



Characterization of the mechanical behavior of intrapulmonary percussive ventilation.

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A new device delivering intrapulmonary percussive ventilation (IPV), called Impulsator® (Percussionaire Corporation, Sandpoint, ID, USA), has recently been introduced in an effort to provide effective clearance and to promote homogeneity of ventilation in the lungs of patients with cystic fibrosis. In order to optimize the treatment based on its use, a better understanding of its functioning is still necessary. In fact, up to now, a complete characterization of this device has not been carried out, thus reducing its effective utilization in clinical practice. With the aim of overcoming this lack, in this study, data concerning flow and pressure delivered during in vitro IPV were acquired under different combinations of device settings and respiratory loads. Quantitative information was obtained about the physical variables administered by the device like percussive frequency, ratio of inspiratory to expiratory time, flow and pressure magnitudes and volume exchanged. The analysis of the data determined the relations among these variables and between them and the mechanical loads, laying the basis for an optimal clinical application of the device.

Physiol Meas - 2013 Oct 28; 34 (12):1583-1592. [Epub ahead of print]



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