



Discussion paper

The concept of frailty in intensive care

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Our population is ageing, and this is also reflected in the ageing of the hospital and intensive care population. Along with ageing, there is also an increase in age-related chronic health conditions or comorbidities, which in turn affects the patient's functional state. There is an increasing need to describe a patient's clinical condition in terms of their functional capacity, such as frailty. Frailty is an age-related syndrome which reduces physiological and cognitive reserves. As a result, frailty increases people's vulnerability to insults such as infection and trauma. The concept of frailty also indicates prognosis and levels of health from a patient's perspective rather than simply from the acute reason for admission to the intensive care unit. Understanding the concept of frailty may facilitate our awareness of long-term outcomes after intensive care and being a trigger for considering its prognostic implications and the need to honestly and empathetically begin discussions with patients and their carers and how the patient's own goals of care could be established around this information.

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1. Background

The ageing population has important implications for the practice of intensive care, including how we as healthcare professionals working in the intensive care unit (ICU) manage the increasing number of frail elderly patients. The ICU was initially established to maintain life while the patient regained function either spontaneously or as a result of interventions. It was initially established to manage younger patients, often with a single disease. There have been noticeable changes in the nature of the patients who have been managed in the ICU. They have become older, and almost all have age-related chronic health conditions. Frail elderly patients are now increasingly attending emergency departments^{1,2}

and being admitted to hospitals^{3,4} and ICUs.⁵ The change in ageing of the hospital population is consistent with the change in ageing of the general population.^{6,7}

Along with the change in the population of the patients we now treat in the ICU, there is a need to define their clinical condition in more appropriate ways. One approach that is receiving increasing attention is to describe the condition in functional rather than medical terms. The term frailty can be used to describe the functional state of the patient. Frailty is likely to play a crucial role for all staff practising in intensive care. It will be important for prognostic reasons; for adjusting risk of outcomes when comparing units; for economic analysis; and as a basis for discussion with patients and their carers. For the purpose of this article, the authors will only be referring to the concept of frailty in the context of elderly patients admitted to the ICU.

1.1. The concept of frailty

Frailty is an age-related syndrome affecting every organ in the body.⁸ It reduces physiological and cognitive reserves, decreasing the ability to perform the normal functions of life.^{9–12} It occurs as a result of the ageing process resulting in features such as sarcopenia,

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cachexia, and decreased mobility.¹³ Frailty is accompanied by a reduction in reserves, resulting in an increased risk of disability and death from relatively minor external stress such as falls and infection.⁸

Most predictive tools used in intensive care are based on the 'medical' criteria such as biochemistry and vital sign abnormalities. On the other hand, frailty describes the patient's condition from perspective, for example, how fast they can walk and how strong is their grip strength. From a patient's perspective, frailty results in gradual loss of independence and impaired functional ability.⁸ The degree of functional disability correlates better with long-term prognosis than scores based on more conventional pathophysiological and clinically based parameters.¹⁴ Importantly, the concept of frailty reflects the condition of the patient from their own perspective and how they are coping with life more than the more commonly used pathophysiological parameters. The increasing incidence of elderly frail people in our society poses challenges for the healthcare system, social services, families, and individuals.¹⁵ It also has implications for intensive care practice. As the focus of this discussion article was to only give a brief outline of the different ways of measuring frailty and the influence of frailty on outcomes, it was always going to be difficult to briefly review the 'concept of frailty in intensive care'. However, to our knowledge, Muscedere et al.¹¹ provides the most comprehensive review of frailty in the context of intensive care.

1.2. Measuring frailty

There have been many attempts to quantify the concept of frailty.¹⁶ Some of the components included in frailty scores include physical, cognitive, and social circumstances.¹⁶ However, most frailty scores are based on the ability to perform motor functions and include Fried's phenotype of frailty¹⁷; Edmonton Frailty Scale¹⁷; Fatigue, Resistance, Ambulation, Illness, Loss of Weight index¹⁷; Tilburg Frailty Indicator¹⁷; Gérontopôle Frailty Screening Tool¹⁷; PRISMA-7¹⁷; Groningen Frailty Indicator¹⁶; individual frailty measurements¹⁷; Sherbrooke Postal Questionnaire¹⁷; and Rockwood's Clinical Frailty Scale.¹⁷ Most of the scales include descriptions of gait, the level of independence, and muscle strength. Frailty may be related to, or even largely caused by, the natural ageing process. The concept of frailty also overlaps with other factors such as chronic diseases and age-related comorbidities.⁹ Currently, there is no agreement about a single standardised and validated tool for measuring frailty. This is limiting our ability to make conclusions about its incidence and importance in our society.

1.3. Relationship between frailty, ageing, and comorbidities

Frailty is intimately related to the ageing process and the development of comorbidities.⁹ Medical conditions such as osteoporosis, heart failure, rheumatoid arthritis, and peripheral vascular disease can be part of the ageing process and contributing to functional dysfunction and frailty. Age is invariably associated with frailty but in a way which is variable and, as yet, unpredictable. This may explain why age alone cannot predict outcomes from the ICU.^{18,19} The pre-existing functional state is probably more important than age alone.²⁰ Importantly, as the patient becomes frailer, they become more vulnerable to adverse events including falls, infections, perioperative complications, unplanned hospital admissions, and death.^{21,22}

1.4. Frailty scales for intensive care

As with frailty scores generally, there is no universally agreed way of measuring frailty in the practice of intensive care.²³

Rockwood's Clinical Frailty Scale measures the degree of frailty with scales from 1 (very fit) to 9 (terminally ill), based on the functional status and clinical judgement.^{10,11,23} It is a visual chart that can be easily used in a clinical setting by ICU clinicians for the screening the degree of frailty among the elderly.²³ Another tool, the frailty index, is more complex and uses a quantitative approach.¹⁷ It is a measurement of accumulated health deficits including disease states, physical and psychological impairments, and common geriatric syndromes and is associated with adverse clinical and general health outcomes.^{24,25} Another more practical measure used in intensive care is Fried's phenotype of frailty.¹⁰ It is based on five components—weakness, bodily shrinking, motor slowness, a low level of physical activity, and becoming easily exhausted. The phenotype of frailty has been used to explore the relationship of frailty with outcomes such as disability and mortality.¹⁰ An obvious shortcoming for the validation and use of any frailty score in the ICU is that it almost always has to be completed by a surrogate and may be overscored or underscored as a result.²⁶

Nevertheless, this represents the reality in intensive care. For use in intensive care, the instrument must be easy to administer; provide readily available data; and the data should have demonstrated utility.^{9,11,12,16} Once a risk-adjusted tool based on frailty is in place, this can be shared with patient and their carers by conducting honest and empathetic discussion with them about their long-term outcomes, empowering them to establish their own goals of care.

1.5. Frailty in intensive care

The number of people aged more than 80 years will double over the next three decades.²⁶ There is an increasing number of frail elderly patients in our ICUs, and this will increase as the population ages²⁶ and the number of hospital admissions increases.^{2,27} Moreover, up to one-third of all treatment delivered in the last 12 months of life may not be beneficial.²⁸

Clinicians are beginning to seriously question the role of intensive care in influencing the outcome of frail elderly patients.³⁰ For instance, the Australian and New Zealand Intensive Care Society has started including frailty as part of the standardised national data collection.^{31,32} Similar to the practice of medicine generally, the intensive care resources has been based on younger patients with a single admitting diagnosis. As patients age, they increasingly develop chronic complex comorbidities. Nevertheless, the way intensive care manage these patients is still largely based on the assumption that the multiple problems can be dealt with by clinicians specialised in single organ dysfunction.³³ In the case of intensive care, clinicians still communicate in terms such as acute respiratory distress syndrome, sepsis, pneumonia, and related organ dysfunctions such as acute kidney injury.³⁴ This approach can overlook the nature of the frail elderly's clinical state where the acute illness is on the background of an age-related chronic health state.^{13,35} In this context, the chronic health state assumes an importance equal to, or greater than, the acute problem. The frail elderly become more vulnerable to acute challenges such as infection or minor trauma.³⁶ For example, a urinary tract infection in an otherwise well 20 year old individual would probably rapidly respond to antibiotics, whereas in the frail elderly, the infection could be life threatening, often requiring complex resuscitation and admission to an ICU.²⁸

1.6. Outcomes of frail elderly patients in the ICU

To investigate the impact of intensive care on the frail elderly, there is a need to look at medium and long-term outcomes and survival at discharge from the ICU. It is clear that intensive care has

improved the outcome of sepsis in the short term by emphasising early intervention and probably as a result of the general improvement in our clinical practice.²⁸

However, there is increasing interest in long-term outcomes. For example, for frail elderly patients (aged ≥ 80 years), mortality at 12 months after hospital discharge varies from 24% to 64%.^{37–40} Importantly, with advanced frailty, the mortality is even higher.^{37–40} For patients aged 50 years and older who are frail on admission to the ICU, the mortality at 12 months is almost 50%.⁹

Moreover, many frail elderly patients suffer impaired quality of life after hospital discharge,⁴¹ including suffering from syndromes similar to post-traumatic stress disorder,⁴¹ and frailty is an important factor in the incidence of these complications.⁴² The concept of the functional status and frailty adds an important prognostic element to age.⁴³ A comprehensive understanding of frailty may alert us to the possibility that the patient is coming to a natural end of their life, rather than simply concentrating on the acute reason for admission to the ICU. It may be that, armed with increasing information from research around frailty, intensive care may become more involved in broader issues such as the quality of life after hospital discharge and long-term prognosis.^{10,11,38,9}

2. What influences the impact of frailty on the ICU?

Frailty is related to the normal and expected deterioration of the body as a result of ageing.^{9,44} It is not a disease as such but a functional description describing the degree of age-related deterioration. Management of frailty involves first, acknowledging its existence and the fact that it is largely irreversible and incurable. Equally important is that the degree of functional disability is a marker of the patient's underlying vulnerability to insults such as infection and their ability to recover from the acute insult.^{9,45}

Current research around frailty in intensive care infers that the admission of a patient to the ICU has an impact on the posthospital period.^{10,9} While the interplay of critical illness and frailty may influence recovery, it may be that the acute reason for admission to the ICU simply reflects the patient's natural and gradual deterioration and that it is more a marker of the patient nearing the end of life.⁴⁶ In other words, the admission to the ICU may, in itself, not influence the patient's posthospital course, but the admission is more a marker of natural and predictable deterioration. This may suggest a different approach to the one currently suggested which emphasises rehabilitation, avoiding mortality, restoring functional dependence, and improving quality of life.^{47,48}

Similarly, identification of frail patients in the ICU has prompted short-term strategies to improve the management of frail patients in the ICU, such as preventing pressure areas, addressing deconditioning,⁴⁹ screening for delirium,⁵⁰ more efficient weaning strategies,⁵¹ appropriate sedation protocols,⁵² and early mobilisation.³⁹

While the identification of frail patients in the ICU encourages strategies to improve their care in the ICU, and on discharge from the hospital, the identification of frailty on admission to the ICU may also encourage a different approach. Depending on the degree of frailty, history of deterioration, and decreasing independence, it may be time to commence honest and empathetic discussions about prognosis and to empower the patient and their carers to consider their own choices with regard to future care.^{53–55} There will always be uncertainty around prognosis, even in young patients with terminal conditions, but it should not prevent us from flagging the functional state of the elderly as the basis for at least beginning discussions along these lines. To assist this cause, prognostic tools for the frail elderly are beginning to appear, which may eventually reduce some of the uncertainty with regard to prognosis.²⁹

The concept of frailty may encourage our specialty to consider the way intensive care currently manages the elderly frail.^{10,16,38}

The acute reasons for admission such as infection and trauma are now relatively straightforward challenges for our specialty. Interestingly, in the largest study on frailty in the ICU setting, the mortality of those frail elderly patients at discharge from the ICU has been reported to be the same for those without frailty.⁹ However, most other outcomes were reported as being significantly worse, including length of stay in both the ICU and hospital; hospital mortality; mortality at 12 months; hospital readmission rates; less likely to be living independently after hospital discharge; more functionally dependent; and having a lower quality of life. In other words, the frail elderly could be kept alive in the ICU without considering what their survival would mean in the longer term. Significantly, the treatment offered to both the frail elderly and nonfrail elderly patients in the ICU had the same level of intensity.

The awareness of frailty as a predictor of outcomes, apart from mortality at discharge from the ICU, may become increasingly important not only to patients and their carers but also for the practice of intensive care generally.

3. Summary

The concept of frailty as a measure of a patient's degree of functionality could add another dimension to how clinicians assess the clinical state of patients and how the resources of intensive care have an impact on clinical outcome. Intensive care may need to broaden the concept of 'prognosis' in terms of, not only whether patients survive but to also consider the long-term outcomes. Intensive care has clearly demonstrated that it can improve mortality rates. In fact, it is often difficult for a patient to die there. That is a reflection of the great advances in our specialty. However, clinicians are just beginning to also examine the nature of the population of patients that we manage in our ICUs and their long-term outcomes, not only in terms of mortality but also their quality of life. Awareness of functionality, and its importance to patients, may facilitate more inclusive discussions with patients and their carers with regard to informed choices about their future care. Up to one-third of all treatment delivered in the last 12 months of life may not be beneficial.²⁹ It may be that many frail elderly patients are in this category. To our knowledge there hasn't as yet been any attempt to translate the outcome findings into a triaging system for screening frail elderly patients. We suggest that there is a need to involve frail elderly patients and their carers more in decisions prior to admission to the ICU about what can be offered and just as importantly, its limitations. This has important implications not only for the patients and their carers, but also in relation to the unsustainable costs of health care. These are exciting times for intensive care as we examine more broadly how the resources of the ICUs potentially influence the outcome of specific patients and define more accurately the potential benefits for those patients and, just as importantly, the adverse and unwanted outcomes.

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