

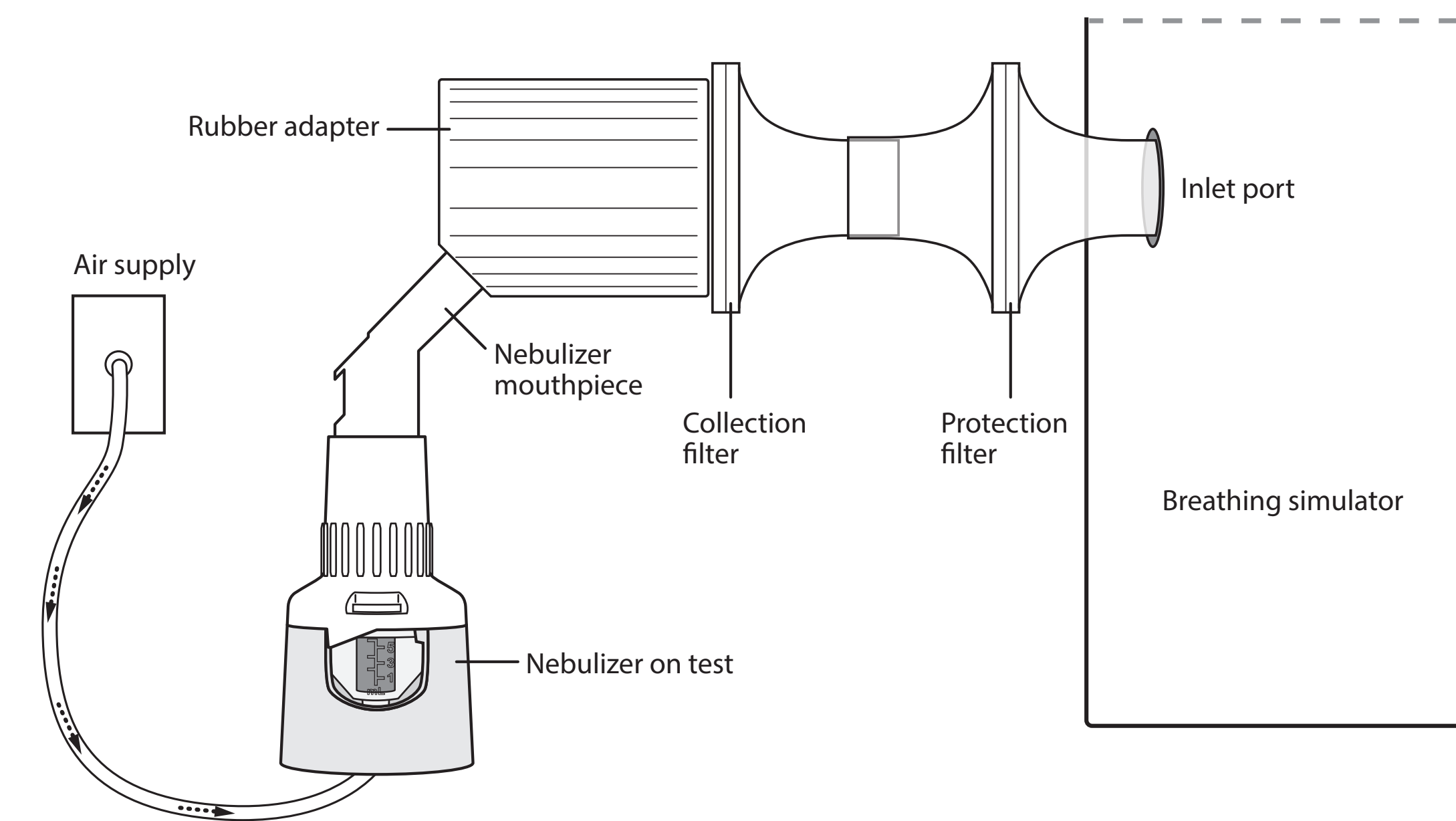
# New Continuous Nebulizer Shortens Treatment Times for Patients Requiring Bronchodilation Therapy

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## RATIONALE

- A continuously operating nebulizer can be an appropriate clinical option when the focus of the therapy is to minimize treatment time.
- The present study describes the laboratory evaluation of a new continuous jet nebulizer for the delivery of a short-acting beta-agonist widely prescribed for patients with asthma.



## RESULTS

- Treatment times for the **MC 300\*** nebulizer were shorter than those of the other nebulizers.
- Respirable Dose ( $\mu\text{g}$ ,  $< 4.7 \mu\text{m}$  diameter), indicative of potential penetration of medication to the airways, was significantly greater than any other nebulizer [ $p < 0.001$ ]

Key Performance Metrics (mean  $\pm$  SD)

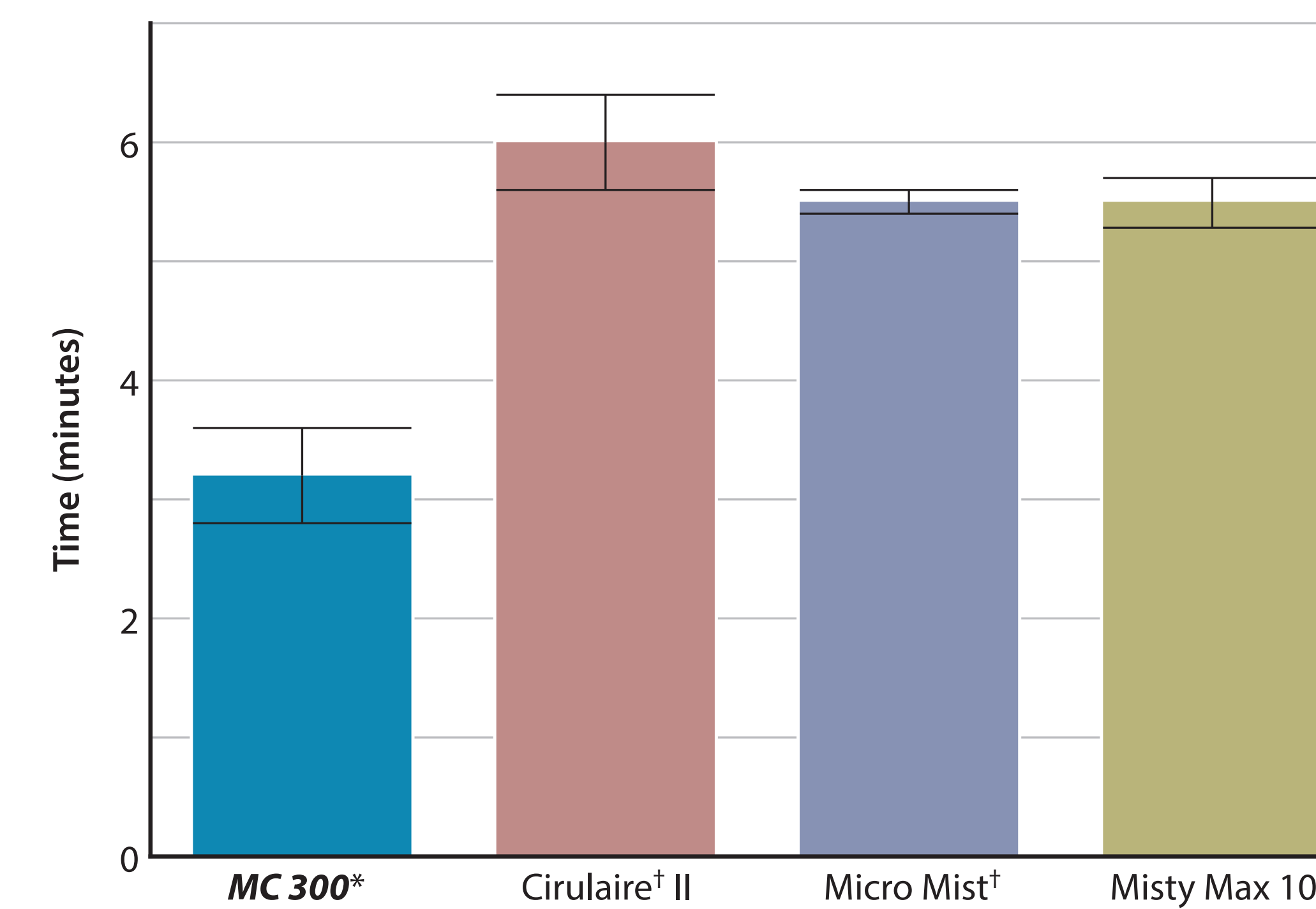
Device	Laser Diffraction		Breathing Simulator Drug Output Testing			
	Dv50	Fine Particle Fraction [%V<4.7 $\mu\text{m}$ (%)]	Total Mass Delivered [ $\mu\text{g}$ ]	Treatment Time [min]	Output Rate [ $\mu\text{g}/\text{sec}$ ]	Respirable Dose [ $\mu\text{g}$ ]
<b>MC 300*</b>	2.7	77.5 $\pm$ 1.9	371.4 $\pm$ 15.4	3.2 $\pm$ 0.4	2.1	287.7 $\pm$ 12.0
Cirulaire <sup>†</sup> II	4.3	54.9 $\pm$ 2.3	160.6 $\pm$ 11.3	6.0 $\pm$ 0.4	0.5	88.1 $\pm$ 6.2
Micro Mist <sup>†</sup>	4.4	53.2 $\pm$ 2.3	365.3 $\pm$ 16.5	5.5 $\pm$ 0.1	1.1	194.3 $\pm$ 8.8
AirLife <sup>†</sup> Misty Max 10 <sup>†</sup>	3.6	65.0 $\pm$ 3.1	347.9 $\pm$ 26.1	5.5 $\pm$ 0.2	1.1	226.1 $\pm$ 17.0

## MATERIALS AND METHODS

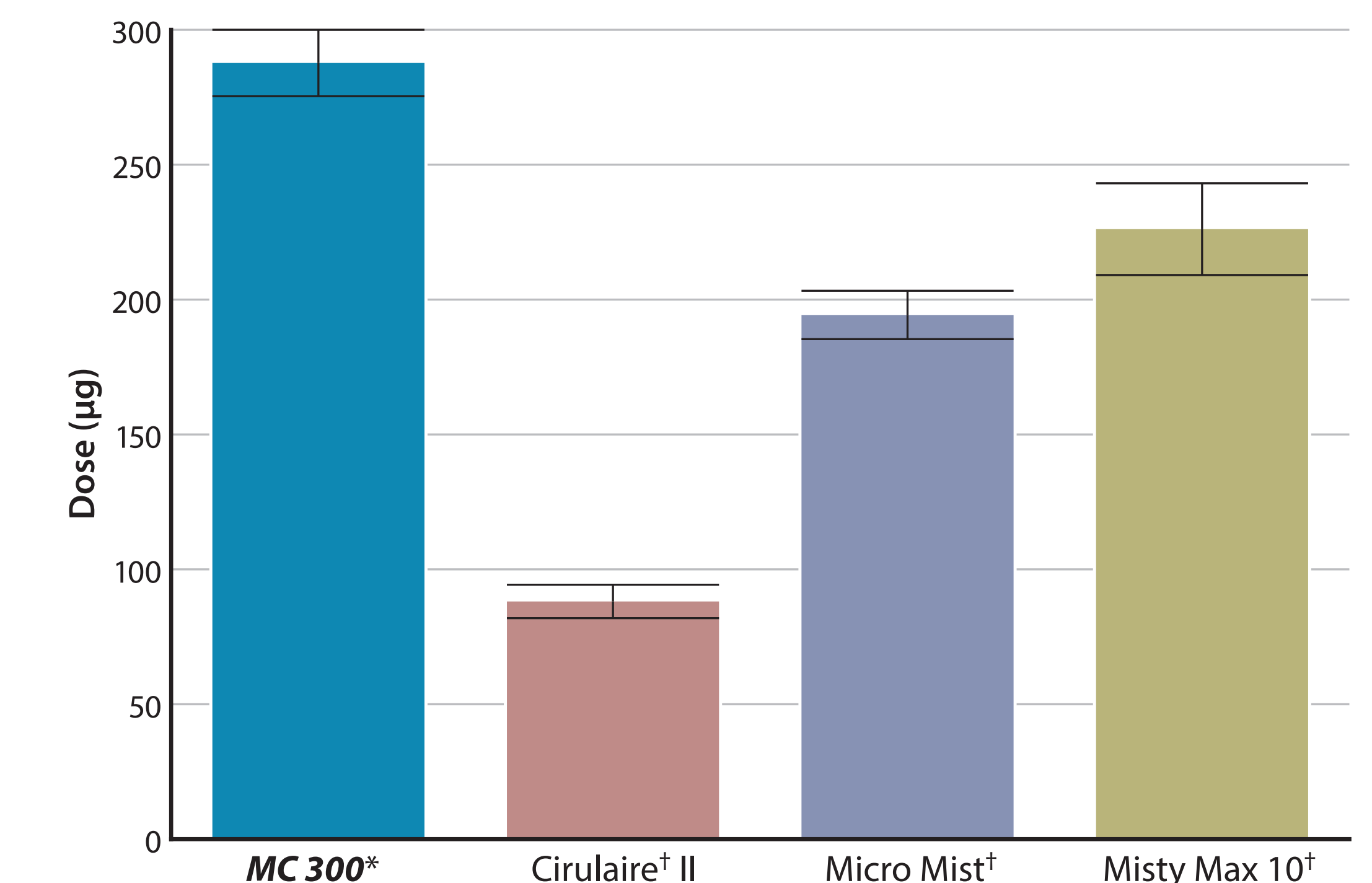


- Each nebulizer in its group ( $n=5$ ) was operated with medical air supplied at 8 L/min and a 3.0 mL fill of albuterol sulfate (2.5 mg).
- The mouthpiece of the nebulizer-on-test was connected to a breathing simulator (ASL5000 IngMar Medical) set to simulate adult tidal breathing
  - Tidal volume = 600 mL
  - 10 breaths per min (bpm)
  - Inspiratory : Expiratory ratio of 1:2
- A bacterial collection filter placed at the mouthpiece collected the emitted aerosol.
- The nebulizer was allowed to operate until sputter and filters were changed every minute of runtime and assayed via an HPLC assay for albuterol.
- Droplet size distribution analysis was undertaken with a saline fill, in parallel measurements ( $n=5$  replicates) using a Laser Diffractionometer (Malvern Spraytec).

Comparison of Treatment Times



Comparison of Respirable Dose



## CONCLUSIONS

- The **MC 300\*** nebulizer offers the clinician additional choice when short treatment times and maximizing respirable dose are a priority.

