



# **Electronic cigarette current use among Korean teenagers**

**Seoul National University Hospital  
Department of Family Medicine  
Cheol min Lee, MD, MPH, PhD**

- ❖ What is E-cig?
- ❖ Debate on E-cig
  - Safety issue
  - Effect on smoking cessation
- ❖ Legal status in Korea
- ❖ Current use of E-cig among Korean teenagers, by KYRBS, 2011-2012
- ❖ Conclusion

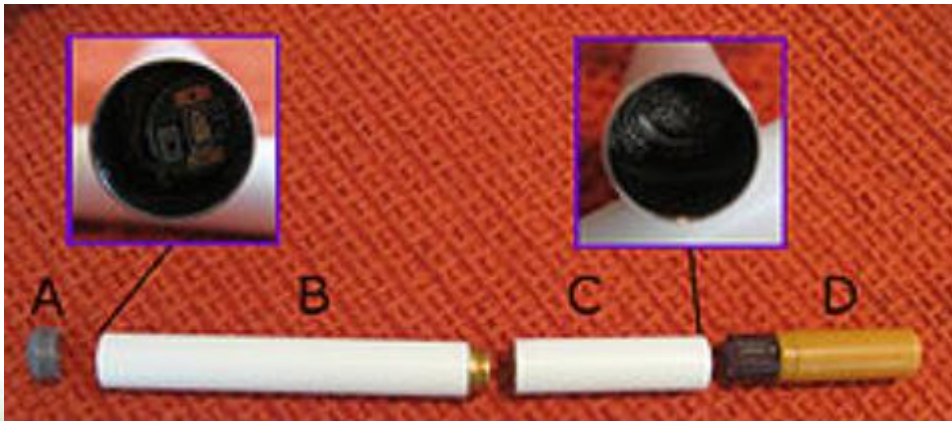
# Electronic cigarette?



- ❖ **E-cigarette**, Electronic cigarette
  - ENDS (Electronic Nicotine Delivery System), ENDD (Electronic Nicotine Delivery Device)
  - Developed by Hon Lik, Chinese pharmacist in 2000
- **Battery-powered** device that provides inhaled doses of nicotine by way of a **vaporized solution**
- ❖ This vapor also provides a flavor and physical sensation similar to that of inhaled tobacco smoke.
- ❖ But, **no tobacco, smoke, or combustion is actually involved in its operation**

# Construction

- ❖ Mouthpiece or cartridge
- ❖ Heating element or atomizer
- ❖ Power
- ❖ Liquid



- A: LED light cover
- B: battery(also house circuitry)
- C: atomizer(heating element)
- D: cartridge(mouthpiece)



**ProVape-1(mod)**



**Super-T**



**Jantystick V3**



**Janty eGo**

## Liquid

- ❖ Liquid for producing vapor in E-cig, known as e-juice or e-liquid
- ❖ Solution of propylene glycol, vegetable glycerin, and/or polyethylene glycol mixed with flavors
- ❖ And optionally, a variable concentration of nicotine

# Debate on E-cig



## Tobacco-free electronic cigarettes and cigars deliver nicotine and generate concern

BMJ

BMJ

BMJ 2013;346:f3840 doi: 10.1136/bmj.f3840 (Published 14 June 2013)

Page 1 of 2

BMJ 2013;346:f3840 doi: 10.1136/bmj.f3840 (Published 14 June 2013)

Page 1 of 2

HEAD TO HEAD

HEAD TO HEAD

### Should electronic cigarettes be as freely available as tobacco cigarettes? No

The Medicines and Healthcare Products Regulatory Agency has decided to license electronic cigarettes as medicines from 2016. **Simon Chapman** agrees with regulation, seeing e-cigarettes as another way for big tobacco to try to make nicotine addiction socially acceptable again, but **Jean-François Etter** (doi:10.1136/bmj.f3845) says restrictions will result in more harm to smokers

Simon Chapman *professor of public health*

### Should electronic cigarettes be as freely available as tobacco cigarettes? No

The Medicines and Healthcare Products Regulatory Agency has decided to license electronic cigarettes as medicines from 2016. **Simon Chapman** agrees with regulation, seeing e-cigarettes as another way for big tobacco to try to make nicotine addiction socially acceptable again, but **Jean-François Etter** (doi:10.1136/bmj.f3845) says restrictions will result in more harm to smokers

Simon Chapman *professor of public health*

# Debate on E-cig

## Safety issue

- ❖ FDA(2009)
  - Some contain TSNAs and diethylene glycol
  - Inconsistent amounts of nicotine delivered when drawing on the device
- ❖ UK NHS(2013)
  - The level in FDA reports was one-thousandth that of cigarette smoke

## Effect on quitting

- ❖ American Association of Public Health(2013)
  - View E-cig as similar to other NRT
  - recommend them as harm reduction method who have failed to quit
- ❖ WHO(2013)
  - No rigorous studies have been conducted to determine



# Legal status in Korea



- ❖ The sale and use of E-cig is legal
- ❖ Double supervision according to nicotine level
- ❖ E-cig without nicotine : device for smoking cessation(under KFDA)
- ❖ E-cig with nicotine: deal with cigarettes(under Korean Ministry of Strategy and Finance)
- ❖ E-cig possession among teenagers remains an issue
  - 0.5% of adolescents reported as having used E-cig(Cho JH et al, 2008)
  - And now?

# KYRBS, 2011-2012



- ❖ The Eights Korea Risk Behavior Web-based Survey, 2011-2012
- ❖ Nationwide survey representing the Korean general youth population
- ❖ Including comprehensive information on health status, health behaviors, and socio-demographic characteristics(797 middle and high schools among 5475 schools)
- ❖ N=149,839(M:76,094, F: 73,735)

# E-cig use in Korean teenagers (1)



	Ever-use	Current use
Male	13.4% (10,159/76,094)	6.3% (4,767/76,094)
Female	3.8% (2,815/73,735)	1.6%(1,163/73,735)
Total	8.7% (12,974/149,829)	4.0% (5,930/149,829)

⇒ Among ever-smoker

	Ever-use	Current use
Male	34.7% (8,836/25,450)	17.0% (4,325/25,450)
Female	18.0% (2,262/12,547)	8.0% (1,000/12,547)
Total	29.2% (11,098/37,997)	14.0% (5,328/37,997)

⇒ Dual use among current smoker (within 30 days)

	Ever-use	Current use
Male	51.5% (6,486/12,599)	29.0% (3,657/12,599)
Female	33.0% (1,566/4,751)	16.9% (803/4,751)
Total	46.4% (8,052/17,350)	25.7% (4,460/17,350)

## E-cig use in Korean teenagers (2)



### ❖ E-cig among non-smokers

- Ever-use: 1.7% (2.6% of male, 0.9% of female)
- Current use: 0.5% (0.9 of male, 0.3% of female)

### ❖ Smoking status among E-cig users

- 37.9% of ever users are not smoking within 30 days (36.2% of male, 44.4% of female)
- 24.2% of current users are not smoking within 30 days (23.3% of male, 31.0% of female)

## E-cig use in Korean teenagers (3)



- ❖ Current E-cig use is positively associated with
  - Current smoking (x10)
  - Male (x2.8)
  - Second-smoking at home (dose-response relationship)
  - Pocket money (dose-response relationship)
  - City (40% more)
  - Depression (40%)
  - Recent smoking cessation (40%)
  - Low grade in school (30%)

		aOR	CI
Sex	male	1.00	
	<b>female</b>	<b>0.35</b>	0.33-0.38
City type	county	1.00	
	<b>Large city</b>	<b>1.46</b>	1.33-1.61
	<b>small-to medium city</b>	<b>1.48</b>	1.34-1.63
Stress	much	1.00	
	normal	0.99	0.93-1.07
	<b>little</b>	<b>1.19</b>	1.08-1.31
Depression for 2 weeks during a year	no	1.00	
	<b>yes</b>	<b>1.40</b>	1.31-1.49
Alcohol ever-use	no	1.00	
	<b>yes</b>	<b>2.41</b>	2.20-2.64
Current smoking (within 30d)	no	1.00	
	<b>yes</b>	<b>10.86</b>	9.91-11.90
smoking cessation trial within 1 year	no	1.00	
	<b>yes</b>	<b>1.40</b>	1.29-1.51
Second-hand smoking at home, days/week	no	1.00	
	<b>1-3d/week</b>	<b>1.42</b>	1.32-1.53
	<b>4-5d/week</b>	<b>1.71</b>	1.53-1.90
	<b>6-7d/week</b>	<b>2.01</b>	1.86-2.18
Anti-smoking education	no	1.00	
	<b>yes</b>	<b>0.93</b>	0.87-0.99
Grade in school	high	1.00	
	middle	1.02	0.94-1.12
	<b>low</b>	<b>1.29</b>	1.19-1.39
Pocket money, Korean won/week	<10000	1.00	
	<b>10000~20000</b>	<b>1.40</b>	1.27-1.54
	<b>20000~30000</b>	<b>1.64</b>	1.47-1.82
	<b>30000~100000</b>	<b>1.85</b>	1.69-2.02
	<b>100000~</b>	<b>3.79</b>	3.38-4.26



## E-cig use in Korean teenagers (4)



❖ In summary,

- E-cig use is rapidly increased among youth
  - 0.5% in 2008  $\Rightarrow$  8.7 in 2011-2012
- Dual use(cigarettes + E-cig) is common in current smoker (25.7%)
- E-cig users among never smokers are very few, but  $\frac{1}{4}$  of current E-cig users are not smoking
  - for quitting?
- E-cig use is associated with current smoking, male sex, depression, recent cessation trial, SHS, low grade, and much pocket money

## Take-home message



- ❖ E-cig is now positioning between poisoning and cessation device
- ❖ Evidence is lacking, but many Korean teenagers use E-cig for harm reduction and smoking cessation
- ❖ Many Korean teenagers use cigarettes and E-cigarette at once
- ❖ Ambiguous legislation for E-cig in Korea makes worse this phenomenon





**THANKS FOR  
ATTENTION**