

Multidisciplinary care for ICU-Acquired Weakness in Adults: a scoping review

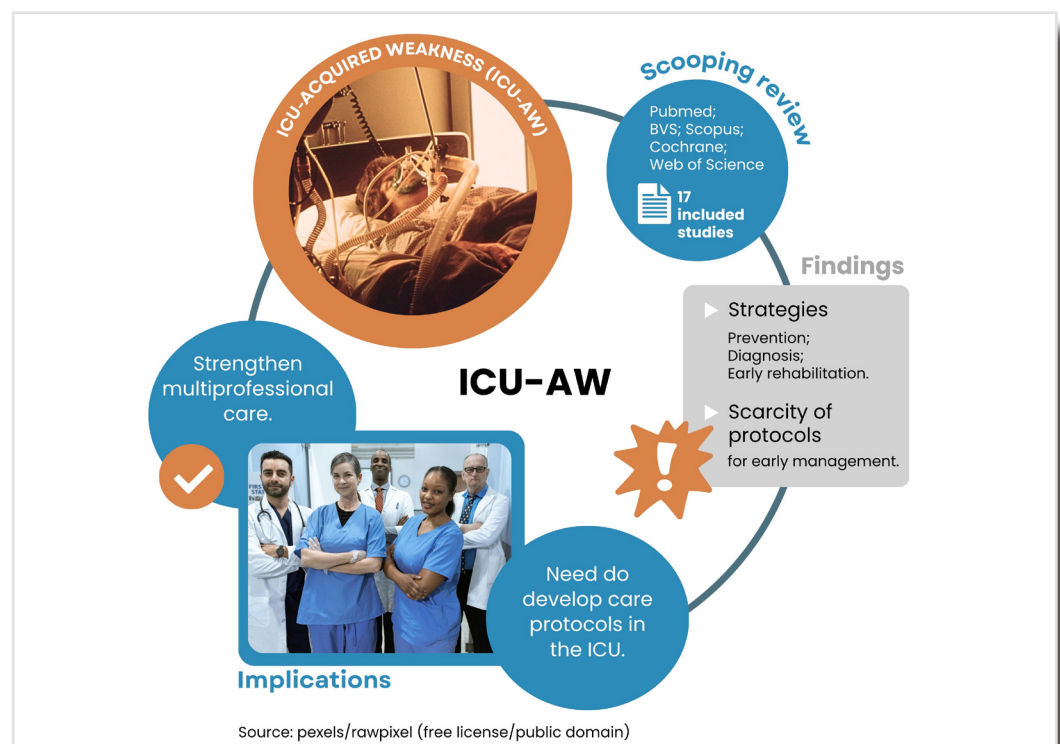
Isabel Cristina Veras Aguiar¹  Fernanda Costa de Mesquita Souza¹  Francisco Sonyanderson da Silva¹ 
Valter Cordeiro Barbosa Filho¹ 

¹Universidade Estadual do Ceará – UECE. Fortaleza/CE, Brasil.
E-mail: icvaguair@uol.com.br

Graphical Abstract

Highlights

- Summarizes studies on multiprofessional recommendations and protocols for ICU-AW in adults.
- Maps structured care strategies for the application of ICU-AW management in the intensive care setting.
- Identifies consensus, divergences, and gaps in the available literature.
- Highlights the importance of multiprofessional collaboration in standardizing care.
- Supports the improvement of care practices in intensive care units.



Abstract

This scoping review aimed to map evidence on multiprofessional care recommendations and protocols for adults with ICU-acquired weakness (ICU-AW), identifying practices and gaps in the literature. The review was conducted in accordance with the methodological recommendations of the Joanna Briggs Institute and reported following the PRISMA-ScR checklist. The search was performed in March 2025 in the MEDLINE/PubMed, BVS, Scopus, Web of Science, and Cochrane Library databases, using DeCS/MeSH descriptors combined with free-text terms. Original articles, reviews, and clinical guidelines published from 2020 onwards, in English, Portuguese, or Spanish, were included. A total of 734 records were identified, of which 373 remained after duplicate removal. Following screening and full-text reading, 17 studies were included. The findings indicate the use of strategies such as early mobilization, neuromuscular electrical stimulation, and multiprofessional care organization in the management of ICU-AW. Heterogeneity among interventions was observed, as well as the absence of widely standardized and integrated protocols in the intensive care context. It is concluded that, although different strategies are described in the literature, gaps persist regarding the standardization and integration of multiprofessional care, highlighting the need for studies that support the consolidation of more consistent recommendations for clinical practice.

Keywords: Muscle Weakness. Early Ambulation. Disease Prevention. Critical Care. Intensive Care Units.

Associate Editor: Edison Barbieri

Reviewer: Alexandre Ricardo Pepe Ambrozini 

Mundo Saúde. 2026,50:e18952025

O Mundo da Saúde, São Paulo, SP, Brasil.

<https://revistamundodasaude.emnuvens.com.br>

Received: 11 november 2025.

Accepted: 07 april 2026.

Published: 04 may 2026.

INTRODUCTION

Intensive Care Unit-Acquired Weakness (ICU-AW) is a frequent complication in critically ill patients hospitalized in intensive care units (ICUs). It is characterized by a significant reduction in muscle strength, predominantly affecting the limbs, and is associated with various clinical factors, including sepsis, prolonged immobilization, hyperglycemia, and the use of glucocorticoids and neuromuscular blocking agents¹. The prevalence of this condition in critically ill patients ranges between 25% and 31%, representing a major clinical problem due to its negative impact on functional recovery and quality of life following hospital discharge².

ICU-AW is associated with adverse clinical outcomes, including prolonged duration of mechanical ventilation, increased length of hospital stay, and higher mortality¹. Furthermore, it may result in persistent functional limitations, cognitive impairment, and a higher risk of institutionalization after hospital discharge, posing a significant challenge for the rehabilitation and recovery of critically ill patients.

Several risk factors for the development of ICU-AW have been described in the literature, including modifiable and non-modifiable determinants. Among the modifiable factors, hyperglycemia, early parenteral nutrition, use of vasoactive drugs, antibiotics, corticosteroids, neuromuscular blocking agents, and sedatives stand out, in addition to immobility resulting from prolonged bed rest^{3,4}. In this context, therapeutic strategies aimed at the prevention and early management of muscle weakness have been progressively incorporated into clinical practice in intensive care.

In this setting, the multiprofessional team plays a central role in implementing integrated care strategies. The coordinated work of professionals such as physicians, nurses, physiotherapists, nutritionists, pharmacists, and speech-language therapists enables early and coordinated interventions that

contribute to the reduction of complications and to the functional recovery of critically ill patients⁵.

Previous studies have investigated different interventions for the management of ICU-AW, including early mobilization, neuromuscular electrical stimulation, nutritional support, ventilatory strategies, and pharmacological management^{5,6,7,8}. Systematic reviews available in the literature focus primarily on evaluating the efficacy of specific interventions, such as early mobilization or neuromuscular electrical stimulation, demonstrating potential benefits in preventing muscle weakness and improving functional outcomes^{5,6}.

However, despite the existence of systematic reviews focused on specific interventions, a gap persists in the literature: the absence of syntheses that comprehensively integrate multiprofessional care recommendations and protocols for ICU-AW management in the intra-ICU context. This limitation hinders understanding of how different strategies can be coordinated in clinical practice.

In this regard, the scoping review presents itself as an appropriate methodological approach for mapping and synthesizing broad and heterogeneous evidence, enabling the identification of concepts, care strategies, and gaps in the scientific literature. Unlike traditional systematic reviews, which focus on evaluating specific interventions, the scoping review allows for a comprehensive exploration of multiprofessional care organization and recommended protocols for ICU-AW management.

The identification of such evidence may contribute to the improvement of care practices in intensive care units, particularly in contexts that require integrated strategies for prevention, early diagnosis, and functional rehabilitation.

Therefore, this study aimed to map evidence on multiprofessional care recommendations and protocols for adults with ICU-AW, identifying practices and gaps in the literature.

METHOD

This study consists of a scoping review conducted in accordance with the methodological recommendations of the Joanna Briggs Institute (JBI) and reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.

The review protocol was registered on the Open Science Framework (OSF) platform (osf.io/36pbg).

The research question was structured based on the PCC (Population, Concept, and Context) framework, recommended for scoping reviews. The population was defined as adults with ICU-ac-

quired weakness (ICU-AW), the concept as multi-professional care recommendations and protocols, and the context as intensive care units. The guiding question was: “What multiprofessional care recommendations and protocols for adults with ICU-AW are described in the scientific literature?”

Original articles, reviews, and clinical guidelines published between 2020 and 2025, in English, Portuguese, or Spanish, that addressed recommendations, strategies, or protocols related to multiprofessional care in the diagnosis, prevention, treatment, or rehabilitation of ICU-AW within the intensive care unit setting were included. Studies describing the roles of professionals involved in patient care were considered. Excluded were studies that addressed muscle weakness only after ICU discharge, those that did not present recommendations or protocols related to multiprofessional care, studies that dealt exclusively with isolated interventions without articulation between different professionals, and publications without full text available.

The literature search was performed in March 2025 in the following databases: Medical Literature Analysis and Retrieval System Online (MEDLINE/PubMed), Biblioteca Virtual em Saúde (BVS), Scopus, Web of Science, and Cochrane Library. The search strategy was developed using descriptors from the Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH), combined with free-text keywords related to the elements of the research question. Terms were organized into groups corresponding to population, concept, and context, using the Boolean operators AND and OR for combining descriptors across the different databases.

Results obtained from the databases were exported to the Rayyan[®] reference manager (Qatar Computing Research Institute, Doha, Qatar), used for duplicate removal and organization of the screening process. Study selection was performed in three stages: title reading, abstract reading, and full-text reading of potentially eligible studies. The

process was conducted independently by two reviewers, with any disagreements resolved by consensus.

Data extraction was performed by one researcher and reviewed by another (IVA, FMS). Information was organized in a pre-structured spreadsheet in Microsoft Excel[®], including study identification data (title, year of publication, journal, country, and database) and information related to multiprofessional care for ICU-AW, including diagnostic, prevention, treatment, and rehabilitation strategies, as well as recommendations and protocols described in the studies.

The initial search identified 734 records (Scopus = 312; Web of Science = 48; Cochrane = 1; BVS = 131; PubMed = 242). After removal of 361 duplicates, 373 studies remained for the title and abstract screening stage. Of these, 30 articles were selected for full-text reading and, at the end of the process, 17 studies met the eligibility criteria and were included in the analysis. The process of identification, screening, and inclusion of studies is presented in the PRISMA 2020 flowchart (Figure 1).

Several methodological limitations should be considered. The inclusion of studies published only in English, Portuguese, and Spanish may have restricted the identification of evidence available in other languages. Another aspect concerns the temporal scope adopted, between 2020 and 2025, which, although related to the increase in research on ICU-acquired muscle weakness following the COVID-19 pandemic, may have limited the inclusion of relevant studies published prior to this period. Additionally, as this is a scoping review, no critical appraisal of the methodological quality of the included studies was performed, which precludes inferences regarding the level of evidence of the identified recommendations. Nevertheless, the review allowed for a comprehensive mapping of multiprofessional care recommendations and protocols described in the literature for the management of ICU-AW in the intensive care setting.

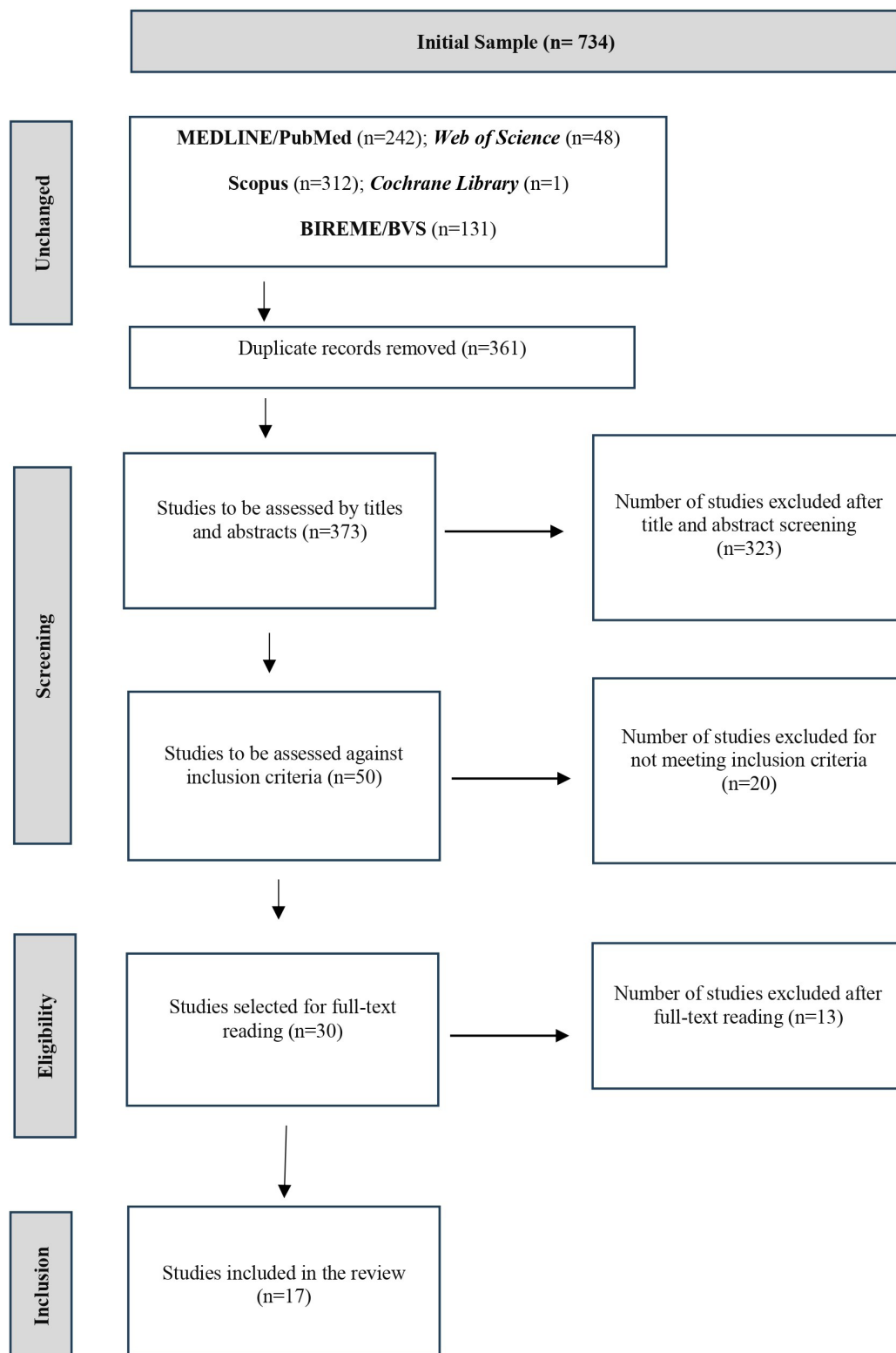


Figure 1 - Article selection flowchart.

RESULTS

Based on the studies included in this review, Table 1 was constructed, presenting a synthesis of the character-

istics of the articles according to title, authors/year, journal (database), country of origin, and thematic focus.

Table 1 - Characteristics of studies included in the review (2020–2025).

Title	Author/Year	Journal (Database)	Country	Thematic Focus
Critical illness weakness, polyneuropathy and myopathy: diagnosis, treatment and long-term outcomes	Latronico N <i>et al.</i> , 2023 ¹	Intensive Care (PubMed)	England	Diagnosis/ Treatment/ Rehabilitation
Bundles for combating ICU-AW	Machado <i>et al.</i> , 2021 ³	BRASPEN (PubMed)	Brazil	Prevention/ Treatment/ Diagnosis
Effectiveness of physical exercise and neuromuscular electrical stimulation interventions in the prevention and treatment of ICU-acquired muscle weakness: a systematic review of randomized clinical trials	García-Pérez-de-Sevilla <i>et al.</i> , 2023 ⁵	Enfermería Intensiva (Scopus)	Spain	Rehabilitation/ Treatment
Risk factors for ICU-AW: systematic review and meta-analysis	Yang Z <i>et al.</i> , 2020 ⁸	Medicine (PubMed)	China	Diagnosis/ Prevention
Summary of best evidence for early exercise rehabilitation in mechanically ventilated patients with ICU-AW	Sun, R <i>et al.</i> , 2024 ⁹	Chinese Intensive Medicine (PubMed)	China	Early Rehabilitation/ Treatment
Effect of Neuromuscular Electrical Stimulation in Critically Ill Patients: An Updated Systematic Review and Meta-Analysis of Randomized Controlled Trials	Nakanishi, N. <i>et al.</i> , 2023 ¹⁰	Intensive Medicine (Scopus)	Japan	Rehabilitation/ Treatment
Early rehabilitation reduces the likelihood of developing ICU-AW: systematic review and meta-analysis	Anekwe DE <i>et al.</i> , 2020 ¹¹	Physiotherapy (PubMed)	Brazil	Prevention/ Early Rehabilitation
ICU-acquired muscle weakness – Diagnostic value of neuromuscular ultrasonography	Klawitter, F., <i>et al.</i> 2023 ¹²	Anaesthesiologie (Scopus)	Germany	Diagnosis/ Prevention
A meta-analysis of the association between vasopressor use and ICU-acquired weakness	Yang T <i>et al.</i> , 2024 ¹³	Brain and Behavior (PubMed)	China	Prevention
Muscle weakness: principles of myopathy and neuropathy in critically ill patients	García-Martínez <i>et al.</i> , 2020 ¹⁴	Clinical Nutrition (PubMed)	United Kingdom/ Scotland	Diagnosis/ Prevention
Early detection of ICU-AW: a comprehensive review	Elkalawy <i>et al.</i> , 2023 ¹⁵	Acute and Critical Care (PubMed)	Egypt	Diagnosis/ Prevention
Care and treatment related to ICU-acquired muscle weakness: a cohort study	Raurell-Torredà, M. <i>et al.</i> , 2021 ¹⁶	Australian Critical Care (PubMed)	Spain	Prevention/ Treatment
Nursing interventions for prevention of ICU-AW: systematic review	Xu Q <i>et al.</i> , 2024 ¹⁷	Intensive and Critical Care Nursing (PubMed)	China	Prevention/ Treatment
Reduction of ICU-acquired weakness with implementation of a multiprofessional protocol: a quasi-experimental clinical trial	Giraldo <i>et al.</i> , 2023 ¹⁸	BIOMEDICA (Web of Science)	Colombia	Prevention/ Treatment
Effect of early mobilization combined with early nutrition on ICU-acquired weakness in critically ill patients: a dual-center randomized controlled trial	Zhou W <i>et al.</i> , 2022 ¹⁹	PLoS ONE (Scopus)	China	Rehabilitation/ Treatment
Meta-analysis of the effects of bundle interventions on ICU-acquired muscle weakness	Zhou Y <i>et al.</i> , 2025 ²⁰	Technology and Health Care (PubMed)	China	Treatment
Early prediction of ICU-acquired muscle weakness: a multi-center external validation study	Witteveen E, <i>et al.</i> , 2020 ²¹	Journal of Intensive Care Medicine (PubMed)	Netherlands	Prevention/ Diagnosis

Table 1 presents the characteristics of the 17 included studies, revealing a diverse geographical distribution, with a predominance of publications from China, followed by Brazil and Spain. The studies were published in different journals indexed in databases such as PubMed, Scopus, and Web of Science.

Regarding thematic focus, a greater concentration of studies addressing prevention, treatment, and rehabilitation of ICU-AW was observed, with fewer investigations directed exclusively toward diagnosis. In

general, the studies encompass integrated approaches, with emphasis on multiprofessional strategies for the management of the condition in critically ill patients.

Table 2 presents the synthesis of original studies included in the review, highlighting their objectives and main results. Overall, the investigated studies addressed different dimensions related to ICU-AW, including risk factors, prevention and rehabilitation strategies, as well as clinical prediction tools.

Table 2 - Original studies according to objectives and results.

Author(s)/Year	Objective	Result
Raurell-Torredà, M. <i>et al.</i> , 2021 ¹⁶	To identify the incidence of ICU-AW in Spain and associated variables.	Incidence of 58%. Increased risk: advanced age, female sex, renal replacement therapy. Protective factors: early mobilization, prior functional independence.
Giraldo, N.D. <i>et al.</i> , 2023 ¹⁸	To evaluate a multiprofessional early mobility protocol.	Lower muscle weakness in the intervention group (41.3% vs. 78.9%). Better mobility scores. No impact on mortality.
Zhou, W. <i>et al.</i> , 2022 ¹⁹	To investigate the effect of early mobilization combined with early nutrition.	EM and EM+N reduced ICU-AW (16% vs. 2%). EM+N improved muscle strength and nutritional status.
Witteveen, E. <i>et al.</i> , 2020 ²¹	To validate a predictive model for ICU-AW.	Original model showed low accuracy (AUC 0.60). Updated model achieved moderate discrimination (AUC 0.70).

The reviews presented in Table 3 complement the evidence identified in the original studies, reinforcing aspects related to the prevention, diagnosis, and early rehabilitation of ICU-acquired muscle weakness (ICU-AW) in critically ill adults.

Among the investigated strategies, neuromuscular electrical stimulation has been identified as a potential intervention for reducing muscle loss in critically ill patients^{14,15}.

Clinical guidelines and multidisciplinary bundles were also described as relevant approaches for the management of ICU-AW in the intensive care con-

text^{1,3}. In the diagnostic domain, muscle ultrasonography was highlighted as a promising tool for monitoring muscle mass loss during ICU hospitalization^{12,15}.

Furthermore, interventions combining physical exercises and neuromuscular electrical stimulation demonstrated benefits in preserving muscle function in critically ill patients⁵. The literature also describes risk factors associated with the development of ICU-AW, emphasizing the importance of early identification of vulnerable patients and the implementation of preventive strategies during intensive care hospitalization⁸.

Table 3 - Reviews according to objectives and results.

Author/Year	Objective	Result
Latrônico <i>et al.</i> , 2023 ¹	To update pathophysiological concepts of ICU-AW.	Highlights complex neuromuscular mechanisms and the need for a multidisciplinary approach.
Yang Z. <i>et al.</i> , 2022 ²	To identify risk factors for ICU-AW.	Advanced age, sepsis, and prolonged mechanical ventilation were identified as the main risk factors.
Machado <i>et al.</i> , 2023 ³	To review ICU-AW prevention bundles.	Bundles showed benefits in reducing complications, with emphasis on early mobilization.
García-Pérez-de-Sevilla <i>et al.</i> , 2023 ⁵	To review evidence on ICU-AW preventive strategies.	Evidence supports early mobilization and NMES as the main strategies.
Sun <i>et al.</i> , 2024 ⁹	To integrate best evidence for early rehabilitation in ICU-AW.	Synthesis of 21 studies highlighted 7 key aspects for clinical practice (assessment, safety, precautions, timing, intensity, team role, education and training).
Nakanishi <i>et al.</i> , 2023 ¹⁰	To evaluate the effect of neuromuscular electrical stimulation (NMES).	NMES improved strength and function, but effects on mortality remain uncertain.
Anekwe <i>et al.</i> , 2020 ¹¹	To review the impact of early mobilization on ICU-AW.	Early mobilization reduced duration of mechanical ventilation and improved functional outcomes.
Klawitter <i>et al.</i> , 2023 ¹²	To review the use of ultrasonography in the diagnosis of ICU-AW.	Ultrasonography proved to be a promising method for early detection of muscle changes.
Yang T. <i>et al.</i> , 2024 ¹³	To evaluate the association between vasopressors and ICU-AW.	High-dose vasopressor use increased the risk of ICU-AW.
García-Martínez <i>et al.</i> , 2020 ¹⁴	To review rehabilitation methods in the ICU.	Emphasized early mobilization as the central strategy for preventing ICU-AW.
Elkalawy <i>et al.</i> , 2023 ¹⁵	To review early detection strategies for ICU-AW.	Proposed integration of clinical assessment, ultrasonography, and biomarkers.
Xu <i>et al.</i> , 2024 ¹⁷	To evaluate nursing interventions in the prevention of ICU-AW.	Systematized nursing care improved prevention and functional rehabilitation.
Zhou Y. <i>et al.</i> , 2025 ²⁰	To review the efficacy of multiprofessional bundles in the ICU.	Bundles reduced ICU-AW incidence and improved functional outcomes.

Table 4 presents a synthesis of the recommended multidisciplinary care strategies for the diagnosis, prevention, treatment, and rehabilitation of ICU-acquired weakness (ICU-AW) in adults.

Table 4 - Synthesis of recommended multidisciplinary care strategies for the diagnosis, prevention, treatment, and rehabilitation of ICU-AW in adults.

Diagnosis	Professionals Involved	Citations
Perform systematic clinical and functional assessment	Physicians, Physiotherapists, Nurses	Latronico <i>et al.</i> , 2023 ¹ , Machado <i>et al.</i> , 2021 ³ , Sun <i>et al.</i> , 2024 ⁹ , García-Martínez <i>et al.</i> , 2020 ¹⁴ , Elkalawy <i>et al.</i> , 2023 ¹⁵ , Giraldo, N.D. <i>et al.</i> , 2023 ¹⁸ , Witteveen, E. <i>et al.</i> , 2020 ²¹
Use standardized scales such as the MRC and neuromuscular ultrasonography	Physicians, Physiotherapists	Machado <i>et al.</i> , 2021 ³ , Klawitter <i>et al.</i> , 2023 ¹²
Monitor muscle strength progression during hospitalization	Physicians, Physiotherapists	Latronico <i>et al.</i> , 2023 ¹ , Machado <i>et al.</i> , 2021 ³
Document functional indicators in the multiprofessional medical record	Multiprofessional Team	Machado <i>et al.</i> , 2021 ³
Prevention	Professionals Involved	Citações
Implement early mobilization and/or NMES	Physiotherapists	Machado <i>et al.</i> , 2021 ³ , García-Pérez-de-Sevilla <i>et al.</i> , 2023 ⁵ , Anekwe <i>et al.</i> , 2020 ¹¹ , Xu <i>et al.</i> , 2024 ¹⁷ , Zhou Y. <i>et al.</i> , 2025 ²⁰
Maintain strict glycemic control	Physicians, Nurses	Machado <i>et al.</i> , 2021 ³ , Yang T. <i>et al.</i> , 2024 ¹³ , Xu <i>et al.</i> , 2024 ¹⁷
Ensure adequate nutritional support	Nutritionists, Physicians	Yang Z. <i>et al.</i> , 2022 ²² , Machado <i>et al.</i> , 2021 ³ , Xu <i>et al.</i> , 2024 ¹⁷
Avoid excessive sedation and optimize ventilator weaning	Physicians, Nurses	Yang Z. <i>et al.</i> , 2022 ²² , Machado <i>et al.</i> , 2021 ³ , Xu <i>et al.</i> , 2024 ¹⁷
Treatment and Rehabilitation	Professionals Involved	Citações
Conduct active exercises and intensive physiotherapy	Physiotherapists, Nurses	Machado <i>et al.</i> , 2021 ³ , García-Pérez-de-Sevilla <i>et al.</i> , 2023 ⁵ , Sun <i>et al.</i> , 2024 ⁹
Apply neuromuscular electrical stimulation (NMES)	Physiotherapists, Nurses	Machado <i>et al.</i> , 2021 ³ , García-Pérez-de-Sevilla <i>et al.</i> , 2023 ⁵ , Nakanishi <i>et al.</i> , 2023 ¹⁰
Establish an individualized rehabilitation plan	Multiprofessional Team	Machado <i>et al.</i> , 2021 ³ , Raurell-Torredà, M. <i>et al.</i> , 2021 ¹⁶

As presented in Table 4, ICU-AW management is organized around four main axes: diagnosis, prevention, treatment, and rehabilitation. In the diagnostic axis, systematic clinical assessment and the use of standardized scales stand out; in prevention, strategies such as early mobilization, glycemic control, and nutritional support are highlighted; and, in treatment and rehabilitation, interventions such as physical exercise and neuromuscular electrical stimulation are emphasized. Across all axes, the integrated action of the multiprofessional team in implementing these strategies is observed.

DISCUSSION

The analysis of the 17 selected studies demonstrates that ICU-acquired muscle weakness (ICU-AW) is a frequent complication in critically ill patients and is associated with prolonged mechanical ventilation, sepsis, use of vasoactive drugs, and length of stay.

The findings reinforce the importance of multiprofessional preventive and therapeutic strategies aimed at controlling modifiable factors, such as early mobilization, adequate management of hyperglycemia, nutritional optimization, rational use of sedation with daily awakening, agitation control, and the use of more accurate diagnostic tools.

A large proportion of original studies and reviews

identify early mobilization as a decisive factor in the prevention and management of ICU-AW. Clinical trials such as that of Zhou *et al.*²⁰ and the quasi-experimental study of Giraldo *et al.*¹⁸ demonstrated significant reduction of muscle weakness and improvement of mobility in patients subjected to early intervention compared to usual care. Reviews such as that of Xu *et al.*¹⁷ synthesize that early mobilization is associated with functional improvement, reduced duration of mechanical ventilation, and shorter hospital length of stay. The Brazilian Guidelines for Early Mobilization in Intensive Care Units had already indicated that early mobilization is safe and is associated with better functional

outcomes, and should be used whenever indicated, respecting contraindications, limitations, and the biological variability of adult patients²².

Beyond mobilization, other strategies were explored. Neuromuscular electrical stimulation (NMES) was investigated in different contexts. Studies such as those of Nakanishi *et al.*¹⁰ and Garcia *et al.*⁵ suggest that NMES can preserve muscle mass and strength when combined with mobilization; however, results regarding its use in isolation remain heterogeneous. This finding converges with recent systematic reviews, which recommend its use preferably in conjunction with mobilization, and not as a substitute²².

Another relevant point in the discussion of ICU-AW prevention concerns the integration of early mobilization and nutritional support. Parra *et al.*²³, in proposing the SARCPRO protocol, emphasize that the combination of protein supplementation with resistance exercises conducted by physiotherapists constitutes an effective strategy for the prevention and management of sarcopenia in hospitalized patients. These findings are consistent with the results presented by Zhou *et al.*¹⁹, who demonstrated additional benefits in functional recovery and nutritional status when early mobilization was associated with nutritional interventions. Thus, convergence with the literature is observed regarding the need for a comprehensive approach that combines adequate nutritional support and early motor rehabilitation as fundamental axes in addressing ICU-AW.

Early diagnosis and monitoring of ICU-AW were also discussed. The multicenter study of Witteveen *et al.*²¹ validated a predictive model for ICU-AW, but demonstrated only moderate performance, underscoring the need for more accurate instruments. The challenge lies in identifying assessment tools that do not require patient cooperation. In this regard, muscle ultrasonography emerged as a promising tool. Studies such as those of Elkalawy *et al.*¹⁵ confirm its utility in monitoring muscle atrophy, even in sedated patients, being more sensitive than traditional clinical methods such as the Medical Research Council (MRC) score. Toledo *et al.*²⁴ found that quadriceps muscle ultrasound is a viable and easily applicable tool.

CONCLUSION

This scoping review enabled the mapping of evidence on multiprofessional care recommendations and protocols for adults with ICU-AW, encompassing strategies related to diagnosis, prevention, treatment, and rehabilitation. The findings highlight the use of different approaches, with variations in their application and organization within the intensive care context.

Several studies have focused on identifying risk factors associated with ICU-AW. Raurell-Torredà *et al.*¹⁶ demonstrated higher incidence in elderly patients, female sex, and those undergoing renal replacement therapy. These results converge with the literature, which points to advanced age, disease severity, prolonged duration of mechanical ventilation, obesity, and pre-existing sarcopenia as important determinants³. Complementarily, Latrónico *et al.*¹ further highlight the impact of critical conditions such as sepsis, prolonged immobilization, and hyperglycemia, as well as the use of glucocorticoids and neuromuscular blocking agents, broadening the multifactorial understanding of the syndrome. Yang *et al.*¹³ reinforced the association between prolonged mechanical ventilation, sedative use, and the development of weakness. These data confirm the importance of minimal sedation protocols and early ventilator weaning, as recommended by the international guidelines of the Society of Critical Care Medicine (SCCM).

Another recurrent axis was the implementation of multiprofessional protocols. The study of Giraldo *et al.*¹⁸ showed that the application of a multidisciplinary early mobility protocol significantly reduced the incidence of ICU-AW. Recent reviews, such as that of Machado *et al.*³, also highlight that integrated care bundles (mobilization, nutritional support, minimal sedation, glycemic control) are effective in reducing complications and improving recovery.

The review of Sun *et al.*⁹ went further and synthesized 21 studies, proposing seven key aspects for clinical practice: assessment, safety, precautions, timing of mobilization initiation, rehabilitation intensity, multiprofessional support, and continuous monitoring, thus reinforcing the need to standardize practices and integrate different professionals in the prevention and treatment of ICU-AW.

Overall, there is convergence in the literature regarding the benefit of these strategies. Such limitations reinforce the importance of evidence-based guidelines that integrate measures for the prevention, assessment, and rehabilitation of ICU-AW in a multidisciplinary manner.

Gaps were identified related to the absence of standardized and integrated multiprofessional protocols, the heterogeneity of interventions, and the limited evaluation of clinical outcomes. In this regard, research is needed to assess the effectiveness of these strategies and contribute to the structuring and validation of multiprofessional protocols in the ICU setting.

CRedit author statement

Conceptualization: Aguiar, ICV; Methodology: Aguiar, ICV; Barbosa Filho, VC; Validation: Aguiar, ICV; Souza, FCM; Silva, FS; Statistical analysis: Aguiar, ICV; Barbosa Filho, VC; Formal analysis: Aguiar, ICV; Souza, FCM; Barbosa Filho, VC; Investigation: Aguiar, ICV; Souza, FCM; Silva, FS; Barbosa Filho, VC; Resources: Aguiar, ICV; Souza, FCM; Barbosa Filho, VC; Writing – original draft preparation: Aguiar, ICV; Writing – review & editing: Aguiar, ICV; Barbosa Filho, VC; Visualization: Aguiar, ICV; Souza, FCM; Silva, FS; Barbosa Filho, VC; Supervision: Aguiar, ICV; Barbosa Filho, VC; Project administration: Aguiar, ICV; Barbosa Filho, VC.

All authors have read and agreed to the published version of the manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

1. Latronico N, Rasulo FA, Eikermann M, Piva S. Intensive care unit-acquired weakness, polyneuropathy and myopathy: diagnosis, treatment and long-term outcomes. *Crit Care*. 2023;27(1):439. doi:10.1186/s13054-023-04676-3.
2. Yang Z, Wang X, Wang F, Peng Z, Fan Y. A systematic review and meta-analysis of risk factors for intensive care unit-acquired weakness. *Medicine (Baltimore)*. 2022;101(43):e31405. doi:10.1097/MD.00000000000031405.
3. Machado JC, Castro MG, Giacomassi IWS, Giorelli GV, Isola AM, Silva Junior JM, et al. Bundles no combate à fraqueza adquirida na unidade de terapia intensiva. *BRASPEN J*. 2023;36(2):131-144. doi:10.37111/braspenj.2021.36.2.01.
4. Zhang Y, Hu Q, Zhou M, Wang Y, Yang J, Jin X, et al. Risk factors for acquired weakness in intensive care unit patients: an umbrella review. *Intensive Crit Care Nurs*. 2025;88:103940. doi:10.1016/j.iccn.2025.103940.
5. García-Pérez-de-Sevilla G, Sánchez-Pinto B. Effectiveness of physical exercise and neuromuscular electrical stimulation interventions to prevent and treat ICU-acquired weakness: a systematic review of randomized clinical trials. *Intensive Crit Care Nurs*. 2023;74:103333. doi:10.1016/j.iccn.2022.103333.
6. Zhang L, Hu W, Cai Z, Liu J, Wu J, Deng Y, et al. Early mobilization of critically ill patients in the intensive care unit: a systematic review and meta-analysis. *PLoS One*. 2019;14(10):e0223185. doi:10.1371/journal.pone.0223185.
7. Yang T, Li Z, Jiang L, Xi X. Corticosteroid use and intensive care unit-acquired weakness: a systematic review and meta-analysis. *Crit Care*. 2018;22(1):187. doi:10.1186/s13054-018-2111-0.
8. Yang T, Li ZQ, Li HL, Zhou JX, Chen GQ. Aminoglycoside use and intensive care unit-acquired weakness: a systematic review and meta-analysis. *PLoS One*. 2020;15(3):e0230181. doi:10.1371/journal.pone.0230181.
9. Sun R, Jiang H, Wang J, Yu J, Zhou Q, Fang K, et al. Summary of the best evidence for early exercise rehabilitation in patients with mechanically ventilated ICU-acquired weakness. *Zhonghua Wei Zhong Bing Ji Jiu Yi Xue*. 2024;36(7):745-752. doi:10.3760/cma.j.cn121430-20240227-00169.
10. Nakanishi N, Yoshihiro S, Kawamura Y, Aikawa G, Shida H, Shimizu M, et al. Effect of neuromuscular electrical stimulation in patients with critical illness: an updated systematic review and meta-analysis of randomized controlled trials. *Crit Care Med*. 2023;51(10):1386-1396. doi:10.1097/CCM.0000000000005941.
11. Anekwe DE, Biswas S, Bussières A, Spahija J. Early rehabilitation reduces the likelihood of developing intensive care unit-acquired weakness: a systematic review and meta-analysis. *Physiotherapy*. 2020;107:1-10. doi:10.1016/j.physio.2019.12.004.
12. Klawitter F, Walter U, Axer H, Ehler J. Intensive care unit-acquired weakness: diagnostic value of neuromuscular ultrasound. *Anaesthesiologie*. 2023;72(8):543-554. doi:10.1007/s00101-023-01300-5.
13. Yang T, Wang Y, Xi X, Yu S. Association between vasopressor use and intensive care unit-acquired weakness: a meta-analysis. *Brain Behav*. 2024;14(9):e70012. doi:10.1002/brb3.70012.
14. García-Martínez MÁ, Montejo González JC, García-de-Lorenzo y Mateos A, Teijeira S. Muscle weakness: understanding the principles of myopathy and neuropathy in the critically ill and management options. *Clin Nutr*. 2020;39(5):1331-1344. doi:10.1016/j.clnu.2019.05.027.
15. Elkalawy H, Sekhar P, Abozena W. Early detection and assessment of intensive care unit-acquired weakness: a comprehensive review. *Acute Crit Care*. 2023;38(4):409-424. doi:10.4266/acc.2023.00703.
16. Raurell-Torredà M, Arias-Rivera S, Martí JD, Frade-Mera MJ, Zaragoza-García I, Gallart E, et al. Care and treatments related to intensive care unit-acquired weakness: a cohort study. *Aust Crit Care*. 2021;34(5):435-445. doi:10.1016/j.aucc.2020.12.005.
17. Xu Q, Tan J, Wang Y, Tang M. Theory- and evidence-based nursing interventions for ICU-acquired weakness prevention in intensive care units: a systematic review. *PLoS One*. 2024;19(9):e0308291. doi:10.1371/journal.pone.0308291.
18. Giraldo ND, Carvajal C, Muñoz F, Restrepo MP, García MA, Arias JM, et al. Reducing intensive care unit-acquired weakness with a multicomponent protocol implementation: a quasi-experimental clinical trial. *Biomédica*. 2023;43(4):438-446. doi:10.7705/biomedica.6947.
19. Zhou W, Yu L, Fan Y, Shi B, Wang X, Chen T, et al. Effect of early mobilization combined with early nutrition on acquired weakness in critically ill patients (EMAS): a dual-center randomized controlled trial. *PLoS One*. 2022;17(5):e0268599. doi:10.1371/journal.pone.0268599.
20. Zhou Y, Sun Y, Pan Y, Dai Y, Xiao Y, Yu Y. Risk prediction models for intensive care unit-acquired weakness in critically ill patients: a systematic review. *Aust Crit Care*. 2025;38(1):101066. doi:10.1016/j.aucc.2024.05.003.
21. Witteveen E, Wieske L, Sommers J, et al. Early prediction of intensive care unit-acquired weakness: a multicenter external validation study. *J Intensive Care Med*. 2020;35(6):595-605. doi:10.1177/0885066618771001.
22. Aquim EE, Bernardo WM, Buzzini RF, Azeredo NS, Cunha LS, Damasceno MC, et al. Brazilian guidelines for early mobilization in intensive care units. *Rev Bras Ter Intensiva*. 2019;31(4):434-443. doi:10.5935/0103-507X.20190084.
23. Parra BFCS, Matos LBN, Ferrer R, Toledo DO. SARCPRO: protocolo multiprofissional para o manejo da sarcopenia em pacientes hospitalizados. *BRASPEN J*. 2023;38(1):27-34.
24. Toledo DO, Silva DCLE, Santos DMD, Freitas BJ, Dib R, Cordioli RL, et al. Bedside ultrasound is a practical measurement tool for assessing muscle mass. *Rev Bras Ter Intensiva*. 2017;29(4):476-480. doi:10.5935/0103-507X.20170071.

How to cite this article: Aguiar, I.C.V., Souza, F.C.M., Silva, F.S., Barbosa Filho, V.C. (2026). Multiprofessional care in ICU-acquired weakness in adult intensive care units: a scoping review. *O Mundo Da Saúde*, 50. <https://doi.org/10.15343/0104-7809.202650e18952025>. *Mundo Saúde*. 2026,50:e18952025.