E-Cigarettes: Unanswered Questions

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SMOKE ANYWHERE

- AIRPLANES
- RESTAURANTS
- NIGHT CLUBS
- BARS
- HOTEL/MOTELS
- EVERYWHERE!
Who is Selling Them?

• About 200 makers
• Swallowing the independent market
  – Lorillard
  – Altria (Philip Morris)
  – RJ Reynolds
  – British American Tobacco
E-Cigarette Companies

• Using the same political and public relations strategies as cigarette companies
  – Organizing users
• Not likely to allow cannibalization of their cigarette sales
5 Basic Parts to Electronic Nicotine Delivery Systems (ENDS)

- Housing
- Tip that is sucked on by user
- Battery
- Atomizer that heats the liquid and vaporizes it
- Tank that holds the e-juice and atomizer (called a cartomizer or clearomizer)
The “e-Juice”

- Propylene glycol and/or vegetable glycerine (glycerol)
- Nicotine (0 – 36 mg/ml)
- Flavorings (tobacco, fruit, mint/menthol, etc)
- Additives (trying to mimic “throat grab”)

First Generation (Cigalikes)

• Two types
  – Disposable
  – Rechargeable (pre-filled cartridges)
Second Generation

• Refillable
• More decorative
Third Generation - Mods

- Advanced personal vaporizers
- Control of battery voltage
My Vapor Record (MVR) is a special PC software of eVic. It has professional data statistics function which can record your vapor information more effectively.

Amazing! The design of PC software realizes human-machine interaction through connecting with computer. After your convenient and quick setup, you just only click mouse gently, your vapor record will be displayed on the computer.
Power on/off
Activate battery energy output
Deactivate battery energy output

Battery indicator
Show remaining battery power, it will warn when the battery decreases to 5%.

Variable voltage
Adjust output voltage of the battery

Standby setting
Set standby time of the screen
Set standby time of the system

Puff setting
Show/renew current total puff number
Set reminder puff number.

Show inhaling
Show vaping time on the screen

Date setting
Set time and date of the device manually or update through MVR automatically

Chart Analysis
After connecting with computer, you will have full access to your vapor record

Device parameters
Show resistance of the atomizer, show output voltage and wattage of the battery

Battery protection
Overheating protection, short circuit protection, low voltage protection, battery inversion protection

Energy saving
Screen of the device will go out when not used
System of the device will fall asleep when not used

PC operation
Through connecting with computer, you can modify information of the device more conveniently
Who Is Vaping?

• Younger
• Higher income
• Better educated
• Both genders
• Dual users
• IS THERE A VAPING SUBCULTURE?
Vaping Subculture

- Believe their addiction can save lives of millions of smokers of “analog” cigarettes
- Disdain cigalikes
- Obsessed with the customizable technology – tricking out vaping pieces with newest upgrades – mods; personal vaporizers
- May spend thousands on hobby in a year for accessories, colors, flavors
Vapefests

- Highly sponsored multi-day events
• “No one has ever heard of a nicotine patch club or a nicotine gum club, where people are addicted to these things say “let’s all get together, you know I’m a patch wearer, and you’re a patch wearer, let’s have a club, we’ve got something in common.””  
  Simon Chapman

• Powerful special interest groups, with industry backing
Are They Effective...

• For nicotine delivery?
• For craving/withdrawal?
• For smoking cessation?
P3 Component of Cortical ERP

Own Brand Cigarette

ENDS with Nicotine
N2 Component of Cortical ERP

Own Brand Cigarette  ENDS with nicotine
Blood Nicotine Levels

• Eissenberg (2010)
  – Compared ENDS to tobacco smoking
  – Only tobacco smoking raised blood nicotine levels

• Bullen (2010)
  – ENDS reached maximum blood level of 1.2 ng/ml in 20 minutes
Problems with Studies

• Naïve users – must learn how to maximize nicotine delivery
• First generation devices may be ineffective
• Vansickel and Eissenberg (2013)
  – Experienced users using their own devices
  – Effective nicotine delivery with 2\textsuperscript{nd} generation devices
• Dawkins and Corcoran (2013)
  – Effective nicotine delivery with 1\textsuperscript{st} generation device in regular users
What about Smoking Cessation?

• Moderately effective at alleviating tobacco craving
• RCTs suggest cessation rates comparable to NRT
• RCTs were done using cigalike ENDS
What May Be the Adverse Effect of FDA Regulation of ENDS?

- Would require an IND application if testing for efficacy for cessation
- May pretty much guarantee no independent RCTs for cessation
So What is the Controversy About?
Expanding the Definition of Harm

• Re-normalizing smoking
  – Marketing back on television using same imagery as old time cigarette ads
  – Similar placement in convenience stores as we once saw for cigarettes (e.g., near candy)

• The problem of use by youth
  – Rapidly adopting
  – Dual use common
  – Youth who use are heavier smokers
  – Temporal relationship between use of ENDS & tobacco cigarettes is not known
The Controversy

• May be another tool for quitting among some cigarette smokers, but...
• May be associated with lower odds of quitting (bridge product to maintain nicotine levels in venues where smoking not permitted)
• Disease risk likely to be only modestly affected in dual users
• Passive exposure results in cotinine levels similar to those of passive smokers
We Just Don’t Have the Answers