician specialists.

dietary quality appeared to be protective factors against frailty. Combined with exercise, dietary interventions may also prove to be an important part of a multimodal approach to prevent and treat frailty, but further evidence is required.⁶³

Medication review

Polypharmacy is common among older adults who are frail and is associated with increased risk of predictable and preventable adverse drug events.⁶⁴ Accumulation of chronic conditions, inappropriate prescribing, suboptimal monitoring of drugs, and age-related changes in pharmacokinetics and pharmacodynamics compound the problem.⁶⁵ A structured medication review guided by the screening tool for older peoples’ prescriptions (STOPP), the screening tool to alert to right treatment (START)⁶⁶ or the American Geriatrics Society Beers⁶⁷ criteria for frailty management is currently recommended by several guidelines, including the best practice guidelines from the British Geriatrics Society, Age UK and the Royal College of General Practitioners,⁶⁸ and the Asia-Pacific clinical practice guidelines.⁶⁹

Addressing social vulnerability

Social isolation has been shown to affect the overall health and survival of older adults in Canada,^{70,71} and there is a graded association with frailty.⁷² However, evidence to support strategies to address social risk in the management of frailty or its adverse outcomes is lacking.⁷⁰⁻⁷²

Geriatric assessment

A comprehensive geriatric assessment is the current gold standard for identifying frailty and guiding management of those who are frail,⁶⁸ a comprehensive geriatric assessment comprises multidimensional assessments to determine the medical, functional, social and psychological aspects of an older adult living with frailty. Randomized trials evaluating assessment intervention programs for frailty in community-dwelling older adults have shown that, with high adherence to initiated interventions, comprehensive geriatric assessments can delay progression of frailty, reduce mortality, increase the odds of staying at home and decrease unplanned admissions to hospital.⁷³⁻⁷⁷ Application of this evidence (i.e., deciding which older adults would benefit from a particular intervention or intervention component) is challenging. However,

Box 3: Gaps in the literature

- Future intervention studies should not be limited to physical function, but should include other components that target nutritive, cognitive, social and psychological frailty separately and in combination.
- Future research needs to consider patient-centred outcomes rather than just the traditional clinical outcomes.
- Cost-effectiveness of models of care from well-executed economic evaluations in large-scale studies with longer intervention and follow-up periods is needed to promote and scale up effective models.

careful interrogation of frailty components followed by personalized care and support planning will help practitioners to tailor frailty management to individual patients. When selecting an intervention for an older adult with frailty, it is important to elicit the patient's goals and priorities and consider the benefit-to-harm ratio based on the severity of frailty.

Conclusion

Although many may point to uncertain benefits of frailty case finding in the primary care setting as a reason not to address frailty at the population level, the increasing prevalence of frailty, its contribution to mounting health care costs, and its impact on quality of life in older adults suggest that early identification and management are prudent even if some important research questions remain unanswered (Box 3). The current availability of validated instruments for both case finding and identifying frailty components moves health care providers beyond theory into practical application in the most appropriate settings. Specifically, this complex phenomenon should be identified, assessed and managed by health care providers beyond geriatric medicine, and primary care physicians are optimally suited to achieve these goals because of primary care's comprehensive, person-centred and team-based approach.

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