

## Fine Particulate Matter Depression of Pulmonary Function in the Developing Lung

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**Categories:** Environmental Health

**Keywords:**

**How to cite this poster**

Gookin G (2012) Fine Particulate Matter Depression of Pulmonary Function in the Developing Lung. *Cureus* 4(10): e400.

### Abstract

Evidence is increasing that ambient air pollution has chronic negative effects on pulmonary function in the developing lungs of children. A mouse model was used to test whether ambient particulate matter delays or stunts lung growth. Mice undergo a rapid period of growth between birth and 6 weeks of age. After lung remodeling and alveolarization is complete normal lung growth occurs from 4 weeks into adulthood. C57BL/6 mice were exposed to concentrated ambient fine particulate matter less than 2.5  $\mu\text{m}$  or purified air for 8 weeks starting at either 4, 6, or 8 weeks of age. An invasive lung function measurement was utilized using parameters that are considered to be classical methods for accurate and specific determination of pulmonary mechanics (e.g., pulmonary resistance and dynamic compliance) Analysis of the data shows a depression of pulmonary function in particle-exposed animals compared to purified-air exposed animals, 1 wk post 8 wk exposure. At the end of their lung growth period particle-exposed mice had a significant decrease in dynamic compliance compared to purified-air exposed mice. The particle-exposed animals also displayed increased pulmonary resistance as well as a depression in maximum inspiratory and expiratory flow compared to purified-air exposed animals.

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**Published 10/11/2012**

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