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"Levalbuterol 1 ml (0.42 mg) Q8h Dosing using the AeroEclipse Breath Actuated Nebulizer"

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Purpose:

To maximize therapist time, an auto-conversion from Levalbuterol (Lev) 1.5 ml (0.63 mg) Q8h to Lev 1 ml (0.42 mg) Q8h using the AeroEclipse Breath Actuated Nebulizer (BAN) in a predominantly COPD in-patient population was evaluated.

Methods:

All patients with orders for Lev assessed by Respiratory Therapists with the ability to perform aerosol treatments by mouthpiece were converted to 1 ml Lev using the BAN. Lev was poured from a standard 3 ml unit dose vial to the 1 ml line in the BAN and administered. All protocol treatments, including breakthrough treatments, delivered during the two-month pilot were recorded. The breakthrough data for Racemic Albuterol (Alb) Q4h and Lev 0.63 mg Q8h was from our previous studies.

Results:

Clinical: Lev 1 ml (0.42 mg) Q8h had similar daily breakthrough rates per 100 treatments as did Lev 1.5 ml (0.63 mg) Q8h and significantly lower breakthroughs rates than Alb 2.5 mg Q4h (6.0, 4.9, 13.7 respectively, both compared to Alb $p<0.05$).

Economic: Time to deliver 1 ml by BAN was 2.67 minutes as compared with 8.33 minutes using a standard small volume nebulizer (SVN). The time saved per treatment multiplied by the number of treatments and the hourly therapist cost annualized to a personnel cost savings of $54,693. The increased cost of BAN vs. SVN annualized to $10,851. Net savings $43,842 per year. Pharmacy costs did not change.

Economic Evaluation

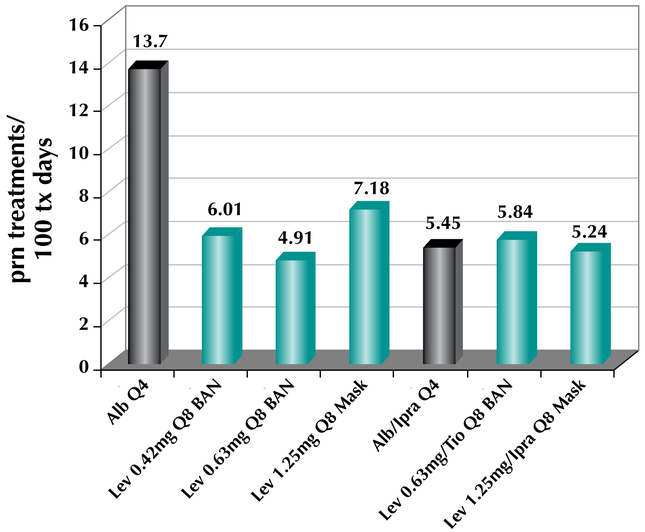
	3 ml Levalbuterol, Misty Neb	1 ml Levalbuterol, BAN	Difference
BAN Lev (time to deliver in min)	8.33	2.67	-5.66
Labor for Pilot (hours)	146	47	-99
Labor for Pilot (dollars)	$4,515	$1,447	$(3,068)
Labor savings annualized	$80,493	$25,800	$(54,693)
Annual device cost	$2,069	$12,920	$10,851
Total cost difference (annualized)			$(43,842)
RT Salary/hr			$31.00
Number of BAN treatments (pilot)			1,049
Total number of treatments (annual)			35,288
% BAN use			53%
Number of BAN treatments (annual)			18,703

Protocol

Levalbuterol (Xopenex) and Tiotropium (Spiriva) Bronchodilator Flow-Chart

Can the Patient Use a Mouthpiece Device?

YES	NO
Levalbuterol Only BAN Mouthpiece: 1.25 mg/3ml Lev UD, Administer 1 ml, Deliver TID and q2hours PRN	**Levalbuterol Only BAN Mask:** 1.25mg/0.5 ml Lev Concentrate with 0.5 ml Saline, Deliver TID and q2hours PRN
Levalbuterol Plus Anticholinergic BAN Mouthpiece: 1.25 mg/3ml Lev UD, Administer 1 ml, Deliver TID and q2hours PRN Tiotropium 18 mcg QAM via HandiHaler	**Levalbuterol Plus Anticholinergic BAN Mask:** 1.25mg/0.5 ml Lev Concentrate in 0.5mg/2.5ml UD Ipratropium, Deliver TID 1.25mg/0.5 ml Lev Concentrate with 0.5 ml Saline, Deliver q2hours PRN



Conclusions:

The conversion from 1.5 ml (0.63 mg) to 1 ml (0.42 mg) Lev using the BAN had similar clinical performance in breakthrough requirements. The savings in personnel cost more than offset the increase in device cost. Lev 1 ml delivered by the BAN is a very cost effective delivery method. Smaller doses in the BAN lead to shorter administration times.

Clinical Implications:

The conversion to 1 ml Lev allows for decreased respiratory therapy time or the re-allocating of workforce needs while maintaining the quality of aerosol administration, as evidenced by the persistently low breakthrough requirements.

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