



## Update on Hookah and E-cigarettes



Presented By: Mary Martinasek, PhD, RRT



## Outline

- Background
- Function and usage
- Concerns
- Prevalence
- Lure
- Effects and research
- E-cigarette device
- Prevalence
- Concerns
- FDA

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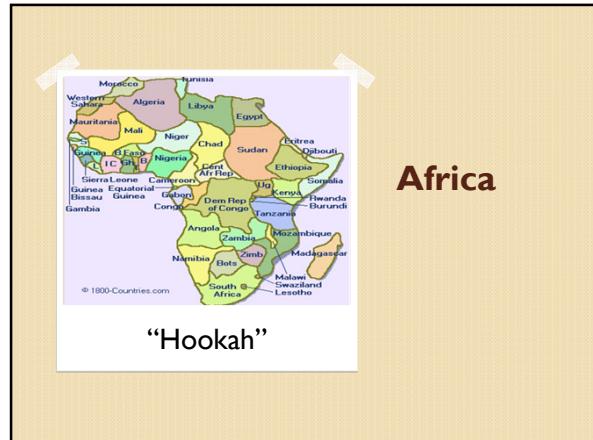
## Hookah Smoking

- Centuries old tradition





## Egypt or Saudi Arabia



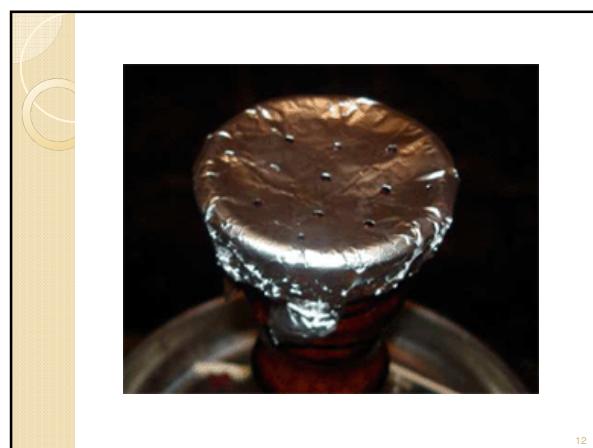
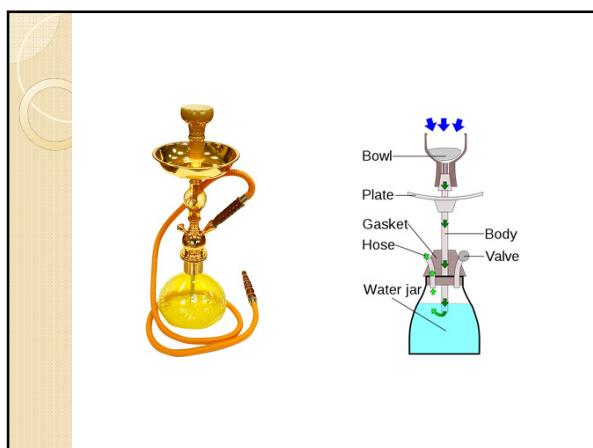
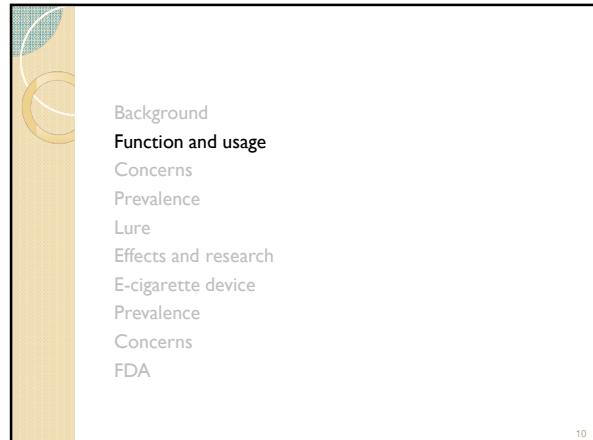
## Africa



## Israel, Jordan or Lebanon



## Persia





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## Waterpipe Tobacco

- **Maassel** – flavored tobacco
  - Shisha



## Single-hose and Double-hose Hookah Pipes



Triple-hose Hookah Pipe

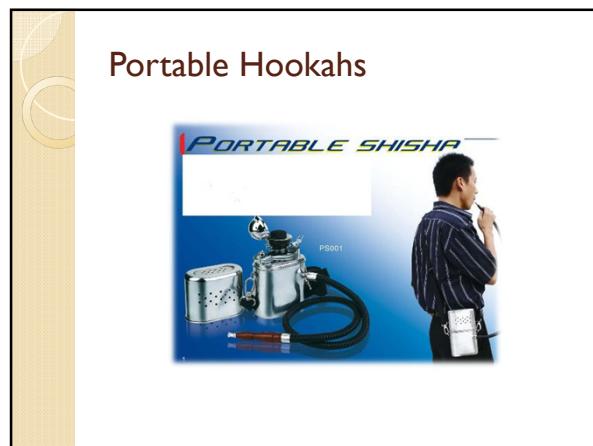


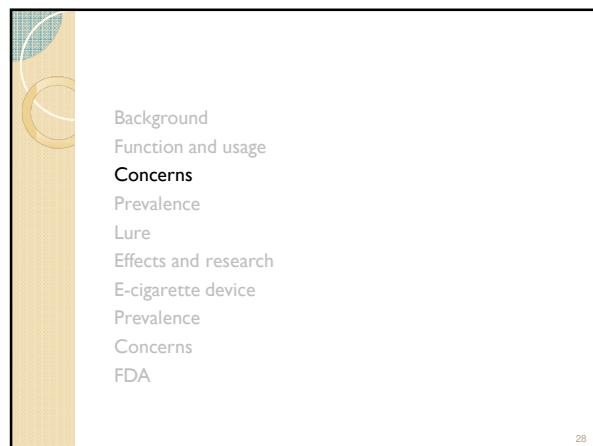
Multiple-hose Hookah Pipe



Portable Hookah Pipe



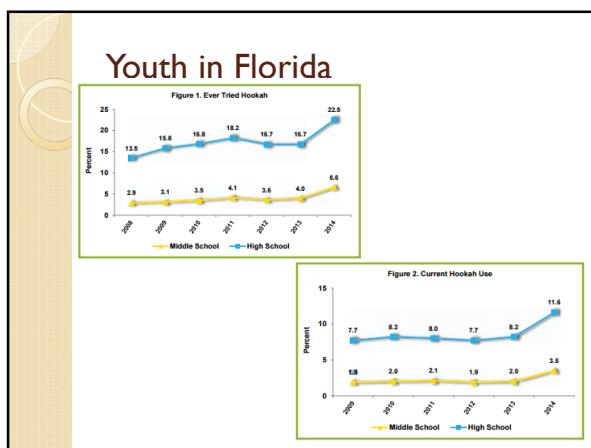




## Hookah as a Gateway

Background  
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 Concerns  
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## Waterpipe Characteristics

- Ever smoker and ethnicity
  - White students are 8.2 times more likely than Black students
  - Asian/Pacific Islander students are 5.1 times more likely than Black students

## Social Utility



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## Positive Outcome Expectancies



## Relieves stress and boredom



## Ease of access/low cost



http://www.hookahcompany.com/ 10/29/2009

## Internet Advertising Study

- 144 websites
  - Of these:
    - 79% served food
    - 41% served alcohol
    - None required age verification
    - <1% included a tobacco warning
    - 4% had a warning on a subsequent page

## Media Portrayal



## Special Appearances



Star Wars Jabba the Hutt Deluxe Figure

By The Toy Store

4.5 stars • 5 customer reviews

Price: \$34.47 + \$4.99 shipping

Only 1 left!

Ships from and sold by Souvenir General Store

Estimated Delivery Date: July 9 - 14 when you choose Standard at checkout

• Figure comes with weapon accessories

• 10% more than \$24.37 1 customer likes this



Power Wheels for Boys

Best Price: \$24.37

Buy it now on Power Wheels items

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### Effects and research

E-cigarette device

Prevalence

Concerns

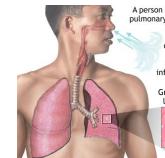
FDA

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## Why are we concerned about water pipe smoking?

What's in a cigarette?

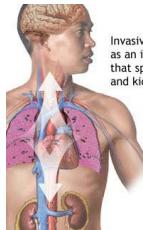
- 40 substances that cause ~~cancer~~
- Ammonia (toilet cleaner)
- Radioactive polonium
- Arsenic (rat poison)
- Formaldehyde (used to embalm dead people)
- Nicotine (rat poison removed)
- Acetone (nail polish remover)
- Tar (yucky that brown your teeth?)
- Carbon monoxide (exhaust fumes)
- Urea (found in human and animal urine)



A person may contract pulmonary tuberculosis from inhaling infected droplets from a cough or sneeze by an infected person



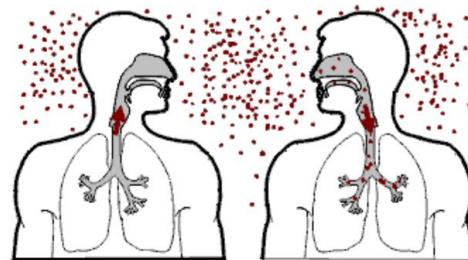
## Aspergillosis



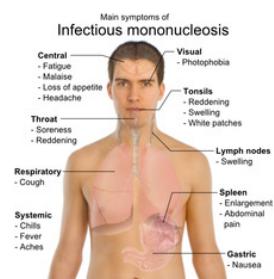
Invasive aspergillosis can occur as an infection with pneumonia that spreads to heart, lungs, brain and kidneys via the bloodstream



## TB Transmission



## Mononucleosis



## Lip Carcinoma



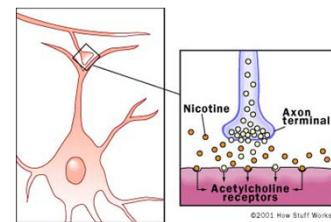
## What we do know about hookah smoke?

- One hookah session versus a cigarette
  - 40 times the tar
  - 30 times the carcinogens
  - 2 times the nicotine
  - 10 times the carbon monoxide



## Blood Nicotine Levels

- Similar to a person who smokes ten cigarettes per day



## Regulatory Concerns

- FDA has been given regulatory over tobacco products, defined as “any product made or derived from tobacco that is intended for human consumption, including any component, part, or accessory of a tobacco product.”

## Sampling vs. Smoking Debate

According to the Tobacco Public Policy Center (2007): “hookah bars may claim to be exempt from clean indoor air ordinances for various reasons” including:

1. Retail tobacco shop exemption
2. Private club exemption
3. Self-employed/ family owned and operated exemption
4. Claim that definitions within the specific legislation does not include hookah

## Public Health Concerns

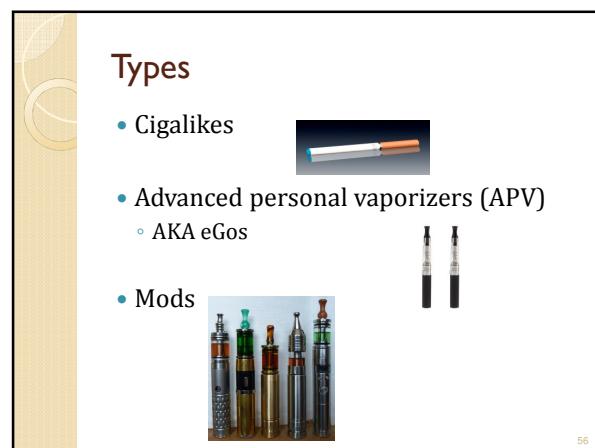
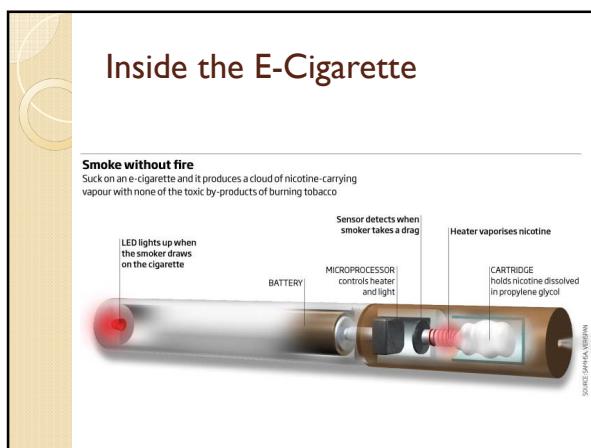
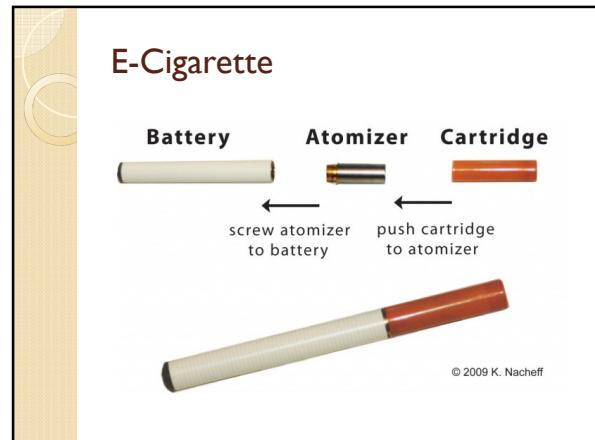
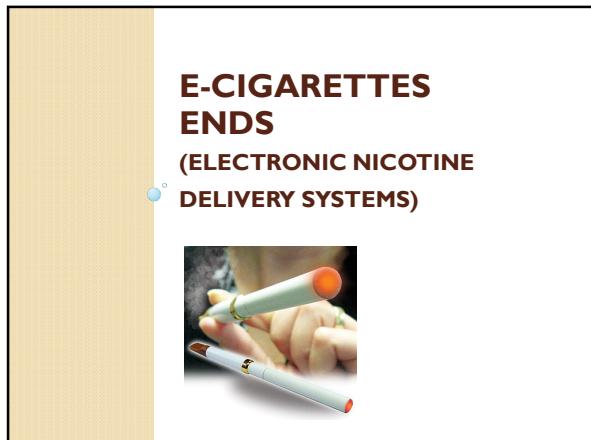
- Regulation of sanitation
- Package warnings
- Inclusion in smoking bans
- Inclusion in FDA controls
- Health education messages
- More research

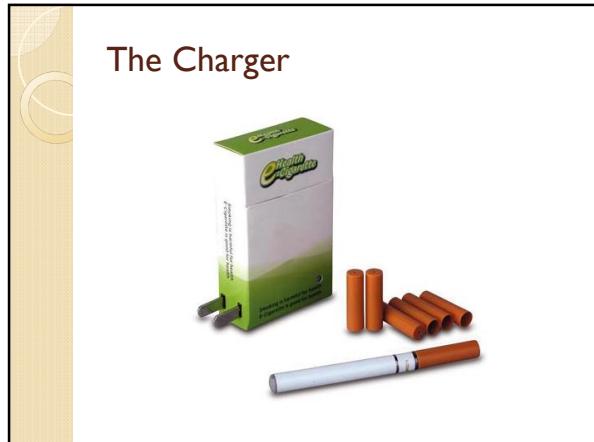


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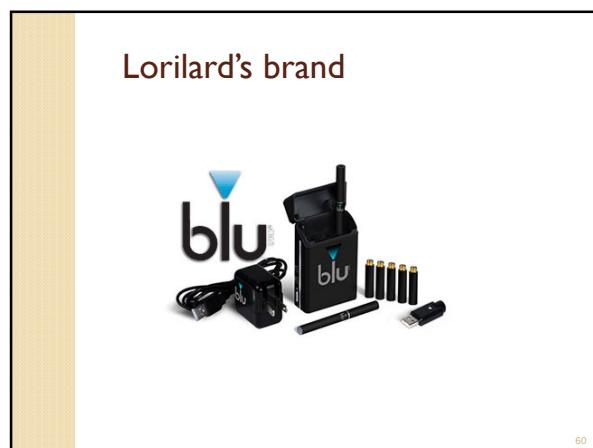
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## Business is soaring..

- By January 2014 there were 466 brands (each with its own Internet site)
- 7764 unique flavors



Zhu, et al., 2014 Tobacco Control

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American Heritage Names Tobacco Education & Cessation Crusader Rick Bender to Advisory Board  
You are here: Home > American Heritage Names Tobacco Education & Cessation Crusader Rick Bender to Advisory Board

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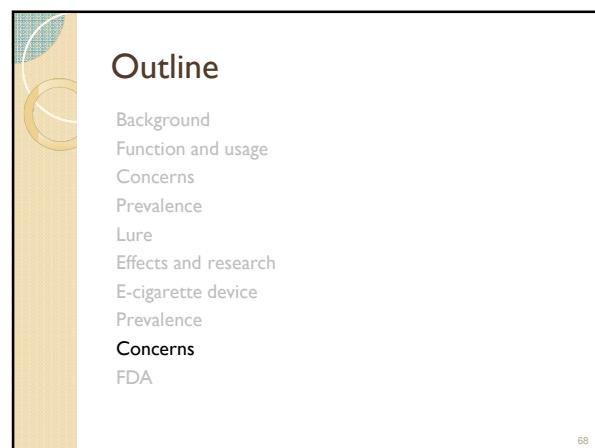
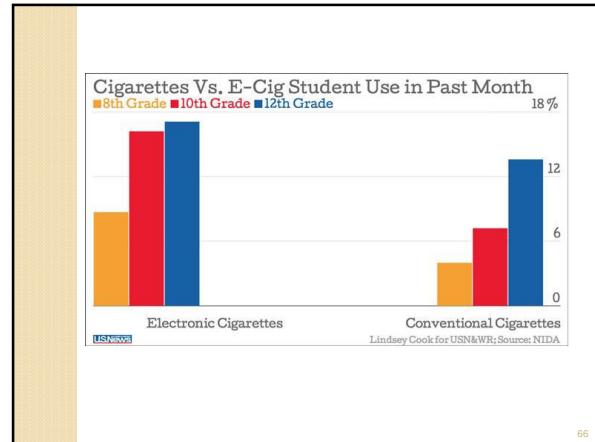
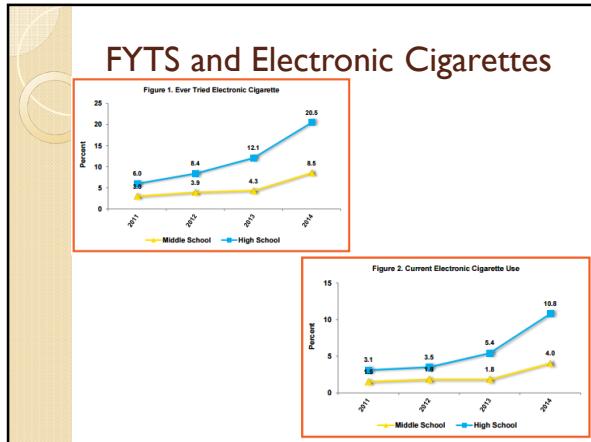
## Other Chargers



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## Research

- Nitrosamines (cancer causing agent)
- Varying amounts of nicotine
- Particulate matter
- Irritability in throat
- Cartridge labeled as 0% nicotine contained nicotine



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## Physiological Effects (n=12-32)

- Mouth and throat irritation and dry cough at initial use
- No change in heart rate, carbon monoxide (CO) level, or plasma nicotine level
- Increase in respiratory impedance and respiratory flow resistance similar to cigarette use
- No change in lung function
- No change in cardiac function as measured with echocardiogram
- No increase in inflammatory markers

Callahan-Lyon P. Electronic Cigarettes: Human Health Effects. *Tob Control* 2014;23:i36–i40. doi:10.1136

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## Studies showing some positive results of e-cigarettes for quit attempts

UK study – cross sectional household survey

- N=5863
- E-cig users more likely to report abstinence (OR= 2.23) compared to no aid (OR=1.38)

Question: abstinence measured to date of survey so could have been 1 day or 6 months – no measures provided

Jamie Brown, Emma Beard, Daniel Kotz, Susan Michie, Robert West. Real-world effectiveness of e-cigarettes when used to aid smoking cessation: a cross-sectional population study. *Addiction*. 2014

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Smokers who used e-cigarettes reported that e-cigarettes were helpful in smoking cessation and had used e-cigarettes to quit smoking.

Eter JF. Electronic cigarettes: a survey of users. *BMC Public Health* 2010;10:231.  
 Eter JF, Bullen C. Electronic cigarette: users profile, utilization satisfaction and perceived efficacy. *Addiction* 2011;106(11):2017–28.  
 Adkison SE, O'Connor RJ, Bansil-Travers M, et al. Electronic nicotine delivery systems: international tobacco control four-country survey. *Am J Prev Med* 2013;44(3):207–15.

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## Studies showing no difference in quit attempts with e-cigarettes

- 657 people were randomized
  - 289 to nicotine e-cigarettes
  - 295 to patches
  - 73 to placebo e-cigarettes
- At 6 months, verified abstinence was
  - 7 • 3% (21 of 289) with nicotine e-cigarettes,
  - 5 • 8% (17 of 295) with patches
  - 4 • 1% (three of 73) with placebo e-cigarettes

**we had insufficient statistical power to conclude superiority of nicotine e-cigarettes to patches or to placebo e-cigarettes.**

Bullen, Christopher, et al. "Electronic cigarettes for smoking cessation: a randomised controlled trial." *The Lancet* 382.9895 (2013): 1629-1637.

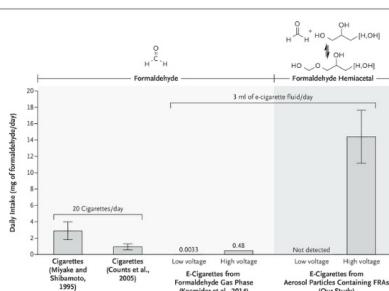
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Ever using e-cigarette is not associated with intention to quit, quit attempt, and smoking cessation.

Adkison SE, O'Connor RJ, Bansal-Travers M, et al. Electronic nicotine delivery systems: international tobacco control four-country survey. *Am J Prev Med* 2013;44(3):207-15.  
 Popova LL, Ling PM. Alternative tobacco product use and smoking cessation: a national study. *Am J Public Health* 2013;103(5):923-30.  
 Caponnetto P, Campagna D, Cibella F, et al. Efficiency and Safety of an electronic cigAReTte (ECLAT) as tobacco cigarettes substitute: a prospective 12-month randomized control design study. *PLoS One* 2013;8(6):e6317.

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## Formaldehyde



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## Air quality study

- n=9
- Gas phase – nicotine and glycerine
- Carcinogenic PAH increased 20%
- Aluminum increased 2.4 fold

During the vaping sessions substantial amounts of 1,2-propanediol, glycerine and nicotine were found in the gas phase, as well as high concentrations of PM<sub>2.5</sub> (mean 197  $\mu\text{g/m}^3$ ). The concentration of putative carcinogenic PAH in indoor air increased by 20% to 147  $\text{ng/m}^3$ , and aluminum showed a 2.4-fold increase. PNC ranged from 46,620 to 88,386 particles/ $\text{cm}^3$  (median), with peaks at diameters 24-36 nm. FeNO increased in 7 of 9 individuals. The nicotine content of the liquids varied and was 1.2-fold higher than claimed by the manufacturer.

Schober, Wolfgang, et al. "Use of electronic cigarettes (e-cigarettes) impairs indoor air quality and increases FeNO levels of e-cigarette consumers." *International journal of hygiene and environmental health* (2013).

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## Research summary

- Nitrosamines (cancer causing agent)
- Varying amounts of nicotine
- Particulate matter
- Metals(Tin, Iron, Nickel and chromium)
- Irritability in throat
- Cartridge labeled as 0% nicotine contained nicotine
- Contaminants



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## Regulation

- 2011 Court decision
  - Denied FDA regulation of E-cigarettes as drug/device
  - Approved FDA regulation of E-cigarettes as a tobacco product

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### E-Cigarette 'May Have Caused Hospital Fire' That Left Woman Badly Burned

An e-cigarette may have been responsible for igniting a hospital patient's oxygen supply and causing her life-threatening burns, it has been reported.

Jean Booth's scalp and face were severely burnt and she was last night fighting for life as an investigation tried to discover whether an e-cigarette found near her at Wythenshawe Hospital in Manchester was responsible for the blaze, [The Sun](#) ([E](#)) reported.



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## AAP Statement on Legislation to Require Child-Proof Packaging for Liquid Nicotine

7/10/2014 by: James M. Perrin, MD, FAAP, president, American Academy of Pediatrics

"The American Academy of Pediatrics (AAP) supports legislation introduced today by Senator Bill Nelson (D-Fla.) and several of his colleagues that would help protect our children from the dangers posed by the highly toxic liquid nicotine used to refill e-cigarettes. Children are being poisoned by these products at an alarming rate, and the Academy endorses the Child Nicotine Poisoning Prevention Act of 2014 as a needed step forward to prevent future child nicotine poisoning."

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## Current state laws

- 28 states' laws regulate e-cigarettes
  - Youth access
  - Smoke-free areas
  - Excise taxation
    - Minnesota

Arkansas and Virginia explicitly excluded e-cigarettes from their laws

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## Take home points

- Not merely water vapor
- No quality control – mainly produced in China
- Not enough evidence to support it as a cessation aid
- When heated and vaporized, propylene glycol can form propylene oxide, [\(International Agency for Research on Cancer class 2B carcinogen\)](#)
- Glycerol forms acrolein, which can cause upper respiratory tract irritation
- Like any poison keep bottles away from small children
- None of the exposure studies have taken into consideration chronic respiratory disease

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## PRESENTER INFORMATION

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