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A systematic review of weaning strategies in neurologic patients

Rogerio da Hora Passos[1], Felipe Galdino Campos[1], Raquel Caserta Eid[1], Carla Luciana Batista[1], Carmen Silvia Valente Barbas[1]

[1] Hospital Israelita Albert Einstein, São Paulo, SP, Brazil.

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Corresponding author
rogerio.passos@einstein.br

Introduction: Optimal weaning from mechanical ventilation (MV) is crucial for neurologic patients, who often face challenges such as altered respiratory mechanics and neurogenic respiratory failure. However, the diversity in weaning protocols across neurologic conditions like traumatic brain injury (TBI), stroke, and neuromuscular disorders complicates effective management.[1-4] **Objectives:** This systematic review seeks to evaluate and synthesize existing research on weaning protocols and strategies for neurologic patients reliant on mechanical ventilation. The primary goal is to identify effective weaning practices, assess prevalent complications, and determine key outcomes. Through comprehensive analysis of current evidence, this review advocates for the formulation and adoption of standardized, neurology-specific weaning protocols to enhance patient outcomes and mitigate complications within critical care settings. **Methods:** This systematic review synthesize literature from PubMed, Embase, and Cochrane Library databases, covering studies published between 2000 and 2023. Inclusion criteria focused on weaning protocols, strategies, outcomes, and complications in both adult and pediatric neurologic populations. Data extraction included study design, patient demographics, specific weaning techniques (*e.g.*, spontaneous breathing trials, automated systems), readiness criteria, complications (*e.g.*, reintubation rates), and key outcomes (*e.g.*, successful extubation, mortality). Study quality was assessed using the Newcastle-Ottawa Scale for observational studies and the Cochrane Risk of Bias Tool for randomized controlled trials. **Results:** Analysis of 32 selected studies revealed a broad spectrum of weaning approaches tailored to diverse neurologic impairments. Successful extubation rates ranged significantly (50% to 90%), with reintubation rates also varying (10% to 30%). Common complications included ventilator-associated pneumonia and respiratory distress, underscoring the need for standardized protocols and individualized management strategies.

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