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Original Article

From bedside to beyond: The long-term impact of early mobilization in the ICU

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SUMMARY

Advances in critical care have substantially reduced intensive care unit (ICU) mortality; however, survivors frequently face long-lasting sequelae, including physical disability, cognitive decline, psychological disorders, and impaired health-related quality of life (HRQoL), collectively known as post-intensive care syndrome (PICS). Critical illness weakness (CIW) is a major contributor to the physical dimension of PICS and is associated with adverse short- and long-term outcomes. EM has been proposed as a key non-pharmacological intervention to mitigate CIW, preserve muscle mass and function, and improve patient recovery. Evidence consistently demonstrates that EM is feasible and generally safe in the ICU setting, and that it confers several short-term benefits, including improved functional independence, reduced duration of delirium, and fewer complications such as ventilator-associated pneumonia and venous thromboembolism. However, the impact of EM on long-term outcomes remains uncertain. Meta-analyses and smaller trials suggest that EM may improve patient-reported physical function at 6 months, but large randomized controlled trials and longer follow-up studies have not shown sustained improvements in objective measures of physical performance, cognitive outcomes, or HRQoL. Several factors may account for these discrepancies, including heterogeneity of mobilization protocols, variations in patient selection, limited continuation of rehabilitation after ICU discharge, and the

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complex multifactorial nature of long-term impairments. Integration of EM with optimal nutrition and multimodal rehabilitation strategies may hold greater promise, but robust evidence is lacking. Overall, while EM remains a cornerstone of ICU rehabilitation with clear short-term benefits, its long-term impact is less certain, underscoring the need for further high-quality, patient-centered research.

Introduction

Advances in critical care have markedly reduced intensive care unit (ICU) mortality, yet survivors frequently experience long-term sequelae after discharge, including new or worsening physical disability, cognitive decline, psychological disorders, and impaired health-related quality of life (HRQoL), collectively defined as post–intensive care syndrome (PICS). [1] In addition, ICU survivors remain at elevated risk for post-discharge complications such as exacerbations of chronic disease, cardiovascular events, infections, rehospitalizations, and increased mortality. [2].

A central driver of the physical dimension of PICS in the acute phase is critical illness weakness (CIW), [3] a syndrome affecting approximately 40% of ICU patients. CIW, which can arise within days of bed rest and mechanical ventilation, manifests as symmetrical weakness of the limb and respiratory muscles, while typically sparing facial muscles but potentially involving bulbar and oropharyngeal muscles, thereby contributing to swallowing disorders (dysphagia). [3,4] It encompasses critical illness myopathy (CIM), critical illness neuropathy (CIN), and disuse atrophy. [5].

CIW pathophysiology involves excessive proteolysis, [6] impaired autophagy, [7] mitochondrial dysfunction, [8] and defective satellite cell-mediated repair, [9] all of which are exacerbated by persistent inflammation. A chronic low-grade inflammatory state may further accelerate muscle aging (“inflamm-aging”). [10].

CIW adversely influences short-term outcomes—such as prolonged mechanical ventilation, increased length of stay, and in-hospital mortality [11]—as well as long-term prognosis. The persistence of weakness (defined as a Medical Research Council sum score (MRCss) below 55) has been associated with increased medium- and long-term mortality. [12,13] Survivors frequently report severe weakness and fatigue, [3,14–17] reduced force generation and endurance, [18] diminished aerobic capacity, [19] and impaired performance on the 6-minute walk test, [20] all of which contribute to decreased HRQoL and functional independence. [21].

Notably, increases in muscle mass do not directly equate to functional recovery, as survivors often regain muscle bulk before strength, reflecting persistent impairments in muscle quality and neuromuscular function despite weight regain [22]. Therefore, our review prioritizes functional metrics (e.g., 6-minute walk distance, handgrip strength, ability to perform ADLs) over raw muscle mass as outcome measures of recovery.

Despite its profound short- and long-term consequences, no pharmacological therapy has yet proven effective in preventing or treating CIW. Current strategies rely mainly on sedation minimization, nutritional optimization, and physical and mental rehabilitation. This narrative review aims to synthesize current evidence on EM in the ICU, with a particular focus on its long-term effects in critically ill survivors.

Early mobilization in the ICU

Rehabilitation is defined as “a set of interventions designed to optimize functioning and reduce disability in individuals with a health condition.” [23] Within this framework, EM represents a core intervention aimed at facilitating patient movement and energy expenditure to promote recovery. [24] Depending on the patient's clinical status, EM may range from passive limb movements to active exercises, progressing to bedside sitting, standing, and eventually assisted walking.

The definition of “early” is heterogeneous across the literature, with initiation ranging from 24 hours to 14 days after ICU admission. In a 2019 network meta-analysis, Ding *et al.* [25] suggested that starting EM within 48–72 hours is optimal for improving CIW and reducing the duration of mechanical ventilation, although no significant differences were observed in ICU length of stay. Based on these findings and subsequent meta-analyses, current guidelines recommend initiating EM within 72 hours of ICU admission. [26].

Several strategies have been proposed to optimize EM in the ICU. First, incorporating EM into the ABCDEF bundle can systematically reduce the risks associated with pain, sedation, delirium, and immobility. [27] Second, establishing multidisciplinary teams—including physicians, nurses, and physiotherapists—enables daily assessment of patient safety criteria (hemodynamic stability, adequate oxygenation, absence of contraindications such as unstable fractures or high-dose vasopressors). Using dedicated assessment tools, teams can tailor interventions to the patient's condition, optimizing the timing, type, and intensity of mobilization. [28,29].

To standardize practice, the ICU Mobility Scale (IMS) has been developed as a quick, reliable, 11-item tool designed to capture the highest level of a patient's functional mobility in the ICU, encompassing only active mobilization. [30,31] Adoption of IMS-guided protocols has been associated with higher mobilization levels and longer session duration, [32] though such strategies have not yet demonstrated superiority over usual care in terms of patient-centered outcomes. [33] Similarly, the Surgical Optimal Mobilization Score (SOMS), initially developed for surgical ICU patients, is now widely applied across ICU populations. [34] This stepwise protocol integrates both passive and active activities (from passive range of motion to walking) and has been endorsed in recent guidelines as a pragmatic, less aggressive approach to mobilization, minimizing patient burden. [35].

Finally, the concept of EM “dose” is receiving growing attention. While prolonged mobilization sessions have been associated with greater benefits, [36] the most effective dose likely depends on individual factors, including baseline functional status and underlying disease. [35] Notably, most clinical trials have excluded patients with pre-ICU functional dependency, limiting the generalizability of findings to this vulnerable subgroup.

Short-term benefits of early mobilization

The effectiveness of EM, particularly when initiated within 72 hours of ICU admission, is supported by growing evidence demonstrating a range of benefits in critically ill patients (Figure 1). By providing a mechanical and metabolic stimulus to muscle fibers, EM helps preserve muscle mass and strength, acting as a protective strategy against neuromuscular degradation and severe deconditioning. [37] Even when active exercise is not feasible, passive interventions such as range-of-motion exercises or passive cycle ergometry have been shown to attenuate muscle atrophy. [38].

Randomized controlled trials indicate that initiating mobilization within 72 hours of mechanical ventilation is associated with improvements in functional independence, mobility, length of ICU and hospital stay, delirium-free days, ventilator-free days, likelihood of discharge home, and in some cases, long-term functional and cognitive outcomes (Table 1 and 2). Moreover, simple activities such as assisting patients to a sitting or standing position can improve pulmonary mechanics, enhance secretion clearance, and reduce the risk of ventilator-associated pneumonia (VAP). [39] EM also supports circulatory function and venous return, thereby lowering the risk of thromboembolic complications. This protective effect against deep vein thrombosis was reinforced by a post-hoc analysis of the multicenter PREVENT trial, originally designed to assess venous thromboprophylaxis. [40].

Collectively, these findings highlight the multifaceted short-term benefits of EM in the ICU, defined as benefits whose results are visible within hospitalization time. While observational data suggest a potential survival advantage, the possibility of residual confounding means this effect should be interpreted with caution.

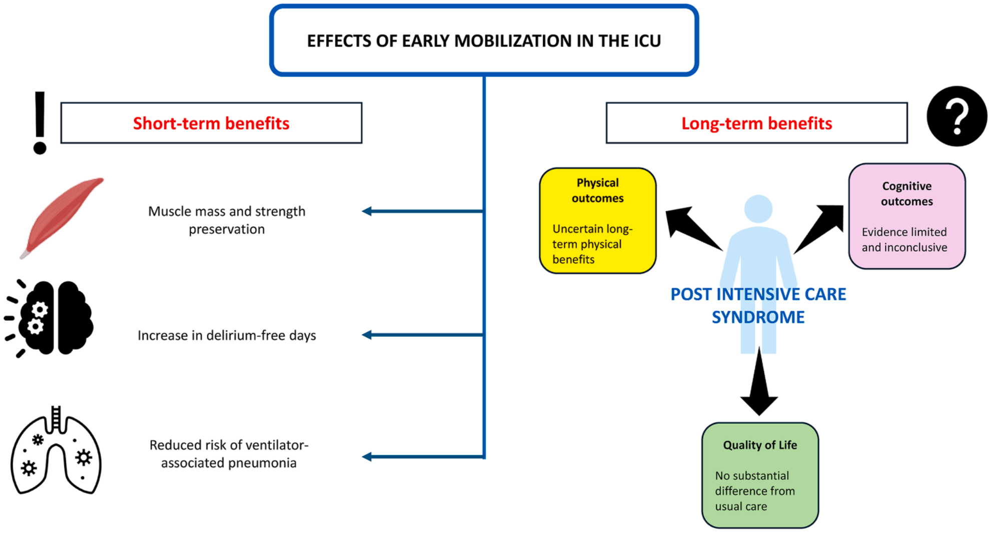

Figure 1. Illustrative summary of the effects of early mobilization in the ICU on patient outcomes across physical and cognitive domains, in both the short-term (ICU phase) and long-term (post-ICU) recovery phase. The left side (ICU) highlights early mobilization's immediate benefits: preventing or lessening CIW, improving respiratory function and mobility, and reducing delirium. The right side depicts long-term outcomes: patients who received early mobilization may achieve better functional mobility and physical independence (improved walking capacity and ability to perform daily activities) and possibly experience a lower incidence of long-term cognitive impairment or dementia-related symptoms. However, long-term benefits are not consistently observed in all studies.

Safety and feasibility of EM and barriers to implementation

EM (EM) protocols have been shown to be feasible across a wide range of ICU settings, including in patients who are invasively ventilated, [28] those with indwelling catheters, and even during the first days of ICU admission. [41] Adverse events (AEs) reported during EM are generally infrequent, mild, and self-limiting. The most common include transient desaturation, tachypnea, hemodynamic fluctuations, accidental loss of devices, and postural hypotension, all of which typically resolve without clinically relevant consequences. [35,42,43] Serious adverse events (SAEs)—such as endotracheal tube dislodgement, cardiac arrest, sustained hypoxemia, or falls—are rare but can occur.

A post-hoc analysis of the TEAM trial [33] illustrated this balance between safety and risk: among 371 patients in the EM group, 37 (10.0%) experienced AEs, compared with 16 of 370 patients (4.3%) in the usual care group. In total, 71 AEs were recorded in the intervention arm versus 24 in usual care. Events also tended to occur earlier with active mobilization (median day 4) compared with usual care (median day 7). SAEs were uncommon but occurred in seven EM sessions compared with one in usual care. It is important to note that in the TEAM trial, both groups received mobilization, and the intervention protocol began each session with the highest possible level and duration of activity, rather than following a gradual escalation approach, which may have influenced event rates. This highlights the importance of a balanced approach – while mobilization is beneficial, excessive intensity without titration can provoke fatigue or instability.

EM may be particularly beneficial for older, frail patients or those with low muscle mass (sarcopenia), as these individuals are most vulnerable to rapid deconditioning. However, they also have limited physiological reserve, so mobilization must be tailored and closely monitored in this cohort. Studies including predominantly older adults have shown feasibility of early mobility with appropriate adjustments, but also that frailty is associated with higher risk of delirium and mortality despite rehab. [10] This underscores the need for an individualized approach to EM in the elderly/frail population.

Table 1
Short-term (ICU) effects of early mobilization: summary of randomized controlled trials

Trial (Reference)	Intervention (Early vs Control)	Early Outcomes (ICU)
Schweickert *et al.*, Lancet 2009	Early PT + daily sedation interruption vs usual care	• Ventilator-free days at 28 days: 21 vs 21 (null) • Delirium duration: 2.0 vs 4.0 days (favorable, p=0.02) • Independent functional status at hospital discharge: 59% vs 35% (favorable, p=0.02)
Schaller *et al.*, Lancet 2016 (SOMS trial)	Early goal-directed mobilization (SOMS protocol) vs standard care in surgical ICU	• SOMS level in ICU: 2.2 vs 1.5 (favorable, p<0.0001) • ICU LOS: 7 vs 10 days (favorable, p=0.0054) • Mobility score (mmFIM) at hospital discharge: 8 vs 5 (favorable, p=0.0002)
Morris *et al.*, JAMA 2016	SRT vs usual care	• Hospital LOS ~10 days both groups (no difference) • Muscle strength/physical function at ICU discharge (no significant difference)
Moss *et al.*, AJRCCM 2016	Intensive PT program vs standard PT in ICU	• Duration of MV, ICU/hospital LOS: no difference (not favorable) • Muscle strength at discharge: no difference
Zhou *et al.*, PLOS One 2022 (EMAS)	Early mobilization (within 24h), alone or combined with early nutrition, vs usual care	• CIW at ICU discharge: 2% vs 16% (favorable, p=0.014) • MRC score at ICU discharge: improved in EMN vs control (favorable, p=0.028) • Barthel Index at ICU discharge: 70.0 vs 57.5 (favorable, p=0.022)
TEAM Study, NEJM 2022	Daily active mobilization during MV vs usual care	• MV duration and ICU LOS: ~14 days both groups (no difference) • Delirium, muscle strength: no significant differences
Patel *et al.*, Lancet Respir Med 2023	Multidisciplinary early mobilization (PT) vs usual care	• Cognitive impairment at hospital discharge: 54% vs 69% (favorable, p=0.029) • Functional independence at discharge: 65% vs 62% (no difference)

CIW = critical illness weakness; ICU = intensive care unit; LOS = length of stay; PT = physical therapy; SOMS = Surgical ICU Optimal Mobilization Score; SRT = standard rehabilitation therapy.

To support clinical decision-making, recent guidelines [26,35,42] provide recommendations on when mobilization should be initiated or discontinued to minimize the risk of AEs. Still, several barriers can limit EM in practice. The presence of indwelling catheters is frequently cited, particularly in patients receiving continuous renal replacement therapy (CRRT) or extracorporeal membrane oxygenation (ECMO). A systematic review by Mayer *et al.* [44] reported very low complication rates in patients undergoing CRRT, with SAEs in 0.24% and AEs in 1.55% of cases, although catheter location was not specified. In ECMO patients, Braune *et al.* [45] observed cannulation-site bleeding requiring transfusion or surgery in 6.9% of actively mobilized patients versus 15.3% of those not mobilized. Across 332 mobilization sessions, only a single femoral cannula dislodgement was reported, which was immediately and successfully recannulated.

Finally, resource-related barriers must also be acknowledged. Successful EM programs require adequate staffing levels, dedicated rehabilitation specialists, and an established ICU culture that prioritizes mobility. [46] Without these elements, widespread and consistent implementation of EM remains challenging.

Long-term outcomes of EM

As anticipated, the impact on long-term outcomes – defined as outcomes assessed at 6–12 months post-ICU discharge – remains uncertain. One reason may be that the benefits of EM initiated in the ICU are often diminished after transfer to general wards, where mobilization is frequently reduced. In many institutions worldwide, continuation of mobilization—and consistent application of elements

Table 2
Long-term (post-ICU) effects of early mobilization: summary of randomized controlled trials

Trial (Reference)	Intervention (Early vs Control)	Late Outcomes (Post-ICU)
Schaller *et al.*, Lancet 2016 (SOMS trial)	Early goal-directed mobilization (SOMS protocol) vs standard care in surgical ICU	• In-hospital mortality: 16% vs 8% (not favorable, ns) • 3-month mortality: 22% vs 17% (not favorable, ns)
Morris *et al.*, JAMA 2016	Standardized Rehabilitation Therapy (SRT) vs usual care	• Physical performance at 6 months (SPPB): 9 vs 8 (favorable, p=0.004) • QoL (SF-36 physical): 31.1 vs 30.8 (favorable, p<0.04) • Functional Performance Index at 6 months: 2.2 vs 2.0 (favorable, p=0.02)
Moss *et al.*, AJRCCM 2016	Intensive PT program vs standard PT in ICU	• Physical function at 1, 3, 6 months (CS-PFP10): no difference • Global functional recovery at 6 months: no difference
TEAM Study, NEJM 2022	Daily active mobilization during MV vs usual care	• Days alive and out of hospital at 180 days: 143 vs 145 (no difference, p=0.62) • Mortality at 180 days: 22.5% vs 19.5% (not favorable, ns) • Physical function, ADLs, QoL, cognition at 6 months: no significant differences
Patel *et al.*, Lancet Respir Med 2023	Multidisciplinary early mobilization (PT) vs usual care	• Cognitive impairment at 12 months: 24% vs 43% (favorable, p=0.0043) • CIW at 12 months: 0% vs 14% (favorable, p=0.0001) • QoL physical (SF-36) at 12 months: 52.4 vs 41.1 (favorable, p<0.0001) • Functional independence at 12 months: 65% vs 62% (no difference); QoL mental: no difference.

CIW = critical illness weakness; MV = mechanical ventilation; PT = physical therapy; QoL: quality of life.

of the ABCDEF bundle (e.g., pain management, delirium assessment and treatment, mobilization, and family engagement)—is less rigorous outside the ICU; continuation of rehabilitation after hospital discharge is also variable across countries. To better understand the broader implications, the long-term effects of EM can be considered in relation to each component of post–intensive care syndrome (PICS): physical, cognitive, psychological, and health-related quality of life (HRQoL).

Physical long-term outcomes

Evidence on the long-term physical effects of EM in ICU patients remains mixed. Meta-analytic [47] data suggest that EM probably improves self-reported physical function at 6 months among survivors, yet it does not consistently translate into gains in objective outcomes such as days alive and out of hospital at 180 days or 12-month walking capacity. Large RCTs, including the TEAM trial [33] and Moss *et al.* [48], found no significant improvement in long-term functional performance, while Denehy *et al.* [49] similarly reported no sustained benefit at 12 months despite early post-ICU rehabilitation. By contrast, smaller trials and systematic reviews (e.g., Menges *et al.*) [50] indicate possible improvements in mobility outcomes such as the 6-minute walk distance at 3–12 months. Importantly, while EM is generally feasible, some trials have signaled an increased risk of adverse events, underscoring the need to refine patient selection, timing, and intensity.

Notably, the recent TEAM trial found no improvement in 6-month functional outcomes with a high-intensity EM protocol, even as it increased daily activity time substantially [33]. This suggests that simply increasing exercise dose beyond a threshold may yield diminishing returns and could induce fatigue-related setbacks, underscoring the need to individualize intensity. Emerging evidence suggests that 'quality over quantity' is key – excessively aggressive mobilization can lead to fatigue or transient setbacks, whereas a tailored approach (even a single well-planned daily may maximize benefits without overstressing the patient [32].

Across these trials, patient demographics were largely comparable: most studies enrolled middle-aged to older adults (median ages in the 50s–60s) with a majority being male, reflecting typical ICU populations. However, differences in case mix and inclusion criteria exist. For example, Schaller *et al.* focused on post-surgical ICU patients [33], whereas the multicenter TEAM trial predominantly included medical ICU patients with sepsis (≈66% of participants) [32]. Moreover, many trials excluded individuals with severe pre-ICU frailty or neurological impairment, which limits direct comparability of outcomes across studies. These variations should be kept in mind when interpreting the collective evidence. Differences in baseline age, sex, frailty, and illness severity between study cohorts could partly explain the variability in reported effects of early mobilization.

Collectively, the literature highlights EM's potential for enhancing recovery in selected populations, but its long-term physical benefits remain uncertain and require further high-quality investigation.

Cognitive outcomes

Cognitive impairment is a major component of the PICS and can persist for months to years after critical illness. While EM has been extensively studied for its impact on physical recovery, evidence for its role in modifying long-term cognitive outcomes remains limited and inconclusive. The theoretical rationale is strong: EM may reduce delirium duration and severity in the ICU, a well-established risk factor for subsequent cognitive decline. Indeed, some early studies suggested that increased mobility might shorten delirium episodes, thereby indirectly protecting against later neurocognitive sequelae. [41,51] However, subsequent larger randomized controlled trials such as the TEAM trial [33] and the intensive physical therapy program studied by Moss *et al.* [48] did not demonstrate meaningful differences in long-term cognitive outcomes at 6 or 12 months compared with usual care.

Systematic analysis of the evidence echoes these findings. A recent Bayesian meta-analysis by Paton *et al.* [47] concluded that although EM probably improves physical function at 6 months, its effect on cognitive function was not supported by available trial data. Similarly, Menges *et al.* [50] reported that evidence for an impact of EM on cognitive domains was of very low certainty, with no consistent signal of benefit. Observational follow-up cohorts (e.g., Dehehy *et al.*) [49] also found no significant differences in cognitive status at 12 months despite structured early rehabilitation interventions.

Subsequently, Patel *et al.* [52] conducted a small (200 patients in total) single-center, parallel, randomized controlled trial, comparing EM with usual care; the primary outcome was cognitive impairment 1 year after hospital discharge. The rate of cognitive impairment at 1 year with early mobilization was 24% compared with 43% with usual care.

Taken together, the literature suggests that while EM is safe and may reduce delirium duration during the ICU stay [41,53] this benefit does not consistently translate into long-term improvements in cognitive function. The persistence of cognitive impairment in ICU survivors likely reflects a multifactorial pathogenesis, including neuroinflammation, hypoxemia, sedative exposure, and critical illness–related encephalopathy, which mobilization alone may not be sufficient to mitigate. Future larger trials specifically are needed to clarify whether EM can play a more targeted role in protecting against long-term cognitive decline.

Quality of life

Health-related quality of life (HRQoL) is a central outcome for survivors of critical illness, reflecting the multidimensional impact of physical, psychological, and social sequelae. EM has been widely promoted as a strategy to improve recovery, but the evidence regarding its effect on long-term HRQoL remains inconsistent. Several randomized controlled trials (RCTs) and observational studies have assessed HRQoL using standardized tools such as the SF-36, EQ-5D, and disease-specific instruments.

The seminal trial by Schweickert *et al.* [41] demonstrated that EM was feasible and associated with reduced delirium and improved functional independence at hospital discharge, yet long-term HRQoL outcomes were not substantially different from usual care. Larger subsequent RCTs, including the TEAM trial [33], confirmed no improvement in HRQoL at 6 months, despite high adherence to mobilization protocols. Similarly, Moss *et al.* [48], testing an intensive physical therapy program, reported no significant differences in HRQoL up to 6 months post-ICU.

Longer-term follow-up studies also reinforce this picture. Denehy *et al.* [49] in a 12-month RCT follow-up, found no sustained HRQoL differences between early rehabilitation and usual care groups. Menges *et al.* [50], in their systematic review, concluded that the certainty of evidence for an effect of EM on HRQoL was low, with no consistent or clinically meaningful benefits demonstrated. Finally, a Bayesian meta-analysis by Paton *et al.* [47] found no robust evidence of HRQoL benefit.

In the already cited Patel *et al.* [52] trial, the authors find a higher physical component score on quality-of-life testing than did the usual care group (median 52·4 [IQR 45·3–56·8] vs median 41·1 [31·8–49·4]; p<0.0001).

Taken together, the literature suggests that EM does not consistently enhance long-term HRQoL. The absence of sustained effects likely reflects the multifactorial drivers of poor quality of life in ICU survivors, including psychological distress, cognitive impairment, persistent inflammation, sarcopenia, and comorbidities. In fact, several new conditions have been described as part of PICS, such as dysphagia, sleep disorders, new-onset diabetes, sexual dysfunctions, endocrine disturbances, pain, and autonomic dysfunction. [3].

These findings underscore the need for multimodal rehabilitation strategies, integrating physical, psychological, cognitive, and social support, rather than relying on mobilization alone, and to meaningfully improve HRQoL after critical illness. Moreover, rehabilitation should extend beyond the ICU, continuing throughout the hospital stay and after hospital discharge whenever needed.

Interaction between nutrition and EM

In recent years, a small but growing body of literature has examined the combined effect of nutrition and physical rehabilitation in critically ill patients during the acute phase. Retrospective studies from Japan suggest that higher energy and protein intake during early mobilization is associated with preserved muscle mass and a lower incidence of ICU-acquired weakness [54,55], while a secondary analysis of the CYCLIST trial linked nutritional risk, rather than protein intake or in-bed cycling, to muscle loss. [56] Only one randomized controlled trial to date demonstrated that a multimodal intervention combining physiotherapy, high-protein supplementation, and neuromuscular electrical stimulation attenuated muscle wasting and delirium, although without impact on length of stay or ventilation duration. [57] Two ongoing trials (NCT03021902 and NCT05877989) are expected to clarify whether combining high-protein delivery with early exercise improves functional recovery.

To date, evidence on the combined role of nutrition and physical rehabilitation after critical illness remains extremely limited. The most recent large multicenter trial, [58] demonstrated improved patient satisfaction with enhanced rehabilitation and nutritional therapy but found no effect on physical recovery or quality of life at 6 or 12 months after discharge. The ongoing PHOENIX trial (NCT06159868) will assess the feasibility of a ward-based program integrating individualized physiotherapy and optimized nutrition guided by indirect calorimetry. Nutritional management in the post-ICU phase is challenging, as survivors frequently face functional, physiological, psychological, organizational, and social barriers to adequate intake, with studies suggesting that food insecurity and reduced intake are common yet underrecognized problems. Overall, the available evidence does not currently support the effectiveness of combined nutrition and rehabilitation interventions delivered after ICU discharge in improving long-term outcomes.

Recently, anabolic adjuvant treatments (testosterone, β-hydroxy-β-methylbutyrate, and ketone) have been proposed to restore lean body mass and function (ISRCTN13903536, NCT05825092).

Collectively, current evidence suggests that integrated nutrition and rehabilitation strategies may mitigate muscle loss and CIW, but individualized nutrition plans, combined where appropriate with physiotherapy and anabolic co-interventions, should be evaluated against usual care in robust, pragmatic RCTs.

Conclusion

Early rehabilitation, and in particular early mobilization, has emerged as a cornerstone non-pharmacological strategy to counteract critical illness weakness and its sequelae. While short-term benefits are well supported—such as improvements in functional independence, muscle preservation, and reduced delirium—the impact on long-term outcomes remains far less consistent. Current evidence shows that early mobilization may improve patient-reported physical function, yet robust effects on objective physical performance, cognitive recovery, or health-related quality of life have not been reliably demonstrated. Safety concerns and heterogeneity in implementation underscore the need for individualized approaches that consider timing, intensity, and patient selection. Importantly, integration with adequate nutritional support and multimodal rehabilitation appears essential to optimize recovery, given the multifactorial nature of post–intensive care syndrome. Future research should focus on well-designed trials with long-term follow-up, targeting multimodal strategies and patient-centered outcomes, to better define the role of early rehabilitation in improving survivorship after critical illness.

Statement of authorship

Elisabetta Roberti: Conceptualization, literature review, drafting of the manuscript, critical revision of the text, approval of the final version.

Michele Bertoni: Literature review, drafting of sections of the manuscript, data interpretation, critical revision, approval of the final version.

Simone Piva: Supervision, critical revision for important intellectual content, guidance on clinical and methodological aspects, approval of the final version.

Nicola Latronico: Senior supervision, critical revision for intellectual content, expertise in ICU-acquired weakness and long-term outcomes, approval of the final version.

All authors have materially participated in the preparation of this article, have reviewed the final manuscript, and agree to its submission for publication.

Declaration of competing interest

The authors declare that they have no conflicts of interest related to this work.

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