



From Heartwire

## Only Three Cigarettes a Day Significantly Increases Cardiovascular Disease Risk

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September 3, 2009 (Provo, Utah) — Exposure to relatively low levels of fine particulate matter (PM) significantly increases the risk of cardiovascular disease [1]. The risk trajectory levels off with higher levels of exposure, researchers report, in a study published online August 31, 2009 in *Circulation*. The study will appear in the September 15 issue. Risk of cardiovascular disease increased 64% by smoking three cigarettes a day. Risk doubled by smoking a pack a day, according to data on more than one million adults prospectively collected by the **American Cancer Society**, as part of the **Cancer Prevention Study II** of 1982. Using this database, **Dr C Arden Pope** (Brigham Young University Provo, UT) and colleagues calculated adjusted relative risks of mortality according to an estimated average daily dose of fine PM from active cigarette-smoke inhalation, as well as the PM doses from second hand cigarette-smoke exposure and from exposure to air pollution. "There were substantially increased cardiovascular mortality risks at very low levels of active cigarette smoking and smaller but significant excess risks even at the much lower exposure levels associated with second hand cigarette smoke and ambient air pollution," the researchers report.

"The results indicate that it is fundamentally implausible that the relationship between cardiovascular mortality and fine particulate pollution from cigarette smoke and ambient air pollution can be characterized as linked by a simple linear dose-response relationship," the authors write. "Rather, our results suggest that the exposure-response function is relatively steep at very low levels of exposure, flattening out at high exposure levels." Pope and colleagues note several limitations of the study, among them the large exposure gap between ambient air pollution, second hand-smoke exposure, and active smoking. And, the authors say, there are no prospective cohort or related studies of long-term exposure across the range of exposure that would fill this gap. Even with its limitations, the study findings have important public-health implications, Pope's team comments. Most studies of the effects of fine PM on cardiovascular disease risk have been conducted in areas where the annual average PM concentrations rarely exceed 30  $\mu\text{g}/\text{m}^3$ . Recent estimates indicate average concentrations of particulate air pollution in urban areas of China, India, and other developing countries often exceed 100  $\mu\text{g}/\text{m}^3$ .

### References

1. Pope CA 3rd, Burnett RT, Krewski D, et al. Cardiovascular mortality and exposure to airborne fine particulate matter and cigarette smoke. Shape of the exposure-response relationship. *Circulation* 2009; DOI: 10.1161/CIRCULATIONAHA.109.857888. Available at: <http://circ.ahajournals.org>.  
[Abstract](#)

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