

Smoke and Mirrors: Electronic Cigarettes and Child Health

**Satellite Conference and Live Webcast
Thursday, April 28, 2016
12:00 – 2:00 p.m. Central Time**

**Produced by the Alabama Department of Public Health
Video Communications and Distance Learning Division**

No Vaping in the Boys' Room

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Goals

- **National Statistics of e-cigarette liquid exposures as reported to poison control centers [2010-2015]**
- **Regional (Alabama) Statistics of e-cigarette liquid exposures as reported to the Regional Poison Control Center (RPCC), Children's of Alabama [2010-4/16/2016]**

Goals

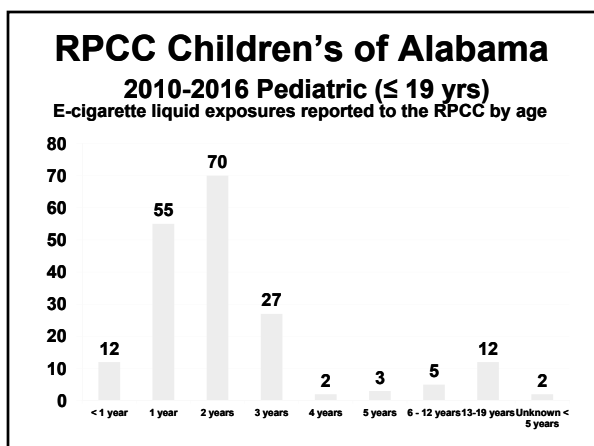
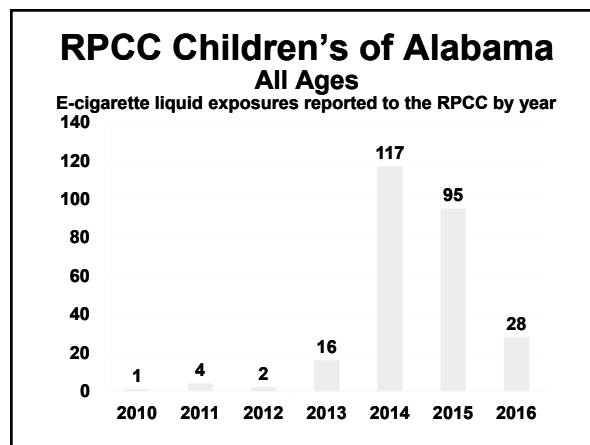
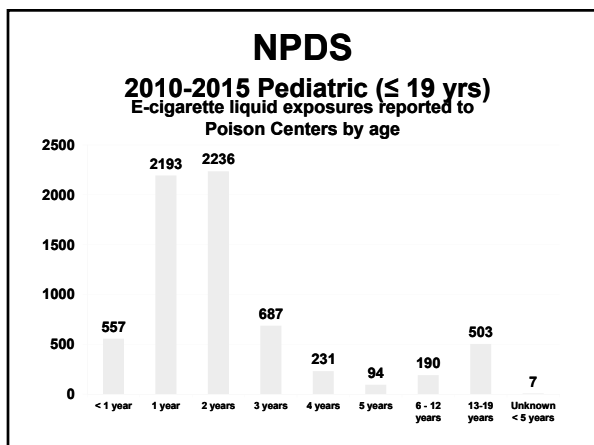
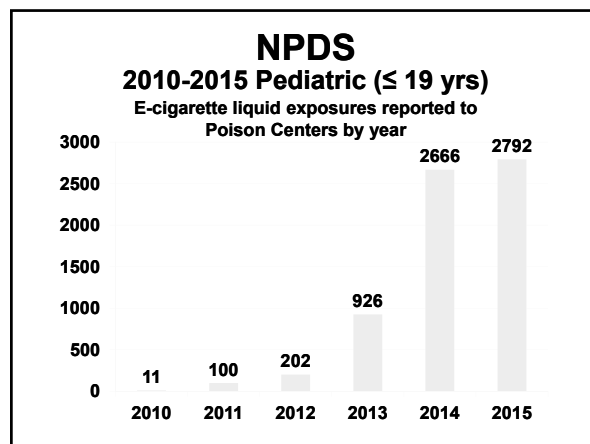
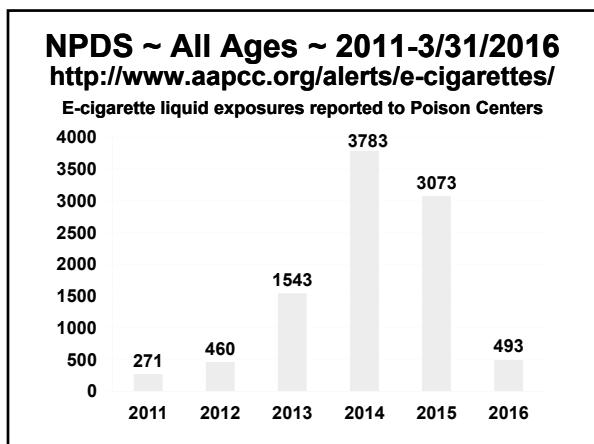
- **Toxicity**
 - **Range of Toxicity**
 - **Signs and symptoms**

National Poison Data System (NPDS)

- **American Association of Poison Control Centers (AAPCC) database**
- **Receives data from all 55 United States Poison Centers**
- **Receives ~ 2.9 million calls per year with ~ 2.2 million human exposures**
- **Currently over 63 million cases (since 1983)**

National Poison Data System (NPDS)

- **The American Association of Poison Control Centers (AAPCC; <http://www.aapcc.org/>) maintains the national database of self-reported data logged by the country's poison centers**
 - **Data referenced from AAPCC should not be construed to represent the complete picture of national exposures to any substance(s)**



Nicotine Toxicity

- 2-5 mg can cause nausea; estimated lethal dose is 1mg/kg
 - 10mg in a child
 - 30-60mg in an adult
- Children - 1.4 – 1.9 mg/kg
- Adults - 40 to 60 mg

Nicotine Toxicity

Referral to an Emergency Department

- Toxic dose if swallowed by a child:
 - 1 cigarette (10 - 30 mg)
 - 3 cigarette butts (5 - 7 mg)
 - 1 skin patch (contains 15 - 52.5mg)
 - a lick from e-refill bottle (depends on conc.)

Sources of Nicotine

- Tobacco – *Nicotiana tabacum*

Nicotine from a Potato

- Potatoes contain 7.1 ng/gm of nicotine
- 140.4 gm (4.7 oz) = 1 mcg nicotine
- 294 lbs of potatoes = 1mg nicotine

Nicotine Levels in Electronic Cigarette Refill Solutions: A Comparative Analysis of Products from the U.S., Korea and Poland

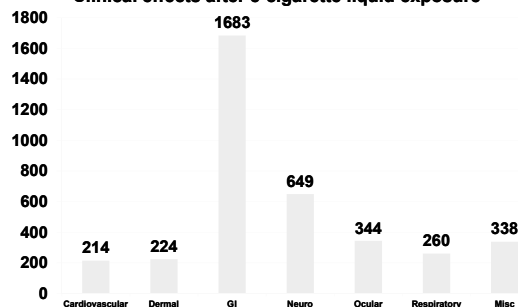
Original Research Article
International Journal of Drug Policy,
In Press, Corrected Proof,
 Available online 7 February 2015
 Maciej L. Goniewicz, Ribhav Gupta,
 Yong Hee Lee, Skyler Reinhardt,
 Sungroul Kim, Bokyeong Kim, Leon
 Kosmider, Andrzej Sobczak

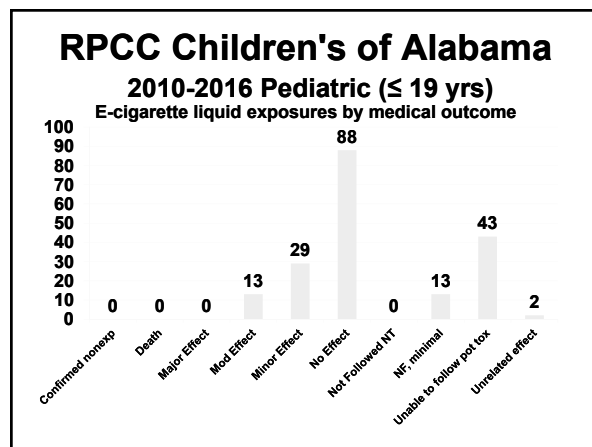
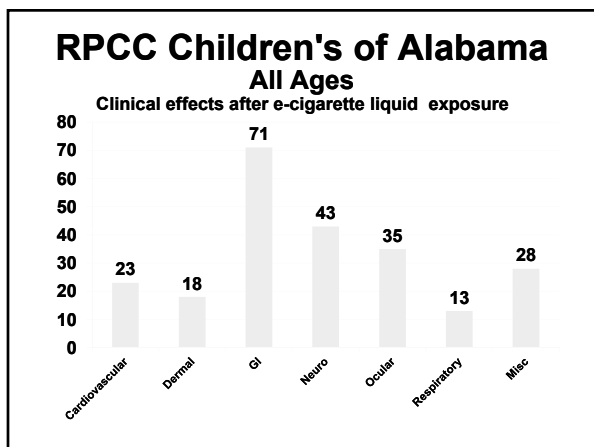
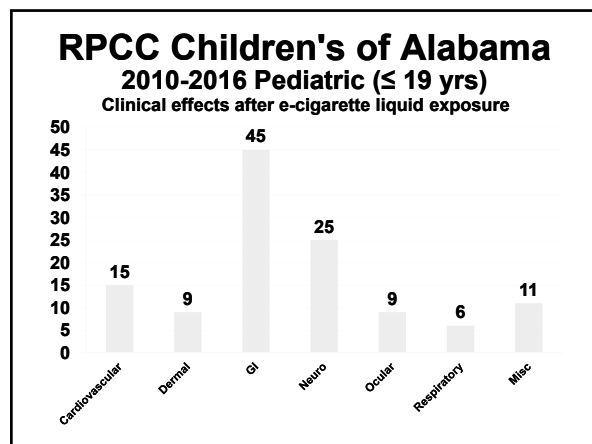
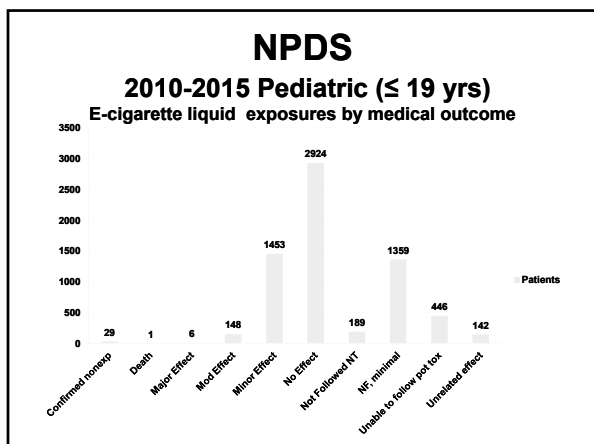
Route of Exposure

- Liquid nicotine is absorbed via
 - Skin
 - Lungs
 - Gastrointestinal tract (orally and rectally)
- Ocular exposures have resulted in severe eye irritation

NPDS

2010-2015 Pediatric (≤ 19 yrs)
 Clinical effects after e-cigarette liquid exposure





Child Death from E-Cigarette Liquid




Photo: Times Union, 12/30/14

- On December 9, 2014, an 18 month old from upstate NY, ingested nicotine solution while his mother was turning on his favorite TV show

Child Death from E-Cigarette Liquid




Photo: Times Union, 12/30/14

- He seized and never regained consciousness
- He is the first child to die in the US from an e-cigarette nicotine solution

Case Closed in Fort Plain Liquid Nicotine Death



Police: 18-month-old boy accidentally consumed e-cigarette ingredients
Keshia Cluke,
Times Union
By Keshia Clukey
Updated 7:10 am,
Monday, April 13, 2015

Treatment for an E-cigarette Liquid Exposure

- If patient exposed to a dose below a potential toxic dose - may treat at home
- Remove from exposure
- Decontaminate
 - Ingestion - Dilute with clear liquids
 - Dermal - Wash skin with soap and (cool) water

Treatment for an E-cigarette Liquid Exposure

- Ocular - Irrigate X 15 minutes with water or saline solution
- Inhalation - Fresh air
- Observe at home 4 hours (refer to emergency department if symptomatic)

Treatment for an E-cigarette Liquid Exposure

- If a toxic amount is ingested
 - Refer to an emergency department (ED)
 - Observe 4-6 hours and until asymptomatic
 - Contact a Regional Poison Center 1-800-222-1222 for further treatment recommendations

Treatment for an E-cigarette Liquid Exposure

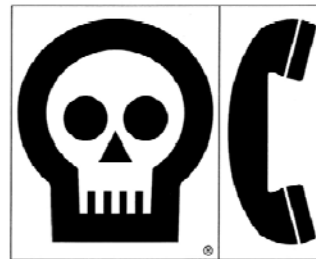
- If symptomatic call 911 and have patient go to ED by ambulance

References

- Domino EF, Hornbach E, Demana T. The nicotine content of common vegetables. *NEJM*. 1993; 329(6): 437.
- Garcia-Estrada H, Fischman CM. An unusual case of nicotine poisoning. *Clinical Toxicology*. 1977; 10(4): 391-393.
- Goniewicz ML, Gupta R, Lee YH, et. al. Nicotine levels in electronic cigarettes refill solutions: A comparative analysis of products from the US, Korea, and Poland. *International Journal of Drug policy* (2015). <http://dx.doi.org/10.1016/j.drugpo.2015.01.020>
- Kim JW, Baum CR. Liquid nicotine toxicity. *Ped Emerg Care*. 2015; 31 (7): 517-521.

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- Soghoian S. 2015. Nicotine. (10th Edition) Goldfrank's Toxicological Emergencies (10th Edition) . McGraw-Hill.
- Smolinske SC, Spoerke DG, Spiller SK, Wruk KM, Kulig K, Rumack H. Cigarette and nicotine chewing gum toxicity in children. Human Toxicol. 1988; 7: 27-31.
- www.aapcc.org



**Regional Poison Control Center
Children's of Alabama
1-800-222-1222**