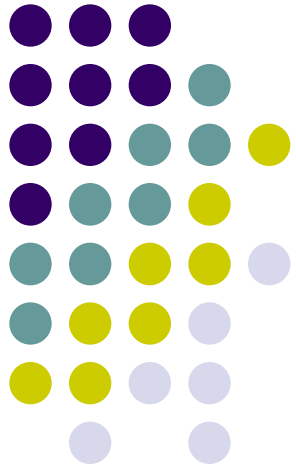
Washington Poison Center Trends: Pediatric Environmental Health Toxins

Erica L. Liebelt MD FACMT
Medical Director,
Washington Poison Center
Clinical Professor of Pediatrics
University of Washington School of Medicine



WASHINGTON POISON CENTER

DEPARTMENT OF PEDIATRICS
UNIVERSITY of WASHINGTON

Objectives

- To provide an update on Washington Poison Center (WAPC)
  - Core Services
  - Real-time surveillance and database
- To discuss harm reduction/prevention programs that address children's environmental health
  - Marijuana products
  - E-Cigarettes/vaping
- To discuss opportunities for collaboration including data sharing/analysis, program growth and research using childhood lead poisoning as an example

Certified Specialists in Poison Information (CSPIs)

Who are we?

- PharmDs, RNs, PIPs with a combined 280+ years of experience

On-Call Toxicologists

Dr. Liebelt

Dr. Garrard

24 hour access to board-certified toxicologists with backgrounds in emergency medicine and pharmacology

On-Call Board Certified Medical Toxicologists:
Dr. Betty Chen (Harborview)
Dr. Melissa Halliday (Harborview)
Dr. Suzan Mazor (Seattle Childrens)
Dr. Scott Phillips (Occ Med consultant)
Dr. Carl Skinner (Madigan)
Dr. Matt Valento (Harborview)

How Are Calls Answered at the WAPC?

Call to WAPC

- Answered by RN or RPh/PharmD 24/7
- Confidential
- Free
- HIPAA-compliant

Triage

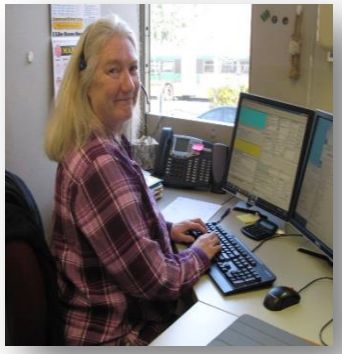
- Initial information gathered
- Demographics
- Clinical presentation and more

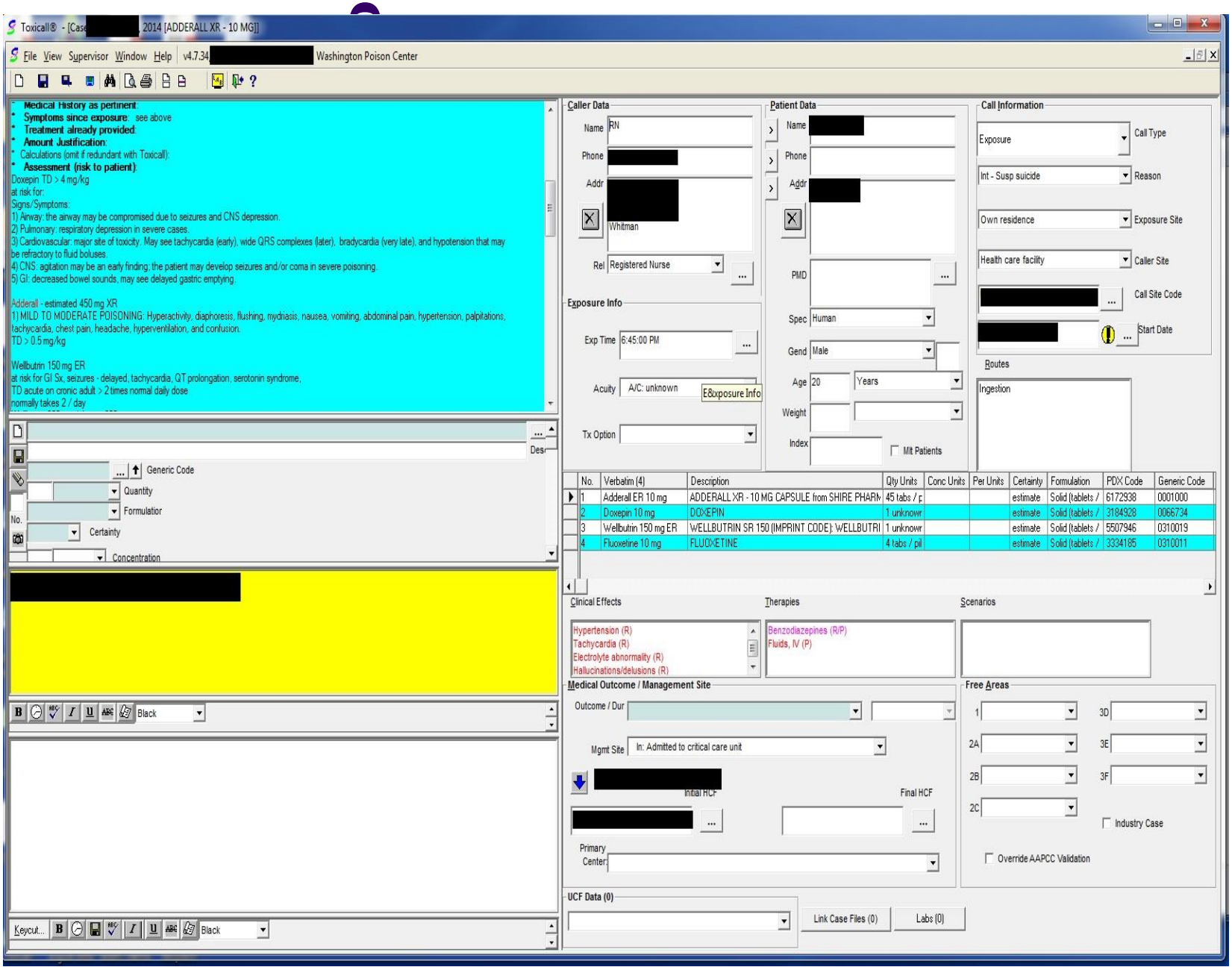
Assessment

- CSPI makes determination of toxicity
- Recommend monitor at home or send to HCF

Management/Follow-up

- CSPI manages case in hospital through consults
- Follow up with patient at home until toxicity is over

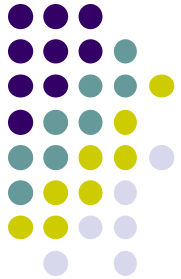



Toxicall® - [Case [redacted] 2014 [ADDERALL XR - 10 MG]]
File View Supervisor Window Help v4.7.34 [redacted] Washington Poison Center
Medical History as pertinent:
Symptoms since exposure: see above
Treatment already provided:
Amount Justification:
Calculations (omit if redundant with Toxicall):
Assessment (risk to patient):
Doxepin TD > 4 mg/kg
at risk for:
Signs/Symptoms:
1) Airway: the airway may be compromised due to seizures and CNS depression.
2) Pulmonary: respiratory depression in severe cases.
3) Cardiovascular: major site of toxicity. May see tachycardia (early), wide QRS complexes (later), bradycardia (very late), and hypotension that may be refractory to fluid boluses.
4) CNS: agitation may be an early finding; the patient may develop seizures and/or coma in severe poisoning.
5) GI: decreased bowel sounds, may see delayed gastric emptying.
Adderall - estimated 450 mg XR
1) MILD TO MODERATE POISONING: Hyperactivity, diaphoresis, flushing, mydriasis, nausea, vomiting, abdominal pain, hypertension, palpitations, tachycardia, chest pain, headache, hyperventilation, and confusion.
TD > 0.5 mg/kg
Wellbutrin 150 mg ER
at risk for GI Sx, seizures - delayed, tachycardia, QT prolongation, serotonin syndrome,
TD acute on cronic adult > 2 times normal daily dose
normally takes 2 / day
Generic Code
Quantity
Formulation
No.
Certainty
Concentration
Black
Keycut...
Caller Data
Name RN
Phone [redacted]
Addr [redacted]
Whitman
Rel Registered Nurse
Exposure Info
Exp Time 6:45:00 PM
Acuity A/C: unknown
E&xposure Info
Tx Option
Patient Data
Name [redacted]
Phone
Addr [redacted]
PMD
Spec Human
Gend Male
Age 20 Years
Weight
Index
Mlt Patients
Call Information
Exposure Call Type
Int - Susp suicide Reason
Own residence Exposure Site
Health care facility Caller Site
[redacted] Call Site Code
[redacted] Start Date
Routes
Ingestion
No. Verbatim (4) Description Qty Units Conc Units Per Units Certainty Formulation PDX Code Generic Code
1 Adderall ER 10 mg ADDERALL XR - 10 MG CAPSULE from SHIRE PHARM 45 tabs / p estimate Solid (tablets / 6172938 0001000
2 Doxepin 10 mg DOXEPIN 1 unknowr estimate Solid (tablets / 3184928 0066734
3 Wellbutrin 150 mg ER WELLBUTRIN SR 150 (IMPRINT CODE): WELLBUTRI 1 unknowr estimate Solid (tablets / 5507946 0310019
4 Fluoxetine 10 mg FLUOXETINE 4 tabs / pil estimate Solid (tablets / 3334185 0310011
Clinical Effects
Hypertension (R)
Tachycardia (R)
Electrolyte abnormality (R)
Hallucinations/delusions (R)
Therapies
Benzodiazepines (R/P)
Fluids, IV (P)
Scenarios
Medical Outcome / Management Site
Outcome / Dur
Mgmt Site In: Admitted to critical care unit
[redacted] Initial HCF
Final HCF
Primary Center:
Free Areas
1 3D
2A 3E
2B 3F
2C
Industry Case
Override AAPCC Validation
UCF Data (0)
Link Case Files (0)
Labs (0)

Community Resource

- Washington Poison Center
  - Toll-free, confidential, HIPAA-compliant
  - 24/7/365 clinical guidance by licensed pharmacists and RNs trained in toxicology
  - 24 hour access to a board-certified medical toxicologist
- Can assist in management recommendations, laboratory interpretation, toxicology consultations, and drug information
- Program your cellphone with the WAPC number
  - Scan the QR code!

Washington Poison Center



- Real time surveillance
- Detect emerging trends and clusters
- Part of National Poison Data System (NPDS)
  - Database with CDC
- Work with partners and collaborators to target investigations

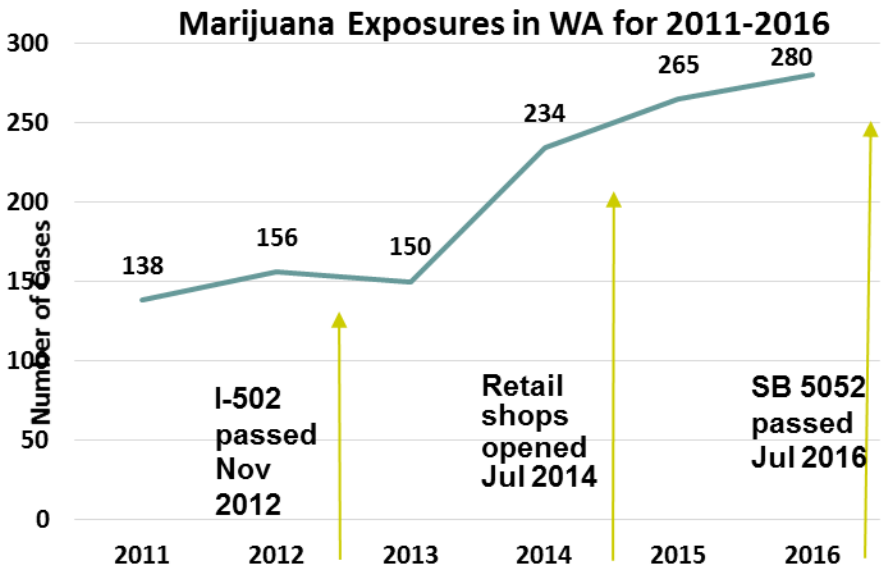
Case 1

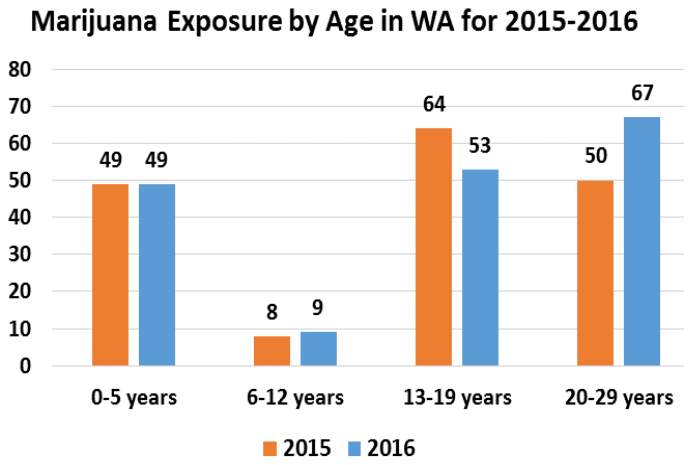
- 18 mo presents with lethargy; difficult to arouse
- Mom reports 1 episode of vomiting 2 hours previously
- PMHx: none
- Extensive work-up in the Emergency Department
  - Labs, Head CT, Lumbar puncture
- Urine drug screen: +THC

Marijuana Edibles: New and Emerging concerns

- Homemade edibles
  - Unknown concentration or if other drugs present
- Many edibles easily confused with commercial products intended for children

WAPC Trends - Marijuana



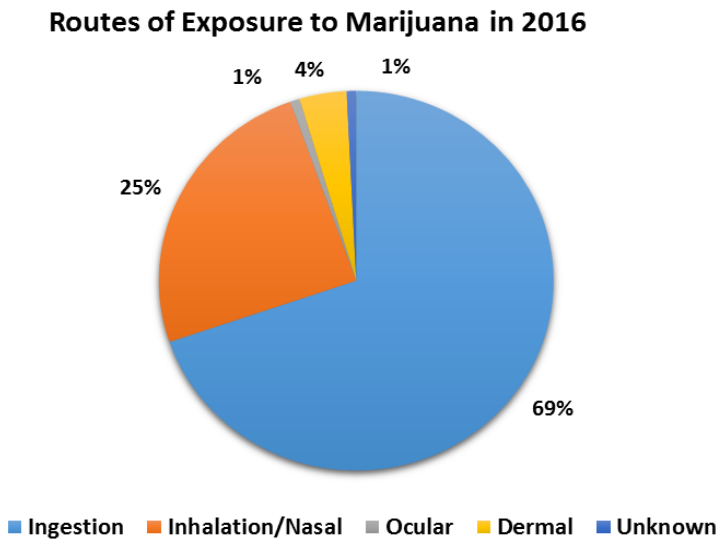


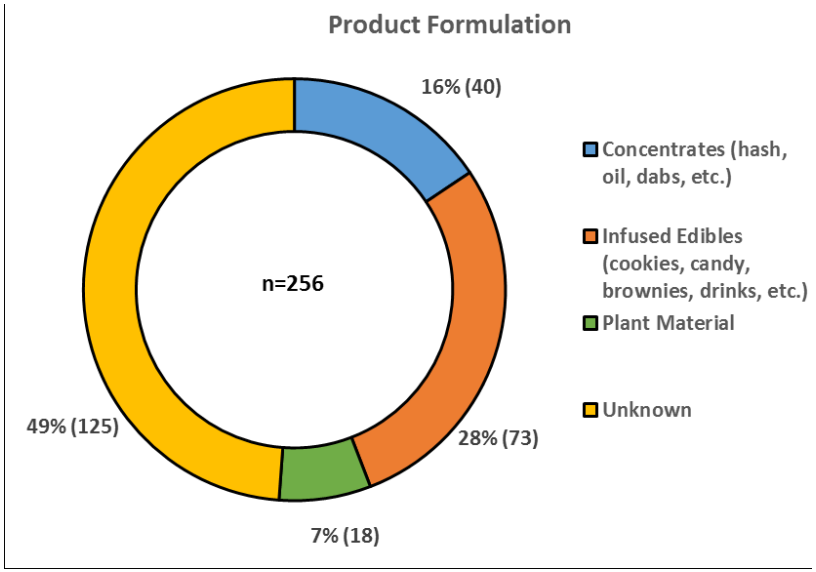
Top 5 symptoms for marijuana exposure include:

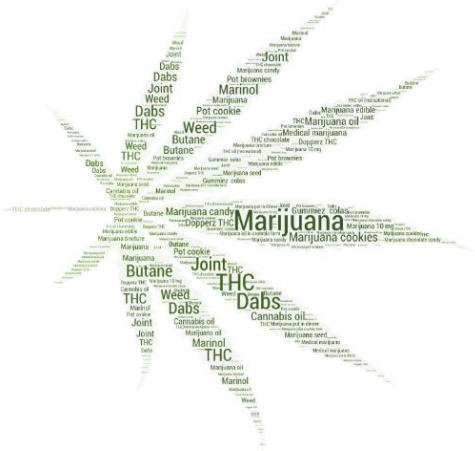
- **Drowsiness/Lethargy**
- **Increased heartrate**
- **Agitated/Irritable**
- **Vomiting**
- **Nausea**

Among exposures in 0-5 year olds for 2016, 73% of exposures occurred in 1-3 year olds.

WAPC Marijuana Trends 2016







Marijuana: Harm Reduction

As of February 14th 2017, the Not For Kids™ logo is mandated on all marijuana edible packaging.

This tool is used to promote safety and provide a free confidential helpline for medical emergencies.

Next steps with NFK stickers and education?

Potential uses for other substances

Marijuana: Products of concern

- Butane Hash Oil (BHO) or dabs
  - Highly concentrated form of THC
  - Dangerous manufacturing which can be explosive
  - Typically smoked but can also be vaped now
- ~25% of marijuana from the illicit market
- May 21st, 2014
  - Hash oil extraction in Puyallup, WA results in a series of explosions that destroyed the car
- Liquid butane passed through tube filled with cannabis plant
  - Butane highly flammable

New & Emerging Concerns

- Electronic cigarettes being used to vaporize cannabis oil
  - Hash oil highly concentrated
    - 30% to 90% THC
- Vape pens resembling asthma inhalers
  - Poisoning risk in kids with asthma

Toxic Trends: Marijuana

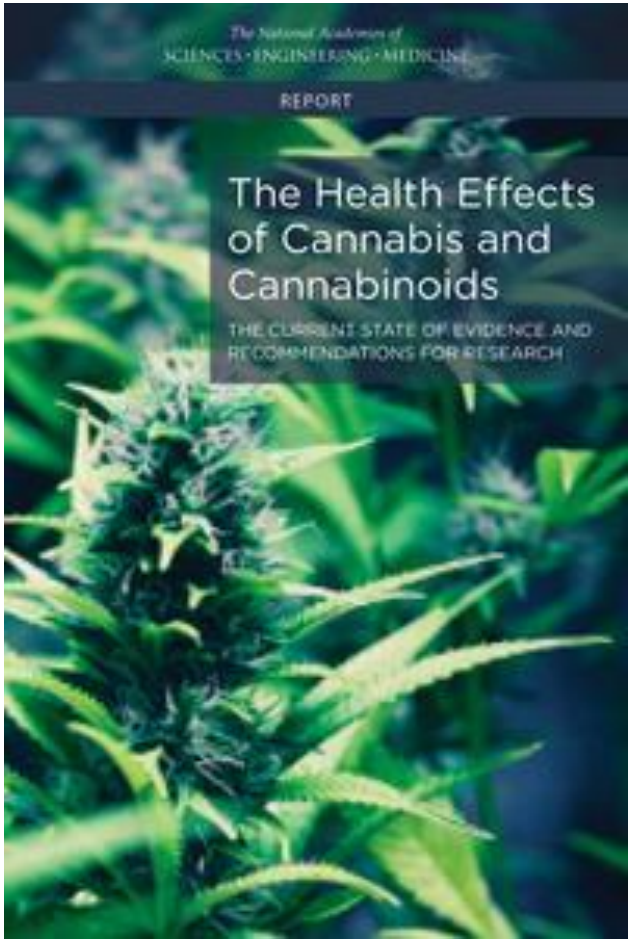
- Naïve users or using large amounts can produce more significant symptoms
  - Chest pain; concern for myocardial infarction
  - Anxiety, paranoia, acute psychosis, violent behavior
- Children
  - Typically present very lethargic and may be difficult to arouse ; comatose
  - Extensive work-up for other causes
  - Passive exposure

Secondhand Marijuana Smoke in Young Children

- 43 subjects 1 month-2years of age admitted for bronchiolitis in Colorado from 2013-15
- COOH-THC (marijuana metabolite) detected in 16% of samples analyzed (THC+) N=6
- 56% of children with cotinine > 2.0 ng/ml were THC+ compared with 7% of those with lower cotinine
- Metabolites of marijuana smoke can be detected in children

Wilson KM, Torok MR, Wei B et al. Detecting biomarkers of secondhand marijuana smoke in young children. Pediatr Res 2017 Jan 18 doi: 10.1038/pr.2016.261.

National Academies of Science January 2017



NAS Cannabis Report

Recommendation 1: To develop a comprehensive evidence base on the short- and long-term health effects of cannabis use (both beneficial and harmful effects), public agencies, philanthropic and professional organizations, private companies, and clinical and public health research groups should provide funding and support for a national cannabis research agenda that addresses key gaps in the evidence base. Prioritized research streams and objectives should include, but need not be limited to:

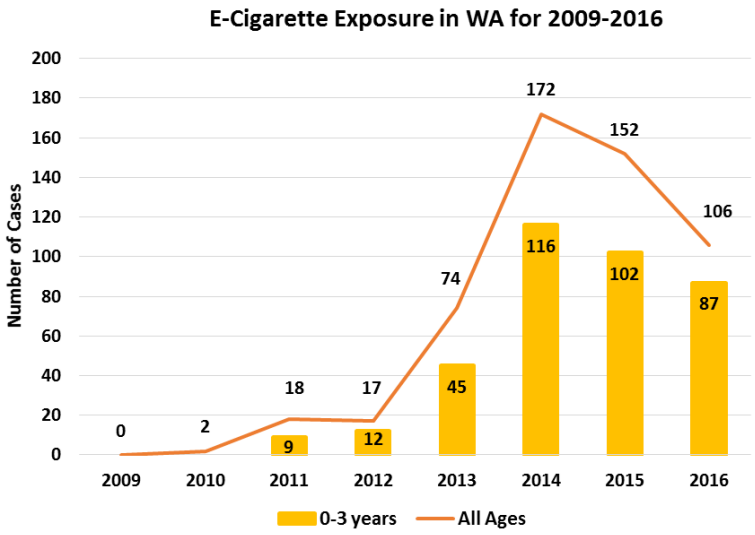
Clinical and Observational Research

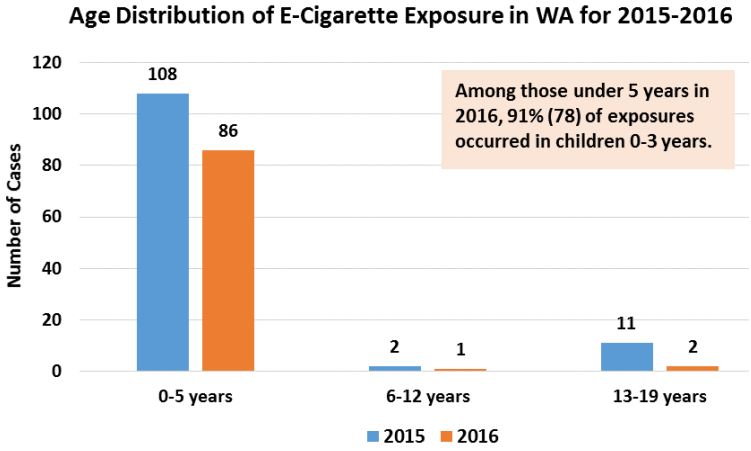
- Examine the health effects of cannabis use in at-risk or under-researched populations, such as children and youth (often described as less than 18 years of age) and older populations (generally over 50 years of age), pregnant and breastfeeding women, and heavy cannabis users.
- Investigate the pharmacokinetic and pharmacodynamic properties of cannabis, modes of delivery, different concentrations, in various populations, including the dose–response relationships of cannabis and THC or other cannabinoids.
- Determine the benefits and harms associated with understudied cannabis products, such as edibles, concentrates, and topicals.
- Conduct well-controlled trials on the potential beneficial and harmful health effects of using different forms of cannabis, such as inhaled (smoked or vaporized) whole cannabis plant and oral cannabis.
- Characterize the health effects of cannabis on unstudied and understudied health endpoints, such as epilepsy in pediatric populations; symptoms of posttraumatic stress disorder; childhood and adult cancers; cannabis-related overdoses and poisonings; and other high-priority health endpoints.

Case 2

- Mother calling about her 2 yo who was found with her vaping pen
- Liquid all over her shirt and around her mouth
- Child has vomited several times
- Product has nicotine 10 mg/ml
- Child sent in to ED

WAPC Trends 2016: e-Cigarettes/Vaping

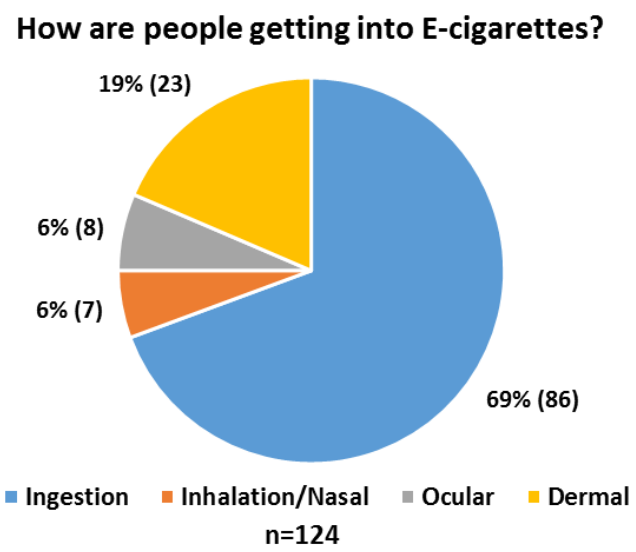


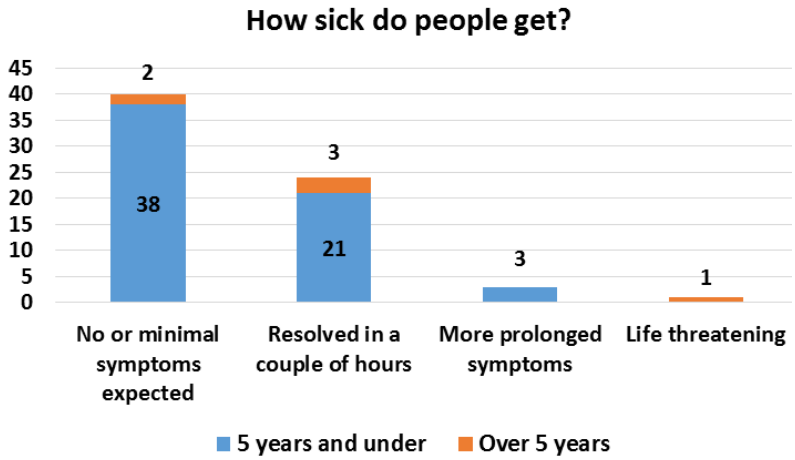


About 67% (n=70) of exposures occurred in the caller's own home, which suggests that public health interventions should continue to focus on safe storage, use, and packaging

The majority of exposures could safely be managed at home (79%, n=55) with follow-up from the WAPC.

2016 WAPC Trends

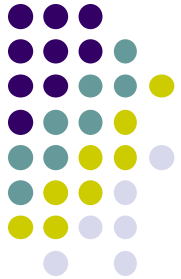




Common Symptoms For E-Cigarette:

- Persistent Vomiting
- Drowsiness/Lethargy
- Eye Irritation/Pain
- Nausea
- Coughing/Choking
- Agitation/Irritability

E-Cigs/Vaping: Public Education



- "Training of the Trainers" program
  - WAPC collaborated with Prevention Works in Seattle Drug-Free Communities Coalition
  - Increase knowledge and confidence of community coalition members, educators and prevention professionals for presenting information about 3-cigarettes and vaping to their adult peers
  - Paired lecture with hands-on activities, discussions, and role play using kit products

Constituents e-Cig liquids and aerosols

- Nicotine
- Propylene glycol
- Other chemicals:
  - Acetone, Acrolein, Cyclohexane, Diethylene Glycol, Formaldehyde
- Metals: cadmium, lead, nickel, copper)
- Flavorings (acetyl propionyl, tobacco extracts – nitrosamines, nitrates, phenol)
- Thermal (explosion)

Dinakar C, O'Connor GT. The Health effects of Electronic Cigarettes. New Engl J Med 2016;375:1372-1381

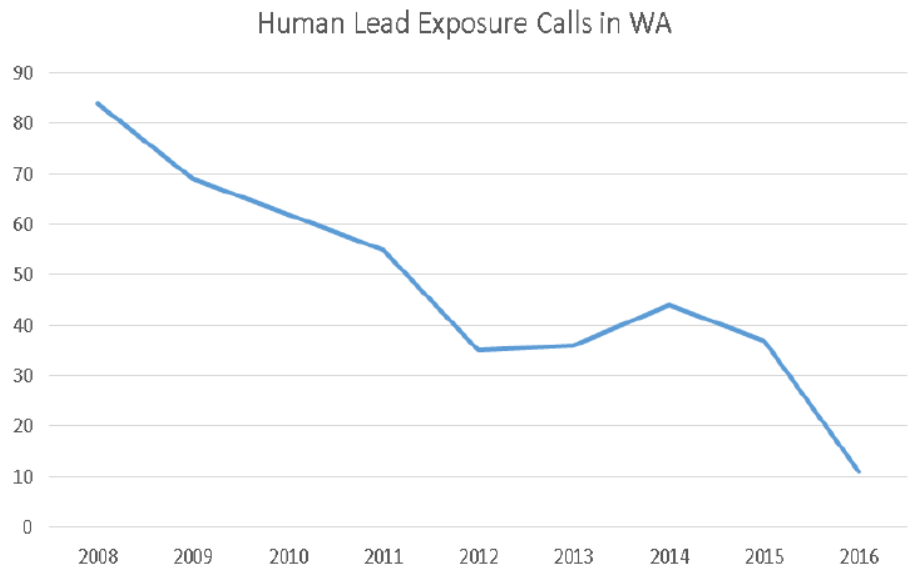
“Training of the Trainers”

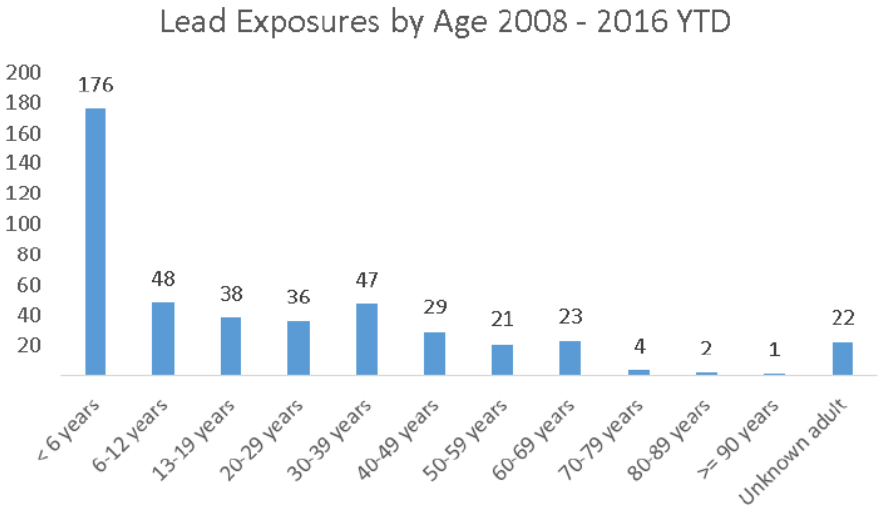
- Program piloted in 2015
- As of Jan 2017: 25 workshops, training 287 adults from across the state, reaching an additional 4000+ adults and youth
- Lessons Learned
- Next Steps

Case 3

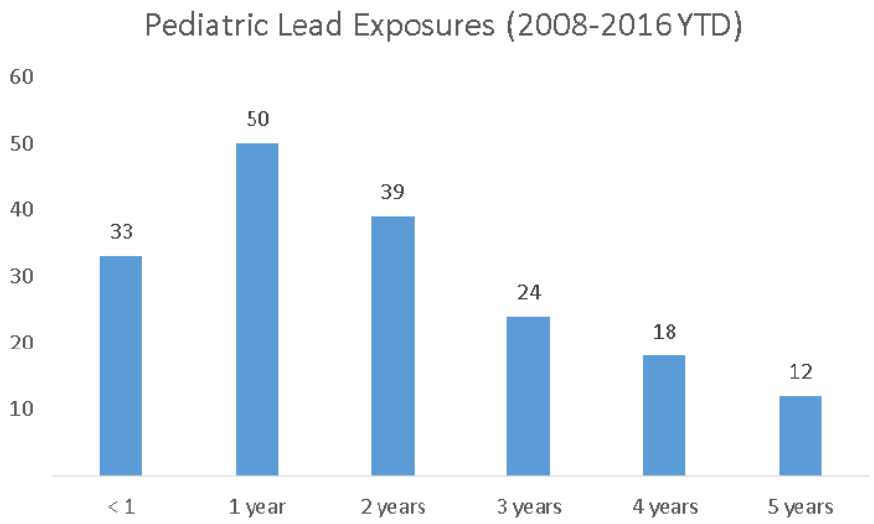
- Mother calls asking if her 2 yo should have Pb level checked
  - 100 year old home undergoing “self-renovation”
  - No previous Pb screen

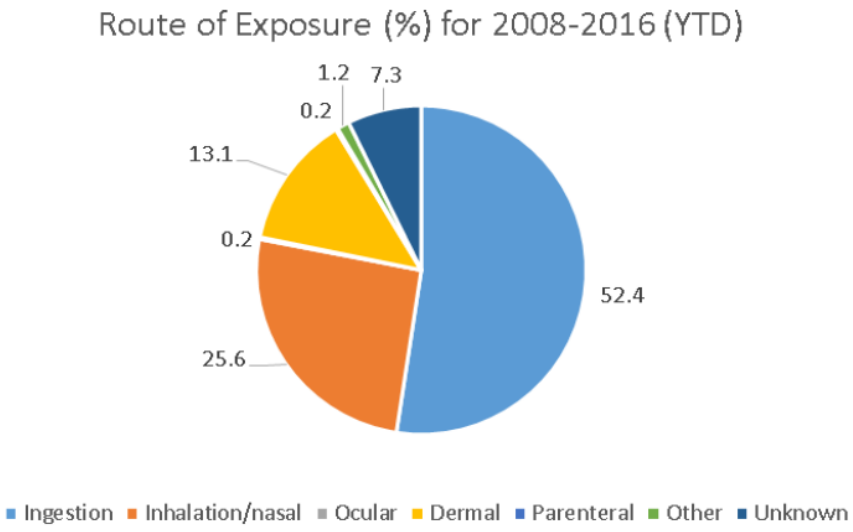
WAPC 10 Year Lead Trends



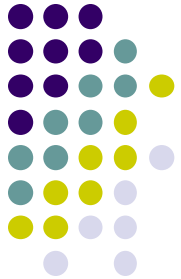


WAPC 10 Year Lead Trends



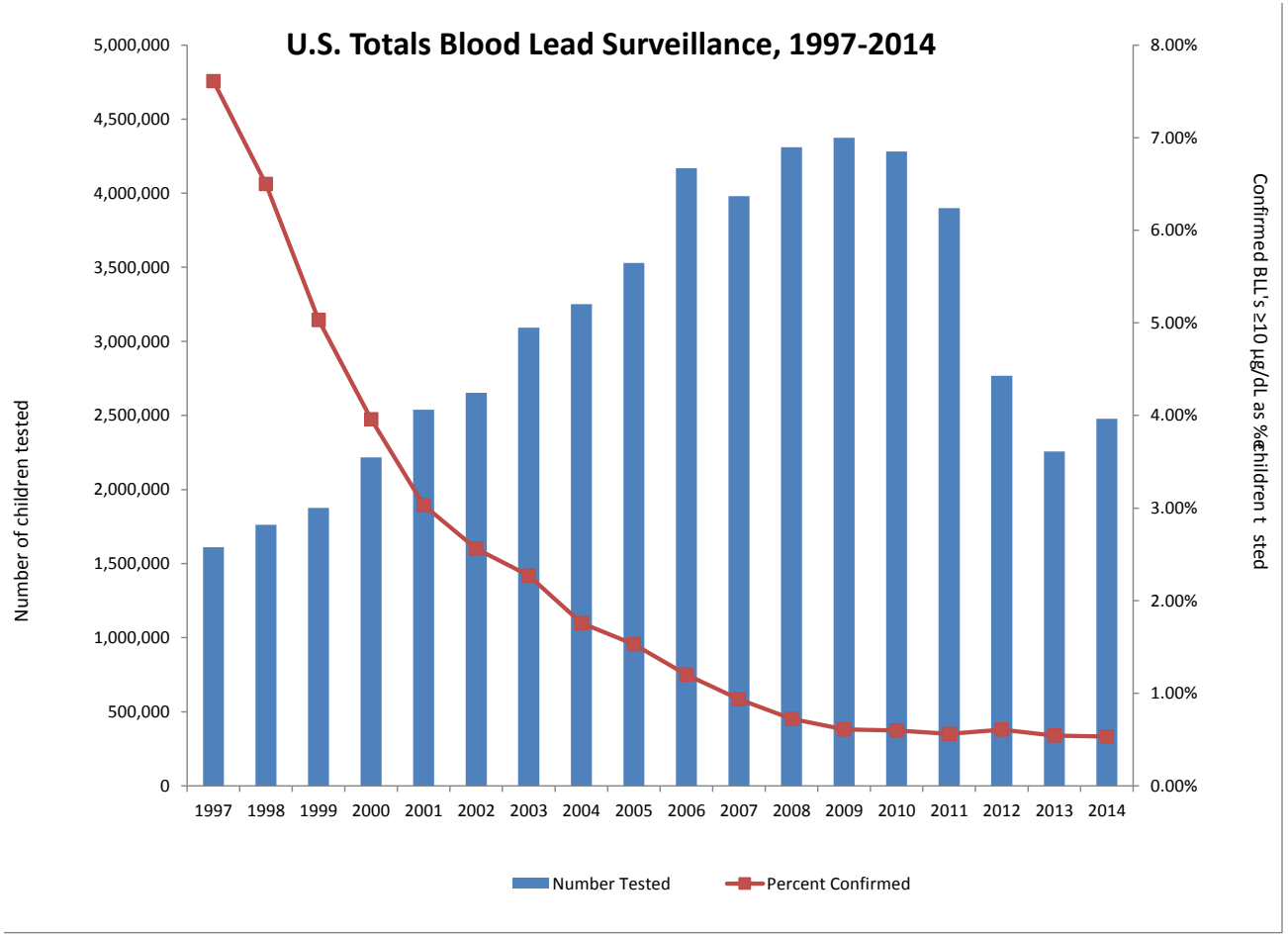


Lead: What has Changed in the last 25 years?



- Decreases in no. of children with elevated BPb
- New sources of lead exposure and increased awareness of “old” sources of lead exposure
- Evidence of lead’s toxicity on “new” organ systems

CDC BPb Surveillance



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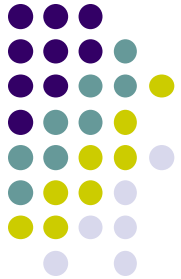
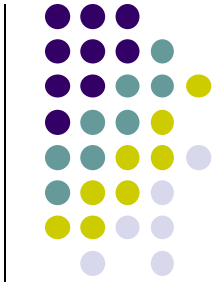


- Decreases in no. of children with elevated BPb
- New sources of lead exposure and increased awareness of “old” sources of lead exposure
- Evidence of lead’s toxicity on “new” organ systems

What has changed in the last 4 1/2 years?



- 2012 - CDC lowered the “Action Level” for Pb in children 1-5 years of age to ≥ 5 mcg/dL
- “level of concern” to “reference level”
- Considered at risk and need further monitoring

Flint Crisis – Not New

The New York Times

The New York Times

Flint Weighs Scope of Harm to Children Caused by Lead in Water

BY ABBY GOODNOUGH

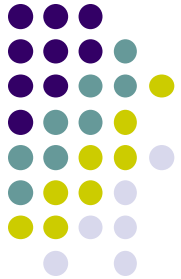
As officials try to track how many children in Flint, Mich., have been exposed to lead, underlying troubles prevalent among low-income families add to concerns.

January 29, 2016

What has Changed in the last 25 years?

- Definition of “lead poisoning” (no threshold effect)
  - Action level of ≥ 5 mcg/dL
- Association of neurocognitive delays, decreases in IQ with BPb < 5 ug/dL
- Much improved public health assessment/intervention with low-level lead exposure
  - Limited resources for screening/case management

What has NOT Changed in the last 25 years?



The Best Treatment is Primary Prevention!

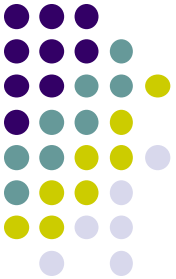
Complementary Roles

Clinicians	Public Health
Primary Prevention	Case Surveillance & Investigation
Testing	Tracking/Epidemiology
Reporting results	Case Management
Medical Management	Health Education
	Enforcement

Primary Prevention

- **History**
  - **Lead Risk Assessment Questionnaire**
  - **Sources of Exposure**
- BPb Screen
- Good diet
- Neurodevelopment

Childhood Lead Poisoning Multidisciplinary Approach



- Collaboration between PCP and Public Health including WAPC
- Targeted screening based on risk
- Integrate case management with other prevention programs
- Statewide database – allows for tracking, targeted interventions, assess for trends, epidemiology
  - Cost savings and value-based healthcare

Questions?

POISON Help™
1-800-222-1222

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EMERGENCY
(800) 222 1222

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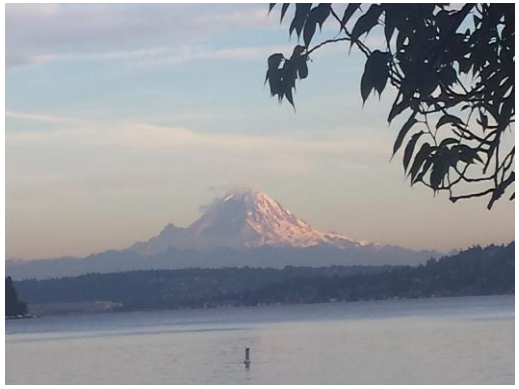

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