

New test allows individualized profiles of cigarette smoking

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An inexpensive test on cigarette filters may provide profiles of individual smoking patterns useful for smoking cessation efforts. Credit: Stepan Popov

A test for one of the thousands of chemicals in cigarette smoke has the potential for more accurately estimating smokers' mouth level exposure and may have applications for developing custom-tailored quitting approaches for the more than 43 million people in the United States who still smoke, and hundreds of millions elsewhere, scientists said here today.

In a report at the 240th National Meeting of the American Chemical Society (ACS), they described development of a way to measure mainstream smoke deliveries of select chemicals that an individual smoker consumes on a per cigarette basis. It provides a much more accurate estimate of exposure than using automated cigarette smoking machines to estimate mainstream smoke deliveries, which traditionally

have been used.

"Historically, our knowledge about the amounts of carcinogens, nicotine, and tar produced by [cigarettes](#) is based on data from smoking machines," Clifford Watson, Ph.D., explained. "Those machines do not smoke cigarettes in the same way as people. [Smokers](#) may inhale large puff volumes or take more puffs per cigarette than the fixed regimen a smoking machine uses. Our method avoids those pitfalls and provides an actual 'mouth level'— rather than a 'machine-level' — profile of smokers' exposure to the harmful substances in tobacco smoke."

Potential future applications include examining a smoker's daily cigarette-to-cigarette consumption pattern and developing an optimized smoking cessation program based on an individual's pattern. According to Watson, it may be possible to develop individualized plans for quitting that are custom-tailored to each individual's smoking pattern to improve cessation rates. Watson added, "Cessation rates for smoking are generally poor so that any improvement may substantially increase quit rates." Dr. Watson is a chemist with the U. S. Centers for Disease Control and Prevention (CDC) in Atlanta.

The new method also could be valuable in better understanding health risks of cigarettes with different levels of smoke constituents, Watson added. Machine-smoked "light" and "ultra-light" cigarettes do produce smoke with less tar and nicotine than regular cigarettes. However, smokers that use such products may compensate and inhale deeper, take more puffs, or smoke more cigarettes. In doing so, their dose of tar, [nicotine](#), and other chemicals may approach the dose from a regular cigarette.

Watson and colleagues based the method on previous research involving a substance naturally present in tobacco called solanesol. During smoking, a fraction of the solanesol deposits in the cigarette filters and

serves as a good surrogate "marker" for other compounds in the mainstream smoke that smokers draw in their mouths. Watson reasoned that measurements of this one compound could be used to gauge a smoker's exposure to numerous other chemicals in the more than 7,000 chemicals present in [cigarette smoke](#).

The scientists removed filters from cigarette butts and measured the solanesol content. The cigarette butts were from a variety of brands machine-smoked under different conditions, including variations in the amount of smoke per cigarette puff, differences in the number of puffs, and effectiveness of the filter. Their findings indicate that measuring solanesol does provide a quick, inexpensive way to estimate a smoker's total exposure, in a way that more closely reflects their natural [smoking](#) habits.

Even cigarettes that are labeled as "low tar" or "light" are unsafe, prompting the U.S. Food and Drug Administration to recently ban tobacco companies from using these terms on cigarette packaging.

"There's no such thing as a safe cigarette," Watson cautioned. "The only proven means to reduce your health risk from tobacco use is to quit."

Provided by American Chemical Society

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