Comparison of Fugitively Emitted Aerosol During Use of the Aerogen® Ultra Versus a Jet Nebuliser


**Background**
Secondary exposure to fugitive aerosol emissions in a respiratory therapy setting is not well understood.

**Objective**
The aim of this study was to evaluate secondary exposure to fugitive aerosols emitted during the administration of albuterol via the Aerogen Ultra and a jet nebuliser under simulated real-use conditions.

**Materials and Methods**

**Design:** Bench study

- The reservoir of each device was filled with albuterol 2.5 mL, which was administered during simulated adult breathing*
- Each device was assessed in multiple test runs employing different interface and mouthpiece scenarios
- Fugitive emissions were measured in real time using an aerodynamic particle sizer (recorded at 20-second intervals over 25 minutes)
- Inhaled dose and residual mass† were analyzed using ultraviolet spectrophotometry
- The 0.8 m distance represented one arms length away from the patient model. The 2.2 m represented the distance bed to bed in an acute care setting.

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*15 breaths per minute, tidal volume of 500 mL, and inspiratory-expiratory ratio of 1:1; †Drug that was available for delivery but remained in the device; ‡Filter placed on the exhalation port.
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The Aerogen Ultra with filtered mouthpiece was the only device to demonstrate no increase in exhaled aerosol emissions versus baseline.

*Mean 5-minute ambient aerosol concentration prior to nebulisation.