



TESTIMONY OF GREGORY CONLEY

PENNSYLVANIA HOUSE HEALTH COMMITTEE

JUNE 15, 2015

Re: Opposition to HB 682

Chairman Baker and distinguished members of the House Health Committee:

Thank you for the opportunity to testify on the important topic of vapor products, which are commonly referred to as electronic cigarettes or e-cigarettes. I am here today on behalf of the American Vaping Association, an organization that advocates for small- and medium-sized vapor businesses across the country that manufacture, wholesale, and retail vapor products, as well as nicotine-containing and nicotine-free e-liquid. This includes vapor retail outlets and wholesalers located in the State of Pennsylvania that are employing Pennsylvania citizens, paying sales, unemployment and excise taxes, and occupying what may otherwise be empty storefronts.

Neither the AVA nor these vape stores represent or speak for Big Tobacco. The AVA has received no funding from cigarette companies and Pennsylvania's "vape shops" (e-cigarette specialty stores) do not sell any products sold by Big Tobacco. We do not consider ourselves to be in the tobacco industry at all. Instead, we consider vapor products to be anti-tobacco technology products, as they are tobacco-free, smoke-free, often nicotine-free, and are increasingly being recognized as a smart way to get smokers to transition away from smoking combustible cigarettes.

As explained below, the AVA urges you to reject the proposed bill to treat 'vaping' and 'smoking' identically under Pennsylvania law.

I. Science on E-Cigarette Vapor Demonstrates No Risk to Bystanders

As the committee is aware, research in this field is contentious, but that is true in many other areas that the legislature is forced to consider each year. A thoughtful examination of claims made by opponents reveals flawed and often careless interpretations of the scientific literature. Below, claims with regard to four chemical classes are analyzed.

A. Chemicals in E-Cigarette Vapor are at Trace Levels – Potential of Any Significant Adverse Effects are Minimal

A favorite tactic of e-cigarette detractors is to make reference to chemicals that have been detected in e-cigarette liquid or vapor. Critically, they fail to note the actual levels of these chemicals found. In doing so, they ignore a central tenet of toxicology – the dose makes the poison. It's not just a presence of a chemical that matter, it is the amount that is present.

In late-2013, the medical journal *BMC Public Health* published a study by Drexel University Professor and expert toxicologist Dr. Igor Burstyn entitled "Peering Through the Mist."¹ Dr. Burstyn utilized over 9,000 observations of electronic cigarette liquids and vapor in order to assess possible threats to the direct user and bystanders. Dr. Burstyn concluded that the levels of chemicals in e-cigarette vapor are so low so as to pose no apparent risk to bystanders.

i. Metals

Opponents often note that e-cigarette vapor contains various metals, implying that e-cigarette vapor is a source of inhaled toxic metals. Without proper context, presentation of this information is patently misleading. Dr. Michael Siegel, a long-time anti-tobacco researcher who testified against cigarette companies in lawsuits that cost them billions, has noted that the levels of metals delivered to vapor product users (bystanders are exposed to much less) are far lower than the daily exposures permitted by the authoritative United States Pharmacopeial Convention for inhalable medications.²

Dr. Siegel compared the levels of metals expected to be inhaled by the average e-cigarette user vs. the average user of the FDA-approved Nicorette nicotine inhaler and found that the levels were nearly identical. For some metals, electronic cigarette vapor contained LESS metals than the Nicorette inhaler. But again, these trace levels are allowed in medications, and metals in neither e-cigarette vapor nor the mist released by a nicotine inhaler represent a threat to the user or bystander.

There is no evidence that e-cigarettes are a source of any appreciable level of harmful chemicals. In a study funded in part by the National Institutes of Health, 12 different e-cigarette products were tested vs. a traditional combustible cigarette vs. the FDA-approved Nicorette inhaler. That study reported the levels of toxicants and chemicals identified as causing harm in cigarette smoke were present at trace amounts 9-450x less than in cigarette smoke.³ Even more importantly, the researchers noted that the levels were similar to those that are released by the Nicorette inhaler.

¹ Burstyn, I. "Peering through the mist: systematic review of what the chemistry of contaminants in electronic cigarettes tells us about health risks." *BMC Public Health Journal*, January 2014.

² Siegel, M. "Metals in Electronic Cigarette Vapor are Below USP Standards for Metals in Inhalation Medications," *Rest of the Story – Tobacco Analysis and Commentary*, April 2013.
<http://tobaccoanalysis.blogspot.com/2013/04/metals-in-electronic-cigarette-vapor.html>

³ Goniewicz, M., et. al. "Levels of selected carcinogens and toxicants in vapour from electronic cigarettes," *Tobacco Control*, March 2013.
<http://tobaccocontrol.bmj.com/content/early/2013/03/05/tobaccocontrol-2012-050859.abstract>

Recently, Dr. Konstantinos Farsalinos, a cardiologist and researcher at the Onassis Cardiac Surgery Center in Athens, Greece, published a thorough analysis using data from two studies that claimed to have found metals in e-cigarette vapor.⁴ Dr. Farsalinos analyzed this data against recognized international standards for inhalable medications. Assuming 600 puffs a day – about 300-400 more than the average vaper takes – Dr. Farsalinos concluded that the average daily exposure for the metals identified was 2.6 to 77,514 times lower than the standards allow.

Please note that these are exposures to *the user*. Bystanders will be exposed to an even tinier and negligible amount of these chemicals.

A summary of the results of the study is reproduced below:

<u>Metals</u>	<u>Average of 13 products tested</u>	<u>Daily Exposure Limits</u>	<u>Ratio – E-cig vs. Daily Limits</u>
<u>Cadmium</u>	<u>0.57 µg</u>	<u>1.5 µg</u>	<u>2.6</u>
<u>Chromium</u>	<u>0.06 µg</u>	<u>25 µg</u>	<u>386.9</u>
<u>Copper</u>	<u>1.87 µg</u>	<u>70 µg</u>	<u>37.4</u>
<u>Lead</u>	<u>0.70 µg</u>	<u>5 µg</u>	<u>7.1</u>
<u>Nickel</u>	<u>0.32 µg</u>	<u>1.5 µg</u>	<u>4.7</u>
<u>Iron</u>	<u>62.40 µg</u>	<u>41,500 µg</u>	<u>665.1</u>
<u>Tin</u>	<u>4.44 µg</u>	<u>16,600 µg</u>	<u>3738.7</u>
<u>Titanium</u>	<u>0.24 µg</u>	<u>2,490 µg</u>	<u>10,375</u>
<u>Zinc</u>	<u>0.54 µg</u>	<u>41,500 µg</u>	<u>77,514.4</u>

⁴ "Are Metals Emitted from Electronic Cigarettes a Reason for Health Concern? A Risk-Assessment Analysis of Currently Available Literature." Int. Journal of Env. Research and Pub. Health. 12(5):5215-5232, 2015. <http://www.mdpi.com/1660-4601/12/5/5215>

ii. **Volatile Organic Compounds**

As with metals, activists opposed to e-cigarette use often state that volatile organic compounds (VOCs) have been found in e-cigarette vapor. In a study published in the Journal of Indoor Air, German investigators at the Fraunhofer Wilhelm-Klauditz-Institute's Department of Material Analysis and Indoor Chemistry detected virtually no quantifiable levels of 20 VOCS found in cigarette smoke.⁵

Of the six chemicals detected (see below), five were at levels less than 1% the permissible exposure limits (PELs) set by the Occupational Safety and Health Administration. The sixth chemical, formaldehyde, was present at 2.4% of the PEL. However, the researchers noted because formaldehyde was detected at similar levels before the e-cigarette was used, the presence of formaldehyde "might be caused by the person in the chamber itself, because people are known to exhale formaldehyde in low amounts."

Concentrations (ug/m3) of VOCs in Vapor From Three E-cigarettes (Average) and Smoke From a Cigarette		
VOC	E-cigarette Vapor	Cigarette Smoke
Propylene glycol	*	112
1-hydroxy-2-propanone	*	62
2,3-butanedione	*	21
2,5-dimethylfuran	*	5
2-butanone	2	19
2-furaldehyde	*	21
2-methylfuran	*	19
3-ethenyl-pyridine	*	24
Acetic acid	13	68
Acetone	20	64
Benzene	*	22
Isoprene	*	135
Limonene	*	21
M,p-xylene	*	18
Phenol	*	15
Pyrrole	*	61
Toluene	*	44
Formaldehyde	12	86
Acetaldehyde	2	119
Propanal	*	12

*Unquantifiable/same as empty chamber

⁵ Schripp T., et. al. "Does e-cigarette consumption cause passive vaping?" Indoor Air 23: 25–31, 2013. <http://www.ncbi.nlm.nih.gov/pubmed/22672560>

iii. Polycyclic Aromatic Hydrocarbons (PAHs)

A flawed study in 2013 asserted that levels of polycyclic aromatic hydrocarbons (PAHs) were raised by 20% after non e-cigarette users were exposed to e-cigarette vapor for a significant period of time. This study has been soundly criticized for its methodological flaws. As explained by Dr. Konstantinos Farsalinos and Dr. Riccardo Polosa – the most published researchers on this topic throughout the world -- in a review of e-cigarette science:

[A] major methodological problem of this study is that control environmental measurements were performed on a separate day and not on the same day of EC use. This is a major limitation, because the levels of environmental PAHs have significant diurnal and day-to-day variations [Ravindra et al. 2008]; therefore, it is highly likely that the differences in levels of PAHs (which are mainly products of combustion and are not expected to be emitted from EC use) represented changes due to environmental conditions and not due to EC use. Bertholon and colleagues [Bertholon et al. 2013] examined the EC aerosol exhaled from a user, in comparison with exhaled smoke from a smoker. The authors found that particle size diameters were 0.29–0.033 μ m. They observed that the half life of EC aerosol was 11 seconds compared with 20 minutes for cigarette smoke, indicating that risk of passive vaping exposure is significantly lower compared with passive smoking.⁶

iv. Particulate Matter

With regard to particulate matter, e-cigarette opponents have misinterpreted the science. It is inherently misleading to refer to the aerosol droplets created by e-cigarettes as “particulates,” as doing so leads the reader to believe that liquid droplets are particles that lead to the same health concerns when inhaled as solid particles (i.e., smoke of any kind). As explained by Dr. Carl Phillips, a longtime researcher on tobacco harm reduction:

While droplets are particulates in the broadest sense of the term, in the context of environmental pollution that term generally refers to fine solid particles that can lodge in or be absorbed through the lungs intact. A liquid, of course, just dilutes into the bloodstream or other bodily liquids, regardless of particle size and deposition location. Thus, the extensive discussion of particulate size, let alone the explicit claims about health implications, is highly misleading. Indeed, the results they found are not all that different from the “particulate” exposure when someone takes a cold shower in terms of both “particle” size and concentrations, which illustrates the need to characterize the tiny bits of matter that disperse light, not merely determine that they exist.

The device the authors used to detect “particles” does not distinguish between droplets and solid particles; to assess any health-relevant particles the authors

⁶ Farsalinos, K., et. al. “Safety evaluation and risk assessment of electronic cigarettes as tobacco cigarette substitutes: a systematic review.” *Ther. Adv. Drug. Saf.*; 5(2): 67-68.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4110871/?report=classic>

should have used gravimetric techniques that determine the mass of solid particles emitted into the air. As such, the authors' work suffers from inadequate testing of their major conclusion and confirmation bias: they assumed health-relevant particles would be present in the aerosol, performed a test that was incapable of ruling that out, and then interpreted their results as confirmation.⁷

II. Conclusion

The science does not support restricting the use of vapor products where smoking is banned. Therefore, private business owners should retain the ability to allow or disallow e-cigarette usage.

In making your decisions, please consider the following:

*"Health professionals should embrace this potential by encouraging smokers, particularly those disinclined to use licensed nicotine replacement therapies, to try them, and, when possible, to do so in conjunction with existing NHS smoking cessation and harm reduction support. **E-cigarettes will save lives, and we should support their use.**"*

- Royal College of Physicians editorial by Dr Ilze Bogdanovica, Professor Linda Bauld and Professor John Britton from the UK Centre for Tobacco and Alcohol Studies⁸

Thank you for your consideration.

Sincerely,



Gregory Conley, J.D., M.B.A.
President – American Vaping Association

⁷ Phillips, C. "Letter re fatal flaws in Schober et al. paper on environmental vapor." Anti-THR Lies. January 2014. <http://antithrlies.com/2014/01/29/letter-re-fatal-flaws-in-schober-et-al-paper-on-environmental-vapor/>

⁸ Bogdanovica, et. al. "What you need to know about e-cigarettes." Royal College of Physicians. March 2014. <https://www.rcplondon.ac.uk/commentary/what-you-need-know-about-electronic-cigarettes>