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Safe mechanical ventilation treatment settings for respiratory failure patients

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Abstract

Mechanical ventilation (MV) is a complex support tool for respiratory failure patients. However, MV is easily mismanaged, and the common practice today relies on clinician's experience and intuition. Due to this subjectivity, along with the complex task of managing multiple interdependent MV settings, setting patient-specific optimal MV is a difficult task. This research proposes a model-based method to manage the wide range of possible MV settings while taking patient-specific conditions into consideration. This method makes use of a "VENT" protocol to aid clinicians' decision makings. The model-based method is integrated recommendations based on landmark studies and established guidelines to guide MV settings. Forward simulation results show acceptable results when recreating patient breath waveform from retrospective data. Protocol validation with retrospective patient data shows that actual clinically implemented settings are among the protocol recommendations. © 2021 The Authors.

Author keywords

Decision making; Mechanical ventilation; Respiratory failure; Respiratory mechanics

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