

Professor Georg Matt, Ph.D. was the guest for a statewide conference call held on May 20th, 2009 and cosponsored by the STEPP Secondhand Smoke Initiatives and the Smoke-Free Housing Action Committee. STEPP has given GASP permission to reprint the notes of that call.

Dr. Georg E. Matt is Chair and Professor of Psychology at San Diego State University and an Associate Member of the Moores Cancer Center at the University of California, San Diego. Dr. Matt studies how indoor spaces become and remain polluted with tobacco smoke, how nonsmokers are exposed to secondhand and thirdhand smoke, and how to develop better strategies for protecting nonsmokers from the harmful effects of exposure to tobacco smoke.

Objectives of call:

- To gain an understanding of the current research findings on thirdhand smoke and the dangers of thirdhand smoke exposure, and
- To learn how the current research on thirdhand smoke is best being used to further the goals of tobacco prevention.

1. What research have you done or are you currently exploring on thirdhand smoke?

My interest in this topic began 14 years ago when my own children were toddlers and I spent time on the floor with them. Children are on the floor and have more contact with floor and furniture surfaces than adults do. I became curious about children's exposure to tobacco-smoke toxins via routes other than inhalation. With funding from the tobacco-control field, I conducted studies comparing tobacco-smoke pollution and residual particulates in the homes of non-smokers with homes of smokers with smoke-free-home rules and the homes of smokers who smoked indoors. The study included collecting air samples, floor-dust samples, and furniture-surface dust from several rooms in the house, and samples from the surface of the mothers' hands. The studies were focused on homes with infants. We also measured the cotinine levels in the blood and urine of the children who resided in the study homes.

2. What are the key findings of the thirdhand smoke research?

The air in homes of smokers—and the surfaces—do have tobacco-smoke contamination. 80-90% of nicotine is sticky and stays in the environment in which the cigarette is smoked. The toxins remain on the parents' hands and stick to the household surfaces. Even in the homes in which the smokers only smoke outside, the study indicates the toxins stay on the parent, and the children are then exposed to the toxins. The study demonstrated that exposure to tobacco-smoke pollution is a 24-hour experience in the home of a smoker.

3. What is the difference between secondhand and thirdhand smoke?

Secondhand smoke is the smoke from the smoking end of the cigarette and the exhaled breath of the smoker. Thirdhand smoke is everything that is left after a cigarette is extinguished. It is the residual contamination on household surfaces, in cars and in elevators—all of the places a smoker goes.

4. Why is thirdhand smoke dangerous and what are the most dangerous chemicals and compounds? What are the concerns about exposure to children and how do kids ingest thirdhand smoke?

This is an important question for which there are no easy answers. There is no specific evidence about the health risks of thirdhand smoke or at what concentrations children absorb the chemicals via dermo-transmission (through the skin). However, we do know what toxins are present in the thirdhand smoke residue, and we know that these toxins have been found to be dangerous in other settings. We also know that nicotine and many carcinogens do dermo-transfer. In fact, this is how the Nicotine Replacement Therapy (NRT) patch works, the drug is absorbed through the skin.

5. Is anything known about how thirdhand smoke affects adults and is there any conclusive evidence of illnesses caused by it?

Again, studies have not been done to demonstrate specific evidence of illness linked to thirdhand smoke exposure. However, we do have evidence that babies do chew on household surfaces. They do ingest household dusts via their mouths. We also know that gases and toxins continue to emit from

tobacco-smoke pollution after a cigarette has been extinguished. We also know that a common pathway for infant exposure to tobacco-smoke pollution is by breathing the air in which a cigarette has been smoked and by picking it up from the household surfaces of a home in which a smoker lives. I think the evidence suggests that the dermo-transfer effect may be even more significant than the inhalation route of exposure.

6. What types of materials collect more thirdhand smoke and how long does it stay on surfaces?

Chemicals and particulates in cigarette smoke physically stick to items in the house. We found chemicals on bed frames, and in the dust on the floor of the living rooms and bedrooms. Chemicals are also found on large surfaces that are not cleaned daily such as curtains, bedspreads, and mattresses.

7. Can thirdhand smoke be removed?

It is very difficult to completely remove the toxins and clean the surfaces. The thirdhand smoke exposure in the home of a smoker can be indefinite. The smoke settles and creates a film over the entire environment.

8. Are smoke removal techniques like ozone treatments effective?

No, ozone treatments just cover up the smell and do not remove the poisonous chemicals in surfaces, according to our studies. In fact, many of these chemicals stay on surfaces for years.

9. What other additional research on thirdhand smoke by the CA Air Resources Board or others should we know about?

The California Air Resources Board is currently studying apartments months after a smoker vacates the unit. They are finding the smoke residue continues to re-absorb chemicals from the air ducts, light fixtures, and surface padding. It is very difficult to clean the units. It requires solvents and vigorous brushing. Some of the techniques used to clean and deodorize apartments actually just stir up and release the toxins. I have been trying to get funding to research thirdhand smoke in family childcare homes but have been unsuccessful so far.

10. What is the best way to frame messages about thirdhand smoke to build community awareness and educate parents?

Thirdhand smoke is a serious issue for children who have parents or caregivers who smoke. (see Question #11 and #12)

11. Is there a better term for thirdhand smoke? Some people react as if the term is similar to a distant cousin that is so far removed that it is not significant.

Good question. We haven't found a better term yet. I do also use "tobacco smoke pollution" and "tobacco smoke residue." It needs to be an easy term for people to understand.

12. What policies would have the greatest impact on reducing thirdhand smoke exposure?

Many states have strong bans on indoor smoking. However, loopholes exist, and there are many indoor spaces that are unregulated, such as cars with kids, hotel rooms, rental homes and family childcare homes. Another good policy idea is to require disclosures about tobacco smoke in used car sales. I think there would be an 8-10% decrease in the Blue Book valuation. Also, a disclosure should be required in real estate transactions about smoke occurring within the home.

Banning smoking in cars is very important. It is very easy to contaminate small indoor environments such as cars. The highest concentration of tobacco smoke is within a car. Additionally cars have a large amount of surface space to which the toxins stick. The padding in the seats, ceilings, rugs and fabric hold tobacco-smoke pollution. Also, municipalities can include policies about thirdhand smoke in the building codes. In addition, Restrictions on smoking in family childcare homes vary by state. This would also be an important policy area.

13. Since no studies prove the health effects of thirdhand smoke, how should health educators proceed?

True, no studies specifically link thirdhand-smoke exposure to illness, but we do know plenty about the chemical compounds in tobacco smoke and the impact on health.

14. Do you recommend smoke detectors? (See Question #8)

15. Colorado's media campaign for parents who smoke around their children is "Always Step Outside," Given your research, is this an appropriate message?

Yes, even with the knowledge that children of smokers have higher rates of exposure to the toxins in tobacco even if the home is smoke-free, the single most important change a parent who smokes can make is to not smoke inside the home and car.

The notes from this conference call are provided by the Group to Alleviate Smoking Pollution.