



What were you able to do in your daily life? Performance status for the critically ill patient

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Mortality, which is the most robust outcome in critically ill patients, depends on risk factors such as comorbid conditions, age and severity of the acute illness. Whilst these risk factors are widely accepted in severity scores for predicting hospital mortality, there is a lack of information about the baseline performance status (PS) of the patients when being admitted to the intensive care unit (ICU). To allow an adequate clinical decision-making process and further discussion with patients or relatives, accurate prognostication of a patient's outcome seems to be mandatory, however difficult and emotionally charged the task is for the physician.

Addressing how the patient was, at an individual level, would allow the determination of the patient's pre-admission status in order to participate in the prognostication. This strategy has been widely used for several decades. A recent publication in a cohort of elderly patients followed for 15 years before ICU admission found an increase of 1-month and 1-year mortality with worse severity of pre-ICU functional trajectories, which had an effect comparable to mechanical ventilation and shock [1]. Unfortunately, intensivists rarely have access to the functional trajectory of a patient over a long period. We need simple and validated assessment tools to measure functional status that are easily administered at the bedside. Frailty is another condition affecting PS that leads to increased vulnerability to adverse events, like ICU admission [2]. Frailty has been associated with ICU mortality [3], hospital mortality, readmissions, institutionalization [4], and poor long-term

quality of life [5]. The same factors that contribute to frailty may affect PS either directly or indirectly (Fig. 1).

Zampieri et al., in an article recently published in *Intensive Care Medicine*, add some insight into the value of PS in the outcome [6]. This is a secondary analysis of a multicentre retrospective cohort study of 59,693 patients admitted to 78 Brazilian ICUs in 2013 [7]. The authors [6] aimed to evaluate the impact of PS, assessed by the Eastern Cooperative Oncology Group (ECOG) scale, on the hospital mortality of 59,693 ICU patients. PS impairment was absent/minor in 75.8 %, moderate in 17.3 % and severe in 6.9 % of the patients. Increasing PS impairment was associated with an increase of mortality according to severity of illness, comorbidities, age, and admission type. The logistic regression analysis showed that PS was independently associated with hospital mortality. Adding the PS assessment to the calculated SAPS3 score slightly improved the discrimination, with small changes in Bier score and without visual impact on the SAPS3 calibration curve. This may happen because the short-term prognosis after intensive care is most likely the result of the interplay between illness severity, baseline patient characteristics (comorbidities, PS) and the quality of care. As Zampieri et al. [6] pointed out, “the full picture of a patient's chronic health status” is not entirely captured by variables commonly included in illness severity score, such as age and major comorbidities. Interestingly, another recent study [8] found that duration of ICU stay prior to death in critically ill patients was longer in older patients but comorbidities did not represent a significant risk factor for the length of stay prior to death. This has important implications in current clinical practice and suggests using a PS index or a frailty index instead of only comorbidities when discussing futility of support care.

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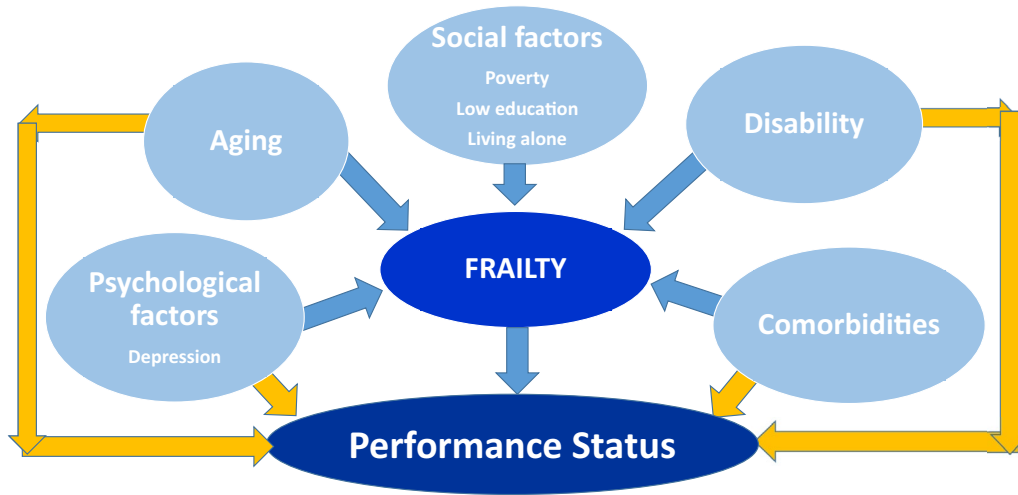


Fig. 1 Factors contributing to frailty and performance status

Credit must be given to the authors who measured a variable that intensivists, generally, include in the clinical evaluation but do not quantify. The large population involved and the robust statistical analyses are the major strengths of the study. This complex analysis included the imputation of the few missing values (5.8 %). There are also some weaknesses. The assessment of PS referred to 1 week before hospital admission. We cannot exclude that, for some patients, the poor PS in the week before hospital admission could be related to the clinical deterioration due to the illness responsible for the hospital and ICU admission. Therefore, the full picture of chronic health status or frailty in the study patients may be overrepresented, as correctly stated by the authors. One concern from the study lies in the use of only three categories to classify PS impairment with a grading system that comprised absent/minor (ECOG 0-1), moderate (ECOG 2) or severe (ECOG 3-4). However, the three categories seem to allow for the increase of PS impairment in the groups, because odds ratio for adjusted hospital mortality was 1.96 (95 % CI 1.63–2.35) for moderate and 4.22 (95 % CI 3.32–5.35) for severe impairment. However, we need to verify the generalizability of the results in countries with national health systems. Although, on the basis of its current gross national income, Brazil is an “upper middle income” country, most of the study patients (92 %) were from private hospitals [6]. We cannot exclude that intensivists working in private hospitals may be more willing to accept patients with poor PS in ICU when requested by ward physicians or families. Conversely, ICUs in public hospitals may not admit some patients with very poor PS as a result of resource constraints. The patient severity of illness (SAPS3 43.0 ± 14.9) was similar to that reported in Spain (46.29 ± 14.34) [9], but lower than in

Italy (65.8 ± 17.1) [10], and the percentage of mechanically ventilated patients was low (19 %). A weakness of the study [6] is the lack of report of end-of-life decision practices. This aspect needs to be considered for future clinical implementation of PS.

Characterization of the PS on ICU admission will become an immediate need in the near future for the whole ICU population. Since intensivists have more and more accessible and complex technologies to provide life support, performance status information will improve the clinical decision-making process for the entire ICU population. Nevertheless, several questions must be debated before integrating PS in severity tools or in our daily ICU admission process: Which measure can we use? What time period before hospital admission do we have to consider? Who must report the PS? Future studies should address these questions.

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Compliance with ethical standards

Conflicts of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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