

## **Comparison of High-Frequency Oscillatory Ventilation and High-Frequency Jet Ventilation in Cats with Normal Lungs**

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Four adult cats received alternating high-frequency oscillatory ventilation (HFOV) and high-frequency jet ventilation (HFJV) at equivalent proximal airway pressures. Physiologic measurements were made before and after each ventilator change. Proximal airway pressures were then adjusted as necessary to reestablish normal pH and PaCO<sub>2</sub> values. Aortic, pulmonary artery, and central venous pressures were monitored. Cardiac outputs were measured. Pulmonary and systemic vascular resistance, intrapulmonary shunt, and alveolar-arterial oxygen gradient were determined. Following the change from HFOV to HFJV at similar proximal airway pressures, HFJV always produced higher pH values ( $p < 0.0001$ ), higher PaO<sub>2</sub> values ( $p < 0.05$ ), lower PaCO<sub>2</sub> values ( $p < 0.0001$ ), as well as higher cardiac outputs ( $p < 0.01$ ), lower pulmonary artery pressures ( $p < 0.001$ ), and lower pulmonary vascular resistances ( $p < 0.001$ ). Following the reciprocal crossover, from HFJV to HFOV, HFJV pH values were again higher ( $p < 0.001$ ), and PaCO<sub>2</sub> values were again lower ( $p < 0.001$ ).

A comparison of HFOV and HFJV at similar pH and PaCO<sub>2</sub> values showed that HFOV consistently required higher peak inspiratory pressures ( $p < 0.001$ ), higher mean airway pressure ( $p < 0.001$ ), and higher pressure wave amplitudes ( $p < 0.001$ ). Under the circumstances of this study, HFJV produced better gas exchange at lower proximal airway pressures.

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