



# Commentary: Pilot Study of Electronic Nicotine Delivery Systems (ENDS) Cessation Methods

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## ABSTRACT

Vaping has dramatically increased in use among many age groups with reasons cited as smoking cessation, good taste, and convenience. Two key differences between vaping and smoking are user's and healthcare provider's ability to quantify consumption and the social pressures to vape. Various questions are used to try to quantify vape use, but there has not been a standard method that is validated and widely used. Newer research is being done for vaping cessation including a text messaging program, but it does not address pharmacotherapy to reduce withdrawal symptoms and sustain the quit attempt long-term. Successful programs will need to address pharmacologic and behavioral interventions.

**Keywords:** Electronic Nicotine Delivery Systems; Vaping; Vaping cessation; Nicotine addiction

## Commentary

The Over the past decade, vaping or use of electronic nicotine delivery systems (ENDS) has dramatically increased in use in many age groups with reasons cited as smoking cessation, good taste, and convenience [1-4]. During this time more and more users have become addicted and have started to question "how addicted am I?" or "how can I stop this?" [5-7]. It took decades to be able to answer these questions for many smokers, and we are still unsuccessful in finding the right therapy for all motivated-to-quit smokers.

One key difference between smoking and vaping is that smoking is very quantifiable. Someone who smokes can easily answer the question of "how many cigarettes do you smoke a day?". Whereas, someone who vapes, typically cannot quantify an amount (puffs, mL of e-liquid) or time spent vaping. Sahr et al. tried to tackle this question of vape use by a series of questions aimed at quantifying use [8].

Questions used during the initial visit:

1. What device do you use?
2. What is the wattage, if applicable?
3. What e-juice brand do you use?
4. What nicotine concentration do you use?
5. What is your daily (or weekly) e-juice consumption?
6. Approximately how much time do you spend vaping each day?
7. How many days of the week do you vape?

When the methods of the study were developed in summer 2018, there was very limited information on quantifying vaping or cessation methods. The researchers modified the Fagerstrom Test for Nicotine Dependence [9] (Table 1) as a starting point for measuring dependence and initiating nicotine replacement therapy [10]. The tool has not been validated for vaping, and this study's results are not able to support or deny use of this tool

[11].

Please check one box for each question		
How soon after waking do you vape?	Within 5 minutes	3
	5-30 minutes	2
	31-60 minutes	1
Do you find it difficult to refrain from vaping in places where it is forbidden? E.g. Church, Library, etc.	Yes	1
	No	0
Which vaping would you hate to give up?	The first in the morning	1
	Any other	0
How many times a day do you vape? (1 time--5 mins)	0-10	0
	Nov-20	1
	21-30	2
	31+	3
Do you vape more frequently in the morning?	Yes	1
	No	0

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Do you vape even if you are sick in bed most of the day?	Yes	1
	No	0
Total Score		
Score	1-2=low dependence	5-7=moderate dependence
	3-4=low to mod dependence	8+=high dependence

**Table 1:** Fagerstrom test for nicotine dependence modified for vaping

Some of the reasons that make quantifying vaping so difficult to answer is that there is a lot of mindless vaping by users and a large variety of products used (nicotine strengths, inactive ingredients, salt forms, devices, wattage, CBD/THC, place of purchase, etc) that modify the amount of nicotine being released [12,13]. Unfortunately, there is no standard yet to quantifying vape use in research or clinical practice and is a need for further research.

Another key difference is the social pressure to vape [4,14]. Vaping for teens and young adults now is what smoking in the 1950's looked like. Many people are doing it, and it can be considered "cool" to participate. This pressure is hitting the youth and young adult populations the hardest. 2020 data shows that 20% of U.S. high schoolers use vape products [1]. In 2018 it was reported that 7.6% of 18-24-year-olds used vapes [15].

Every day the scientific community is discovering more and more information related to vaping, e-juice, and why people do it. Even though there are differences between smoking and vaping, most vaping cessation methodologies are being structured from smoking cessation literature [16], like the authors of this study [11]. Even though this pilot study was not powered to find statistical differences, there is tremendous value to the scientific and medical community in exploring methods for cessation, learning more about the history of vape users, and discovering additional benefits to quitting vaping [11].

While evidence that text messaging works for smoking cessation [17,18], the Truth Initiative has adapted this to help youth quit vaping [19]. Their results have been impressive for short-term cessation and we look forward to seeing how this holds up long-term [20]. This is a great steppingstone for additional studies to use for behavioral support, but there is a need to address pharmacotherapy.

For successful vaping cessation, it is important to combine a pharmacologic and behavioral method to address both components of addiction. I believe, two important pieces when evaluating literature is to look at the sustained quit and withdrawal symptoms experienced. Additionally, thorough social histories need to be taken and one-on-one support needs to be given to address the user's needs and modify frequently as their needs change.

## Commentary

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