

THE DELIVERY TIME, EFFICACY, AND SAFETY OF BETA AGONIST BRONCHODILATOR ADMINISTRATION WITH THE **AEROECLIPSE**[®] BREATH ACTUATED NEBULIZER (“BAN”).

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Purpose: Aerosol delivery consumes the highest level of Respiratory Care resources. This study evaluated the delivery time, efficacy, and safety of rapidly nebulized Albuterol with the use of the **AeroEclipse**[®] Breath Actuated Nebulizer as compared to both an MDI with **AeroChamber**[®] VHC (both from Monaghan Medical Corp. Plattsburgh, N.Y.) and the AirLife Misty-Neb Nebulizer (SVN) (Allegiance Healthcare Corporation).

Methods: A consecutive, non-randomized, mostly COPD population receiving pre & post bronchodilator testing in our Pulmonary Function Lab were studied. Three different Albuterol medication dosages were administered with the BAN: 0.5 ml Albuterol (2.5 mg) with 0.5 ml Normal Saline, 1.0 ml (5 mg) of undiluted Albuterol, and 0.75 ml Albuterol (3.75 mg) using an oxygen flow rate of 8 L/min. Two puffs of Albuterol were administered by MDI with **AeroChamber**[®] VHC. Treatments with the SVN consisted of nebulizing 2.5 mg of Albuterol diluted with 3 ml of Normal Saline Unit Dose (UD) using an oxygen flow rate of 8 L/min. The SensorMedics Vmax 22 Pulmonary Function System was utilized to measure FEV1. A standardized subjective questionnaire to determine side effects was completed.

Results: The table shows the Albuterol dosages, mean% change of FEV1 from pre-treatment and 10 minute post treatment, mean administration time and tremulousness. The mean treatment time with all BAN patients was 2.78 minutes as compared to 8.33 minutes with the SVN (p<.001) *. The mean treatment time with the MDI was 2.86 minutes as compared to 8.33 minutes with the SVN (p<.001) **. The changes in FEV1 were not significant. There was no difference in heart rate, respiratory rate or nausea. Seventeen patients receiving the 1.0 1 undiluted Albuterol indicated an increase in tremulousness.

Nebulizer (n)	Dose	% Change FEV1	Time (min)	Tremulousness
AeroEclipse [™] BAN (12)	0.5 ml + 0.5 ml NS	8.2%	2.67*	0
AeroEclipse [™] BAN (64)	1.0 ml undil.	10.9%	3.29*	17
AeroEclipse [™] BAN (23)	0.75 ml undil.	5.6%	1.30*	5
MDI (21)	2 puffs	8.5%	2.86**	1
Misty-Neb (52)	2.5 mg UD	9.1%	8.33	2

Conclusion: The rapid administration of Albuterol in the 0.5 ml + 0.5 ml NS and 1.0 ml undiluted doses using the BAN was equally efficacious as the MDI with **AeroChamber**[®] VHC and SVN UD. The 1.0 ml Albuterol dosage has the highest incidence of tremulousness. The 0.75 ml Albuterol dosage underperformed. Delivering 0.5 ml Albuterol (2.5 mg) with 0.5 ml Normal Saline using the BAN offered the best delivery time, efficacy and safety profile of the nebulizer trials. The BAN performance was comparable to the MDI with **AeroChamber**[®] VHC.

Clinical Implications: In a health care facility that delivers large volumes of aerosol treatments, the decrease in delivery time could have a significant impact on resource utilization. The results supported changes in the Respiratory Care practice throughout Crouse Hospital. Further studies evaluating additional medication dosing regimens measuring safety, efficacy and resource utilization are needed.

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