REFERENCE MATERIAL

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Dose Nebulizer Brand Make a Clinical Difference in the Emergency Room Management of Pediatric Asthma?

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Abstract Form

DOES NEBULIZER BRAND MAKE A CLINICAL DIFFERENCE IN THE EMERGENCY ROOM MANAGEMENT OF PEDIATRIC ASTHMA?

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BACKGROUND: All children visiting our emergency department (ED) for asthma are treated using an asthma care path (ACP). The ACP is an assessment-driven, algorithm-based treatment regimen.

AIM: To determine if nebulizer brand utilized in the ED treatment of children with status asthmaticus makes a difference in patient and/or clinical outcomes.

METHODS: We randomized 280 children, ages of 1 through 7, to receive standardized treatment (3.75 mg of Albuterol) in our ACP with three different nebulizers (Marquest's Acorn, Westmed's Circulaire, and Salter's Nebutech). The ACP standardized assessments and therapy (O_2, albuterol aerosols and corticosteroids) at prescribed intervals (every twenty minutes). Treatment was discontinued when discharge criteria were met: good air exchange, mild or absent end expiratory wheezing, no accessory muscle usage, $S_pO_2 > 93\%$ and respiratory rate < 40/min. After meeting criteria, patients were observed for an hour and discharged home. Patients not meeting discharge criteria after six aerosols or one hour of continuous aerosols were admitted. A chronic asthma severity was assigned based on history, symptoms, and therapeutic drug usage.

RESULTS: Retrospectively, twenty-one children originally randomized to the study were eliminated from the results for the following reasons: inappropriate age (6), inappropriate diagnosis (7), removed from study by guardian (1), and not receiving at least 1 ED treatment (7) by assessment. Outcomes were analyzed by ANOVA and Chi Square tests ($p < 0.05$) for the 259 children completing the study. A comparison of the predetermined outcomes by means (SD) or percentages are listed in the tables below.

Demographics	**Acorn**	**Circulaire**	**Nebutech**	**p value**
Number	88	86	85	
Age	3.6 ± 1.9	4.2 ± 2.0	4.1 ± 2.3 0	.10
Gender (male)	78%	64%	69%	0.09
Non-caucasian	84%	85%	85%	0.97
S_pO_2 at presentation (%)	94.7 ± 3.4	94.7 ± 3.4	95.5 ± 3.1	0.14
Respirations @ presentation	44.2 ± 12.8	41.2 ± 12.9	41.2 ± 15.6	0.28
Severe Asthma	34%	36%	34%	0.94
Outcomes				
ED length of stay (hrs)	2.4 ± 0.8	2.5 ± 0.8	2.1 ± 0.8	0.001
Treatment duration (hrs)	2.2 ± 0.8	2.2 ± 0.7	1.8 ± 0.6	0.001
Aerosols given	4.3 ± 1.6	4.1 ± 1.7	3.1 ± 2.0	<0.001
Hospital Admits	47%	36%	23%	0.02
ICU admits	3%	6%	4%	0.57

CONCLUSION: In this study, patients treated with the Nebutech nebulizer demonstrated significant decreases in ED length of stay, total treatment times, admission rates and mean number of treatments given compared to the other two devices (Acorn and Circulaire). In our ED study, nebulizer brand utilized to treat pediatric asthma appears to make an impact on both clinical and financial outcomes.

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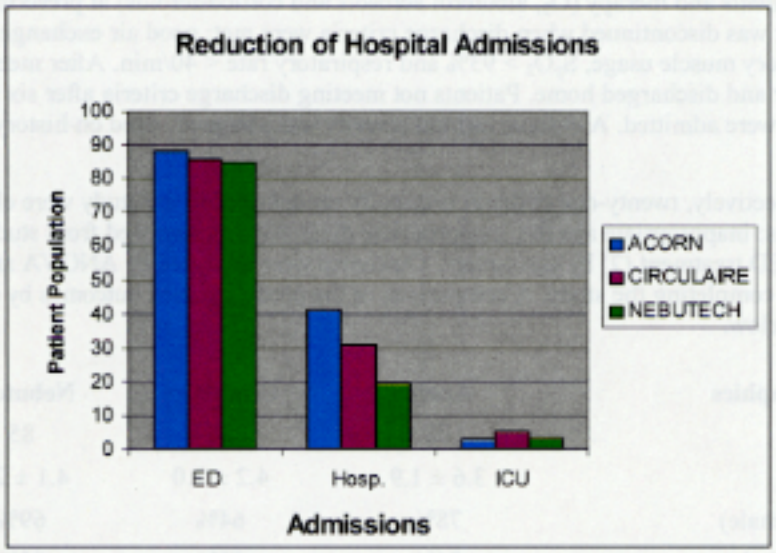
***NEW** clinical trial at University Hospitals Cleveland – Rainbow Babies & Childrens Hospital demonstrates the superior performance of the Nebutech™ HDN™ nebulizer as compared to a standard nebulizer – Acorn™, and the Circulaire™.

- Study population – 259 pediatric patients
- Emergency department admissions
- Treatment duration
- Aerosols treatments given



- ***Nebutech™ HDN™ vs. Acorn™ 50% reduction in hospital admissions.***
- ***Nebutech™ HDN™ vs. Circulaire™ - 36% reduction in hospital admissions.***
- ***Nebutech™ HDN™ vs. Acorn™ 39% less aerosol treatments given.***
- ***Nebutech™ HDN™ vs. Circulaire™ - 32% less aerosol treatments given.***

CONCLUSION: In this study, patients treated with the Nebutech™ HDN™ nebulizer demonstrated significant decreases in ED length of stay, total treatment times, admission rates and mean number of treatments given compared to the other devices (Acorn™ and Circulaire™). In our ED study, nebulizer brand utilized to treat pediatric asthma appears to make an impact on both clinical and financial outcomes.

*Respiratory Care 1999;44:(10):1278