

Framework to decide on withholding intensive care in older patients

E. de Jonge¹, S.P. Mooijaart^{2,3}

¹Department of Intensive Care, Leiden University Medical Center, Leiden, the Netherlands

²Institute for Evidence-based Medicine in Old Age (IEMO), Leiden, the Netherlands

³Department of Internal Medicine, section of Gerontology and Geriatrics, Leiden University Medical Center, Leiden, the Netherlands

Correspondence

E. de Jonge - e.dejonge@lumc.nl

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Abstract

Although often life-saving, admission to an intensive care unit is not necessarily beneficial for all older patients. These patients do not always prefer life-extending treatment over care focused on preserving functional capacity or relieving pain and discomfort. Physicians are allowed, even obliged, to choose not to provide treatment that is not for the patient's good, especially if that treatment is harsh and burdensome. In this paper we propose a model to facilitate better provision of appropriate care based on explicit estimations of baseline physical, cognitive and social status and subjective quality of living, the likelihood of long-term survival and fair/good functional performance, individual preferences and the burden of treatment. While absolute criteria on when to withhold intensive care cannot be given, it is important that physicians have a uniform set of explicit criteria to consider in all older patients.

Introduction

The world population is ageing. For the United States it has been projected that the percentage of people aged ≥ 65 years will grow from 11% in 1980 to 22% in 2050. This increase will be even greater in some countries such as China (from 5% to 28% in 2050). In the US the absolute number of people > 85 years will increase from approximately 5 million in 2016 to 20 million in 2050.^[1] The percentage of people in the Netherlands aged ≥ 80 years increased from 1% in 1950 to 4% in 2013 and is expected to rise to 9% in 2040 and 11% in 2055.^[2] More information on the life expectancy of older people in the Netherlands is provided by Statistics Netherlands (<https://www.cbs.nl>) and the National Institute for Public Health and the Environment (<https://www.rivm.nl/nationaal-kompas-volksgezondheid>). As older patients are more often admitted to hospital, the number of intensive care unit (ICU) admissions in older patients may

also substantially increase in future years.^[3,4] ICU admission is often considered life-saving in critically ill patients, even though a recent study did not show a survival benefit in old patients if a policy to promote ICU admission was instituted.^[5] But even if it were to generally improve survival, admission to an ICU is not necessarily beneficial for all older patients. Mortality is high, especially in patients admitted for medical reasons,^[6] and functional performance after ICU admission is often worse than before.^[7] Even in patients who make a good recovery, life expectancy is always limited if they are old. However, it is not always clear which older patients will benefit from intensive care and for which it will be the start of a period of low quality of life, decreasing functional capacity or even death.

The need for serving the best interests of a patient holds true for all patients, it is not specific for older patients. However, old patients have in common that life expectancy is always limited and that the risk of frailty (including physical, cognitive and social status) is higher, which increases the chance of complications and negative health outcomes. Thus, the balance between potential benefits (extra years alive) and burden of treatment is often more negative than in younger patients.

The aim of this paper is to propose a model for making careful decisions on appropriate care in critically ill older patients, specifically on providing or withholding intensive care treatments.

Patient preference

Older patients may have very diverse treatment preferences, but do not necessarily prefer life-extending treatment over care focused on preserving functional capacity or relieving pain and discomfort. The willingness to receive life-sustaining treatment depends on the burden of the treatment, and the likelihood of a

beneficial outcome. In a population of patients with limited life expectancy and aged ≥ 60 years, 74% stated that they would not choose treatment if the burden of that treatment was high and the anticipated outcome was survival with severe functional impairment.^[8,9] In an observational cohort study of consecutive community-dwelling older individuals previously hospitalised in medical or surgical wards and of volunteers residing in nursing homes or assisted-living facilities (mean age 85 years), participants were interviewed after viewing films of scenarios involving the use of non-invasive mechanical ventilation (NIV), invasive mechanical ventilation (IMV) and renal-replacement therapy (RRT) after ICU treatment. In 68% (NIV), 47% (IMV) and 21% (RRT), these older persons chose to undergo intensive treatments if necessary. Factors associated with acceptance of ICU treatment were married status, female gender, good quality of living, no earlier ICU admission and a good Activities of Daily Living score. Interestingly, in this study, none of the older participants had established advance directives or designated a healthcare proxy. About half of them had spoken with close relatives about their wishes in the event of severe illness.^[10] When doctors were presented with the same scenarios, they felt more positive towards intensive care treatments than the older individuals. They felt that intensive care treatments were warranted in 86%, 78% and 62% for NIV, IMV and RRT, respectively. Agreement between physicians was low for their opinion regarding life-sustaining treatments.^[11]

Treatment limitations by physicians

Autonomy of humans regarding medical treatments is undisputed and patients can always refuse intensive care. However, even if patients do not refuse treatment, it is obvious

that not everything that we can do thanks to technical and biomedical resources promotes the best interests of the patient, nor is for the patient's good.^[12] Although the patient's 'good' is not always easy to define, physicians are allowed, even obliged, to choose not to provide treatment that is not for the patient's good, especially if that treatment is harsh and burdensome. The fact that important differences exist between physicians in their willingness to provide intensive care to older patients^[11] is related to the lack of clear criteria on how to determine the best interests of a patient. Although it is not possible to unambiguously define the patient's good, it would be beneficial to have consensus on how to make an individual decision.

Framework for treatment decisions

When considering treatment options, we should see older patients as individuals with pre-existent diseases and an acute reason for ICU admission, each with a certain likelihood of survival and fair/good physical and cognitive recovery. In these patients we should know how they functioned prior to the acute reason for intensive care and how they subjectively rated their quality of living. What matters is what is important for an individual patient. Is functional dependency and diminished functional performance acceptable for this specific individual? Lastly, the willingness to choose ICU treatment is also influenced by the burden of the treatment. A conceptual framework for treatment decisions in critically ill older patients is presented in *figure 1*.

To offer optimal care while avoiding harmful treatments in patients who cannot expect to benefit from that treatment, we propose that treatment decisions should be made in all older

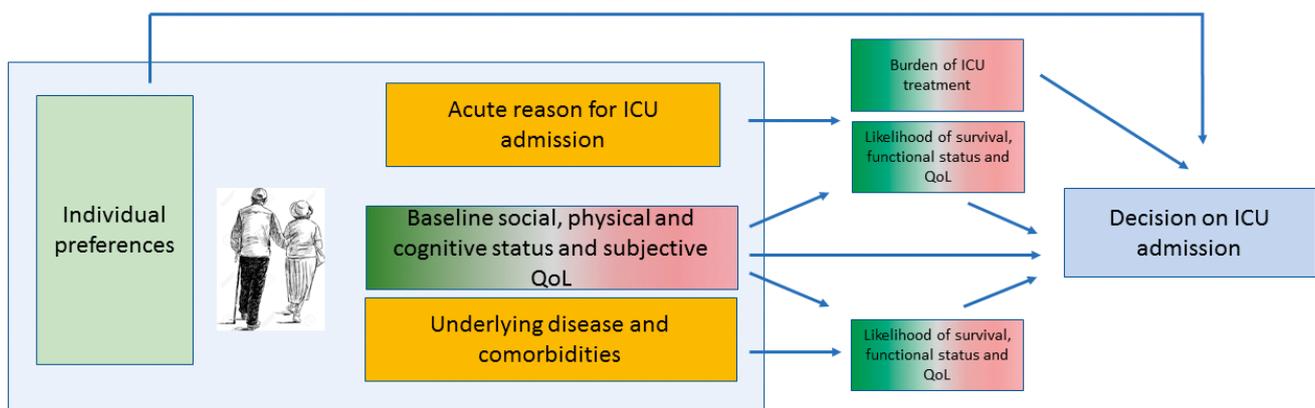


Figure 1. Conceptual framework of factors to consider in decisions on ICU treatment in older patients.

The willingness to undergo ICU treatment is determined by individual preferences, the burden of ICU treatment, and the likelihood of survival, long-term fair/good functional performance, cognitive status and subjective quality of living. Baseline social, cognitive and functional status in itself are important determinants of quality of living and also predictors of functional and cognitive recovery or decline after ICU.

patients with explicit consideration of at least the following aspects:

1. Subjective quality of living before ICU admission
2. Probability of survival of the underlying disease
3. Probability of survival of the reason for ICU admission
4. Probability of fair/good functional performance after the ICU if the patient survives
5. Burden of treatment
6. Is a decrease in performance acceptable for this individual patient?

Subjective quality of living before ICU admission

Irrespective of what the prospects of intensive care are, this treatment appears not to be in the interest of a patient if the pre-existing subjective quality of living is poor and is not expected to improve. For example, intensive care seems inappropriate in patients who subjectively suffer from severe chronic dyspnoea or pain, or from severe depression, which are unlikely to resolve. What matters is how patients subjectively rate their 'happiness with being alive'. An exceptional situation would be if the subjective pre-existing quality of living could improve by intensive care, for example if a patient with chronic dyspnoea due to heart failure needed intensive care following a heart valve repair. Asking the patient and/or his family about subjective quality of living is important and should be part of the initial history taking in all older patients. It should be documented in the patient files.

Probability of survival

To determine the probability of survival, we should separately consider both the prognosis of the acute reason for ICU admission and the prognosis of the underlying disease(s) of a patient and his important comorbidities.

Obviously, intensive care treatment should be avoided in patients with a disease leading to death in the short term, for example a patient with end-stage liver disease, intractable ascites, encephalopathy and no options for liver transplantation. To establish the probability of survival based on the underlying disease, we need the assessment of the medical specialist involved in this disease (e.g. the hepatologist in the above-mentioned example). A challenging problem in this assessment is the fact that physicians are often too optimistic in the prognosis of their own patients, a phenomenon called 'ego-bias'.^[13] Good communication between intensivists and other physicians involved in the care of a patient is often necessary to carefully predict the chances of future survival.

Many prognostic models are available to predict the likelihood of survival until hospital discharge in patients who are admitted to an ICU. Models, such as APACHE IV or SAPS II, may be used for all ICU patients,^[14-16] other models are specific for older patients.^[17,18] Although overall discrimination of survivors and non-survivors is good, outcome may differ from predictions in

individual patients. Therefore, mathematical predictive models should be used together with the expert judgement of ICU physicians. It has been shown that subjective expert opinion may be as accurate in predicting mortality and that combining expert opinion with objective prognostic mathematical models significantly improves the discrimination and accuracy of the predictions.^[19]

Although it is impossible to absolutely label a certain risk of mortality as indicative of futility, a very high risk not to survive the hospital admission should be an argument against ICU admission in very old patients.

Functional performance after hospital discharge

In older patients who survive the ICU, functional performance and independence is often less than before ICU admission. In a cohort of 610 Canadian patients aged ≥ 80 years admitted to an ICU, 26% were alive at 12 months and had recovered to their baseline physical function.^[20] In this same cohort a quantitative model was developed to predict performance status one year after ICU admission. Reasonable performance was defined as a palliative performance scale (PPS) of ≥ 60 . A PPS of < 60 represents a person who needs at least considerable assistance in self-care, is unable to do any work and spends most of the time sitting or in bed. At 12 months, 50% of the patients had died and 29% made at least a reasonable physical recovery. Using a logistic regression model, a likelihood of $> 90\%$ of death or poor functional recovery was predicted in 24% of patients and 96% of these patients indeed died or ended with poor functional recovery.^[7] Predictors associated with poor outcome were low baseline performance scale, male gender, APACHE II score, Charlson Comorbidity Score, admission for stroke, and clinical frailty score.

In a recent study from Finland, premorbid functional status (PFS) was poor in 43% of ICU patients (> 80 years). One-year mortality in patients with a poor PFS was 47% and in survivors, functional status at one year was worse than PFS in 22%.^[21] In a Dutch cohort of patients ≥ 80 years, the ability to perform usual activities was lower in ICU survivors than in a general age-matched British population, but other quality-of-life scores (from EuroQoL-5D score) were similar in ICU survivors and the general population. However, it should be noted that most ICU survivors were admitted to the ICU after planned surgery and thus positively selected for fitness and absence of geriatric comorbidities, making this cohort less representative for the general ICU population.^[22]

Frailty

Frailty is a multidimensional syndrome characterised by loss of physiological and cognitive reserves that results in increased vulnerability to adverse outcomes.^[23] Frailty has substantial implications for quality of life, functional autonomy and use of health services. There are many different operational scoring scales to measure frailty. In critically ill patients, the Canadian

Study of Health and Aging (CSHA) Clinical Frailty Score^[24] was found to be an important predictor of poor functional outcome 12 months after ICU admission.^[7] The CSHA Clinical Frailty Score is an easy to use 7-point scale discriminating between very fit, well, vulnerable, and mild to severe frailty. Frailty is an important factor to consider when decisions on ICU treatments are made in older patients. First, frail patients already have limitations in their functional performance before ICU admission, influencing their subjective quality of living and their preferences towards life-sustaining treatments. Second, frail patients have a high likelihood of death or poor functional outcome after ICU. In a study among critically ill patients, compared with non-frail survivors, frail survivors were more likely to become functionally dependent (71% vs. 52%), had a significantly lower quality of life and were more often readmitted to hospital (56% vs. 39%) in the 12 months following ICU admission.^[23] In another study in older ICU patients, the odds ratio for the outcome death or poor functional outcome was a 3.45 per 2 points increase in the 7-point CSHA Clinical Frailty Score.^[7] A large multinational European study found that frailty was present in 43% of patients (>80 years) and that frailty was independently associated with 30-day survival (hazard ratio 1.54; 95% CI 1.38-1.73). All these studies used the CSHA Clinical Frailty Score as instrument to measure frailty.^[25]

Burden of treatment

Treatment guidelines and treatment decisions are traditionally made from a perspective that places the highest value on achieving a beneficial outcome, but the burden of treatment is often not considered explicitly.^[26] Both monitoring and organ support during intensive care include invasive procedures, such as central venous line placement or mechanical ventilation, which are uncomfortable and painful for patients. Many patients cannot sleep and suffer from delirium, especially the more elderly. When making decisions about the appropriateness of intensive care the burden of treatment should be weighed against the possible outcomes. In a study to understand the preferences of seriously ill American patients aged ≥ 60 years who had cancer, congestive heart failure or chronic obstructive pulmonary disease, Fried and others found that the willingness to choose treatment rather than to accept death was related to the likelihood of a beneficial outcome, as well as to the burden of treatment.^[8] In a study of older patients with a mean age of 85 years, most patients refused intensive care complicated by the need for renal replacement therapy and they more often refused invasive mechanical ventilation than non-invasive ventilation.^[10]

Is a decrease in performance acceptable for this individual patient?

Not everyone has the same thoughts about the prospect of decreasing functional performance and increasing dependence on others in daily care. Some people easily accept a life when they

are confined to sitting in a chair or lying in bed, being dependent on others for washing and dressing. For others, however, the prospect of functional decline may be completely unacceptable. This individual diversity should be taken into account when considering a likely decrease in functional performance when weighing the pros and cons of offering intensive care. For this, it is important that a patient can express his preferences or that family members have knowledge of the patient's wishes. Some patients write advance directives that may help in acting in accordance with their preferences. However, these documents are often written in general terms, lack a specific description of the situations when an advance directive is valid and, lastly, lack a motivation why a certain treatment should not be given. Furthermore, in the face of a medical crisis or approaching death, patients or their caregivers often change their minds about what they want and need. Thus, advance directives are often not good enough to really know a patient's wishes towards life-extending treatments. However, in many cases family members and other representatives do know the patient's thoughts about end of life.^[27] Their information should be carefully considered by physicians making treatment decisions.

How to make decisions

Autonomy is an indisputable right of patients. Clearly, they have the right to accept or reject treatments offered by clinicians. However, physicians do not necessarily have to offer ICU treatment to all patients. The medical staff should weigh the benefits of the ICU against the burden of treatment. A prolongation of life should be considered beneficial if it offers the patient a period of time with at least for him/her fair physical and cognitive performance.

While absolute criteria on when to withhold intensive care cannot be given, it is important that physicians have a uniform set of explicit criteria to consider. We propose that in all older patients admitted to hospital with a condition that may be life threatening and for which the ICU could be considered, information is collected and documented on pre-existing functional status, frailty, subjective quality of living, on personal preferences regarding life-sustaining treatments, on personal thoughts about the importance of functional performance and independence and on the probability of survival and reasonable functional outcome. Some of this information is qualitative and subjective, the probability of functional performance and survival can be objectively estimated using existing prognostic models that should be validated for the Dutch situation. Patients and their families should not be asked if they wish to have ICU care, but presented with a realistic picture of the benefits of life-extending care and also the potential negative prospects of further decline of functional and cognitive reserves. It may well be that for a 90-year-old patient, dying from pneumonia with proper palliative care is more acceptable than going through a demanding and uncomfortable ICU period, surviving for

a limited time with severe functional decline, and being fully dependent on others. Importantly, some (very) old patients have a good pre-existing functional status and have fair prospects of a good recovery from critical illness. For these patients, the ICU is a good option that clinicians should offer. If in doubt, a time-limited trial of intensive care, probably not including the most invasive and demanding treatments, can be instituted to identify patients who can quickly recover from their critical illness without too much functional decline.^[28] However, this policy of time-limited trials of intensive care has not yet been studied in very old patients.

Disclosures

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