

To: Out-of-bed extubation: a feasible study

Para: Extubação fora do leito: um estudo de viabilidade

To the Editor,

Weaning from mechanical ventilation represents one of the major challenges and concerns in intensive care units worldwide. The withdrawal time represents at least 40% of the overall mechanical ventilation period. Furthermore, in 30% of clinical cases some incidents will force the clinician to stop the attempt. Fortunately, there have been substantial improvements in mechanical ventilation weaning since release of the weaning and discontinuation ventilation guidelines in 2001,⁽¹⁾ standardizing the clinical practice of weaning protocols. Sedation control, adjusting doses to the minimum amount needed, daily spontaneous breathing trials after satisfying the respiratory assessment criteria and chest physical therapy (inspiratory muscle strength training) in the early stages of the illness, to avoid ventilator-induced diaphragm dysfunction (VIDD), are the cornerstones of current weaning protocols intended to avoid secondary wean failure (SWF). However, there remain many questions on this topic that merit further investigation.

Dexheimer Neto et al. make progress in addressing these as yet unanswered questions.⁽²⁾ The goal was to assess the advantages of extubating a patient after mobilization in an unusual position (seated in an arm chair) compared with the regular practice of extubation in the supine position. They concluded that there were no differences in the results for the two groups, (seated versus supine position).⁽¹⁾

With respect to the three main tools intended to prevent SWF mentioned above, the most poorly understood at present is chest physical therapy. Although controversy still exists because of limited data and a lack of multicenter trials on chest physical therapy,⁽³⁾ it seems pathophysiologically⁽⁴⁾ that this therapy, in association with uncontrolled ventilator modalities, would significantly reduce the incidences of muscle atrophy, structural injury and respiratory muscle fiber remodeling, thereby preventing VIDD and failure to wean. However, the problem extends beyond the specific type of therapy, to when and how to use it. Chest physical therapy protocols are needed to solve this problem. These protocols should be tailored to address the main named causes of VIDD; however, we cannot forget cost effectiveness, respiratory secretion control and general motor muscle training. These are additional major concerns related to and causes of SWF that can interfere with weaning. Pharmacologic therapies such as expectorants, mucolytics, mucokinetics and mucoregulators and non-pharmacologic therapies such as humidification (active or passive), percussion

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and cough assist (manually or mechanically), forced expiratory technique, and intrapulmonary percussive ventilation, although controversial, have been shown to improve the airway. As a result, they have some beneficial effects on pulmonary function, gas exchange, oxygenation and length of stay.⁽⁵⁾ To summarize, chest physical therapy protocols should be developed to improve respiratory outcomes before extubation and create the best conditions for preventing failure to wean. Instead of focusing on how or where we extubate a patient we have focused on the approach we take to preparing the patient for extubation. However, further randomized clinical trials

and research studies are needed to investigate these issues. Additionally, Dexheimer Neto et al.⁽²⁾ improved our understanding of the proper conditions for extubation with their excellent paper.

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AUTHORS' RESPONSE

Resposta dos autores

We thank you for your letter and compliments. Improvements in weaning are crucial to avoiding both unnecessary prolongation of mechanical ventilation and premature extubation because both are related to an increased risk of complications in critically ill patients.⁽¹⁾

As you highlighted, weaning from mechanical ventilation has significantly improved in the last 15 years due to the implementation of weaning protocols.⁽¹⁾ Less sedation, daily trials of spontaneous breathing, and physical therapy in the earliest days of a critical illness have changed our current practice; now, the intensive care unit (ICU) team faces new questions.⁽¹⁻³⁾ When we designed our study, we focused on one specific issue, which was related to how we should schedule our routine care.⁽⁴⁾

Recently, a systematic review was performed that evaluated the efficacy of interventions targeting physical

functioning (PF) among ICU survivors.⁽⁵⁾ As you noted, none of the available trials studying medications or devices showed better outcomes for long-term PF. The conclusion of this systematic review was that the only effective intervention for improving long-term PF is exercise/physical therapy.⁽⁵⁾

However, most of the reports included individualized physical therapy programs that varied in intensity and frequency, from subject to subject.⁽⁵⁾ There are many physiological theories attempting to explain the potentially synergistic effects of these therapies on muscle strength; however, questions regarding the best type and timing (early therapy seems better) of therapy are unanswered.^(5,6) Unfortunately, another important barrier to rehabilitation may be the lack of physical therapists.^(5,6)

In conclusion, the implementation of protocols for preventing ICU-acquired weakness, which combine daily sedation interruption, spontaneous breathing and early physical therapy, are associated with a shorter duration of mechanical ventilation.^(1,3) Supporting and expanding upon your statement, our study was not only about where to extubate a patient but also emphasized that early exercise and mobilization during daily periods of sedation

interruption are the best options for preparing the patient for optimal recovery. However, as you indicated, further research is necessary.

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