

PROSPECTIVE EVALUATION OF THE VAPOTHERM[®] 2000I DELIVERING HIGH FLOW OXYGEN THERAPY (HFT) VIA NASAL CANNULA IN ADULT RESPIRATORY INSUFFICIENCY. Arthur Taft, PhD, RRT¹, Richard Battles, RRT², Owen Bamford, PhD³, Felino Cortez, MD³, An Nguyen, RRT⁴, John Hill, RRT⁵. ¹Medical College of Georgia, Augusta, GA. ²Lawrence General Hospital, Lawrence, MA. ³Vapotherm, Inc. Stevensville, MD. ⁴Memorial Health University Medical Center, Savannah, GA. ⁵DEBORAH Heart and Lung Center, Browns Mills, NJ.

Introduction: Patients with respiratory insufficiency often exhibit worsening hypoxemia and increasing work of breathing despite receiving supplemental oxygen using standard oxygen therapy devices. The Vapotherm[®] 2000i has been shown to deliver high inspired oxygen concentrations (>90%) at high flow via nasal cannula and may improve oxygenation when compared to traditional O₂ therapy (TOT). The aim of this study was to compare the effectiveness of high flow oxygen therapy via NC to traditional O₂ therapy (including nasal cannula, venti-mask, simple mask, aerosol mask, and NRB mask) in patients experiencing respiratory insufficiency. **Methods:** Patients with impending respiratory failure (as determined by the medical staff) that remained dyspneic and hypoxemic despite TOT were included in this study. After at least 30 minutes of TOT, SpO₂ and RR were recorded. Patients were then switched to HFT. After at least 30 minutes of HFT, SpO₂ and RR were again recorded. Data was independently obtained from two institutions, Lawrence General Hospital (LGH) and DEBORAH Heart and Lung Center (DHLC), then pooled for statistical analysis. The effects of TOT and HFT on SPO₂ and respiratory rate were compared using paired t-tests. Consistency of data across institutions was determined by computing a difference score (TOT value minus HFT value) which was compared between institutions using one-way ANOVA. Patients with missing data points were not included in the statistical analysis. **Results:** Sixty-one patients were enrolled, 12 were excluded due to missing data points, leaving 49 for statistical analysis (n = 30 from LGH and n = 19 from DHLC; 32 male, 14 female, and 3 unknown (no gender recorded). Mean age was 64.1 ± 15.75 (all data reported as mean ± SD) and ranged from 16 to 88 years of age. During HFT mean gas flow was 29.3 ± 5.28 LPM and mean gas temperature was 37.1 ± 0.49°C. There were no differences in oxygenation (SpO₂ during TOT minus SpO₂ during HFT) across institutions (-8.07 ± 4.76 at LGH vs -7.06 ± 4.49 at DHLC; p = 0.327). However, LGH reported a greater decrease in RR with HFT than did DHLC (9.25 ± 9.29 vs 4.33 ± 4.0; p = 0.047). SpO₂ was significantly higher during HFT compared to TOT (96.5 ± 2.78% vs 88.9 ± 4.98%; p < 0.001). RR was significantly lower during HFT compared to TOT (20.6 ± 6.39 vs. 25.8 ± 7.32; p < 0.001). No patient required either intubation/mechanical ventilation or non-invasive ventilation (NPPV). **Conclusions:** These results demonstrate an improvement in oxygenation and a decrease in respiratory rate with HFT when compared to TOT. High flow oxygen therapy should be considered as an alternative for patients with respiratory insufficiency that do not respond adequately to traditional methods of administering oxygen prior to implementation of NPPV or intubation/mechanical ventilation.

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