

# Comparative Scintigraphic Assessment of Deposition of Radiolabeled Albuterol Delivered from a Breath Actuated Nebulizer and a Small Volume Jet Nebulizer to Healthy Subjects

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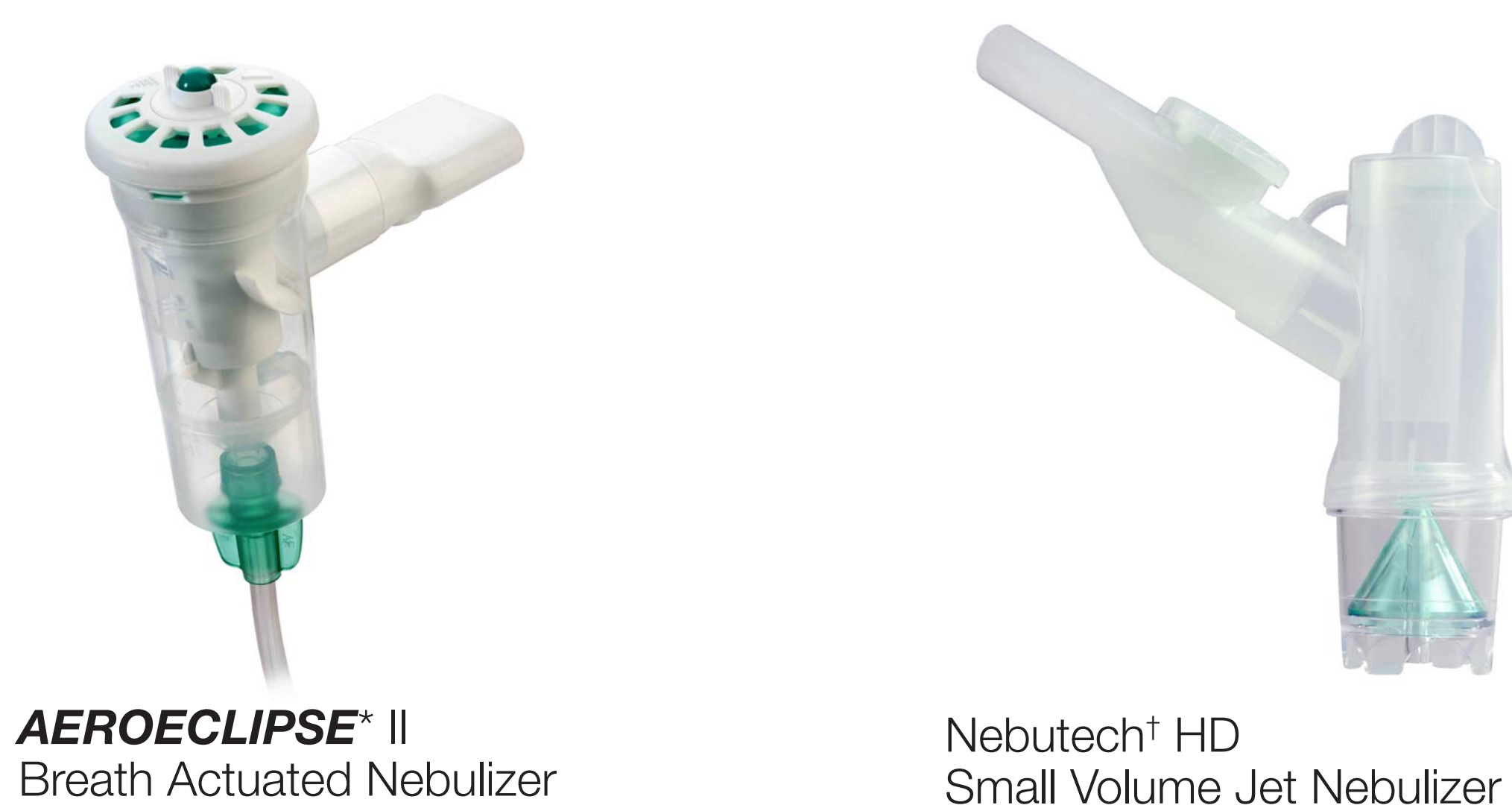
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## RATIONALE

- Medication nebulizers are commonly used to deliver aerosolized medications to patients with respiratory disease.
- To compare *in vivo* aerosol delivery characteristics of a Breath Actuated Nebulizer (BAN) to that of a standard Small Volume jet Nebulizer (SVN) we evaluated output and regional lung deposition of indirectly radiolabeled albuterol.

## METHODS

- Eight healthy subjects received albuterol (2.5 mg/3mL) admixed with 2 mCi of Tc-DTPA (Technetium-99m bound to diethylenetriaminepentaacetic acid) administered using both the **AEROECLIPSE<sup>®</sup> II BAN** and Nebutech<sup>†</sup> HD SVN
- Regional doses were then determined from anterior and posterior gamma camera images collected after delivery.
- Lung perimeters were defined using Cobalt-57 transmission scans and applied to Tc-DTPA deposition images.

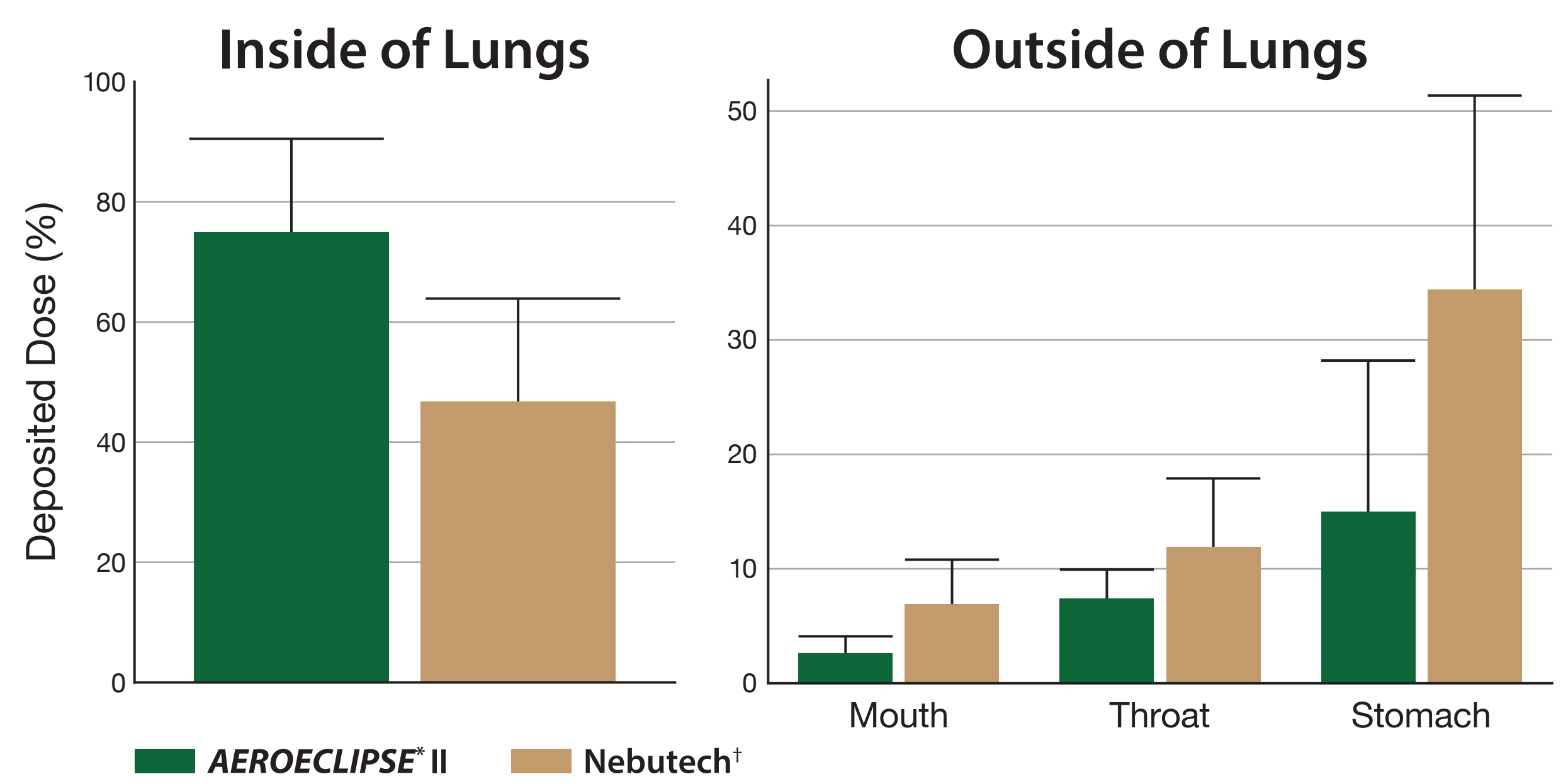


## RESULTS

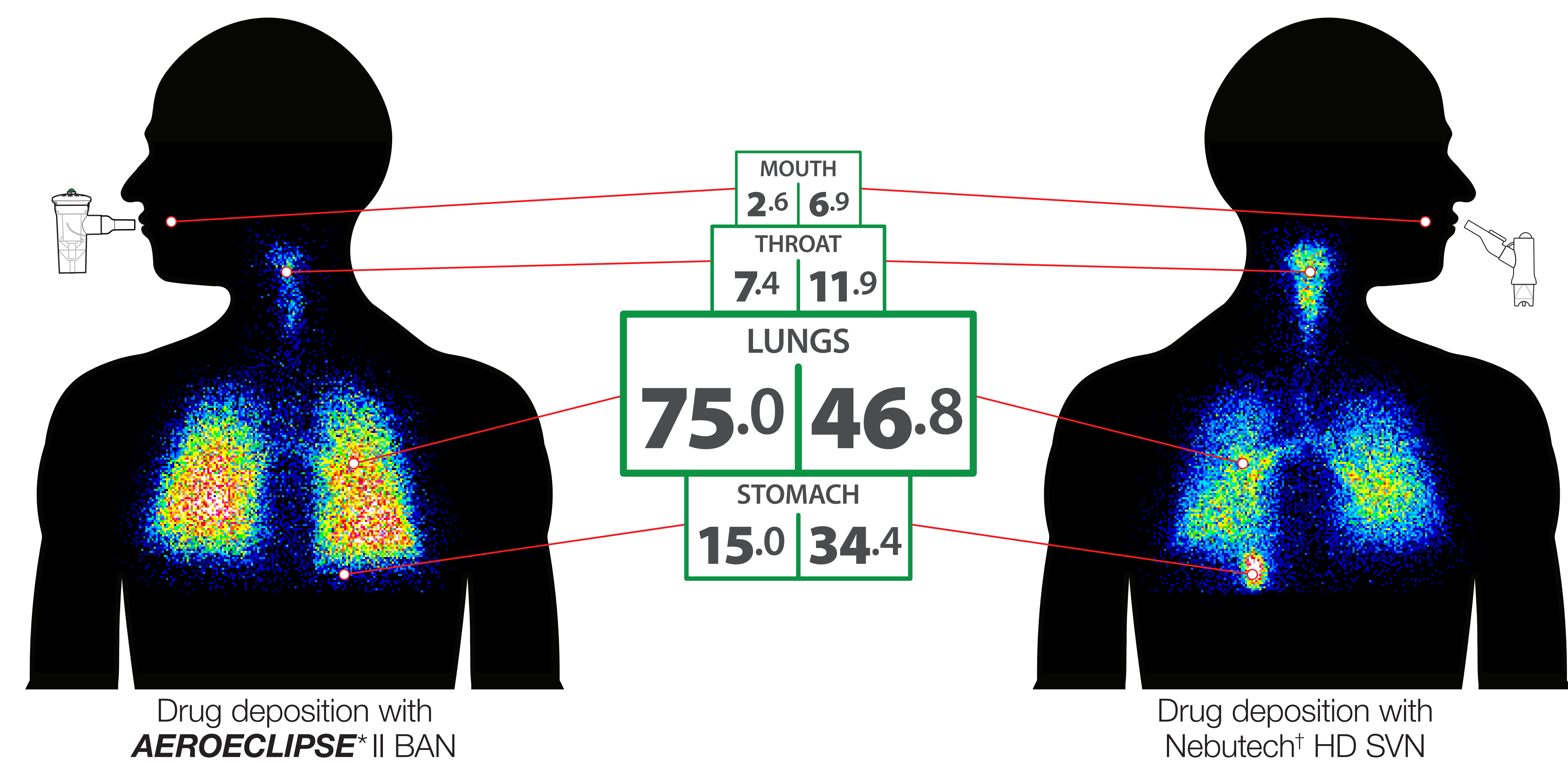
- Average age of all 8 subjects (4 male, 4 female) was 33 years.
- The total dose deposited in each subject, on average, was 1.03 ± 0.14 mg vs 0.89 ± 0.15 mg for the BAN and SVN respectively
- The dose deposited in each subject regionally quantified into the following regions and averages were expressed as percentage of deposited dose (%) ± one standard deviation.

Percentage of Deposited Dose (%)

Location	AEROECLIPSE <sup>®</sup> II BAN	Nebutech <sup>†</sup> HD SVN
Mouth	2.6 ± 1.5	6.9 ± 3.9
Throat	7.4 ± 2.5	11.9 ± 6.0
<b>Lungs</b>	<b>75.0 ± 15.5</b>	<b>46.8 ± 17.1</b>
Left	35.9 ± 9.2	21.7 ± 8.2
Right	39.1 ± 7.8	25.0 ± 8.9
Stomach	15.0 ± 13.2	34.4 ± 17.0



## Percentage of Deposited Dose (%) — Sample Scintigraphy Images



## CONCLUSIONS

- The **AEROECLIPSE<sup>®</sup> II BAN** demonstrated increased aerosol deposition to the lungs in healthy subjects as compared to the Nebutech<sup>†</sup> HD SVN. Further studies in patients are needed to confirm the clinical benefit of this increased lung deposition.
- In vivo* deposition patterns also demonstrated that the SVN delivered significantly more aerosol to the upper respiratory tract as indicated by deposition found in both the stomach and tracheo-esophageal regions