
Children's Environmental Health Research Findings
March 2017

Topic: Secondhand smoke exposure

Title: Cardiovascular Consequences of Childhood Secondhand Tobacco Smoke Exposure: Prevailing Evidence, Burden, and Racial and Socioeconomic Disparities: A Scientific Statement From the American Heart Association.

Conclusion: Exposure to secondhand tobacco smoke in children may have detrimental cardiovascular consequences

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Abstract:

Background: Although public health programs have led to a substantial decrease in the prevalence of tobacco smoking, the adverse health effects of tobacco smoke exposure are by no means a thing of the past. In the United States, 4 of 10 school-aged children and 1 of 3 adolescents are involuntarily exposed to secondhand tobacco smoke, with children of minority ethnic backgrounds and those living in low-socioeconomic-status households being disproportionately affected (68% and 43%, respectively). Children are particularly vulnerable, with little control over home and social environment, and lack the understanding, agency, and ability to avoid exposure to secondhand tobacco smoke on their own volition; they also have physiological or behavioral characteristics that render them especially susceptible to effects of secondhand tobacco smoke. Side-stream smoke (the smoke emanating from the burning end of the cigarette), a major component of secondhand tobacco smoke, contains a higher concentration of some toxins than mainstream smoke (inhaled by the smoker directly), making secondhand tobacco smoke potentially as dangerous as or even more dangerous than direct smoking. Compelling animal and human evidence shows that exposure to secondhand tobacco smoke during

childhood is detrimental to arterial function and structure, resulting in premature atherosclerosis and its cardiovascular consequences. Childhood exposure to secondhand tobacco smoke is also related to impaired cardiac autonomic function and changes in heart rate variability. In addition, childhood exposure to secondhand tobacco smoke is associated with clustering of cardiometabolic risk factors such as obesity, dyslipidemia, and insulin resistance. Individualized interventions to reduce childhood exposure to secondhand tobacco smoke are shown to be at least modestly effective, as are broader-based policy initiatives such as community smoking bans and increased taxation.

Purpose: The purpose of this statement is to summarize the available evidence on the cardiovascular health consequences of childhood exposure to secondhand tobacco smoke; this will support ongoing efforts to further reduce and eliminate exposure to secondhand tobacco smoke in this vulnerable population. This statement reviews relevant data from epidemiological studies, laboratory-based experiments, and controlled behavioral trials concerning secondhand tobacco smoke and cardiovascular disease risk in children. Information on the effects of exposure to secondhand tobacco smoke on the cardiovascular system in animal and pediatric studies, including vascular disruption and platelet activation, oxidation and inflammation, endothelial dysfunction, increased vascular stiffness, changes in vascular structure, and autonomic dysfunction, is examined.

Conclusions: The epidemiological, observational, and experimental evidence accumulated to date demonstrates the detrimental cardiovascular consequences of exposure to secondhand tobacco smoke in children.

Implications: Increased awareness of the adverse, lifetime cardiovascular consequences of childhood exposure to secondhand tobacco smoke may facilitate the development of innovative individual, family-centered, and community health interventions to reduce and ideally eliminate exposure to secondhand tobacco smoke in the vulnerable pediatric population. This evidence calls for a robust public health policy that embraces zero tolerance of childhood exposure to secondhand tobacco smoke.

Policy Implications: Public health policy should embrace reducing children's exposure to secondhand tobacco smoke.

Keywords: tobacco, cardiovascular disease, secondhand smoke