

# Inverse correlation of ENDS device power and liquid nicotine concentration: Are users self-regulating nicotine emissions?

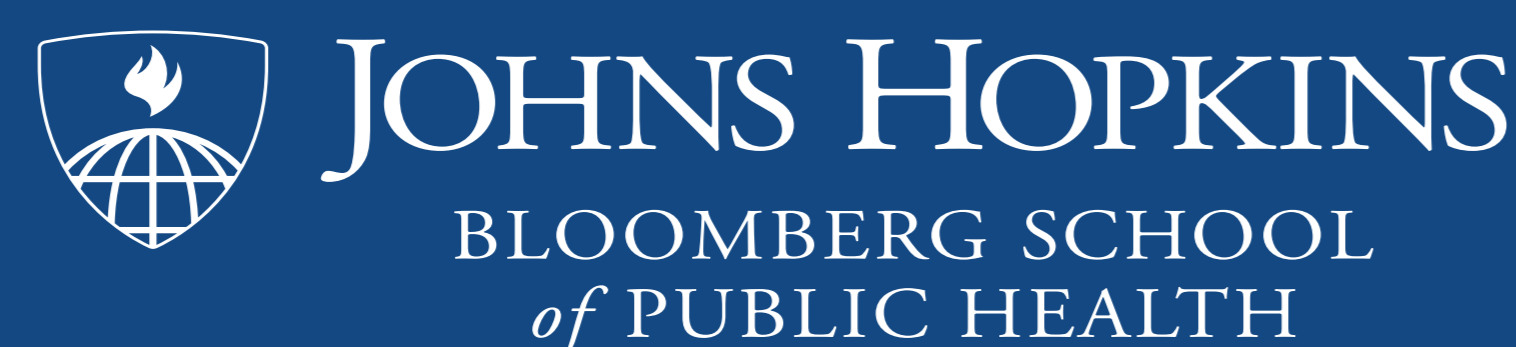
Presenter: Kevin Welding, PhD

## Background

Electronic Nicotine Delivery Systems (ENDS) power (Watts, W) and liquid nicotine concentration (mg/mL) are important determinants of nicotine delivery. We examined the relationship between device wattage and liquid nicotine concentration among regular ENDS users to determine the extent that these two factors are related in practice.

## Methods

- 1179 U.S. adults (21+) using ENDS 5+ days/week were asked about, and submitted photos of, their most used device/liquid from the past week.
- Information from photos, online research, and survey responses were used to construct a comprehensive database of device and liquid characteristics. Additional wattage values were obtained by purchasing devices and measuring voltage and resistance.
- Pearson correlation analyses were conducted on a total of 1000 participants who used liquid containing nicotine and we had complete information on nicotine concentration, device power and device type.



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# ENDS wattage and liquid nicotine concentration vary by device type and have a weak to moderate inverse relationship

Device Type	n	Median (Min, Max) Wattage	Median (Min, Max) Nicotine Concentration	Correlation Coefficient between Wattage & Nicotine Concentration*	p*
Refillable Tank	435	60.00 (5.60, 220.00)	6.00 (1.00, 90.00)	-0.20	<0.001
Refillable Pod/Cart	226	15.09 (3.00, 80.00)	25.00 (3.00, 60.00)	-0.19	<0.005
Disposable Pod/Cart	282	10.00 (6.00, 30.00)	50.00 (1.00, 80.00)	-0.17	<0.005
Disposable	57	9.48 (7.69, 14.42)	50.00 (50.00, 50.00)	0.00	=1.000
<b>All Devices</b>	<b>1000</b>	<b>34.04 (3.00, 220.00)</b>	<b>25.38 (1.00, 90.00)</b>	<b>-0.60</b>	<b>&lt;0.001</b>

\*Pearson's correlation coefficients are presented; p<0.05 significance noted in green

Note: Nicotine concentration is displayed in mg/mL and reported based on labels from photos of liquid or self-reported data

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## Results

- Median wattage tended to be higher for refillable devices.
- Median nicotine concentration tended to be higher for disposable devices and devices with disposable pods/cartridges.
- Overall, the correlation between wattage and nicotine concentration was negative and significant.
- By device type, the negative correlations were weaker, but still significant for all but the disposable devices.
- There was no variation in the nicotine concentrations used with disposable devices, which lead to no correlation with device wattage.

## Discussion

While it is possible to consume high nicotine concentrations from high powered devices, findings suggest that participants tend to use lower nicotine concentrations with higher powered devices and vice versa.

## Authors

Kevin Welding<sup>1</sup>, Joshua Sinamo<sup>1</sup>, Jeffrey J Hardesty<sup>1</sup>, Joanna E Cohen<sup>1</sup>, Elizabeth Crespi<sup>1</sup>, Qinghua Nian<sup>1</sup>, Ryan David Kennedy<sup>1</sup>, Alison Breland<sup>2</sup>, Eric K Soule<sup>3</sup>, Thomas Eissenberg<sup>2</sup>

1. Institute for Global Tobacco Control, Johns Hopkins Bloomberg School of Public Health
2. Center for the Study of Tobacco Products, Virginia Commonwealth University
3. Department of Health Education and Behavior, East Carolina University