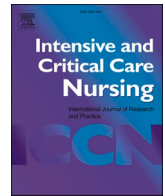


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## Editorial

## Redefining “Critical care”: From where intensive care unit beds are located to patients’ status

A patient’s discharge from the intensive care unit (ICU) is a critical, but often underestimated event in the critical illness journey. Premature discharge decisions are associated with ICU readmission and increased mortality (Madotto et al., 2021). Patients after their ICU stay are exposed to several adverse events during transitions of care to high dependency units (HDU) or hospital wards (Sauro et al., 2020). In effect, they change their provider team (physicians, nurses, therapists) and are transferred from a high nurse-to-patient ratio area to a resource-limited environment.

Before the COVID-19 era, when the pressure on ICU beds was not as intense, physicians’ clinical judgment was the main indicator to identify when patients were ready for ICU discharge. ICU readmission during the same hospital stay, involved about 10% of patients (Garland et al., 2015). Incidence of unexpected hospital deaths after ICU discharge and ICU readmission, in patients with no limitation in care, are used as a performance metrics in many hospitals. To improve this survival rate, many tools were developed to describe the patients’ risk at the time of discharge. Independent risk stratification may provide clinicians with additional information to guide clinical decision-making. However, there is no consensus on the most appropriate risk stratification tool. In a systematic review encompassing eight studies, Hosein and colleagues (2013) identified eight “ICU discharge” risk stratification tools. Outcome variables included ICU readmission, post-ICU mortality or a combination of both. They concluded that it was unclear whether existing tools provided value above clinical judgment or whether they can be used to improve healthcare delivery.

In this issue, Azevedo and colleagues (2021) suggest that the Nursing Activities Score (NAS) could support healthcare professionals with decision-making regarding ICU discharge. Results from this retrospective study, carried before the COVID-era, showed that the discharge NAS was associated with readmission, even after adjusting for several variables recognized as risk factors for this outcome. The median NAS at ICU discharge (59.9 – IQR: 50.9–67.3) in this study was similar to other previous published studies reported in Table 1 (Bruyneel et al., 2021; Lucchini et al., 2019; Silva et al., 2011). These values suggest, for the last day spent in ICU an ideal nurse-to-patient ratio equal to 0.6. Nurse-to-patient ratio is highly variable in HDU. For example, in Europe, it ranged from 0.5 to 0.125 according to the varying practices across different countries. The nurse-to-patient ratio in hospital wards is even lower. Azevedo and colleagues (2021) reported a nurse-patient ratio of 0.05 in their study. During the last day of an ICU stay, the higher workload was mainly due to nursing interventions like mobilization-positioning and hygiene procedures. The patients’ dependency is often associated with long-term and unresolved ICU complications (critical care polyneuropathy, ICU-acquired weakness). Moreover, ICU

admission and discharge procedures during the pandemic became more difficult due to the huge demand for ICU beds. To increase the number of beds for respiratory support and monitoring for hypoxaemic patients, many general wards were adapted as intermediate care units. Non-invasive ventilation outside the ICU alongside awake prone position was feasible and effective in preventing invasive mechanical ventilation in many COVID-19 patients. So, in many cases, HDUs were reorganized to decrease admissions into ICU and facilitate the early discharge of ICU patients with an anticipated prolonged length of ICU stay (Masa et al., 2021). After pandemic peaks, these optimizations of care, delivering advanced treatments outside the ICU, could represent a new feasible strategy to manage patients after ICU discharge, especially those with care limitations. A follow-up visit, after ICU discharge, from a member of the ICU staff could be recommended in this new scenario. Nurse-led critical care outreach services demonstrated benefits in terms of improved patient care and reduction in adverse events (Sumner and Yadegafar, 2011). Since the end of the 1990’s, studies suggest that early recognition of patients’ deterioration by ward nurses and their treatment by critical care outreach services help to prevent unexpected morbidity and mortality (NICE, 2018).

ICU survivors, discharged after a long stay and prolonged time of mechanical ventilation require specialized care to minimize Post Intensive Care Syndrome (PICS). Nurses, in every kind of hospital setting (ICU, HDU, general wards), are responsible for managing patients, i.e. aiming for health progress while minimizing risk of hospital-acquired complications, but also for preventing the further spread of disease. Therefore, providing a continuum in the care of patients discharged from the ICU seems evident. Specifically, interventions to avoid PICS should be implemented rapidly by multidisciplinary medical teams during the ICU stay and immediately following ICU discharge. ICU follow-up programs provide support and guidance for those people who had an extended stay in intensive care. How much the COVID-19 pandemic affects the current landscape of critical illness recovery, follow-up and rehabilitation services, in the long-term remains to be evaluated (Bruyneel et al., 2021; Lucchini et al., 2020; Reper et al., 2021). Finally, in all hospital settings, the COVID-19 pandemic caused visiting restrictions for patients’ relatives. The workload and stress on hospital settings was higher, and nurses found new ways to care for and support the relatives (Naef et al., 2021).

Political and organisational decisions, such as the number of ICU beds per country, the presence of HDU beds, ICU and non-ICU nurse staffing and the ICU level can also influence early discharge decisions of ICU patients and increase readmissions. For all these reasons, nursing workload and other well-known risk factors should be considered in planning ICU discharge and delivering adequate nursing staff for HDU.

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**Table 1**  
Nursing Activities Score (NAS) per 24 h at ICU discharge day.

	COVID-19 patients		non-COVID-19 patients	
	n	NAS (points)	n	NAS (points)
Azevedo et al., 2021			600	59.9 [50.9–67.3]
Bruyneel et al., 2020	95	91.8 (±16.7)	1064	68.3 (±22.6)
Lucchini et al., 2019			2606	62.4 [52.6–73.7]
Silva et al., 2011			600	52.8 (±15.8)

NAS: Nursing Activities Score, Mean ± (Standard Deviation), Median [p25–p75].

Fixed staffing models cannot efficiently accommodate for the fluctuation in critical care nursing requirements (Jin et al., 2021). More studies are needed to investigate the role of miss-match between ideal nurse-to-patient ratio, measured with NAS and nurse resources available in ICU, HDU and general wards.

We have always known where the “critical care” area begins, but after the COVID-19 era we need to redefine where “critical care” ends. Has the time finally come to consider “critical care” as the patient’s status instead of where ICU beds are allocated?

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The authors declare they have no conflict of interest.

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