How Dangerous is Driving Under the Influence of Marijuana?

trafficschoolonline.com/blog/driving-marijuana

January 8, 2019

Fix your ticket now.

In the United States, and on this blog, we spend a lot of time talking about the dangers of drunk driving, particularly around holidays like the Fourth of July and New Year's, and with good reason - about one third of total traffic fatalities involve alcohol impairment.

But as states have begun to legalize marijuana for medical or even recreational purposes in the last few years, driving while under the influence of marijuana is becoming an increasingly important topic.

It's a common myth that driving under the influence of marijuana isn't all that dangerous. But how does marijuana really affect the ability to drive safely?

Marijuana Use Impairs Driving Performance

While the National Highway Traffic Safety Administration reports that marijuana-impaired drivers are sometimes able to "pull themselves together" to concentrate briefly on simple tasks, or may try to make up for their impairment by driving more slowly or cautiously, driving high is by no means safe.

According to the NHTSA, marijuana has been shown to impair driving performance significantly for 1 to 2 hours following use, and residual effects have been reported up to 24 hours after use. These impairments are moderate in low doses, and severe with high doses, chronic use, and in combination with alcohol.

Reported impairments include:

- Inability to concentrate and maintain attention
- Difficulty performing divided-attention tasks
- Reduced hand-eye coordination
- Distortion of time and distance
- Increased evaluation, decision, and reaction times
- Sleepiness

Even a moderate impairment can prevent drivers from responding quickly to unexpected hazards and maintaining the high level of attention needed for safe driving.

The National Organization for the Reform of Marijuana Laws (NORML), which promotes the legalization of the responsible use of marijuana, recognizes this danger in its Principles of Responsible Use, arguing that:

> "The responsible cannabis consumer does not operate a motor vehicle or other dangerous machinery while impaired by cannabis, nor (like other responsible citizens) while impaired by any other substance or condition, including some medicines and fatigue."

Limited Data Available on Marijuana-Impaired Crashes and DUIs

We already have a wealth of information on how alcohol, drowsiness and even distraction affect our risk of being in a crash, so it may seem surprising that researchers do not yet have a clear picture of how many crashes or DUI convictions involve marijuana.

Law enforcement, court systems, and researchers have significant challenges to overcome in obtaining and interpreting this information:

- Standard field sobriety tests, which are 90% effective in identifying drunk drivers, only correctly identify 30% to 50% of marijuana-impaired drivers, according to the New York Times.
- Evaluations by specially trained Drug Recognition Experts are accurate, but must be completed after an arrest, not at the scene of a traffic stop.
- Chemical tests of blood and urine are available, but do not reliably predict how impaired a driver actually is. Drivers may test positive for marijuana days or even weeks after use.
- Many law enforcement and court record-keeping systems do not include whether an impaired driver was affected by alcohol, drugs, or both. The NHTSA has strongly recommended that these systems be updated to provide for more accurate monitoring of DUI cases.

As detection methods and reporting policies become more accurate, we can expect our understanding of this issue to become much clearer.

Los Angeles is already testing out a saliva swab drug test that can be used at the time of a traffic stop. Officials hope that having a quick and effective method to detect the presence of drugs will deter people from getting behind the wheel while under the influence of any substance.

Looking for More Information?

While the data is limited, researchers are still studying the issue! Take a look at the findings at the links below.

- A study by Columbia University released this past January found that the proportion of fatally injured drivers who tested positive for marijuana tripled from 1999 to 2010, from 4.2% to 12.2%. This may indicate that marijuana-impaired driving is playing an increased role in fatal crashes. The study is based on data from six states where toxicological testing is routinely performed on drivers involved in fatal car crashes.
- In Washington, 25% more drivers tested positive for marijuana in 2013, the first full year after the state legalized the drug, than in 2012. However, there was no overall rise in DUI arrests, and no significant increase in crashes.
- In Colorado, an increased proportion of drivers involved in fatal crashes tested positive for marijuana after 2009, when medical marijuana was legalized, than in the period before legalization. The study did not reveal whether the drivers were found to be impaired at the time of the crash, or whether they were at fault in the crash, so the results may only reflect an increase in use.

Curious about laws on marijuana and driving in your state? Check out NORML's state-by-state list of drugged driving laws.

INDOOR AIR POLLUTION FROM MARIJUANA EMISSIONS AS BAD AS THE WORST WILDFIRES

August 30th, 2018 | Categories: Marijuana, Secondhand Smoke | Tags: Air Pollution, Wildfires

In a year that experienced the nation's worst wildfires in recent history, it is significant that the latest research on marijuana vaping and dabbing shows indoor particulate concentrations equivalent to dangerous air pollution events.

In a recent study (which will be published this fall), researchers studied marijuana particle concentrations at an event in a dispensary where vaporizing and dabbing were the primary sources of indoor air pollution. They saw Particulate Matter (PM) levels that ranged from 250 to 600 ug/m3 and emissions from dabbing and other forms of vaping marijuana that were near constant for six hours. Their take-home was that particle concentrations from dabbing and vaporizing cannabis can create levels of indoor air pollution similar to those seen in extreme air pollution events like wildfires and severe industrial pollution. Exposure at these concentrations can cause cardiovascular and respiratory disease.

Three ways to use this research to protect nonsmokers' rights:

1. Send this research summary to your local, county and state elected officials along with a personalized note about the need to protect nonsmokers' rights. Elected officials are often approached by marijuana industry representatives and lobbyists to roll back smokefree and aerosol-free protections, so they need to hear from those on the side of public health too.

2. In places that allow public smoking and vaping, ask the municipality (contact your local health department) to test the air quality in any place that allows vaping and determine if it poses a health risk to workers and people who must come in for deliveries or maintenance. Check also to see if the particles are entering neighboring buildings and causing a health risk.

3. Write a letter to the editor about the dangers of exposure to marijuana smoke and emissions from vaporizers and dabbing, and include a link to the study. Much of the public simply doesn't understand that marijuana smoke can be dangerous to public health.

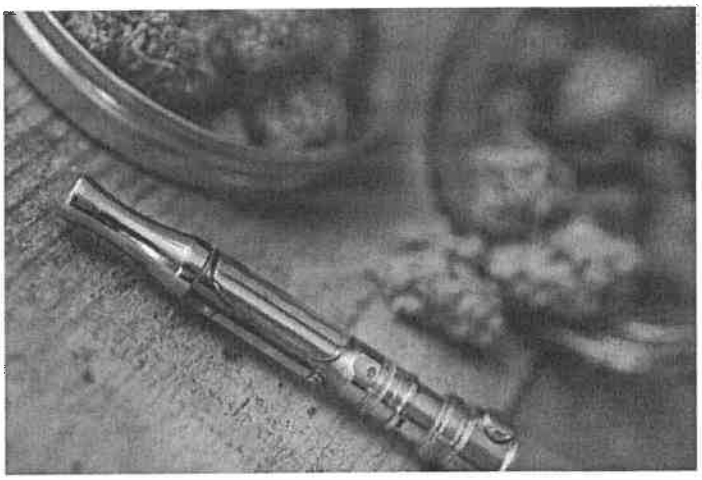
Share This Story

NEWS FROM BERKELEY LAB

ARTICLE

Emissions from Vaporizable Cannabis Concentrates Have Potential Health Risks

By Media Relations
May 21, 2021



Berkeley Lab researchers investigated the emissions from vaporizable cannabis concentrates, which come in the form of concentrated liquids or waxy solids often referred to as "extracts" or "hash oils." (Credit: iStock)

As more U.S. states and countries legalize medical and recreational marijuana, consumers are increasingly turning to new types of products that avoid toxic smoke inhalation. Researchers at Berkeley Lab who previously identified potentially harmful emissions from electronic cigarettes are now identifying the potential health risks of vaping cannabis.

Berkeley Lab researchers investigated the emissions from vaporizable cannabis concentrates, which come in the form of concentrated liquids or waxy solids often referred to as "extracts" or "hash oils." (Credit: iStock)

By Kiran Julin

As more U.S. states and countries legalize medical and recreational marijuana, consumers are increasingly turning to new types of products that avoid toxic smoke inhalation. Researchers at Berkeley Lab who previously identified potentially harmful emissions from electronic cigarettes are now identifying the potential health risks of vaping cannabis.

When a person vapes marijuana, they are inhaling vaporizable cannabis concentrate (VCC), which is a concentrated liquid or a waxy solid form of cannabis also commonly referred to as "extracts" or "hash oils." The concentrated liquid is usually heated into an aerosol by a battery-operated electronic device, while waxy concentrates can be aerosolized by direct application onto a heated surface (known as "dabbing").

In a new Berkeley Lab study recently published in the journal Environmental Science & Technology, researchers examined emissions associated with heating only the non-cannabinoid constituents of VCC, which are extracted from the cannabis plant alongside the psychoactive constituents but do not cause drug-like effects on the body. These non-cannabinoid compounds are a major part of VCC formulations and include terpenoids, flavonoids, and lignins - all commonly found in plants and potentially harmful when inhaled.

The research team, led by Berkeley Lab scientist Hugo Destaillats, heated and aerosolized mixtures of those compounds to simulate cannabis vaping and dabbing. They observed the formation of a large number of ultrafine particles that were released into a room-sized chamber and remained airborne for at least three hours.

"Our results suggest that high molecular weight compounds such as lignins, flavonoids, and triterpenes enhance the formation and accumulation of ultrafine particles in the air, which can then serve as carriers of substances that normally are not found in the air - otherwise known as nonvolatile and semivolatile species," said Berkeley Lab scientist and co-author Xiaochen Tang. "These substances can then be breathed into a person's lungs and found in the indoor environment."

The research team also quantified 11 degradation byproducts as a result of heating the mixtures, including acrolein and methacrolein, which are highly irritating to eyes and the respiratory system. According to the study, these compounds are predicted to reach levels that may exceed reference exposure levels recommended by California.

"The bottom line is that emissions from heated cannabis concentrates are not innocuous," said Destaillats. "Vaping and dabbing can be a source of harmful chemical exposure, and more research is needed to determine the full extent of the risk."

The study was funded by the University of California Tobacco Related Diseases Research Program (UC-TRDRP).

Measuring Aerosol Particle Emissions from Cannabis Vaporization and Dabbing

Peter A. Jaques[1], Marley Zalay[1], Abel Huang[2], Kathryn Jee[2], Suzaynn Schick[2*]

[1] Independent Contractor
[2] University of California, San Francisco, San Francisco, USA
[*] *Corresponding email: Suzaynn.schick@ucsf.edu*

SUMMARY
Cannabis smoke contains many of the same carcinogens and chemicals found in tobacco smoke (Moir, Rickert et al. 2008, Wei, Alwis et al. 2016). Exposure to secondhand cannabis smoke can impair endothelial function, which increases the risk of cardiovascular disease (Wang, Derakhshandeh et al. 2016). However, US data show that the perceived health risks of marijuana use are, in fact, declining among adults (Compton, Han et al. 2016). We measured the concentrations of airborne fine particles ($PM_{2.5}$) and cannabinoids at an indoor cannabis event where dabbing and vaporizing were the only cannabis emissions. We found average particle concentrations of 200-600 micrograms per m^3 and peak concentrations over 1,600 micrograms per m^3. Particle concentrations this high are seen in extreme air pollution events like wildfires (Landis, Edgerton et al. 2018, Li, Han et al. 2018) and severe industrial pollution (Nagar, Singh et al. 2017, Li, Han et al. 2018). Exposure at these concentrations can cause cardiovascular and respiratory disease (Zheng, Ding et al. 2015, Li, Fan et al. 2016). We show that dabbing and vaporizing cannabis can create levels of indoor air pollution that are hazardous to human health, in the absence of actual combustion.

KEYWORDS
Cannabis, Vaping, Dabbing, Environmental Cannabis Pollution, Particulate

INTRODUCTION
Study of the health and environmental effects of cannabis is complicated by diverse preparations and routes of administration. Cannabis can be purchased as dried flowers, mechanically separated trichomes (hash), concentrates, tinctures, and edible and topical preparations. The dried flowers can be smoked using a cigarette (Ramo, Liu et al. 2012), a blunt, or a pipe (Golub, Johnson et al. 2006). Cannabis, hash and cannabis concentrates can also be consumed by "vaporizing" (Gieringer 2001, Gieringer, St. Laurent et al. 2004, Malouff, Rooke et al. 2014, Pepper and Brewer 2014, Walker 2014). To vaporize whole cannabis, dried flowers from female plants are ground finely and heated to between 180° and 300° C, and the resulting aerosol is inhaled. Vaporizers are being popularized among medicinal cannabis users as a way to reduce exposure to toxins (Malouff, Rooke et al. 2014), however, there is little known about the chemical composition of vaporizer aerosols. Cannabis concentrates are made by extracting cannabis plant material with organic solvents or liquid carbon dioxide. Pure cannabis concentrates can be "dabbed". Dabbing uses a surface heated to 300-750° C to flash-vaporize concentrates. At the higher temperatures, combustion can occur.

Because cannabis research has been strictly limited in the U.S., academic and public health researchers have little experience studying it. To meet this research gap, we have conducted field experiments at public events in the San Francisco Bay Area where people use cannabis. We present aerosol particle data from a single experiment conducted at a farmers' market sales event conducted on December 16th, 2017. The event took place in two rooms in a retail

space. In room one, vendors were providing samples of cannabis concentrates using six electrically-powered dabbing instruments and one vendor was providing samples of vape pens that contained cannabis. In room two, people were providing samples of cannabis flowers using two electrically-powered vaporizers. The dabbing equipment and the vaporizers were provided by the retailer and all vendors used the same type of equipment in each category.

METHODS

We measured $PM_{2.5}$ concentrations in real time with three laser photometers (two model AM510, one model 8532 (Dusttrak), TSI, Shoreview, MN), fitted with 2.5 μm impactors to exclude larger particles. For gravimetric aerosol particle measurements, we used 5 air pumps (GilAir-3, Sensidyne L.P., St. Petersburg, FL) were fitted with filters (Pallflex, EMFAB, Pall Corporation, Cortland, NY). The air pumps were calibrated a flow rate of 2.0 LPM for the Gillian pumps and photometers were calibrated to 1.7 LPM, with a soap bubble spirometer (Gilibrator 1, Sensidyne L.P, St. Petersburg, FL). The laser photometer data reported have been adjusted using a calibration factor of 0.30 (Jiang, Acevedo-Bolton et al. 2011).

RESULTS

Unlike a burning cigarette, dabbing equipment and vaporizers do not emit aerosol constantly. Emissions are episodic and depend on the device design and the intensity of use. A dabbing rig consists of a heated surface, and a trap or cover that captures the aerosol so it can be inhaled. Dabbing-associated aerosol emissions occurred in three phases:

1. When the concentrates were applied to the heated surface, before the aerosol trap was put over the surface
2. When the customer exhaled
3. When the trap was removed and the remaining concentrate was "burned off."

The Volcano vaporizer used a fan below the heating plate to blow cannabis aerosol into a plastic bag that was then removed from the vaporizer and held or given to a customer to inhale. Several bags would be filled from a single load of cannabis and then held for use by customers. Vaporizer-associated aerosol emissions occurred in four phases:

1. When the bag was removed from the vaporizer
2. When the customer exhaled
3. When the unused aerosol was pressed out of the bag so it could be refilled for a new customer
4. When the spent cannabis flowers were removed from the vaporizer.

Because the aerosol emissions were not constant, we found we had to increase the observation time for a given area from 1 to 5 minutes to properly count emission activities. We were not able to observe correlations between the emission phases described above and the continuous particle concentrations observed because there were multiple sources in both rooms.

We sampled for ~6 hours. The battery of one pump died at 4 hours. The mean particle concentrations measured gravimetrically at four different locations in room one (dabbing) sampled over the same six hour time span were 445, 578, 582 and 654 $\mu g/m^3$. The average laser photometer measurements collected at two of the same locations in room one, during the same time period, were 297 and 242 $\mu g/m^3$. The mean particle concentration measured gravimetrically at one location in room two (vaping) was 354 $\mu g/m^3$ and the

corrected average laser photometric measurement collected at the same location was 939 $\mu g/m^3$.

We do not have chemical analyses of these aerosols to report at this time. However, it was possible to distinguish the aerosols in the two rooms by smell. The aerosol in the dabbing room smelled acrid and more like smoke. The aerosol in the vaporizing room smelled more like unheated cannabis.

DISCUSSION

Our main finding is that dabbing and the use of a Volcano vaporizer can cause high levels of $PM_{2.5}$ in indoor air. Our gravimetric data show that average concentration in the dabbing room over 6 hours was 564 $\mu g/m^3$. The laser photometer data from both rooms shows a pattern of high mean levels with brief peaks of 3-5 times higher concentrations. The people who worked in these rooms were exposed to aerosol particle concentrations that are recognized as hazardous by the US Environmental Protection Agency and by the World Health Organization (World Health Organization 2006, US Environmental Protection Agency 2015). Specifically, the US EPA national ambient air quality standards state that the 24-hour average outdoor $PM_{2.5}$ concentration should not exceed 35 $\mu g/m^3$. A 6-hour exposure to 564 $\mu g/m^3$ creates a 24-hour average of 142 $\mu g/m^3$, even if the $PM_{2.5}$ concentration is 2 $\mu g/m^3$ for the remaining 18 hours of the day. Using the US EPA air quality index calculator, a PM2.5 concentration of 142 $\mu g/m^3$ is associated with "increased aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; increased respiratory effects in general population"(US Environmental Protection Agency 2018). While the chemical composition of dabbing aerosol emissions is not yet known and may not be as toxic as the combustion aerosols that are a primary constituent of outdoor $PM_{2.5}$ in most areas, it is unlikely that exposure to concentrations this high are without health consequences.

Our secondary finding is that the relationship between the gravimetric and laser photometric measurements of dabbing aerosol did not follow the relationship normally seen with tobacco cigarette smoke, where the gravimetric mass is equal to the laser photometer mass x ~0.30 (Jiang, Acevedo-Bolton et al. 2011). For the vaporization aerosol, where the gravimetric value is less than the photometric value, this may be due to evaporation of volatiles from the gravimetric samples. For the dabbing aerosols, the gravimetric values are higher than the photometric values, so loss of volatiles is unlikely to be the cause of the discrepancy. It may be necessary to derive specific calibration factors for cannabis dabbing aerosol and vaporizer aerosol.

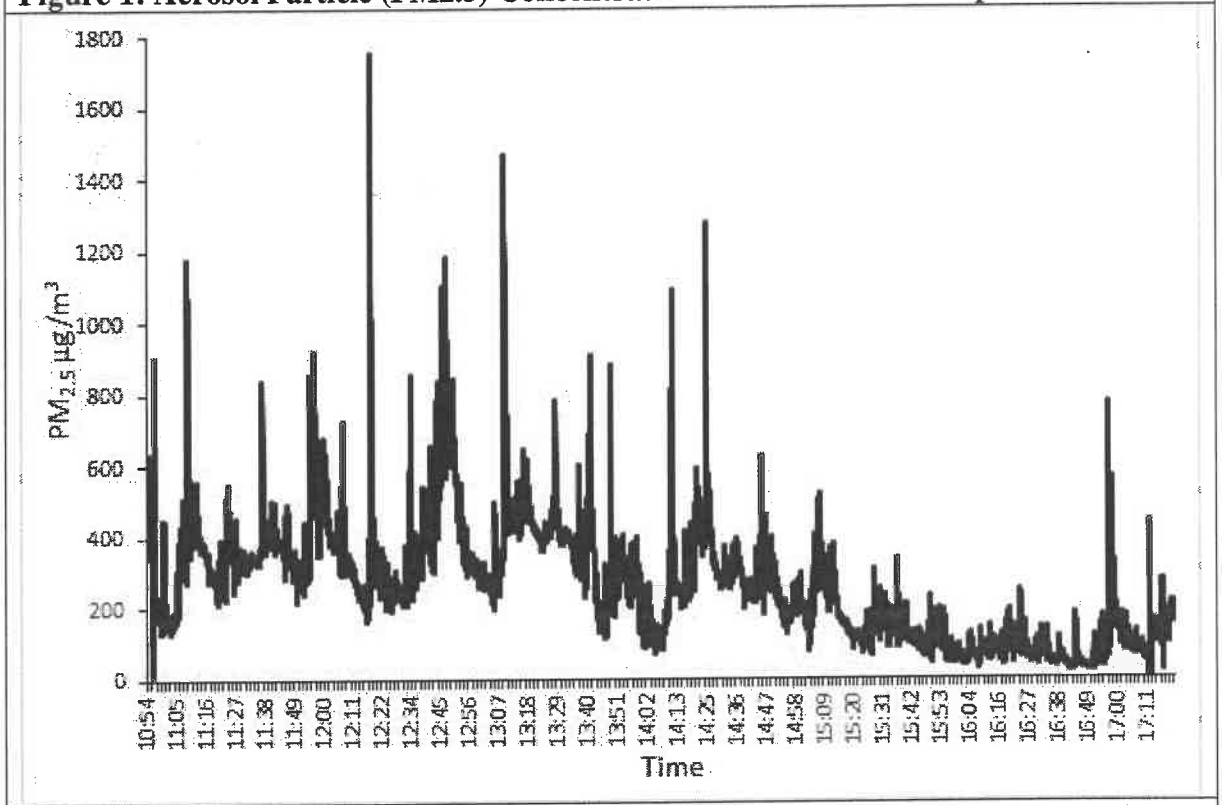
CONCLUSIONS

Although there is reason to believe that vaporizing and dabbing cannabis may create aerosols that contain lower concentrations of toxins than are found in cannabis smoke, these activities can still create high concentrations of $PM_{2.5}$ indoors. Chemical analysis of these aerosols will allow an accurate assessment of the health risks of these behaviors.

ACKNOWLEDGEMENT

This research was funded by California Tobacco-Related Disease Research Program grant 24RT-0039

Figure 1: Aerosol Particle (PM2.5) Concentrations From Cannabis Vaporization



Data are values from a factory-calibrated laser photometer, corrected for biomass smoke. (Dusttrak model 8532, TSI Inc, Shoreview, MN)

REFERENCES

Compton, W. M., B. Han, C. M. Jones, C. Blanco and A. Hughes (2016). "Marijuana use and use disorders in adults in the USA, 2002-14: analysis of annual cross-sectional surveys." Lancet Psychiatry **3**(10): 954-964.

Gieringer, D. H. (2001). "Cannabis vaporization: a promising strategy for smoke harm reduction." Journal of Cannabis Therapeutics **1**(3-4): 153-170.

Gieringer, D. H., J. St. Laurent and S. Goodrich (2004). "Cannabis vaporizer combines efficient delivery of THC with effective suppression of pyrolytic compounds." Journal of Cannabis Therapeutics **4**(1): 7-27.

Golub, A., B. D. Johnson and E. Dunlap (2006). "The Growth in Marijuana Use Among American Youths During the 1990s and the Extent of Blunt Smoking." J Ethn Subst Abuse **4**(3-4): 1-21.

Jiang, R. T., V. Acevedo-Bolton, K. C. Cheng, N. E. Klepeis, W. R. Ott and L. M. Hildemann (2011). "Determination of response of real-time SidePak AM510 monitor to secondhand smoke, other common indoor aerosols, and outdoor aerosol." J Environ Monit **13**(6): 1695-1702.

Landis, M. S., E. S. Edgerton, E. M. White, G. R. Wentworth, A. P. Sullivan and A. M. Dillner (2018). "The impact of the 2016 Fort McMurray Horse River Wildfire on ambient air pollution levels in the Athabasca Oil Sands Region, Alberta, Canada." Sci Total Environ **618**: 1665-1676.

Li, J., X. Han, X. Li, J. Yang and X. Li (2018). "Spatiotemporal Patterns of Ground Monitored PM2.5 Concentrations in China in Recent Years." Int J Environ Res Public Health **15**(1).

Li, M. H., L. C. Fan, B. Mao, J. W. Yang, A. M. K. Choi, W. J. Cao and J. F. Xu (2016). "Short-term Exposure to Ambient Fine Particulate Matter Increases Hospitalizations and Mortality in COPD: A Systematic Review and Meta-analysis." Chest **149**(2): 447-458.

Malouff, J. M., S. E. Rooke and J. Copeland (2014). "Experiences of marijuana-vaporizer users." Subst Abus **35**(2): 127-128.

Moir, D., W. S. Rickert, G. Levasseur, Y. Larose, R. Maertens, P. White and S. Desjardins (2008). "A comparison of mainstream and sidestream marijuana and tobacco cigarette smoke produced under two machine smoking conditions." Chem Res Toxicol **21**(2): 494-502.

Nagar, P. K., D. Singh, M. Sharma, A. Kumar, V. P. Aneja, M. P. George, N. Agarwal and S. P. Shukla (2017). "Characterization of PM2.5 in Delhi: role and impact of secondary aerosol, burning of biomass, and municipal solid waste and crustal matter." Environ Sci Pollut Res Int **24**(32): 25179-25189.

Pepper, J. K. and N. T. Brewer (2014). "Electronic nicotine delivery system (electronic cigarette) awareness, use, reactions and beliefs: a systematic review." Tob Control **23**(5): 375-384.

Ramo, D. E., H. Liu and J. J. Prochaska (2012). "Tobacco and marijuana use among adolescents and young adults: a systematic review of their co-use." Clin Psychol Rev **32**(2): 105-121.

US Environmental Protection Agency (2015). National ambient air quality standards table. Washington, DC, US Environmental Protection Agency,.

US Environmental Protection Agency (2018). AQI Calculator, PM2.5.

Walker, N. (2014). CHP: Teens converting e-cigarettes to use THC oil. KTVU. Richmond, CA.

Wang, X., R. Derakhshandeh, J. Liu, S. Narayan, P. Nabavizadeh, S. Le, O. M. Danforth, K. Pinnamaneni, H. J. Rodriguez, E. Luu, R. E. Sievers, S. F. Schick, S. A. Glantz and M. L. Springer

(2016). "One Minute of Marijuana Secondhand Smoke Exposure Substantially Impairs Vascular Endothelial Function." J Am Heart Assoc **5**(8).

Wei, B., K. U. Alwis, Z. Li, L. Wang, L. Valentin-Blasini, C. S. Sosnoff, Y. Xia, K. P. Conway and B. C. Blount (2016). "Urinary concentrations of PAH and VOC metabolites in marijuana users." Environ Int **88**: 1-8.

World Health Organization (2006). WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. Geneva, Switzerland, World Health Organization: 22.

Zheng, X. Y., H. Ding, L. N. Jiang, S. W. Chen, J. P. Zheng, M. Qiu, Y. X. Zhou, Q. Chen and W. J. Guan (2015). "Association between Air Pollutants and Asthma Emergency Room Visits and Hospital Admissions in Time Series Studies: A Systematic Review and Meta-Analysis." PLoS One **10**(9): e0138146.

Published: May 31, 2022

In secondhand vape, scientists smell risk

By Tate Gunnerson, American Heart Association News

(Eleonora Galli/Moment via Getty Images)

Available in an enticing array of flavors, electronic cigarettes have exploded in popularity since they hit the market about 15 years ago, particularly among middle and high school students. But research indicates that e-cigarettes – even just being around their use – may not be as "safe" as some people believe.

While the dangers of breathing in secondhand cigarette smoke are well-understood, the science is still unfolding on how inhaling secondhand vapor, or aerosol, affects the body. And people may be underestimating the health risk, said Dr. Talat Islam, an assistant professor of research population and public health sciences at the University of Southern California in Los Angeles.

Related Articles

Amid an 'epidemic' of school vaping, a search for solutions

Millions who have never smoked cigarettes are using other tobacco products

What You Need to Know About Vaping

Islam and his research colleagues have found that exposure to secondhand aerosols from e-cigarettes is associated with increased risk of bronchitis symptoms and shortness of breath among young adults, especially among those who don't smoke or vape themselves, the team reported last year in the journal Thorax.

"Aerosols from vaping contain heavy metals and ultrafine particles," Islam said. "If somebody else is vaping in the same area, you're breathing it – those particles are entering your lungs, where they can do damage."

In addition to nicotine, the aerosols include heavy metals such as lead, nickel and zinc, cancer-causing substances such as benzene, and diacetyl, which has been linked with a condition nicknamed "popcorn lung" in people who vape.

A 2021 study in New York, published in the journal Tobacco Control, found the use of e-cigarettes increased the number of fine particles in the surrounding room. Exposure to fine particles, or microscopic particles capable of reaching deep into the lungs, can worsen heart and lung disease, and even lead to premature death.

E-cigarettes were the most commonly used tobacco product among U.S. middle and high school students in 2021, government research shows. And while about 1 in 4 students between 2015 and 2017 were exposed to secondhand e-cigarette aerosols, that figure grew to 1 in 3 students in 2018, according to a 2019 study in JAMA Network Open.

"There's a perception as a whole that vaping is not as harmful as smoking," Islam said. "I think that's why we see such high levels of secondhand exposure."

By the time the health impacts are fully understood, it may be too late, said Dr. Ellen Boakye, a postdoctoral research fellow at the Johns Hopkins Ciccarone Center for the Prevention of Cardiovascular Disease in Baltimore.

"When people started smoking, the health effects were not known until years later, and that's the same thing we're seeing with e-cigarettes," said Boakye, who is also a fellow with the American Heart Association's Tobacco Center for Regulatory Science.

"There is evidence to suggest that e-cigarette use is associated with respiratory conditions and cardiovascular diseases," she added. "As more evidence becomes available, we may see that this association is causal, both for e-cigarette use and for exposure to secondhand vapor."

Boakye said people should minimize their exposure to vaping, ideally by leaving the area. And she urged people who vape to quit, noting that more funding is needed for vaping cessation programs.

"Some of the work we are currently doing shows that a lot of (young people) are making attempts to quit, and there isn't a lot of support for them," she said, noting most nicotine replacement products are intended

for adults. "I think this is an area where a lot of focus should be placed." For help quitting, call 800-QUITNOW (784-8669), text "QUIT" to 47848 or visit smokefree.gov.

Whether inhaling traffic exhaust, cigarette smoke or e-cigarette aerosols, experts say the message is the same. "We want to breathe in that clean air," Islam said. "Anytime you add things there, we know that has an effect."

If you have questions or comments about this American Heart Association News story, please email editor@heart.org.

American Heart Association News Stories