

Effect of a tracheostomy speaking valve on secretions, arterial oxygenation, and olfaction: a quantitative evaluation.

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Abstract:

Tracheostomy speaking valves consist of a one-way valve that closes upon exhalation, causing a redirection of exhaled gas into the upper airway, thus allowing for the primary benefit of speech. The present study was undertaken to test various hypotheses concerning the secondary benefits of speaking valves. We hypothesized that use of a speaking valve will result in a decrease in accumulated secretions, an increase in arterial oxygenation and an improvement in olfactory function. A total of 8 tracheotomized patients met the following inclusion criteria: age > 18; ability to tolerate wearing a speaking valve for at least 3 hours; no unstable medical conditions; no use of thrombolytic agents. While using the speaking valve patients accumulated fewer secretions (74.3 +/- 63.6 vs. 122.8 +/- 44.6 ml/day, $p = 0.004$, $n = 7$) and had improved olfactory function (accuracy = 28.4 +/- 5.2 vs 8.1 +/- 2.9%, $p = 0.02$; and percent correct = 64.2 +/- 2.6 vs 50.0 +/- 3.9%, $p = 0.03$, $n = 6$) than when off the speaking valve. No significant differences were found in 24-hour arterial oxygen saturation (pulse oximetry and ABG analysis respectively, $n = 7$), arterial PO₂, pH, PCO₂, HCO₃, or 24-hour heart rate ($n = 7$). Thus, the present study found a significant decrease in secretions and improvements in olfaction when tracheotomized patients wore a speaking valve, but no difference in arterial oxygenation.

Weaning from Mechanical Ventilation Augmented by the Passy-Muir Speaking Valve

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Abstract:

Difficulties in weaning can result in prolonged periods on mechanical ventilation. This can be very frustrating to patients, especially when they are unable to communicate easily. A Passy-Muir Speaking Valve was utilized on long-term mechanically ventilated patients (n=9) to assist in speaking. This device was attached to the inner cannula of the tracheostomy tube and was used during Continuous Positive Airway Pressure (CPAP) weaning attempts. In our experience with the Passy-Muir Valve we observed that the weaning of a group of patients who had a history of Chronic Obstructive Pulmonary Disease or significant smoking history (77%) seemed to be augmented by the use of this device. Our observations include improvement in oxygen saturation, greater tolerance of weaning attempts (56%) eventually leading to independent breathing (33%), and the subjective reports from patients that breathing was made easier with the device (44%).