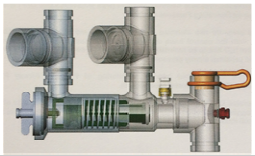

# Mechanical loads modulate tidal volume and lung washout during high-frequency percussive ventilation.

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High-frequency percussive ventilation (HFPV) has been proved useful in patients with acute respiratory distress syndrome. However, its physiological mechanisms are still poorly understood. The aim of this work is to evaluate the effects of mechanical loading on the tidal volume and lung washout during HFPV. For this purpose a single-compartment mechanical lung simulator, which allows the combination of three elastic and four resistive loads (E and R, respectively), underwent HFPV with constant ventilator settings. With increasing E and decreasing R the tidal volume/cumulative oscillated gas volume ratio fell, while the duration of end-inspiratory plateau/inspiratory time increased. Indeed, an inverse linear relationship was found between these two ratios. Peak and mean pressure in the model decreased linearly with increasing pulsatile volume, the latter to a lesser extent. In conclusion, elastic or resistive loading modulates the mechanical characteristics of the HFPV device but in such a way that washout volume and time allowed for diffusive ventilation vary agonistically.

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