

Third-Hand Smoke: the “Gift” that Keeps on Giving by Esther Schiller

Perhaps you have been hearing the term, “third-hand smoke” and you have some sense of what it is. You’ve heard that when tobacco products are smoked in a unit, some of that smoke attaches to surfaces such as walls, floors, furniture, etc. You probably know that third-hand smoke is responsible for the particular smell that indicates tobacco has been smoked in a unit. But landlords have been frustrated, trying to figure out how to get rid of that tell-tale tobacco smell which is a turn-off for many potential tenants.

For the past few years, scientists have been studying third-hand smoke and there is more information that can be shared with you, but it is not good news. According to Suzaynn F. Schick, Ph.D., an environmental scientist who studies the health effects of air pollutants, ten percent of the smoke in every cigarette is tar, and it accumulates in the environment of the unit. Tar is the substance that leaves the yellow/brown stain on your walls and absorbs into porous materials like rugs, curtains, furniture and even dry wall. Third-hand smoke starts with tar, because it sticks, but it also includes other toxins and chemicals that can cause cancer. Schick explains the problems caused by third-hand smoke as the three R’s: “The third-hand smoke **REMAINS** and accumulates on surfaces and in dust. It **RE-EMITS** or *returns* back into the air in a gas form even when no one is actively smoking, and it **REACTS** with other substances in the environment to make new and more dangerous chemicals over time.”

For example, the nicotine in third-hand smoke combines with ozone to form formaldehyde which is a carcinogen. Nicotine also combines with nitrous acid, a common chemical found in most households. (Nitrous acid is a byproduct of combustion, such as is found with the operation of a gas stove.) Nicotine and nitrous acid combine to form a very dangerous chemical known as NNK, which is one of the most dangerous carcinogens.

According to the California Department of Public Health, researchers exposed mice to third-hand smoke and found it caused health problems with lungs, liver, blood vessels and reproductive systems. Mice also had problems with wound healing and behavior problems like hyperactivity.

In the past, hotels have tried to remove the smell of third-hand smoke with ozone generators. But the combination of tar and ozone results in the creation of ultrafine particles in the air which are dangerous for everyone, but especially for people with heart and lung disease. This may be one of the reasons that most hotels have adopted 100% no smoking in all of their rooms.

According to scientist Georg Matt, Chair of the Psychology Department, San Diego State University, and one of the first scientists to study third-hand smoke, the chemicals in third-hand smoke persist for a very long time. Even after cleaning and weeks and months of ventilation of apartment units, third-hand smoke has been found in the dust in the air, on skin and clothing of new, non-smoking residents, and on surfaces like toothbrushes, eating utensils and children’s toys. Common methods of cleaning such as wet wiping with cleaning products, vacuuming, and airing out rooms have not been successful in completely removing third-hand smoke.

Tenants who are complaining that their neighbor's tobacco smoke is infiltrating into their units will also have the problem of accumulation of third-hand smoke, not only in their units, but also on their furniture, clothing, and other belongings. When they move, some of that third-hand smoke will go with them.

The removal of third-hand smoke requires intensive cleaning along with carpet replacement and perhaps replacement of windows. Depending on the number of years the unit was smoked in, even drywall may have to be replaced. It is also likely that third-hand smoke will be found in ventilation systems. Again, according to scientist Georg Matt, the longer tobacco is smoked in apartment units and other indoor environments, the more difficult and costly they will be to clean.

Scientists are suggesting that marijuana smoke will create the same kinds of third-hand smoke problems as tobacco smoke. Marijuana smoke will also move throughout an apartment building and contains many of the same carcinogens and toxins as tobacco smoke.

There can be significant savings when landlords adopt no smoking policies. According to the Kennedy Restoration Company located in Portland, Oregon, a thorough cleaning of a two bedroom apartment including replacement costs could cost up to \$15,000. According to an article by Dr. Michael Ong in the **American Journal of Public Health** in 2012, multi-unit housing property owners in California would save \$18.1 million in renovation expenses each year by adopting no smoking policies. But both of these estimates were made years before the information about third-hand smoke became readily available.

Landlords have always had the legal authority to adopt no smoking policies. In California there is even a law which protects landlords who adopt no smoking policies for their buildings. In addition, the California law which de-criminalizes adult use of marijuana provides that if a landlord adopts a no smoking policy for a building, that policy will automatically include marijuana. However, it is a good idea to state in contracts and leases that marijuana is included in the no smoking policy. An excellent lease addendum which includes tobacco, marijuana and electronic cigarettes can be found in the "Landlord" section of the website, www.smokefreeapartments.org.

Landlords and managers might want to provide information about third-hand smoke to their tenants who smoke. According to the America Lung Association, most people who use tobacco products would like to quit. Information about third-hand smoke might provide the stimulus to encourage more people to quit smoking. An organization that provides assistance to those who want to quit is available by phone at 1-800-NO BUTTS. Approximately 90 cities and counties in California have passed ordinances which require no smoking in apartments. These laws will help landlords to prevent the problem of third-hand smoke accumulation.

Suggestions for removing third-hand smoke:

- 1. Thoroughly wash walls and ceilings with detergent and very hot water** to remove as much nicotine and tar residue as possible. Wear gloves and use multiple clean rags to prevent simply pushing the residue around. Wash, rinse, repeat! Wearing a mask is also a good idea.

- 2. Repaint walls with 2 or 3 coats of paint.** If walls are not thoroughly washed prior to repainting, nicotine can seep through even multiple layers of paint.
- 3. Remove carpeting and padding, and wash floors** before replacing carpeting.
- 4. Replace curtains/blinds/window coverings** to prevent off-gassing into the environment.
- 5. Clean out ventilation ducts and replace filters.** Heating and air conditioning systems will recirculate stale smoke in the unit and throughout the building.
- 6. It may be necessary to remove and replace dry wall prior to all of the above.**

While these steps do not and cannot remove **all** of the potential problems associated with a formerly smoke-filled apartment, it can reduce the third-hand smoke residue and mitigate some of the off-gassing of tobacco toxins into the environment.

Esther Schiller was the Executive Director of the non-profit organization, Smokefree Air For Everyone (S.A.F.E.).