

# The Truth about Vaping and E-Cigs

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# The Truth about Vaping and E-Cigs

- Are e-cigs safer than regular cigarettes?
- What are the risks for those who vape as well as bystanders?



# The Truth about Vaping and E-Cigs

## *Overview of Cigarette and Tobacco Products*



# Remember when...



20,679\* Physicians  
say "LUCKIES are  
*less irritating*"

"It's toasted"  
Your Throat Protection  
against irritation against

\* The figures quoted have been checked and certified to by LYBRAND, ROSS BROS. AND MONTGOMERY, Accountants and Auditors.



Don't smoke the anti-radiation cigarette from your package of Camels after you smoke it. The Radiator Pack is guaranteed against throat and chest irritation, to reduce and remove, even in the dry atmosphere of arid lands, the Radiator Pack delivers fresh Camels and keeps them, right until the last one has been smoked.



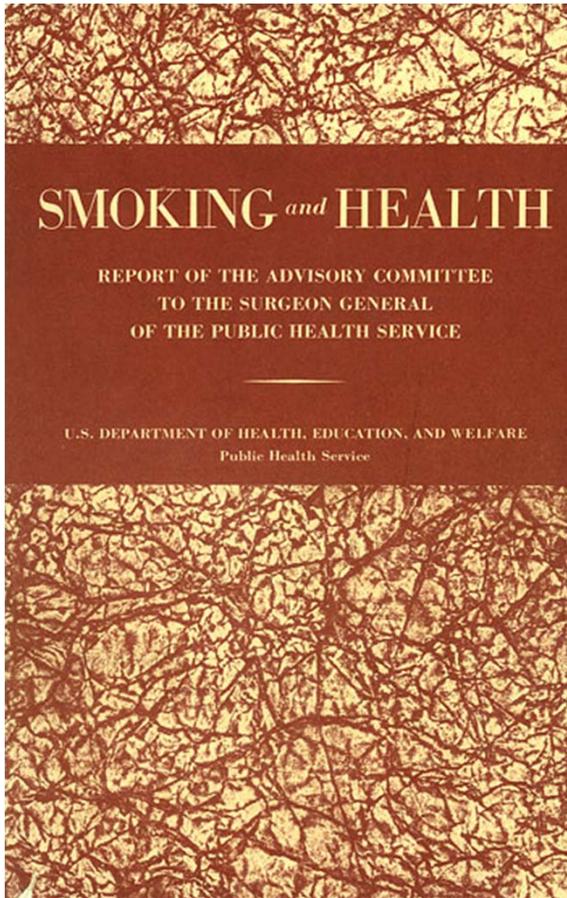
**Viceroy**  
**FILTER**  
**the Smoke!**

As your Dentist,  
I would recommend  
**VICEROYS**

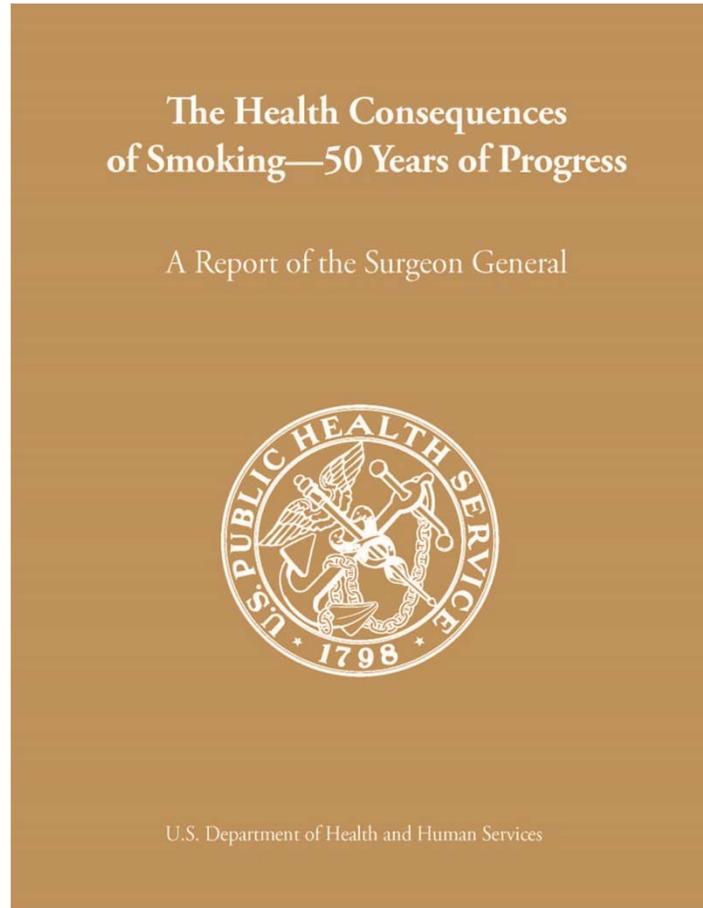


# The Health Consequences of Smoking: 50 Years of Progress

## A Report of the Surgeon General



1964



2014

# The Grim Tobacco Use Statistics

## Between 1964 and 2014:

- ❑ **Over 20 million Americans died because of smoking, including**
  - 2.5 million nonsmokers
  - More than 100,000 babies
  
- ❑ **Smoking is still the leading cause of preventable disease and death in the United States.**

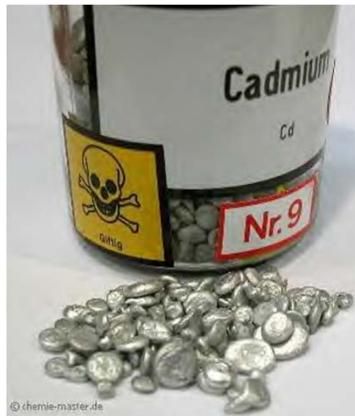
## What We've Learned over the Past 50 years

# The Killer Cigarette

- ❑ **Smoking risks are more deadly than 50 years ago.**
- ❑ **Smokers inhale over 7,000 chemical compounds.**
- ❑ **At least 70 CAUSE CANCER.**
- ❑ **Smoking causes disease in nearly every organ.**
- ❑ **Secondhand smoke kills more than 41,000 nonsmokers every year.**
- ❑ **There is no safe level of SHS exposure and NO SAFE CIGARETTE.**

Source: University of Washington

# Chemical Box:



## What's in Tobacco?

- ★ **Tar:** black sticky substance used to pave roads
- ★ **Nicotine:** Insecticide
- ★ **Carbon Monoxide:** Car exhaust
- ★ **Acetone:** Finger nail polish remover
- ★ **Ammonia:** Toilet Cleaner
- ★ **Cadmium:** used batteries
- ★ **Ethanol:** Alcohol
- ★ **Arsenic:** Rat poison
- ★ **Butane:** Lighter Fluid

Source: University of Washington

Facquet Spring 2016

## **21<sup>st</sup> Century Tobacco Use Statistics**

**Between 2010 and 2014 smoking caused**

- ❑ Nearly half a million premature deaths a year**
- ❑ More than 87% of all lung cancer deaths**
- ❑ 61% of all pulmonary deaths**
- ❑ 32% of all coronary deaths**

Source: University of Washington

## Smoking and Children

- ❑ Today about half of all children 3-18 years of age are exposed regularly to cigarette smoke.
- ❑ Every day over 3,200 kids try their first cigarette and another 2,100 youth and young adults become daily smokers.
- ❑ Nearly 9 out of 10 smokers started before age 18.

Source: University of Washington



## The Power of Nicotine Addiction

- ❑ Nicotine is the primary addicting drug in cigarettes.
- ❑ Nicotine keeps people smoking longer and that causes more damage to the body.
- ❑ Nicotine patches, gum, and lozenges are safe when used as directed.

Source: University of Washington



# Nicotine

- ❑ Nicotine is the primary addicting drug in cigarettes.
- ❑ It can raise heart rate and blood pressure.
- ❑ It can result in premature births and low birth weight babies in women who smoke during pregnancy.
- ❑ It can be harmful to developing brains.

Source: University of Washington

# The Truth about Vaping and E-Cigs

## *Overview of E-Cigarettes and Vaping Products*



# E-Cigs Facts

- E-cigarettes have been around since the 1960s.
- Started to take off in the last decade with more than 250 brands and flavors like watermelon, pink bubble gum and Java.
- Estimated **4 million Americans** use them, according to the Tobacco Vapor Electronic Cigarette Association.
- Researchers compared e-cigarettes to nicotine patches and other smoking cessation methods and found them statistically comparable in helping smokers quit over a six-month period
- According to a CDC study: **nearly 1.8 million young people** had tried e-cigarettes and the number of U.S. middle and high school students e-smokers doubled between 2011 and 2012.

Source: CDC 2016

# E-Cigs Defined

- *E-cigarette or e-hookah* means any electronic oral device or nicotine delivery device or nicotine delivery device, such as one composed of a heating element, battery, and/or electronic circuit, which provides a vapor or nicotine or any other substance, and the use or inhalation of which simulates smoking.
- The term shall include any such device, whether manufactured, distributed, marketed or sold as an e-cigarette, e-cigar, e-pipe- e-hookah, hookah pen or under any other product name or description.



# E-Cigs What is it?

## How does it work?

- **Electronic cigarette:** smokeless, battery operated device used to deliver nicotine with flavorings or other chemicals to the lungs.
- **Vaporizer pen “vape pen”:** hand-held device used to generate an inhalable vapor from a solid, semi-solid, or liquid substance.
- Specifically designed to vaporize **THC**.
- Both use the same technology, leave no detectable odor, and are similar in appearance.

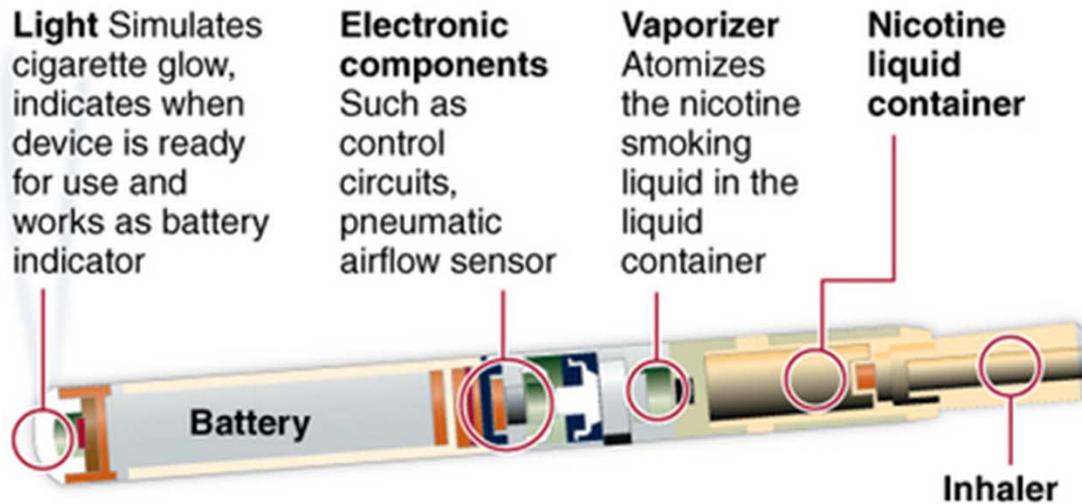
# What are E-Cigs ?

## Theory behind E-Cigs -

A device containing a liquid solution, containing nicotine, which is heated, turning into a vapor, which is then inhaled, delivering that nicotine in a manner that is not harmful (or, at least, is significantly less harmful than traditional, combustible, tobacco).

# Electronic cigarette

*An electronic cigarette, developed by a Chinese company, gives the user nicotine but no fire, no tar, no carbon monoxide, no ash and no stub.*



Electronic cigarette	Comparison	Regular cigarette
One e-cigarette	Equivalent	6-7 cigarettes
100	Puffs per cigarette	15
6-24 mg.	Nicotine level	0.6-2.4 mg.
E-cigarette with 24 mg of nicotine: 0.16 mg/puff	Nicotine per puff	Cigarette with 1.8 mg of nicotine: 0.16 mg/puff

Source: E-Cig    Graphic: Eeli Polli, Elsebeth Nielsen    © 2008 MCT

# What are E-Cigs ?

## Current Reality

- Much of the “theory” may be true.
- Significant concerns around manufacture of products
  - Lack of quality control standards
- Concern around ingredients
  - No oversight or disclosure
  - Propylene glycol is GRAS for ingestion, not inhalation
  - Flavorings also untested for inhalation
  - Levels of nicotine vary widely
  - Other chemicals (such as Pyrazine) may be added to boost addictive qualities

# Types of E-Cigs

## First Generation Devices

- Designed to look and feel like traditional cigarettes
  - Sometimes referred to as “cigalikes”
- Battery-operated, initially composed of 3 pieces
  - Battery (provides power)
  - Atomizer (produces heat)
  - Cartridge (holds liquid/flavoring)
- Atomizer and cartridge now typically replaced by a combined “cartomizer”
- Disposable, designed for 1-time use
- Available in various nicotine concentrations and flavorings



# Types of E-Cigs

## Second Generation Devices

- Devices are larger and **typically do not resemble a cigarette**
  - Sizes, shapes, and colors vary widely
- Large, separate cartridges (“tanks”) for liquids and flavorings
  - Sold separately
- Larger-capacity and rechargeable batteries, larger atomizers, and more powerful electronic circuits
- Some allow manual control of both puff length and frequency



# Types of E-Cigs

## Third Generation Devices

- Similar to the second generation, but are **usually larger and more customizable**
- Contain a range of different cartridge, atomizer, and battery options
- Low-resistance cartomizers produce higher heating element temperatures, generating more heat and affecting the amount and quantity of the aerosol.
  - Potentially problematic in that components are not tested to work with each other.
  - Overheating has been a problem.

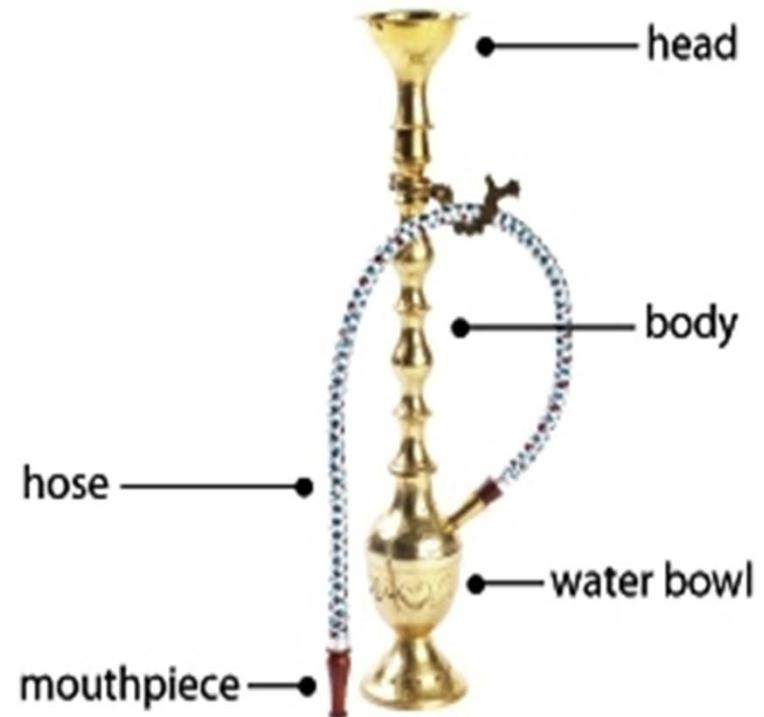
Third Generation ECs ('mods')



# Hookahs Defined

## The hookah device consists of four parts:

- A base, or smoke chamber, which is partially filled with water
- A bowl, which contains tobacco and the heating source
- A pipe that connects the bowl to the base and dips into the water in the base
- A hose, a second tube in the pipe that does not dip into the water but opens into air in the base and allows users to inhale the hookah smoke
- When a smoker inhales through the tube, a pressure difference forces air past the heating source and heats the tobacco, which gives off smoke. The smoke is pulled away from the tobacco and passes through the water and into the smoke chamber — from which it is inhaled by the smoker.



# Hookahs Defined

- Not safer than regular tobacco smoke.
- Causes the same diseases
- Raises the risk of lip cancer, spreading infections like tuberculosis.
- Users ingest about 100 times more lead from hookah smoke than from a cigarette.



# Hookahs

- The World Health Organization noted in a report from 2011 that the smoke inhaled in a typical one-hour hookah session can equal 100 cigarettes or more.
- The WHO report also stated that even after it has been passed through water, the tobacco smoke in a hookah pipe contains high levels of cancer-causing chemicals.

Research has been so limited, but new trends are emerging

## RISKS – REAL & POSSIBLE

Source: CDC 2016

# Strong Adverse Effects

- Pneumonia
- Congestive heart failure
- Disorientation
- Seizure
- Low blood pressure
- Chest pain
- Second degree burns to face
- Loss of vision
- Possible infant death from choking on EC
- Physically ill
- Poisoning



## The FDA warns...

- **E-cigarettes can increase nicotine addiction among young people and may lead kids to try other tobacco products, including conventional cigarettes, which are known to cause disease and lead to premature death**
- **The products may contain ingredients that are known to be toxic to humans**
- **Conducted a preliminary analysis on some samples of electronic cigarettes and components from two leading brands.**

## FDA 2009 Study Revealed...

DPA's analysis revealed the following:

- Diethylene glycol was detected in one cartridge at approximately 1%. An ingredient used in antifreeze and is toxic to humans.
- Certain tobacco-specific nitrosamines which are human carcinogens were detected in half of the samples tested.
- Tobacco-specific impurities suspected of being harmful to humans

# Propylene glycol

- Found in antifreeze, de-icing agents in cars, planes, and boats.
- Studies have shown that inhalation exposure to glycerin affects airways
- Short term exposure causes eye, throat, and airway irritation (wieslander et al 2001, Occup Environ Med; Vardavas et al, 2012 Chest)
- Long term exposure can result in children developing asthma. (Cjoi et al 2010, PlosOne)



Source: CDC, 2016

# What do we know today is in the vapor?

- E-cigarette users exhale – passive vaping like secondhand smoke does happen.
- This chemical aerosol is not “just” water vapor.

Studies so far show it contains:

- nicotine
- propylene glycol
- fine & ultrafine (UF) particles
- low levels of toxins known to cause cancer
- nanoparticles of chromium, nickel, tin
- volatile organic compounds (VOCs)



# FDA 2009 Study Revealed...

- The electronic cigarette cartridges that were labeled as containing no nicotine had low levels of nicotine present in all cartridges tested, except one.
- Three different electronic cigarette cartridges with the same label were tested and each cartridge emitted a markedly different amount of nicotine with each puff. The nicotine levels per puff ranged from 26.8 to 43.2 mcg nicotine/100 mL puff.
- One high-nicotine cartridge delivered twice as much nicotine to users when the vapor from that electronic cigarette brand was inhaled

## Additional Studies

- A study examining the biological effects of e-cigarettes found **“strikingly similar” gene mutations in lung cells** exposed to e-cig vapor as those found in smokers.
- This means that although e-cigarette vapor is tobacco and tar-free and that the device does not require combustion, it could **potentially increase a user’s risk of cancer.**

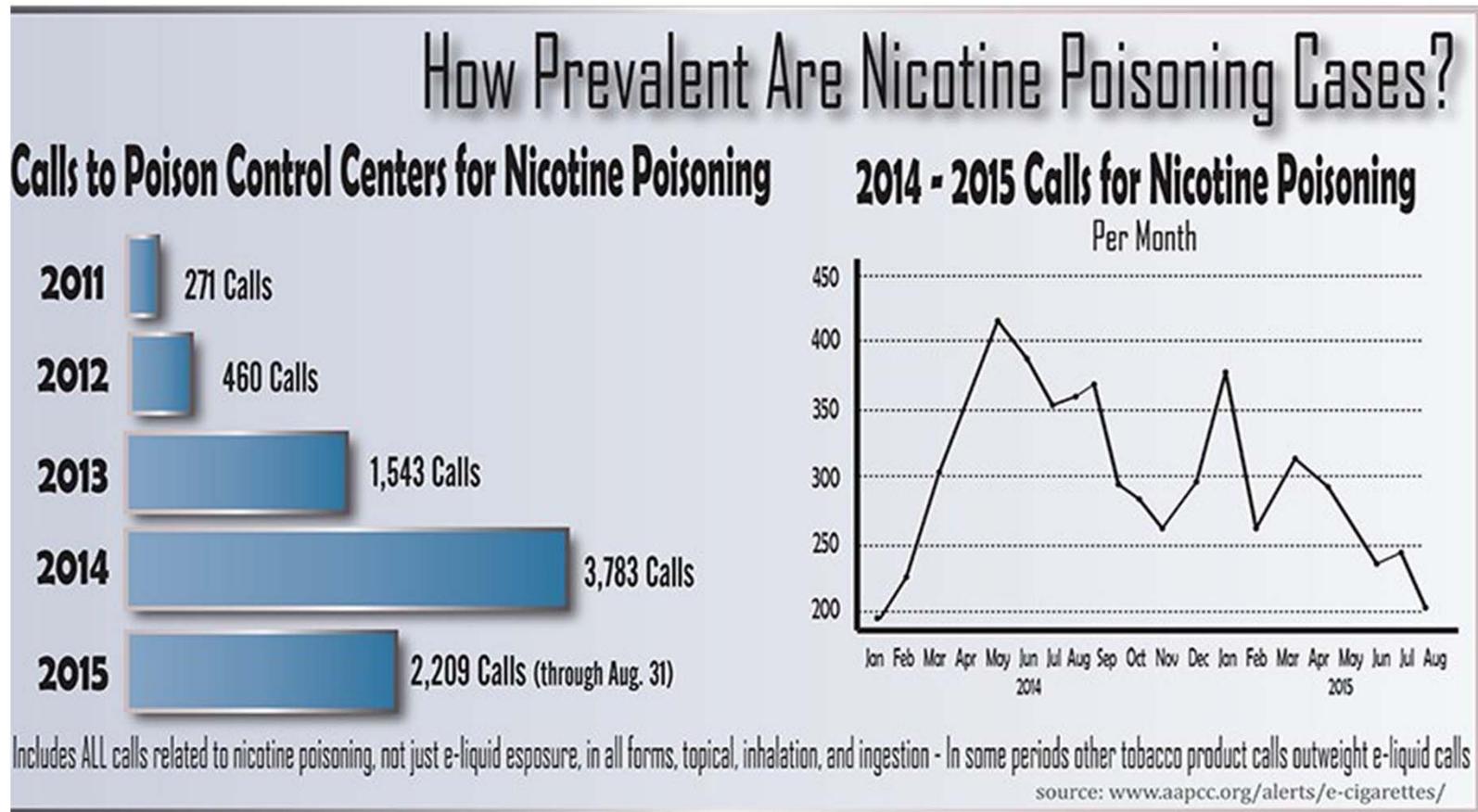
# Additional Studies

- Another study published in Germany examined secondhand emissions from several e-cigarettes in a human exposure chamber.
- While the e-cigarette produced lower levels of toxins in the air for nonsmokers to breathe than the conventional cigarette, there were still elevated levels of acetic acid, acetone, isoprene, formaldehyde and acetaldehyde, averaging around 20% of what the conventional cigarette put into the air. **Putting detectable levels of several significant carcinogens and toxins in the air**

# Nicotine – A POISON!

- Large amounts of nicotine are lethal (60 mg adult, 6 mg children)
- Is also an insecticide and toxicant
- The number of poisoning cases linked to e-cigarettes liquids was 1,351 in 2013, a 300% increase from 2012
- According to the National Poison Data System, these number for 2015 – 2209 for the first 8 months

# Nicotine – a **POISON!**



# Why so many poisonings?



Can you find the candy?

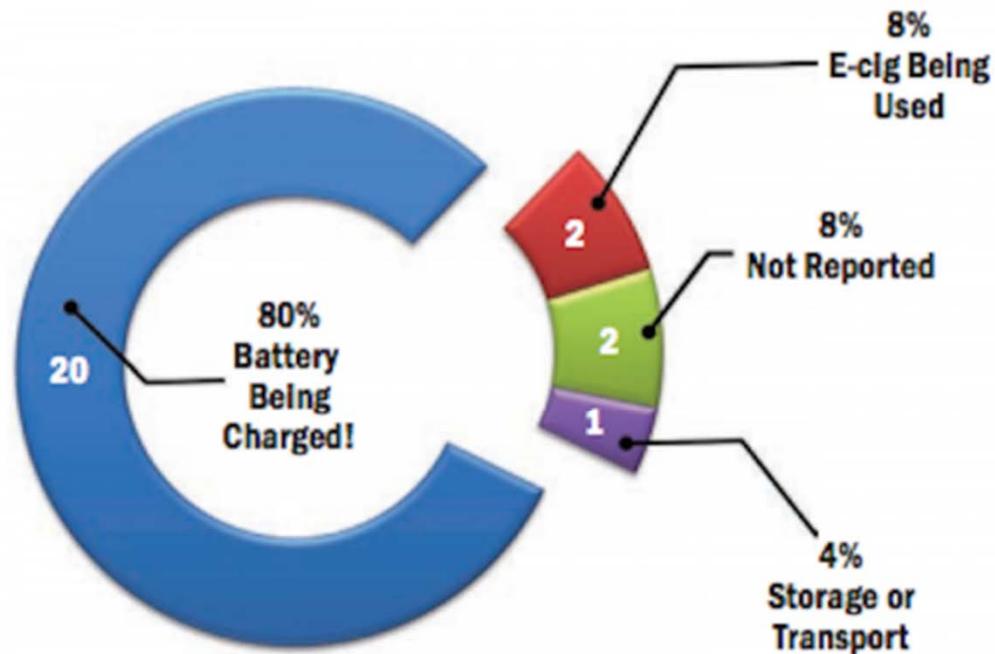


# ECigs and Vaping in the News

- [NY Senator Schumer calls for Investigation & Recall on Exploding Ecigs](#)
- [Man says ECigarette explodes in his pants pocket](#)
- [Royal College of Physicians strongly endorses e-cigarettes as smoking substitutes4/2016](#)



## Status of E-cigarette at Time of Fire



<sup>3</sup> Press in the United Kingdom has reported one death in an August 2014 incident where an e-cigarette that was being charged in a nonmanufacturer-approved device exploded and ignited nearby oxygen equipment.



# ECigarette Explosions

- [ECigarette Explosions cause Law Suits](#)





- E-Cigarette explaodes in man's pocket



- [E-Cigarette explodes striking student](#)

# The Truth about Vaping and E-Cigs

## FDA Extends Tobacco Regulations to E-Cigarettes and Other Products

### Details of New Tobacco Regulations



The rule broadens the definition of tobacco products to include e-cigarettes, hookahs, pipe tobacco, premium cigars, hand-rolled cigars and other products



The regulations ban the sale of e-cigarettes to anyone under 18 and require adults under the age of 26 to show a photo identification to buy them



The new rules require companies to register with the FDA and provide it with a detailed account of their products' ingredients and their manufacturing process. Producers will also have to apply to the FDA for permission to sell their products



Under the new rule, the FDA would have to approve all tobacco products not currently regulated that entered the market after February 2007 – this includes nearly every e-cigarette on the market and every different flavor and nicotine level

### Analysis

- There is an intensifying debate over whether e-cigarettes are a gateway to nicotine addiction and traditional cigarettes or an effective way to help the long-addicted quit smoking
- Lacking a scientific consensus on the long-term health effects of e-cigarettes, this FDA action is unlikely to resolve the dispute
- Representatives of the e-cigarette industry argue that some of the rules put forward by the agency will endanger the market for products that may be able to help people move away from traditional tobacco
- On the other hand, anti-smoking advocates argue that e-cigarettes could be harmful and that companies are using the same tactics and themes to appeal to younger consumers that traditional cigarette companies used years ago
- The rules go in effect 90 days after the rule's publication date of May 10th

# QUESTIONS???



