



Services Area

Anesthesia and Intensive Care, IRCCS Humanitas Research Hospital

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Mechanical Ventilation (MV) is one of the most frequent treatments in intensive care units (ICUs). Although MV is frequently employed as a lifesaving measure in cases of acute respiratory failure, its utilization may lead to complications during both the acute phase of respiratory failure and in the weaning phase. Specifically, PVAs are frequently observed in the weaning-recovery stages of Acute Respiratory Failure, and are associated with lung damage, delayed weaning from MV, and unfavorable outcomes. Currently, there are no established methods for consistently monitoring and detecting of PVAs. PVAs are generally detected by human bedside evaluation of ventilators' waveforms, a time-consuming process which is by definition limited in time. Recently, Machine learning (ML) methods, such as Neural Networks, have been suggested for the purpose of waveform analysis. These techniques aim detect and classify autonomously the various types of waveforms. Our group recently conducted a pilot research that utilized machine learning approaches to identify and categorize asynchronies in patients on mechanical ventilation, with data. Object of this PhD program is to further proceed on respiratory waveform analysis for recognition and classification of PVAs, with the underlying scope of 1) further validate the algorithm for detection and classification of PVAs 2) develop and test real time detection of classification, comparing ML performance with trained healthcare

