

EDITORIAL



Challenging dogma: low-dose norepinephrine and extubation in obese ICU patients

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Extubation in critically ill obese patients remains a challenging decision. Although traditional weaning indices can help predict readiness, the effect of the interplay between respiratory function and hemodynamic stability remains uncertain. Although prior studies [1, 2] have indicated that patients may be extubated safely with low doses of vasopressors (0.1 µg/kg/min), these studies did not specifically analyze obese patients. Given that obese patients present a clinically distinct phenotype of critically ill patients, with higher incidence of acute respiratory failure, prolonged mechanical ventilation and ICU stay, it is important to study this patient population in isolation to determine the optimal conditions for extubation [3, 4].

In a recent issue of *Intensive Care Medicine*, Dr. De Jong and colleagues present compelling evidence on this topic. Using two large (primary and validation) cohorts of over 1400 critically ill obese patients and 2300 non-obese patients, the authors show that the use of low-dose norepinephrine (<0.1 µg/kg/min) at extubation does not increase the risk of reintubation within 7 days for both patient populations when compared to no norepinephrine, even after adjusting for major confounding factors. However higher doses (>0.1 µg/kg/min) are associated with a higher rate of reintubation [5].

Results from this study have important clinical implications. Classically, to determine readiness for extubation,

multiple protocols and safety screens suggest ensuring resolution of shock, with unclear definitions of whether any level of vasopressor use is safe [6–8]. Often, this can be interpreted as extubating patients when they are vasopressor free, leading to prolongation of mechanical ventilation and potentially poorer patient outcomes and increased usage of healthcare resources. In obese patients, who are likely to have poorer outcomes at baseline, these effects may be exacerbated. This study challenges this paradigm by providing robust safety data that low levels of hemodynamic instability, as defined by low level pressor use, should not be an absolute contraindication against extubation in both obese and non-obese patients.

However, the generalizability of the study's findings requires careful consideration. Almost half of the included patients were surgical patients and most of them were extubated after a short duration of mechanical ventilation. While sensitivity analyses supported similar trends among patients ventilated for more than 24 or 48 h prior to extubation, the results may not be fully applicable to medical patients undergoing prolonged ventilation.

Additionally, due to the study design—based on standard clinical practice—the evaluation of “substantially” high norepinephrine doses (e.g., >0.50 µg/kg/min) was not possible. Nevertheless, the data clearly illustrate a dose-dependent effect of vasopressors at the time of extubation, which prompts several critical questions. First, the underlying etiology of hemodynamic instability (e.g., sepsis, sedative drug effects) may play a pivotal role in patient outcomes. As the authors acknowledge, the influence of sedative drug dosing—which was not addressed in this study—warrants further exploration. The impact

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of persistent sepsis on extubation outcomes—traditionally regarded as a contraindication—remains a critical area for further investigation. Another important consideration is the method used to express norepinephrine dosage (i.e., mg/h versus µg/kg/min), particularly in obese patients. When dosing is adjusted for body weight, it is essential to clarify whether ideal, actual, or adjusted body weight should be used for calculations. Relying on actual body weight, for instance, may result in an underestimation of vasopressor requirements in obese individuals.

In conclusion, the study by De Jong and colleagues offers robust evidence that low-dose norepinephrine (<0.1 µg/kg/min) at extubation is safe for both obese and non-obese patients, challenging the practice of delaying extubation solely due to vasopressor use. These findings advocate for a more tailored, patient-specific approach—especially for obese individuals—and emphasize the need to carefully consider norepinephrine dosing methods and the underlying causes of hemodynamic instability. By integrating these insights, the clinicians can refine the weaning process and enhance patient care in the ICU.

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Declarations

Conflicts of interest

The authors declare no competing interests in relation to this editorial.

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