

THIRDHAND

SMOKE Resource Center

Can thirdhand smoke hurt my pet?

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. It 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.

The harmful effects of second- and thirdhand smoke exposure on people are widely known, but the same effects can apply to cats, dogs, and even birds and fish! Most pet owners protect their pets from tobacco smoke because they know that as they breathe in secondhand smoke in the air, they inhale hundreds of carcinogenic toxic chemicals.

Cats and Dogs


If your cat or dog spends a lot of time indoors in an environment that contains thirdhand smoke, they may be exposed to the chemicals in thirdhand smoke. If pets sleep or play on floors or furniture polluted with thirdhand smoke, the residue can be transferred onto their fur. If pets snuggle with humans who smoke, tobacco residue may be transferred onto their fur from clothing or skin. Cats and dogs can inhale thirdhand smoke chemicals that off-gas from carpets, furniture, blankets, and other polluted surfaces.

Cats are at increased risk for ingesting thirdhand smoke because of their grooming habits. Cats frequently lick their fur to clean and maintain their coat. In the process, they ingest any thirdhand smoke residue that has accumulated on their fur.

A recent study examined the fur of cats who lived with non-smokers and smokers (indoor and outdoor smokers). The study determined that cats with more exposure to second- and thirdhand tobacco smoke in their homes had an increased amount of hair nicotine concentration compared to cats with less exposure. The nicotine levels in the cat’s hair increased with the number of cigarettes the owners smoked each day—the more cigarettes smoked, the higher the nicotine level in the cat’s hair. The location where the owners smoked also mattered. Cats whose owners smoked inside the home had higher levels of nicotine in their hair than cats whose owners smoked outside or not at all. Other studies have shown that tobacco smoke toxicants increase the risk of cancer in cats.

Dogs can absorb tobacco smoke residue through their skin, and they can ingest it by licking it off their fur, toys, and the hands of someone who smoked. In indoor environments, dogs can inhale contaminated house dust or ultra-fine particles and gases that are released back into the air. Like humans, inhaling ultra-fine particles can make a dog’s breathing problems worse.






A dog's breed influences the health effects of tobacco smoke exposure. A dog's nose acts like a filter. Dogs with shorter noses have a smaller "filter," so toxic particles are not stopped in the nose and get into the lungs, where they can cause harm. Dogs with longer noses have a larger "filter," so more of the toxic particles are stopped before they get to the lungs. However, the particles can get stuck in the nose and sinuses, where they can cause harm.


But what about other household pets?

Birds and Fish



Birds and fish also need protection from thirdhand smoke. Just like humans, birds can be exposed to the particles and gasses of thirdhand smoke through breathing, eating, and touching the toxic residue left behind by tobacco smoke. Birds are sensitive to air pollution. Birds can develop breathing problems, such as allergies, pneumonia, and sinus irritation, when they are exposed to air polluted by tobacco smoke.


Birds can accidentally eat thirdhand smoke residue. Birds like to "preen" themselves. If their feathers have been coated with thirdhand smoke, they will ingest it as they groom. If they perch on the clothes or skin of someone who has smoked, they can absorb thirdhand smoke through their feet or ingest it as they preen someone's hair. Along with a variety of health problems, birds exposed to tobacco smoke can develop feather plucking, a condition that is very difficult to treat.



Thirdhand smoke can hurt your fish, too. Because nicotine is toxic to fish and easily dissolves in water, it can contaminate the tank and poison the fish. If your fish are exposed to nicotine, they may get muscle spasms, rigid fins, lose their color, or die.

The best way to protect your pet from thirdhand smoke is to ban smoking inside your home. If you smoke, do your best to stop (support is available at 1-800-QUITNOW, and 1-800-300-8086 at Kick It CA), and enforce a smoking ban in your home. The best way to avoid second- and thirdhand smoke exposure is to not smoke at all. However, if you or a visitor do smoke, it should be done outside away from the house. When returning inside after smoking, immediately wash your hands and change your clothing.

Your pet cannot make a choice to avoid second- or thirdhand smoke, but you can! Take these simple steps:

- 
- Do not let anyone smoke around your pet (inside or outside).
 - Do not let anyone bring thirdhand smoke into your pet's home.
 - Do not move your pet into a new home that contains thirdhand smoke. Before moving into a new home, ask about smoking policies and habits of previous residents.

Updated March 2023

Sources

Bertone-Johnson, E. R., Procter-Gray, E., Gollenberg, A. L., et al. (2008) Environmental tobacco smoke and canine urinary cotinine level. *Environmental Research* 106, 361-364

Iosr J., Sandhya K., & Patil S. Toxic effect of Cigarette Smoke on Vital organs of Aquarium fish *Carassius auratus*.

Matt GE, Hoh E, Quintana PJE, Zakarian JM, Arceo J. Cotton pillows: A novel field method for assessment of thirdhand smoke pollution. *Environ Res.* 2019;168:206-10. Epub 2018/10/15. doi: 10.1016/j.envres.2018.09.025.

Picket, L. (2021). Secondhand smoke causes cancer in cats. 2021. <https://www.nwaonline.com/news/2021/jan/04/secondhand-smoke-causes-cancer-in-cats/>

Reif JS, Bruns C, and Lower KS. Cancer of the nasal cavity and paranasal sinuses and exposure to environmental tobacco smoke in pet dogs. *Am J. Epidemiology.*1998; 147(5): 488-492.

Roza MR, Viegas CA. The dog as passive smoker: effects of exposure to environmental cigarette smoke on domestic dogs. *Nicotine Tob Res.* 2007; 9(11): 1171-1176.

Slaughter E, Gersberg RM, Watanabe K, et al Toxicity of cigarette butts, and their chemical components, to marine and freshwater fish *Tobacco Control* 2011;20:i25-i29.

Smith, V. A., McBrearty, A. R., Watson, D. G., Mellor, D. J., Spence, S., & Knottenbelt, C. (2017). Hair nicotine concentration measurement in cats and its relationship to owner-reported environmental tobacco smoke exposure. *The Journal of small animal practice*, 58(1), 3–9.

Snyder, L. A., Bertone, E. R., Jakowski, M. S., et al. (2004) p53 expression and environmental tobacco smoke exposure in feline oral squamous cell carcinoma. *Veterinary Pathology* 41, 209-214.

US Food and Drug Administration. Second and (thirdhand) smoke may be making your pet sick. 2016. Retrieved 03/22/2020 from: <https://www.fda.gov/consumers/consumer-updates/secondhand-and-third-hand-smoke-may-be-making-your-pet-sick>

