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Decisions on withholding of "non-beneficial" intensive care: Can they actually Be unbiased?

"*Intensive care unit (ICU) bed availability, hospital admission diagnosis, disease severity, age, and surgical status*" have been shown to determine decisions regarding ICU admission [1,2]. However, the reliability of patient-related factors in predicting survival in an individual patient is limited and their use can lead to patients who might benefit from ICU treatment not being admitted. In a study of ICU triage decisions patients with acute physiology and chronic health evaluation (APACHE) II scores of >15 were more likely to be refused admission but maximal, ICU-associated mortality benefit was noted in patients with APACHE II scores of 11–20 [1]. Hence, as the scores of >90% of the non-admitted patients ranged within 14–19 [1], some of them might have been deprived of the ICU-admission benefit.

Amyotrophic lateral sclerosis (ALS) is a common, progressive, incurable motor neuron, degenerative disease that ultimately causes respiratory failure and death. Late-stage ALS is associated with ventilator-dependence and increased risk for pneumonia [3]. Should a patient with ALS and acute respiratory distress syndrome (ARDS) be admitted to a medical ICU? To respond to this dilemma, a contemporary intensivist needs to consider 1) the patient's comorbid condition and acute illness, 2) his/her pre-admission functional status, "perceived" quality of life, and wishes; 3) his/her potential to benefit from interventions such as lung-protective, invasive mechanical ventilation in the prone position, invasive monitoring and vasopressors, rescue oxygenation strategies (e.g., extracorporeal membrane oxygenation or high-frequency oscillation), and renal replacement therapy in case of acute kidney injury; 4) his/her prognosis; and 5) ICU bed availability and the risk of inability to treat another patient with a higher chance of recovery [4].

In the 1980s, Professor Stephen Hawking was such a patient. When he experienced an episode of severe pneumonia [5], he was already suffering from late-stage ALS, associated with a 1-year mortality risk of ≥45% for patients with a body mass index of <18.50 [6]. An assessment of physical functioning [7] would have revealed "severe limitation" before the occurrence of the pneumonia. Assuming a pre-ICU admission APACHE II score of ≥20, the severe pneumonia-associated, predicted probability of death would be ≥ 40%. Even if scoring systems may prove inaccurate for assessing the prognosis in individual cases [4,8], the 1-year mortality of patients with ARDS exceeds 40%, whereas >75% of long-term ARDS survivors have residual neurocognitive disturbances impacting their quality of life [9]. Based on these facts, an evaluating intensivist would probably refuse ICU admission [10]. However, such a decision would not have taken into account that despite severe physical and functional limitations, there was both subjective (his own views [5]) and objective (his contribution to science [11]) evidence that he was leading a full and active life prior to hospital admission.

The example of Professor Hawking's experience highlights two ethical pitfalls for clinicians making triaging decisions for ICU admission. First, the necessity to understand functionality and quality of life from the individual patient's perspective rather than relying solely on assessment tools or physician assessment; this fails to respect the patient as an autonomous person with their own values and priorities. Second, the uncertainty inherent in applying prognostic tools in individual cases, which fails to take account of an individual patient's interpretation and tolerance of risk and may result in withholding of potentially beneficial treatment. Current Guidelines identify knowledge gaps, especially regarding the objective criteria in determining futile treatment [4]. Schneiderman et al. suggest physicians should regard ICU treatment as futile if empirical data show that the treatment has <1% chance of benefiting the patient as a whole, including weaning from ICU-dependent organ support [12,13]. The term "*non-beneficial treatment*" has been proposed to replace "*medical futility*"; however, there is still no consensus on a corresponding, single definition [4]. Given this lack of consensus, most decisions regarding ICU admission will be based on a balance of benefits and burdens of treatment. However, burdens and benefits will be perceived differently by different patients.

Justice means "*equality of rights to healthcare, and the legal obligation of healthcare providers to adhere to appropriate care and allocation of burdens and benefits*" [14,15]. If ICU clinicians are to fulfil their obligations with regard to justice they must guard against making assumptions about how their patients perceive the burdens and benefit of treatment, in particular with respect to quality of life. One does not have to be a globally famous scientist to experience a life that is full and active. However, in the presence of scarce resources, as is often the case in the ICU, justice also requires that resources are distributed fairly to everyone with a similar need. In these situations, prognostic indicators of survival may be important in informing ethically justifiable triaging decisions. However, a crude utilitarian allocation of ICU resources on the basis of differences in prognosis and cost can result in beneficial treatment being refused to members of vulnerable societal subgroups such as the elderly, or those with chronic, debilitating diseases [15].

Should endotracheal intubation and mechanical ventilation (and ICU care) to prevent hypoxemia-induced death have been withheld as potentially non-beneficial treatment for Professor Hawking? "Definitely not" is the response based on his post-ICU

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survival of >30 fruitful years. Could any generalizable conclusion be drawn from this exceptional case? "Yes." Patient-perceived quality of life may be so individualized and subjective that it is unrealistic to attempt to grade it according to any objective criterion such as recent level of physical activity [7]. Even multi-scale instruments for the assessment of patient-reported quality of life such as the Short Form-36 questionnaire [16,17] do not directly provide for a qualitative or quantitative grading of the overall patients' satisfaction with their lives. In the current authors' opinion, this is a robust criterion for a perceived good quality of life. Decisions regarding ICU admission should be informed by good-quality evidence of potential benefits and burdens of treatment, and knowledge of the patient's preferences, values and current life experience. This should be the case regardless of patient's physical or intellectual ability or their status in society.

Professor Hawking was admitted to the ICU in Switzerland, where he had fallen ill [5]. Given the severity of his condition, attending physicians considered withdrawing mechanical ventilation. However, he was transferred to Cambridge, where he eventually recovered to his prior level of physical functioning. This enabled him to continue his exceptionally productive professional life for >30 years [5].

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.tacc.2018.09.002.

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