



## COMMENT

## Rehabilitation and physiotherapists in the critical care medicine

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Received 30 March 2024; accepted 3 April 2024

Available online xxx

The rehabilitation process is effective care with physical approach for several highly prevalent clinical conditions with associated disability, estimating that over 2 billion people worldwide would benefit from it.<sup>1</sup> Examinations performed in ICU survivors after severe acute respiratory failure have clearly demonstrated that exercise performance and cognitive status might result in impairment up to 5-years later, the patients having higher complex needs which may incur greater health-care costs.<sup>2</sup> The demographic shift together with economic constraints urge reassessment of the trajectory of care for old or very old critically ill patients.<sup>3</sup> Moreover, intermediate unit and specialized respiratory intensive care units have been consequently implemented to assist very disabled patients under prolonged weaning and with tracheostomy.<sup>4</sup>

Indeed, as also shown by the recent COVID-19 pandemic,<sup>5</sup> the goal of the ICU care is not only to avoid immediate death, but also to maintain an acceptable functional autonomy in survivors both after discharge and in the long term.

Since immobilization and subsequent muscle weakness are among the principal causes and consequences of critical

illness, and therefore indication for early (day-1) rehabilitation has been discussed,<sup>6</sup> a step-by-step mobility protocol has been tested as feasible and safe in patients admitted to ICU, in order to promote an earlier recovery and discharge.<sup>7</sup>

The first randomized controlled trial conducted in 104 sedated patients when mechanically ventilated in ICU demonstrated that a strategy for whole-body rehabilitation was safe and associated with less delirium and more ventilator-free days at 1 month compared with controls under standard therapy.<sup>8</sup> In addition, the rate of patients returning to independent functional status (i.e. ability to perform six activities of daily living and to walk independently) at hospital discharge was higher in the intervention group (59%) compared with controls (35%).<sup>8</sup> Other single-center<sup>9</sup> and multi-center<sup>10</sup> studies conducted in a similar setting did not confirm the results in terms of increased survival and reduced disability when compared with standard care. However, programs and outcomes were not fully comparable throughout these trials to derive firm conclusions on the true role of early physical therapy.

Overall, the accumulated evidence to date has suggested that physical rehabilitation in the ICU improves function and reduces ICU and hospital length of stay but it does not appear to impact other stronger outcomes.<sup>11</sup>

Very recently, a systematic review including 15 trials from 2073 participants and comparing active mobilization versus

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<https://doi.org/10.1016/j.pulmoe.2024.04.006>

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usual care in critically ill adults concluded that early physiotherapy did not have an adverse effect on days living nor physical function from leaving hospital to 6-month later; in particular, authors reported a 95% probability that the intervention improved an individual's physical function, as well as a 75% probability that increased days alive after discharge.<sup>12</sup> More interestingly, the same authors were then able to show, by systematically reviewing 67 trials from 7004 ICU patients, that implementation of mobilization was associated with less than 3% chance of adverse events with no increased risk of mortality.<sup>13</sup> This should definitively reassure clinicians and health care professional in the critical care area about safety when performing an early rehabilitative approach.

Intensive and critical care more often requires a global approach to patients. However, in only a few countries do national documents guide recommendations on the staffing levels in ICU, including allied health professionals such as therapists, psychologist, and dieticians. More frequently, there are no guidelines on how to structure the staffing levels in critical care areas; for example, in countries such as Australia and New Zealand.<sup>14</sup> In UK, physiotherapists are provided most frequently, while other specialists of core therapies such as occupational therapists and psychologists are still under-represented in the ICU multi-professional staff.<sup>15</sup> As a whole, higher staffing ratios are associated with higher levels of satisfaction in completing professional roles and responsibilities.<sup>14</sup>

Saying that the physical approach in the critical care area may provide measurable benefits to patients and produces no major adverse events even in the long term,<sup>12,13</sup> physiotherapists play a key role in delivering appropriate care therapies to patients admitted with acquired and/or increased disability following acute episodes.

Early in the new millennium, a study conducted in 17 western European countries reported that almost 25% of ICUs surveyed had no exclusive physiotherapists working in the allocated staff, with substantial differences across countries<sup>16</sup>; unlike North America. In more recent years, exclusive dedication of physiotherapists in ICU is still reported as insufficient in the same world area.<sup>17</sup> In Switzerland 50% of surveyed ICU reported having a specialized physiotherapy team regularly using a rehabilitation approach with early mobilization protocols.<sup>18</sup>

So far, one additional problem in Europe may depend on the lack of a common educational profile of physios employed in the critical care area across different countries.<sup>19</sup> These professionals, indeed, are still marginally involved in the implementation of more modern practices such as noninvasive ventilation to treat acute respiratory failure or to assist the intubation/extubation process in ICU.<sup>16</sup>

However, European Respiratory Society (ERS) and European Society of Intensive Care Medicine (ESICM) jointly published recommendations for optimal practices for physios treating critically ill adults both in terms of respiratory and physical early approach.<sup>20</sup>

More recently, evidence-base recommendations of a safe assessment and intervention strategies for physiotherapists in ICU have been developed to guide frequency, intensity, type, and time of intervention in northern European countries.<sup>21</sup>

The academic programs leading to the bachelor's degree in physiotherapy also diverge in different countries worldwide and generally mainly focus on the assessment and treatment of musculoskeletal and neurological diseases, rather than address the acquisition of round-the-clock skills to manage disabilities whenever they occur in human beings. However, minimum clinical standards to practice as autonomous physiotherapists in ICU have been established with substantial agreement in very different contexts.<sup>22-26</sup> At present, the ERS-HERMES (Harmonised Education and Training in Respiratory Medicine for European Specialists) exist as a specific post-graduate program of education and training aimed at developing advanced skills and knowledge for physiotherapists working in the clinical area of cardiorespiratory disorders and critical care.<sup>27</sup> The exact percentage of specialized physiotherapists is however not available. In Portugal, 54% of graduate physios acquired specific cardiorespiratory post-graduate skills, but only 15% of them is employed in the field.<sup>28</sup> In Italy, a nationwide web-survey showed that only 18% were working with acute COVID-19 patients.<sup>29</sup>

Future directions include determining the optimal modality to deliver physiotherapy and whole rehabilitation in ICU, including all those co-interventions related to the patients' need.<sup>30</sup> Understanding trajectories of patient recovery and determining subgroups that may be of maximum benefit<sup>31</sup> is the goal to address and implement the optimal allocation of resources of health care professionals; these are still scarce. Physiotherapists should constitute an essential although minimal workforce to speed up the recovery of the individual person admitted to critical care.

## Conflict of interest

The authors have no conflicts of interest to declare related to the content of the manuscript.

## Funding

The authors declare that no funding was received for this paper.

## Consent to publish data

Not applicable.

## Acknowledgments

Not applicable.

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