Thirdhand Smoke Creates Indoor Cancer Risk

Lingering Tobacco Particles React with Common Indoor Air Pollutant to Form Cancer-Causing Compounds, Study Finds

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Feb. 8, 2010 -- Taking a breath inside a smoker's home or car could increase your risk of cancer, even if there is not a lit cigarette in sight.

Tobacco smoke residue lurking in carpets, upholstered furniture, and on other everyday surfaces can react with common chemicals in indoor air to form cancer-causing substances, according to a new study in the *Proceedings of the National Academy of Sciences*.

Tobacco smoke residue on everyday surfaces has recently been dubbed "thirdhand" smoke. Researchers say their findings further demonstrate that exposure to thirdhand smoke is a potential long-term health hazard. It is especially concerning for infants and toddlers, who tend to have more frequent contact with the contaminated surfaces when crawling and playing.

For the study, Hugo Destaillats and colleagues looked at how nicotine behaved when exposed to a common indoor air pollutant called nitrous acid (HONO) found inside a smoker's automobile. Nicotine is released into the air during smoking and persists for weeks to months on indoor surfaces. HONO is found in higher levels indoors than outdoors.

The nicotine reacted with the indoor air pollutant to form carcinogenic compounds called tobacco-specific nitrosamines (TSNAs). Researchers found "substantial levels" of TSNAs on surfaces inside the smoker's truck that was used in the study. More than half of the cancer-causing compounds remained more than two hours after the cigarette smoke had cleared.

Researchers say the most likely human exposure to TSNA is by touching a surface that has been contaminated with tobacco smoke, such as clothing, furniture, even skin or hair. The study authors warn that infants and young children are at danger of receiving higher exposures than adults.