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Model iterative airway pressure reconstruction during mechanical ventilation asynchrony: Shapes and sizes of reconstruction (Conference Paper)

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Abstract

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Model-based methods estimating patient-specific respiratory mechanics may help intensive care clinicians in setting optimal ventilation parameters. However, these methods rely heavily on the quality of measured airway pressure and flow profiles for reliable respiratory mechanics estimation. Thus, asynchronous and/or spontaneous breathing cycles that do not follow a typical passive airway profile affect the performance and reliability of model-based methods. In this study, a model iterative airway pressure reconstruction method is presented. It aims to reconstruct a measured airway pressure affected by asynchronous breathing iteratively, trying to match the profile of passive breaths with no asynchrony or spontaneous breathing effort. Thus, reducing the variability of identified respiratory mechanics over short time periods where changes would be due only to asynchrony or spontaneous artefacts. A total of 2000 breathing cycles from mechanically ventilated patients with known asynchronous breathing were analyzed. It was found that this method is capable of reconstructing an airway pressure free from asynchronous or spontaneous breathing effort. This work focuses on several cases, detailing how iterative pressure reconstruction method performs under different cases, as well as its limitation. © 2018, Springer Science+Business Media Singapore.

Author keywords

Airway pressure reconstruction Asynchrony Mechanical ventilation Spontaneous breathing

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