

Combination Therapy (OPEP and Nebulizer) to Provide Focus to Mucus Clearance – Results from a Lab Study using Hypertonic Saline

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INTRODUCTION

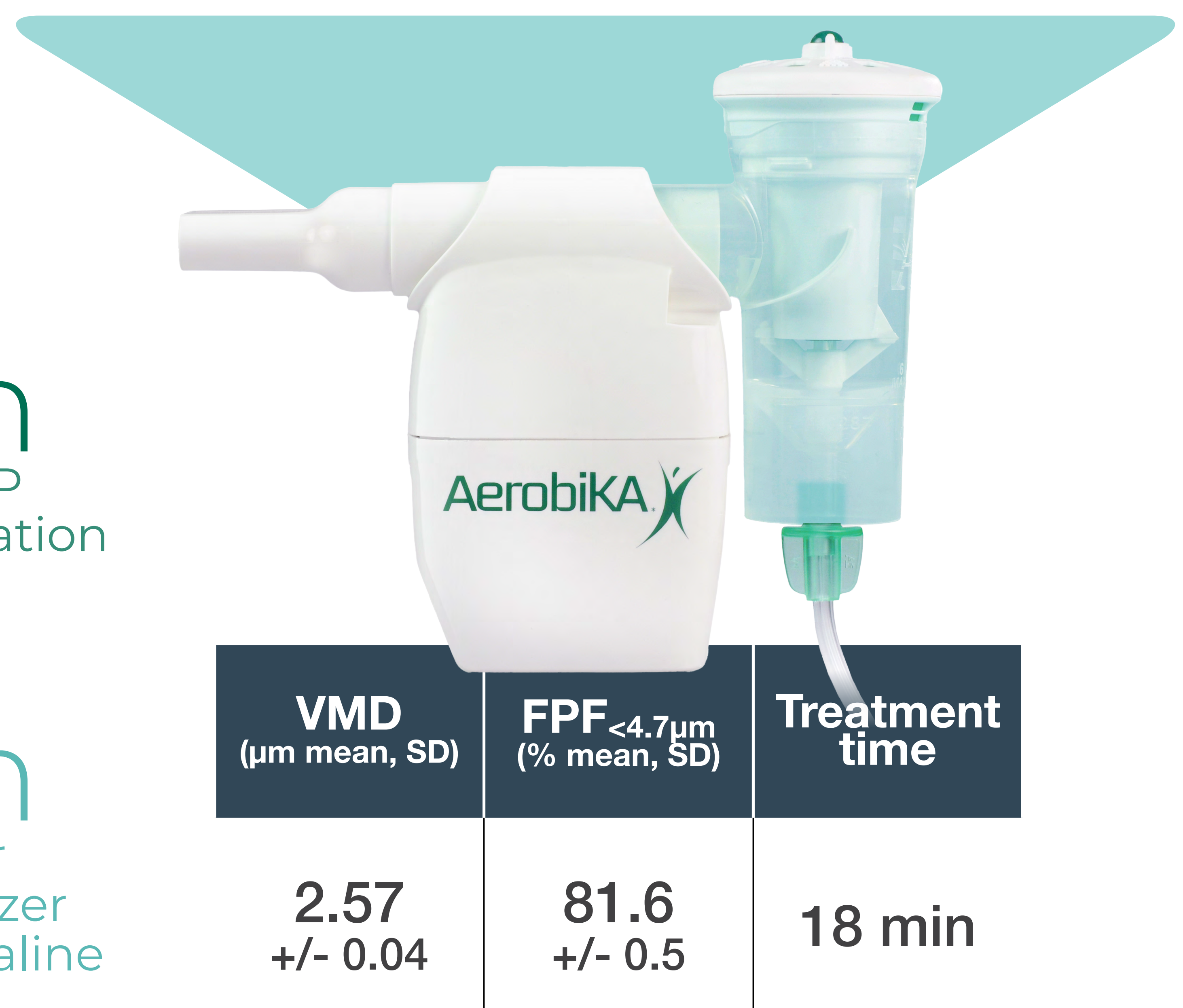
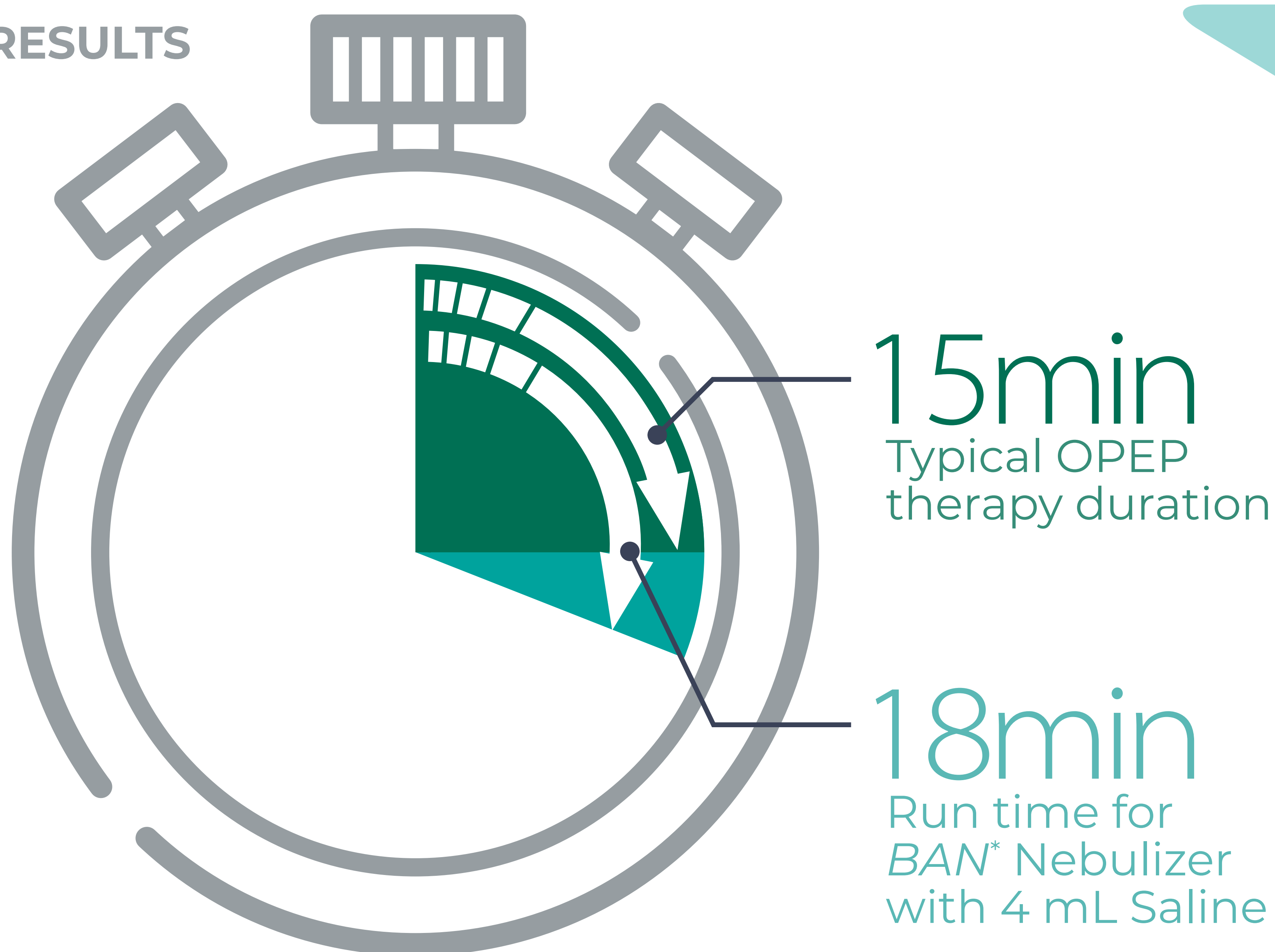
Management of excess mucus is a major treatment goal for bronchiectasis patients. Inhaled, nebulized mucolytics such as hypertonic saline are often used with other modalities, such as Oscillating Positive Expiratory Pressure (OPEP) devices. The treatment time burden is significant and therefore being able to combine therapies offers potential benefits to the patient in terms of reduced treatment duration. This study evaluated the medication delivery performance of hypertonic saline when delivered via a nebulizer with breath actuated technology (inhalation) attached to an OPEP device (exhalation).

METHODS

An **AeroEclipse* XL BAN*** Nebulizer / **Ombra*** Compressor (TMI) was connected to an **Aerobika*** OPEP device (TMI), $n = 5$. A 4 mL fill of hypertonic saline (7% NaCl) was delivered through the combination system and a laser diffractometer was used to determine the volume median diameter (VMD) as well as the fraction of delivered medication that was <4.7 microns (fine particle fraction, $FPF_{<4.7\mu m}$). Treatment time was also determined when operating the combination therapy using an adult USP breathing pattern with the nebulizer in breath actuated mode.



RESULTS



DISCUSSION / CONCLUSIONS

A typical treatment time for a single session of OPEP therapy is approximately 15 minutes. This laboratory study showed that with combination therapy there was a similar time associated with the completion of OPEP therapy and nebulized hypertonic saline, with more than 80% of the delivered medication being in the respirable droplet size range to work therapeutically in the lung. It has also previously been reported that such combination of these devices did not appreciably change the respirable mass delivered using the nebulizer alone.¹

In addition to providing the benefit of treatment time savings, this combination of devices reduces both medication wastage / fugitive emissions and has the potential to provide dual benefits of airway clearance compared to only performing one individual therapy.

Given the efficiency of hypertonic saline delivery demonstrated in the study, as well as the good degree of alignment between ideal OPEP therapy time and nebulizer run time, this type of combination therapy should be considered to reduce the burden of therapy and for mucus management in bronchiectasis patients.