

YOUR GOOD HEALTH

Thirdhand SMOKE

A new worry for families of smokers

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Michael Miller, 44, does what most smokers do to protect their children from the fumes cigarettes: He takes it outside.

After his 7 a.m. coffee, he walks out of his home in Cincinnati to smoke his first cigarette of the day. Then, as a branch manager of a road safety construction company, he smokes dozens more on street curbs.

The tobacco never appears when Miller is coaching on the baseball or football field, or when he's in the car with his children. But when he's alone on the road, he sometimes rolls the windows down and lights up.

"I know [cigarettes are] bad," Miller said. "I know I need to quit."

New findings highlight the scientific community's efforts to identify potential dangers of another byproduct of cigarettes that may slip past Miller's precautions and affect his kids: "third-hand smoke."

A recent study in the journal *Tobacco Control* found high levels of nicotine on the hands of children of smokers, raising concerns about thirdhand smoke, a name given to the nicotine and chemical residue left behind from cigarette and cigar smoke that can cling to skin, hair, clothes, rugs and walls. This thin film can be picked up by touch or released back into the air when disturbed.

The researchers examined 25 children who arrived at an emergency room with breathing problems associated with secondhand smoke exposure.

They discovered the average level of nicotine on the children's hands was more than three times higher than the level of nicotine found on the hands of non-smoking adults who live with

smokers. They said nicotine on the skin of a nonsmoker is a good proxy to measure exposure to thirdhand smoke.

"Because nicotine is specific to tobacco, its presence on children's hands may serve as a proxy of tobacco smoke pollution in their immediate environment," the researchers wrote.

They also found that all but one of the children had detectable levels in their saliva of cotinine, a biomarker for exposure to nicotine. All of the children in the study had parents who smoked but did not smoke themselves.

The high nicotine readings on the kids' hands, coupled with the "light smoking" habits of the majority of their parents, signaled to lead author E. Melinda Mahabee-Gittens that these toxins could have arrived from a source other than direct access to cigarette smoke.

"Clearly they're getting it from somewhere, and perhaps it may be this third-hand smoke connection," said Mahabee-Gittens, an emergency room physician at Cincinnati Children's Hospital Medical Center.

Children face a higher risk of developing health complications from thirdhand smoke than adults. Infants tend to spend more time indoors and can be surrounded by contaminated objects like rugs and blankets, according to a 2004 study written by Georg Matt, a professor of psychology at San Diego State University who co-authored the study and has researched thirdhand smoke. An infant's propensity to place their hands in their mouth increases the likelihood of the young ingesting the toxic residue.

Thirdhand smoke can linger in an area long after a cigarette or cigar is snuffed out — for up to five years, Matt said.



[MARKFRIESTEDT/GATEHOUSE]

How to remove thirdhand smoke

According to Bo Hang, a scientist at the Lawrence Berkeley National Laboratory who conducts research on the toxic effects of thirdhand smoke, the best way to get rid of thirdhand smoke is by removing affected items, such as sofas and carpeting. Vacuuming and washing clothes, curtains and bedding can also help, as well as sealing and repainting walls or even removing and replacing contaminated wallboard.

"Tobacco smoke doesn't go up in the air and it disappears and it's gone," Matt said. "That's the illusion."

The negative health consequences of secondhand smoke are well-established.

Researchers at the U.S. Centers for Disease Control and Prevention estimate that since 1964 at least 2.5 million nonsmokers have died of diseases linked to their exposure to cigarette smoke.

In contrast, research on thirdhand smoke gained popularity only a decade ago, but multiple studies suggest the mix of toxins can lead to adverse health outcomes. An animal model simulating thirdhand-smoke-contaminated homes found the chemicals harmed mice's livers, lungs and healing abilities. A separate 2010 study showed thirdhand smoke mixed with nitrous acid can form cancer-causing chemical compounds.

"All in all, I think the evidence that we've gathered is basically pointing to potentially high levels of risk to young children and toddlers, and also expectant mothers," Anwer Mujeeb, program officer for the Tobacco-Related Disease Research Program.

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