Thirdhand Smoke Resource Center

If someone smokes outside, do they bring thirdhand smoke indoors with them?

The Short Answer

Thirdhand smoke is the chemicals left behind when someone smokes tobacco. Thirdhand smoke is unhealthy for people and pets. It can stick around for a long time in homes and cars. It gets into your body if you inhale, swallow, or touch the chemicals. Getting rid of it is really hard and can cost a lot of money.

Yes, after smoking, people bring thirdhand smoke with them when they enter a home, car, or other enclosed spaces, such as a movie theater, hospital, or public transportation.

When someone smokes, thirdhand smoke sticks to their clothes, skin, hair, and mouth. The thirdhand smoke chemicals can transfer from the person to surfaces they touch. The chemicals can be released back into the air, producing a smell of old or stale tobacco smoke.

To avoid people carrying thirdhand smoke into your home or car, ask those who smoked to change clothes, wash their hands and face, and shower before entering your home or car.

The Long Answer

Thirdhand smoke is the chemical residue from tobacco smoke. It is also called “tobacco smoke residue” or “stale tobacco smoke.” The chemicals in thirdhand smoke are toxic to humans, especially children. Thirdhand smoke chemical residue can linger for years in dust and on household surfaces. It can also become embedded in carpets, furniture, clothes, and building materials. It is difficult and expensive to remove.

When someone who smokes outside enters a home, car, or other enclosed space, such as a movie theater, hospital, or public transportation, they bring thirdhand smoke with them. Often, they will smell like tobacco smoke, but even if they don’t, they still carry thirdhand smoke chemicals on their clothes, skin, hair, mouth, and breath. We smell tobacco smoke when the thirdhand smoke chemicals are released into the air, a process known as off-gassing. Some of these chemicals in the air are recognized by the odor receptors in our noses, and our brains tell us that this is the unpleasant smell of stale tobacco smoke.

Once this tobacco residue is brought inside, the effects are similar to when someone smokes a cigarette inside your car or home. The gases and particles in the tobacco residue on the hands, clothes, skin, and hair of the person who smoked can be transferred, stick to, and ultimately become embedded in materials and objects. In your home and workplace, these include carpets, walls, furniture, blankets, and toys. In your car, these include the seats, steering wheel, floor mats, and ceiling liner. The gases and particles can also be released into the air and accumulate in dust. As a result, people and pets may be exposed to toxic thirdhand smoke even though no one smoked inside your car or home.

The first step to avoiding exposure to thirdhand smoke is to tell family members and friends about thirdhand smoke and encourage them to avoid exposure. Ask friends and family who smoke to adopt these strategies to protect others:

1. Always wash your hands and face very carefully after smoking to remove tobacco residue from your skin.
2. Wash clothes worn while smoking each day to avoid releasing toxic compounds into the air.
3. If possible, shower and change into clean clothes upon entering the home of someone who does not smoke.

Be sure to thank them for helping to protect you and your loved ones from toxic thirdhand smoke.

Do you have more questions about the toxic legacy of tobacco smoke, how it affects human health, and what we can do about it? Learn more here.

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Sources:

Fortmann A L, Romero RA, Sklar RA, et al. Residual tobacco smoke in used cars: Futile efforts and persistent pollutants. *Nicotine & Tobacco Residue*. 2010;12(10):1029-36. doi: 10.1093/ntr/ntq144

Licina D, Morrison GC, Bekö G, et al. Clothing-mediated exposures to chemicals and particles. *Environmental Science & Technology*. 2019;53(10):5559-5575. doi: 10.1021/acs.est.9b00272

Lidón-Moyano C, Fu M, Pérez-Ortuño R, et al. Third-hand exposure at homes: Assessment using salivary cotinine. *Environmental Research*. 2021;196:110393. doi: 10.1016/j.envres.2020.110393

Matt GE, Romero R, Ma DS, et al. Tobacco use and asking prices of used cars: Prevalence, costs, and new opportunities for changing smoking behavior. *Tobacco Induced Diseases*. 2008;4(1):2. doi: 10.1186/1617-9625-4-2

Matt GE, Quintana PJ, Hovell MF, et al. Residual tobacco smoke pollution in used cars for sale: Air, dust, and surfaces. *Nicotine & Tobacco Research*. 2008;10(9):1467-1475. doi: 10.1080/14622200802279898

Matt GE, Quintana PJ, Zakarian JM, Fortmann AL, Chatfield DA, Hoh E, Uribe AM, Hovell MF. When smokers move out and non-smokers move in: Residential thirdhand smoke pollution and exposure. *Tobacco Control.* 2011;20(1):e1. doi: 10.1136/tc.2010.037382

Northrup TF, Stotts AL, Suchting R, et al. Thirdhand smoke contamination and infant nicotine exposure in a neonatal intensive care unit: An observational study. *Nicotine & Tobacco Research.* 2021;23(2):373-382. doi: 10.1093/ntr/ntaa167

Rosen LJ, Zucker DM, Gravely S, et al. Tobacco smoke exposure according to location of home smoking in Israel: Findings from the project zero exposure study. *International Journal of Environmental Research and Public Health*. 2023;20(4):3523. doi: 10.3390/ijerph20043523

Sheu R, Stönner C, Ditto J, et al. Human transport of thirdhand tobacco smoke: A prominent source of hazardous air pollutants into indoor nonsmoking environments. *Science Advances*. 2020;6(10):eaay4109. doi: 10.1126/sciadv.aay4109

Quintana PJE, Lopez-Galvez N, Matt GE, et al. Cotton pillow samplers for assessment of thirdhand smoke in homes of smokers and nonsmokers with children. *Journal of Environmental Exposure Assessment*. 2023;2(4):23. doi: 10.20517/jeea.2023.28

Quintana PJ, Matt GE, Chatfield D, et al. Wipe sampling for nicotine as a marker of thirdhand tobacco smoke contamination on surfaces in homes, cars, and hotels. *Nicotine & Tobacco Research.* 2013;15(9):1555-63. doi: 10.1093/ntr/ntt014