

## WHAT'S NEW IN INTENSIVE CARE



# Ten things to know about critically ill elderly patients

Guillaume Leblanc<sup>1,2</sup>, Ariane Boumendil<sup>2</sup> and Bertrand Guidet<sup>2,3,4\*</sup>

© 2016 Springer-Verlag Berlin Heidelberg and ESICM

## Introduction

The proportion of the world population aged 60 years or over is expected to increase from 12 % in 2013 to 21 % in 2050 [1]. This increase will represent more than 2 billion elders, including 400 million aged 80 years or over. As the population ages, intensive care units (ICU) are facing an increasing demand for care of the elderly [2], with patients aged 80 or over now representing 10–20 % of all ICU admissions.

### 1. The benefit of intensive care is controversial

Elderly patients have a higher prevalence of chronic diseases and an age-related diminution of physiological reserve, which makes them more vulnerable to acute illnesses. This vulnerability puts them at high risk of death when admitted to the ICU and potentially mitigates the benefits of intensive care. Observational studies demonstrated conflicting results on the matter, with decreased [3] or unchanged [4, 5] mortality in elderly patients admitted to the ICU versus those admitted elsewhere.

### 2. Few elements help ICU triage

The lack of validated criteria to accurately identify which patient would benefit from ICU and the absence of triage guideline adapted to the elderly result in a high variability in the triage process among clinicians [4]. The only consensus among the medical community is that triage should not solely rely on age. The classical ICU scoring systems take age into account, but they are not adapted to the specific characteristics of the elderly and are not designed for triage. Frailty, a concept representing the

loss of physiologic and cognitive reserves, has recently gained attention for the evaluation of elderly patients. Frailty has been associated with 6-month mortality and may be a better predictor of mortality than usual ICU scoring systems [6, 7]. Other prognostic factors associated with adverse outcome should be considered: poor baseline functional and nutritional status, poor baseline quality of life, active cancer, cardiopulmonary resuscitation and do-not-resuscitate orders [4, 8, 9].

### 3. Patients and their relatives should participate in the decision-making process

A crucial and basic element to determine if ICU admission is appropriate is to consider whether intensive care is consistent with the patient's wishes regarding care. However, few patients or their surrogate decision-makers are asked about end-of-life issues [10]. In fact, elderly patients often prefer a lower intensity of care and one focused on comfort rather than undergoing invasive procedures [11]. Recent evidence suggests that there are discrepancies between family preferences for end-of-life issues and actual care provided [12]. There is a need to improve the quantity and the quality of communications between stakeholders during the decision-making process. This could possibly limit the use of expensive and prolonged life-sustaining therapies in patients whom might have different goals of care.

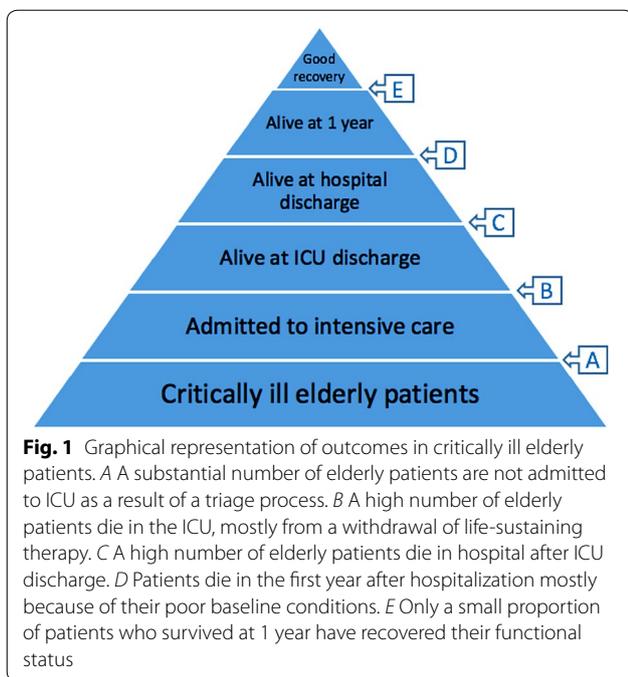
### 4. An ICU trial may be an alternative

A substantial number of patients are not referred to the ICU by emergency room physicians or are refused by intensivists (Fig. 1A) [13]. When the benefit of ICU is uncertain or when the patient is ambivalent about his goal of care, an ICU trial may be an alternative choice. An ICU trial consists in an ICU admission with mandatory re-evaluation at 48–72 h. Depending on the clinical evolution and patient's wishes, there is thereafter a

\*Correspondence: bertrand.guidet@aphp.fr

<sup>2</sup> Service de Réanimation Médicale, Assistance Publique-Hôpitaux de Paris (AP-HP), Hôpital Saint-Antoine, 184 rue du Faubourg Saint-Antoine, 75012 Paris, France

Full author information is available at the end of the article



possibility to continue intensive care or to step down the therapeutic intensity level.

### 5. Mortality is high in critically ill elderly patients

Despite a high intensity of care and a prolonged stay, mortality is high in elderly patients admitted to the ICU [14]. In recent observational studies, ICU mortality of elderly patients aged 80 or over was between 15 and 25 % (Fig. 1B). The in-hospital mortality rate is estimated between 25 and 45 % (Fig. 1C) and the mortality at 1 year can reach as high as 70 % (Fig. 1D). There is a large difference in outcome according to the motive for admission, patients admitted for elective surgical procedures being the least likely to die and patients admitted for urgent medical conditions being at highest risk of death.

### 6. A substantial number of patients die early after ICU discharge

About 20 % of elderly patients discharged from ICU subsequently die in the hospital (Fig. 1C). The high in-hospital mortality rate following an ICU stay questions the appropriateness of the usual discharged trajectory and discharge policies. Although not yet evaluated, a higher use of intermediate care units or specialized geriatric wards in the elderly might be beneficial and improve in-hospital mortality [15]. Furthermore, elderly patients discharged from ICU need more resources, and adequate healthcare services should be available to ensure appropriate and secure discharge.

### 7. Few patients have a good recovery at 1 year

Important endpoints when evaluating the benefit of intensive care in elderly patients are health-related quality of life (HRQOL) and long-term functional status. Recent data demonstrated mixed results with preserved [16] or lower [17] long-term HRQOL after being admitted to ICU. On the other hand, the long-term recovery of functional status seems much lower. In a prospective cohort study of 610 patients aged 80 years or over admitted to ICU, only one-quarter survived and returned to baseline level of physical function at 1 year [8] (Fig. 1E).

### 8. There are alternatives to ICU

When not admitted to the ICU, other hospital wards may be appropriate for elderly patients. Intermediate care units require less human and technical resources, have been associated with good outcome, and may represent an interesting alternative for the elderly who do not require invasive procedures [15, 18]. Instead of ICU or after an ICU stay, medical units specifically dedicated to the multidisciplinary care of older patients (geriatric ward) can improve functional status and reduce the frequency of discharge to long-term care facilities.

### 9. End-of-life issues are critical in the elderly

A high proportion of deaths in critically ill elderly patients follow a withdrawal of life-sustaining therapy [19]. Even if advanced care planning has been shown to improve end-of-life care and patients and family satisfaction, healthcare professionals often do not document the patient's wishes about end-of-life issue [20]. There is a need to assess the patient's opinion, as the elderly are highly reluctant to undergo life-sustaining treatments [11]. Ambiguous end-of-life directives can make ICU triage difficult and complex, highlighting the importance of proactively addressing goals of care in elderly patients.

### 10. There is also a social perspective

Considering the increasing demand for intensive care in elderly and the limited ICU resources, we will face in the near future a critical point where demand for care will be higher than ICU supply. Increased spending on intensive care delivery in the elderly is already underway and will inevitably continue, despite the apparently low rates of good long-term recovery in those patients. In order to give rise to sustainable intensive care services, future research will need to focus on how to provide care to the elderly according to their needs, and with a minimal impact on healthcare expenditures.

### Author details

<sup>1</sup> Department of Anesthesiology and Critical Care, Université Laval, Quebec, QC, Canada. <sup>2</sup> Service de Réanimation Médicale, Assistance Publique-Hôpitaux de Paris (AP-HP), Hôpital Saint-Antoine, 184 rue du Faubourg Saint-Antoine, 75012 Paris, France. <sup>3</sup> Sorbonne Universités, Université Pierre et Marie Curie-Paris 06, Paris, France. <sup>4</sup> Institut National de la Santé et de la Recherche Médicale (INSERM), UMR\_S 1136, Institut Pierre Louis d'Épidémiologie et de Santé Publique, 75013 Paris, France.

Received: 27 July 2016 Accepted: 29 July 2016

Published online: 4 August 2016

### References

- United Nations (2013) World population ageing 2013. Population Division of Department of Economic and Social Affairs New York. <http://www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2013.pdf>. Accessed 20 July 2016
- Ilhara GC, Lehberger J, Hochrieser H, Bauer P, Schmutz R, Metnitz B, Metnitz PG (2012) Development of demographics and outcome of very old critically ill patients admitted to intensive care units. *Intensive Care Med* 38:620–626
- Sprung CL, Artigas A, Kesecioglu J, Pezzi A, Wiis J, Pirracchio R, Baras M, Edbrooke DL, Pesenti A, Bakker J, Hargreaves C, Gurman G, Cohen SL, Lippert A, Payen D, Corbella D, Iapichino G (2012) The Eldicus prospective, observational study of triage decision making in European intensive care units. Part II: intensive care benefit for the elderly. *Crit Care Med* 40:132–138
- Boumendil A, Angus DC, Guitonneau AL, Menn AM, Ginsburg C, Takun K, Davido A, Masmoudi R, Doumenc B, Pateron D, Garrouste-Orgeas M, Somme D, Simon T, Aegerter P, Guidet B (2012) Variability of intensive care admission decisions for the very elderly. *PLoS One* 7:e34387
- Fuchs L, Novack V, McLennan S, Celi LA, Baumfeld Y, Park S, Howell MD, Talmor DS (2014) Trends in severity of illness on ICU admission and mortality among the elderly. *PLoS One* 9:e93234
- Bagshaw SM, Stelfox HT, McDermid RC, Rolfson DB, Tsuyuki RT, Baig N, Artiuch B, Ibrahim Q, Stollery DE, Rokosh E, Majumdar SR (2014) Association between frailty and short- and long-term outcomes among critically ill patients: a multicentre prospective cohort study. *CMAJ* 186:E95–E102
- Le Maguet P, Roquilly A, Lasocki S, Asehnoune K, Carise E, Saint Martin M, Mimoz O, Le Gac G, Somme D, Cattenoz C, Feuillet F, Malledant Y, Seguin P (2014) Prevalence and impact of frailty on mortality in elderly ICU patients: a prospective, multicenter, observational study. *Intensive Care Med* 40:674–682
- Heyland DK, Garland A, Bagshaw SM, Cook D, Rockwood K, Stelfox HT, Dodek P, Fowler RA, Turgeon AF, Burns K, Muscedere J, Kutsogiannis J, Albert M, Mehta S, Jiang X, Day AG (2015) Recovery after critical illness in patients aged 80 years or older: a multi-center prospective observational cohort study. *Intensive Care Med* 41:1911–1920
- Sim YS, Jung H, Shin TR, Kim DG, Park SM (2015) Mortality and outcomes in very elderly patients 90 years of age or older admitted to the ICU. *Respir Care* 60:347–355
- Le Guen J, Boumendil A, Guidet B, Corvol A, Saint-Jean O, Somme D (2016) Are elderly patients' opinions sought before admission to an intensive care unit? Results of the ICE-CUB study. *Age Ageing* 45:303–309
- Philippart F, Vesin A, Bruel C, Kpodji A, Durand-Gasselien B, Garçon P, Levy-Soussan M, Jagot JL, Calvo-Verjat N, Timsit JF, Misset B, Garrouste-Orgeas M (2013) The ETHICA study (part I): elderly's thoughts about intensive care unit admission for life-sustaining treatments. *Intensive Care Med* 39:1565–1573
- Heyland DK, Dodek P, Mehta S, Cook D, Garland A, Stelfox HT, Bagshaw SM, Kutsogiannis DJ, Burns K, Muscedere J, Turgeon AF, Fowler R, Jiang X, Day AG (2015) Admission of the very elderly to the intensive care unit: family members' perspectives on clinical decision-making from a multicenter cohort study. *Palliat Med* 29:324–335
- Garrouste-Orgeas M, Boumendil A, Pateron D, Aegerter P, Somme D, Simon T, Guidet B, ICE-CUB Group (2009) Selection of intensive care unit admission criteria for patients aged 80 years and over and compliance of emergency and intensive care unit physicians with the selected criteria: an observational, multicenter, prospective study. *Crit Care Med* 37:2919–2928
- Heyland D, Cook D, Bagshaw SM, Garland A, Stelfox HT, Mehta S, Dodek P, Kutsogiannis J, Burns K, Muscedere J, Turgeon AF, Fowler R, Jiang X, Day AG (2015) The very elderly admitted to ICU: a quality Finish? *Crit Care Med* 43:1352–1360
- Capuzzo M, Volta C, Tassinati T, Moreno R, Valentin A, Guidet B, Iapichino G, Martin C, Perneger T, Combescore C, Poncet A, Rhodes A (2014) Hospital mortality of adults admitted to intensive care units in hospitals with and without intermediate care units: a multicentre European cohort study. *Crit Care* 18:551
- Hofhuis JG, van Stel HF, Schrijvers AJ, Rommes JH, Spronk PE (2015) ICU survivors show no decline in health-related quality of life after 5 years. *Intensive Care Med* 41:495–504
- Khouli H, Astua A, Dombrowski W, Ahmad F, Homel P, Shapiro J, Singh J, Nallamothu R, Mahbub H, Eden E, Delfiner J (2011) Changes in health-related quality of life and factors predicting long-term outcomes in older adults admitted to intensive care units. *Crit Care Med* 39:731–737
- Weiss L, Graf C, Herrmann F, Salomon R, Perrenoud JJ (2012) Intermediate geriatric care in Geneva: experience of ten years. *Rev med Suisse* 8:2133–2137
- Andersen FH, Flaatten H, Klepstad P, Romild U, Kvale R (2015) Long-term survival and quality of life after intensive care for patients 80 years of age or older. *Ann Intensive Care* 5:53
- Heyland DK, Barwich D, Pichora D, Dodek P, Lamontagne F, You JJ, Taylor C, Porterfield P, Sinuff T, Simon J, ACCEPT (Advance Care Planning Evaluation in Elderly Patients) Study Team, Canadian Researchers at the End of Life Network (CARENET) (2013) Failure to engage hospitalized elderly patients and their families in advance care planning. *JAMA Intern Med* 173:778–787