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Risk prediction models for weaning failure in patients with mechanical ventilation: a systematic review

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 February 2025 and was last updated on 17 February 2025.

INTRODUCTION

Review question / Objective To systematically evaluate domestic and international studies on relevant mechanical ventilation off-loading failure risk prediction models, with a view to providing a basis for clinical healthcare professionals to select or develop appropriate mechanical ventilation off-loading failure risk prediction models.

Condition being studied Mechanical ventilation, as a respiratory support technique, is one of the most widely used interventions in the intensive care unit. Mechanical ventilation deconditioning refers to the process of removing the endotracheal tube and withdrawing mechanical ventilation support from a patient who requires mechanical ventilation support after the primary disease has been controlled and ventilation and ventilation functions have been improved. There is no standardized definition and practice of mechanical ventilation deconditioning, and the incidence of deconditioning failure ranges from approximately 10.4% to 35.0%. Failure of extubation not only increases the incidence of complications such as ventilator-associated pneumonia and lung injury, but also prolongs ICU hospitalization, increases the burden of patients' healthcare costs, wastes healthcare resources, and is even closely related to in-hospital mortality. Therefore, early identification of the high-risk group of mechanical ventilation off-loading failure and timely and effective interventions on their risk factors are of great significance in reducing the failure rate of mechanical ventilation off-loading and improving the clinical prognosis of patients. At present, domestic and international studies have constructed a variety of risk prediction models for mechanical ventilation withdrawal failure, but the predictive ability and clinical applicability value of different models for mechanical ventilation de-energization failure are still unclear, and no study has been found to systematically evaluate them.

Translated with http://www.DeepL.com/Translator (free version).

METHODS

Participant or population Patients receiving mechanical ventilation.

Intervention Development and/or validation of a predictive model for the risk of failure to extubate mechanically ventilated patients.

Comparator None.

Study designs to be included Cross-sectional, cohort and case-control studies.

Eligibility criteria (1) Study population: patients undergoing MV, aged ≥18 years; (2) Study content: construction and/or validation of a predictive model for MV offline failure; (3) Outcome metrics: occurrence of MV offline failure.

Information sources PubMed, Embase, Web of Science, Cochrane Library, CBM, CNKI, Wanfang, and Wipro databases were systematically searched. A combination of subject terms and free words was used and references incorporated into the literature were retrieved retrospectively.

Main outcome(s) Failure of mechanical ventilation off-loading occurs.

Quality assessment / Risk of bias analysis Risk of bias and applicability of the included literature was assessed by 2 investigators using a risk of bias assessment tool for predictive modeling studies.

Strategy of data synthesis Due to the large heterogeneity among the included studies and the different sources of bias in the studies, only the characteristics and outcomes of the included studies were analyzed descriptively in this study.

Subgroup analysis None.

Sensitivity analysis None.

Country(ies) involved China.

Keywords Mechanical ventilation; Weaning failure; Prediction model; Systematic review.

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