

Respiratory mechanics in mechanically ventilated patients: from physiology to clinical practice at the bedside

In recent years, the role of protective mechanical ventilation has gained increasing importance in the clinical management of not only patients with acute respiratory distress syndrome, but also in those patients requiring respiratory support for non-pulmonary reasons or during general anesthesia. The knowledge of physiological basics and advanced monitoring of respiratory mechanics, exchange and hemodynamics is mandatory to optimize mechanical ventilation and avoid ventilation-induced lung injury which may negatively affect clinical outcome. In this special issue of *Annals of Thoracic Medicine*, entitled “Respiratory mechanics in mechanically ventilated patients with and without lung injury” several world-wide well distinguished clinicians and researchers in Anesthesiology and Intensive Care discuss the principles of physiology in respiration applied to mechanically ventilated patients, the rationale for optimizing ventilatory setting, as well as specific “pro-con” debates on “hot topics” like the use of transpulmonary pressure, driving pressure, energy and power, as well as positive end-expiratory pressure setting in ARDS and non ARDS mechanically ventilated patients including during anesthesia for general and specialistic surgeries. Further, additional focus has been dedicated to the role of non-invasive ventilation and respiratory functional monitoring at the bedside. Medicine is evolving more and more to “precision medicine” with clinical treatment individually targeted according to physiological characteristics of the single patient. This approach is becoming a standard of care in selecting tailored rather than average treatments, and in this line, physiological measurements of respiratory function and its appropriate monitoring, might represent the first step in applying personalized therapy not only in the intensive care units but also in operating rooms as well as in the ward. We believe that the present issue may help the physicians, nurses, physiotherapists, different health care professionals, as well as students and residents in different fields of medicine and surgery to better interpret and apply at the bedside the basic and advanced principles of respiratory mechanics which might guide protective mechanical ventilation settings, optimizing the use of economic and human resources and possibly improve patients’ outcomes. *The knowledge of physiology is the cornerstone for a better clinical treatment for each individual patient.*

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