



Opioid and Methamphetamine Hazard Awareness Training for Public Workers

Occupational and Environmental Epidemiology,
Division of Public Health
Pierre Lauffer, Industrial Hygiene Supervisor
Rick Langley, MD, MPH



Agenda/Objectives

- OEEB (What we do?)
- Understand the Medical and Environmental Hazards of Opioids and Methamphetamine
- Chemicals Used in Manufacturing Methamphetamine and Their Health Hazards
- Physiology and Risk Factors for Opiates and Meth
- Overdose:
 - Signs and Symptoms
- Responding to an Overdose
- Exposure Prevention:
 - PPE Required and Recommendations
- Using Naloxone



Occupational and Environmental Epidemiology Branch (OEEB)

Why we do it?

We believe in a world where everyone can have a quality of life:

- free from exposures to environmental hazards
- with a safe place to work

Contact us in cases of incidents or releases at:
919-707-5950.

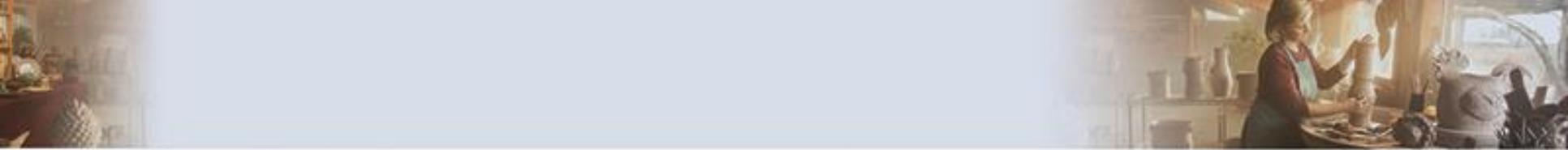


Occupational Health and Industrial Hygiene Consultation

What We Do?

- Conduct risk assessments and risk communication; provide medical evaluation and surveillance for adverse health effects.
- Provide health-based guidance and advisories on levels of exposure to such contaminants.
- Monitor the potential exposure to harmful substances in the workplace and environment.
- Interpret and recommend control measures to eliminate or minimize exposure to these hazards and developing strategies to control the hazards and prevent work-based chemicals from transferring to the home.





- November 2016, 11 SWAT officers in Hartford, Connecticut, ended up in the emergency room when a stun device they tossed into a house during a raid sent a batch of fentanyl into the air. Hartford Deputy Chief Brian Foley said narcotics officers could deal with the threat by wearing gas masks whenever they enter a drug location, but that would impair their vision and communication.
-

- In August 2016, two Atlantic County, New Jersey, detectives were hospitalized after inhaling the pain killer when a puff of it escaped from a plastic bag of heroin and cocaine during a field test. "I felt like my body was shutting down," Detective Eric Price said of the experience. "I thought I was dying."
-

- April 2018, Rich Gilkey, chief of the Mason City Police Department in West Virginia, was conducting a vehicle search along with a patrolman when he came in contact with cotton balls soaked in suspected fentanyl. Gilkey and Officer Kendall Roush had pulled over a Ford Ranger for erratic driving and the driver became agitated after the pair asked to search the car. After restraining the driver, Gilkey searched the vehicle and found heroin, suboxone, a hypodermic needle and the cotton balls soaked in fentanyl. Gilkey became lightheaded and dizzy after coming into contact with the cotton balls, and said the quick action of West Virginia State Trooper G.C. Burnem likely saved his life. Gilkey was rushed to Pleasant Valley Hospital, where he tested positive for fentanyl.
-

- May 2018, Fayetteville, NC police said officers were executing a narcotics search warrant at about 9:30 a.m. at a home in the 1100 block of Bernadine Street when an officer was exposed to Fentanyl. Police said the officer began showing signs and symptoms of exposure and other officers recognized the symptoms and administered two doses of Narcan to the officer.



Why are We Conducting this Training?

There is an Occupational Health need for all public sector employees who work intimately with the public (i.e. make home visits, home investigations, etc.) to receive training in recognizing the signs of the presence of these substances or the signs of processing these substances.



A close-up photograph of a purple flower, likely a poppy, with a prominent yellow center and stamens. The petals are a deep purple color with visible veins. The background is a solid light green color.

Opioids

Opiates:

Opium

Morphine

Codeine

Semi-Synthetic

Heroin

Hydrocodone

Hydromorphone

Oxycodone

Oxymorphone

Buprenorphine

Synthetic

Fentanyl

Methadone

Tramadol

Carfentanil

Why are We Conducting this Training?

Strength of Heroin vs. Fentanyl vs Carfentanil:

- Fentanyl is 40-100 times more powerful than Heroin.
- Carfentanil is 10,000 times more powerful than Heroin.
- Fentanyl and Carfentanil can be deadly if inhaled. Though incidental dermal absorption is unlikely to cause opioid toxicity

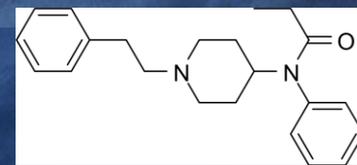


Why are We Conducting this Training?

Overdose Levels of Heroin, Fentanyl and Carfentanil

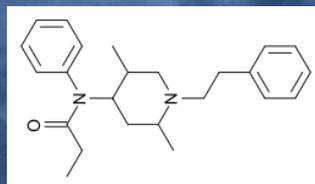


Fentanyl Analogues

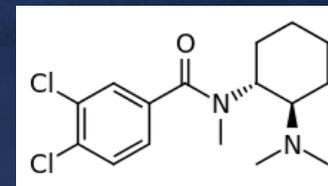
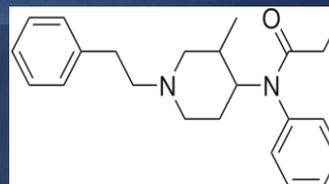


There are now 42 Analogues of Fentanyl Including:

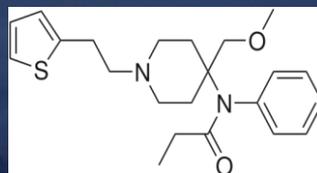
Dimethylfentanil



U-47700

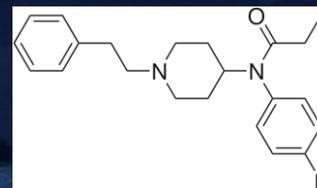


Methylfentanyl

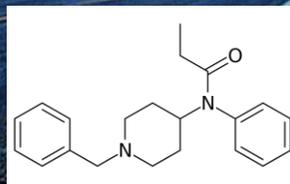


Sufentanil

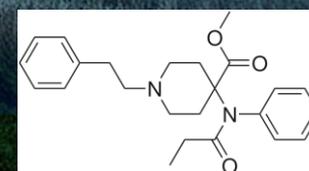
Fluorofentanyl



Benzylfentanyl

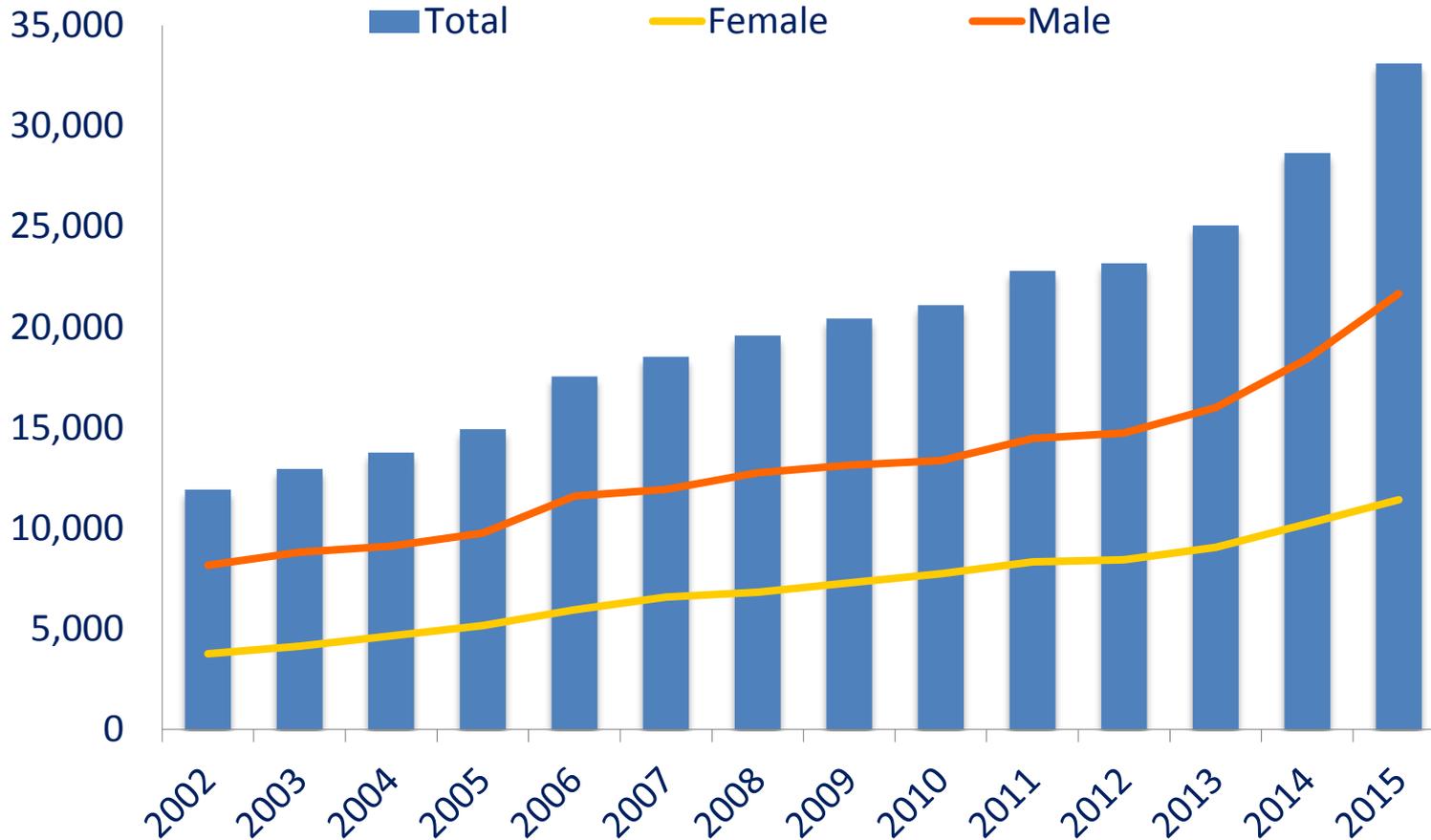


Carfentanil



National Overdose Deaths

Number of Deaths from Opioid Drugs



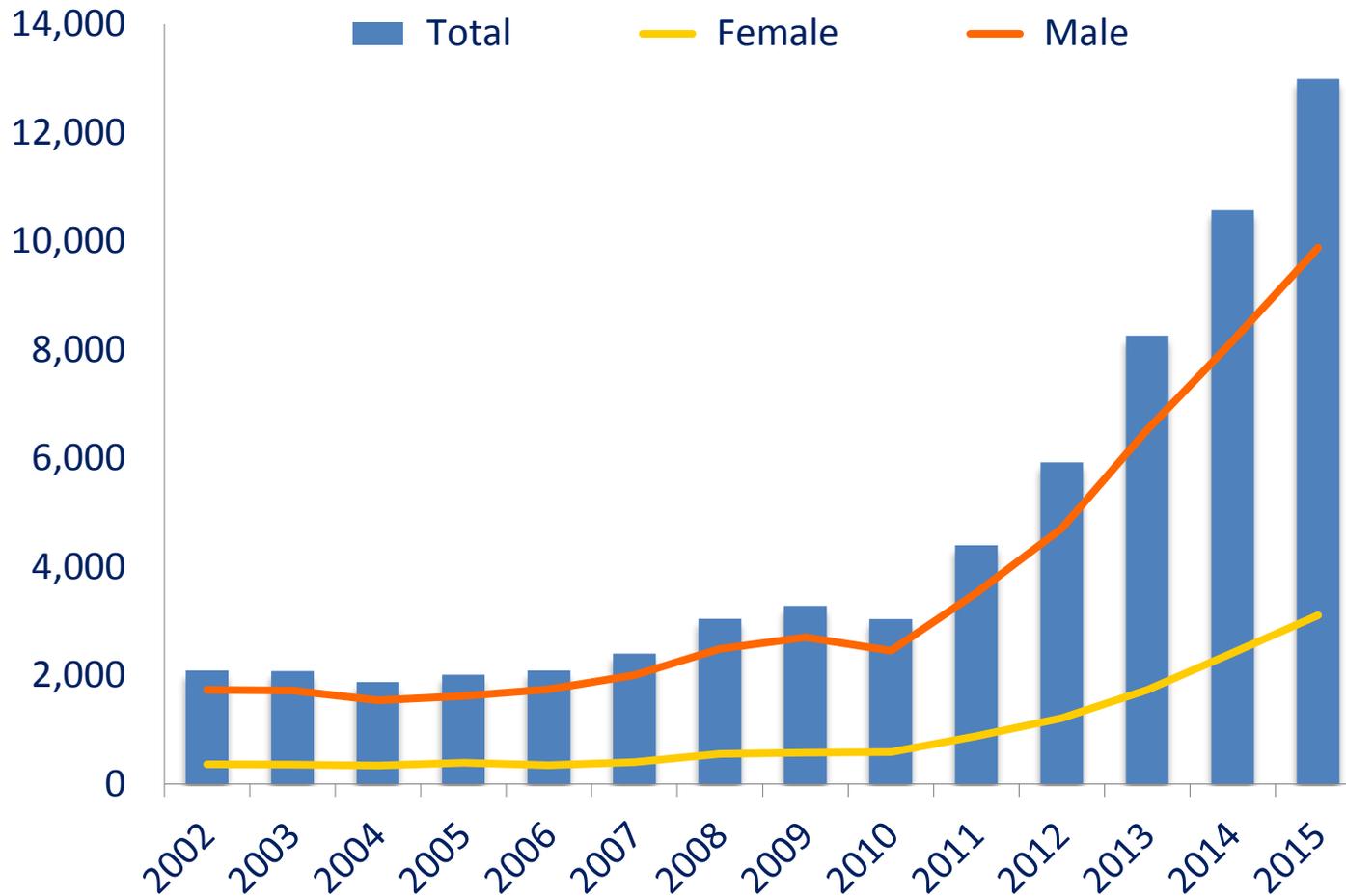
Source: National Center for Health Statistics, CDC Wonder





National Overdose Deaths

Number of Deaths from Heroin



Source: National Center for Health Statistics, CDC Wonder



National Overdose Death Rate

Each day, roughly 650,000+ opioid prescriptions are written

In 2014, 28,647 or 61% of all drug-related deaths involved opioids.

In 2016, 46,771 or 73% of all drug-related deaths involved opioids.

In 2017, 49,068 or 68% of all drug-related deaths involved opioids.

Every 24 hours, 175 people die from an overdose
Staggering annual costs-

- \$20 billion dollars in ED and hospital care
- \$55 billion in related health and social costs

Sources: HHS (2017). Opioids: The prescription drug and heroin overdose epidemic. Accessed 04/28/2017 from: <https://www.hhs.gov/opioids/>;

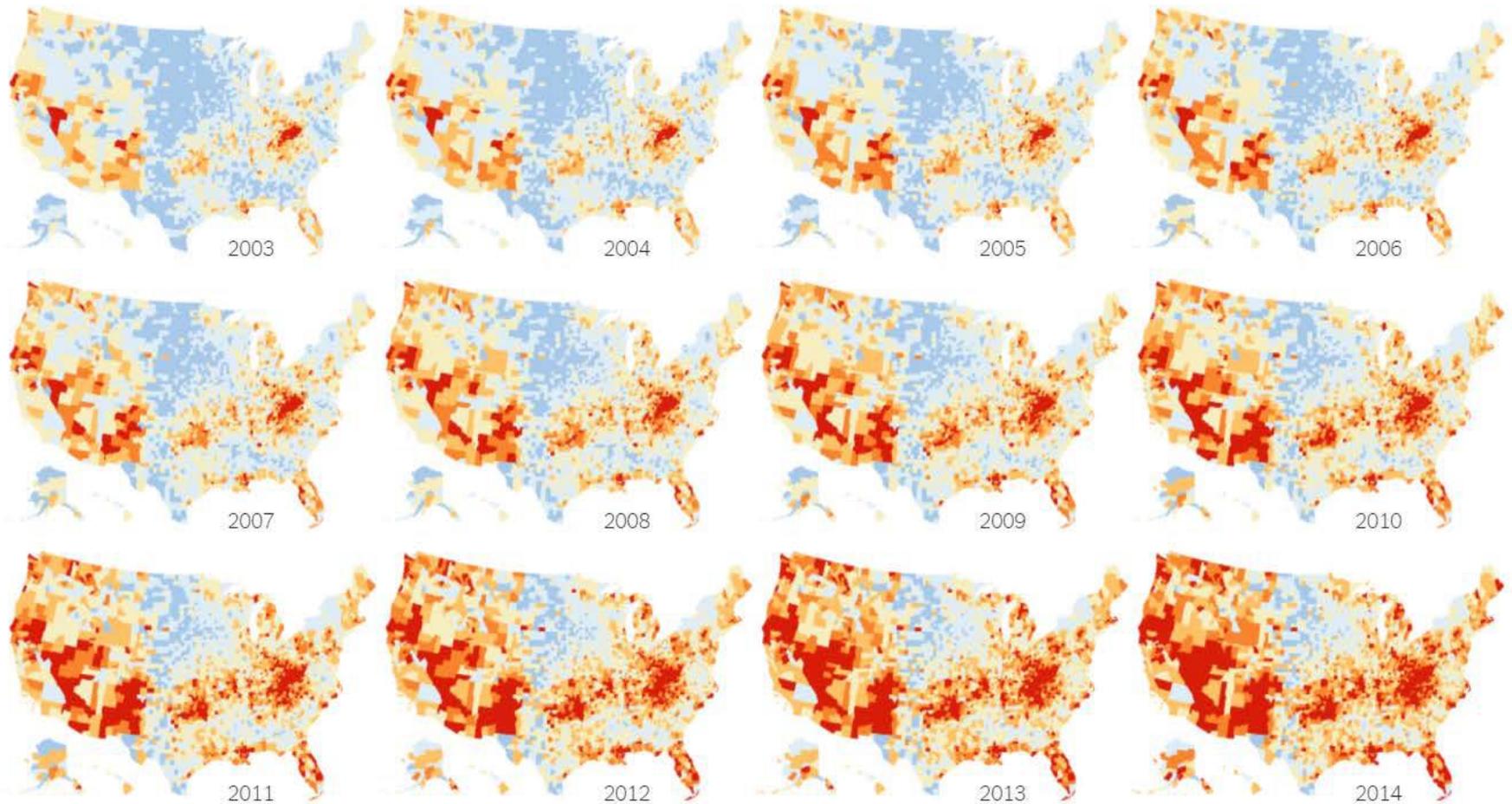
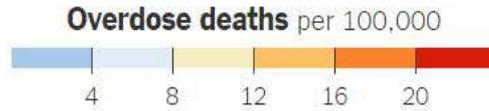
Rudd et al. (2016). Increases in drug and opioid-involved overdose deaths— United States, 2010–2015. *MMWR*, 65(50-51):1445–1452;

Park & Blosh(2016). How the Epidemic of Drug Overdose [Image]

Deaths Ripples Across America. The New York Times. Accessed on 04/28/29017 from: <https://www.nytimes.com/interactive/2016/01/07/us/drug-overdose-deaths-in-the-us.html>



National Overdose Death Rate



Source: National Center for Health Statistics, CDC Wonder

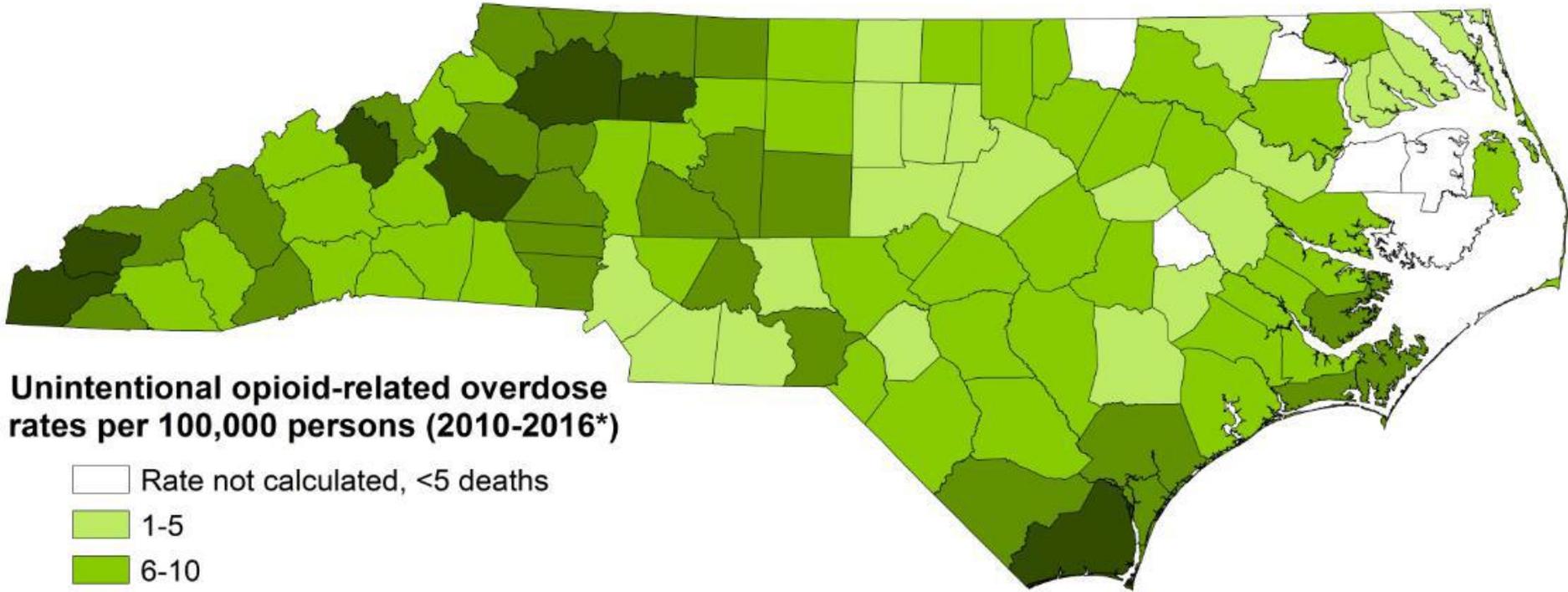
Autopsies Performed by the North Carolina Medical Examiner System, March-May 2017

Autopsy Facility	Suspected Overdoses	Other Autopsies	Total
OCME	227 (51.2%)	216 (48.8%)	443
ECU	53 (40.5%)	78 (59.5%)	131
Mecklenburg	83 (51.2%)	79 (48.8%)	162
Wake Forest Baptist	185 (62.9%)	109 (37.1%)	294
Jacksonville	85 (60.3%)	56 (39.7%)	141
Lumberton	3 (37.5%)	5 (62.5%)	8
Piedmont Pathology	19 (70.4%)	8 (29.6%)	27
Sampson	4 (66.7%)	2 (33.3%)	6
Sylva	24 (72.7%)	9 (27.3%)	33
Total	683 (54.9%)	562 (45.1%)	1,245



Source: Alison Miller, MA, Autopsies Performed by the North Carolina Medical Examiner System, March-May 2017

Opiate Overdoses in NC (by County)



Unintentional opioid-related overdose rates per 100,000 persons (2010-2016*)

- Rate not calculated, <5 deaths
- 1-5
- 6-10
- 11-15
- 16-25



How Opioids Are Used

- Ingested – pills or powder
- Snorted – powdered or crushed pills
- Smoked - opium or heroin, meth
- Injected – powder or crystals cooked



Goldfranks Toxicologic Emergency.
2011 Levine. CHEST. 2011

Consequences of Use

- Dependence - the experience of withdrawal symptoms when use is stopped
- Increased tolerance - need for increased amounts of these drugs to experience the same effect
- Progression, a result of increased tolerance and dependence, to more potent opioids, and more dangerous methods of administration



Signs of Exposure

- Sedation, sleepiness
- Slurred speech
- Dizziness
- Euphoria
- Respiratory depression
- Small pupils
- Nausea, vomiting
- Itching, flushing



Overdose: Most Critical Signs

- Bluish or grayish tint to the skin and lips
- Cold, clammy skin
- Small Pupils
- Unresponsive and unconscious
- Breathing is slow or has stopped
- Muscle/Respiratory Rigidity
- Overdose so quickly syringe may still be in arm (Fentanyl and Carfentanil)



Opioid Withdrawal Symptoms

- Muscle and joint pain
- Runny nose and eyes
- Nausea, vomiting, abdominal cramps, diarrhea
- Goosebumps, chills, sweating
- Anxiety, depression, intense craving
- Loss of appetite
- Confusion, irritability



Responding to an Overdose

Call 911:

- Say, “My friend is unconscious or not breathing”
- Give exact location

Rescue breathing:

Administer naloxone

Stay with person

Recovery position



Recovery Position

•If you must leave the person who is overdosing, put them into the recovery position so they won't choke on their own vomit.



Naloxone

Naloxone (Narcan) will reverse the effects of opioids, reversing an overdose.

Simple nasal spray or injectable

No effect other than blocking the opioids

No adverse reactions

No potential for abuse

No potential for overdose



Naloxone

- A prescription medicine that reverses an opioid (may cause withdrawal)
- Injectable and intranasal applications
- Wakes a person who is overdosing in 3-5 minutes and lasts 30-90 minutes
- Does not have psychoactive effects – does not make a person “high”



Naloxone Formulations



Nasal with separate atomizer
“Multi-step”
Amphastar Pharmaceuticals



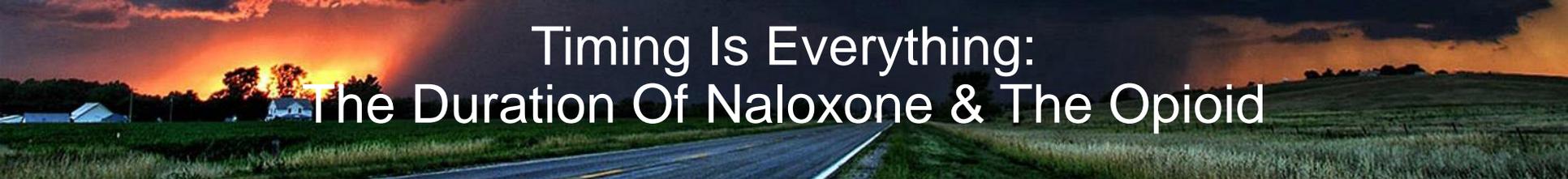
Narcan Nasal Spray
“Single-Step”
Adapt Pharma



Auto-injector
Kaleo Inc.



Intramuscular Injection
Various Companies



Timing Is Everything: The Duration Of Naloxone & The Opioid

Drug	Duration	Naloxone wears off in...
Methadone	24-32 hours	30-90 mins
Heroin	6-8 hours	30-90 mins
Oxycontin	3-6 hours	30-90 mins
Codeine	3-4 hours	30-90 mins
Demerol	2-4 hours	30-90 mins
Morphine	3-6 hours	30-90 mins
Fentanyl	2-4 hours	30-90 mins

Recommendations*

Fentanyl and its analogues (in powder, tablet, and liquid form) pose a potential hazard to a variety of responders who could come into contact with these drugs in the course of their work. Possible exposure routes to fentanyl and its analogues can vary based on the source and form of the drug.

Potential exposure routes of greatest concern include inhalation, mucous membrane contact, ingestion, and percutaneous exposure (e.g., needlestick).

Skin contact is also a potential exposure route, but is not likely to lead to overdose unless large volumes of highly concentrated powder are encountered over an extended period of time. Brief skin contact with fentanyl or its analogues is not expected to lead to toxic effects if any visible contamination is promptly removed.

There are no established federal or consensus occupational exposure limits for fentanyl or its analogues.



*Source: National Institute of Occupational Safety and Health

PPE Recommendations

Personal protective equipment recommendations for protection against fentanyl

Personal Protective Equipment	Pre-Hospital Patient Care			Law Enforcement Routine Duties			Investigations and Evidence Collection			Special Operations and Decontamination			
	Exposure Level	Minimal	Moderate	High	Minimal	Moderate	High	Minimal	Moderate	High	Minimal	Moderate	High
<i>Respiratory Protection</i>													
Disposable N100, R100, or P100 FFR ¹		✓				✓			✓			✓	
Elastomeric APR ²								●	✓			●	✓
PAPR ³									●			●	●
SCBA ⁴									■				■
<i>Face and Eye Protection</i>													
Safety goggles/glasses ⁵		✓				✓			✓	✓		✓	✓
<i>Hand Protection</i>													
Nitrile gloves ⁶		✓	✓			✓	✓		✓	✓		✓	✓
Nitrile gloves, double or use of thicker gloves			●				●		●	●		●	✓
<i>Dermal Protection</i>													
Wrist/arm protection ⁷		✓				✓			✓			✓	
Particulate hazards protective ensemble (i.e., NFPA 1999 Single or Multi-Use or NFPA 1994 Class 4 Ensemble)										✓			✓
Chemical hazards protective ensemble (i.e., NFPA 1994 Class 3 Ensemble or Higher)										●			●

Not recommended

Not recommended

Key

- ✓ Minimum protection recommended.
- When an on-scene health risk assessment is conducted and higher protection is warranted.
- If particulate + gas/vapor hazard is expected above the immediately dangerous to life or health (IDLH) values or concentration is unknown, SCBA is recommended.
- Not recommended, refer scene to special operations response workers (such as local hazmat team)



Exposure Prevention for Public Workers*

Hazard Recognition- Observe your surroundings and back-out if you think you are in contact with an illicit operation. Contact a Hazmat Response Team

For those involved in active criminal operations investigations, recommended workers use.

- **air purifying (P-100) respiratory protection.**
- **chemical resistance gloves.**
- **long sleeve shirts.**

For First Responders, recommended that they use:

- **NIOSH-certified CBRN Self Contained Breathing Apparatus (SCBA).**
- **Level A protective suit when entering an area with an unknown contaminant or unknown concentration.**
- **Level A protection should be used until monitoring results confirm the contaminant and the concentration.**



**Source: National Institute of Occupational Safety and Health*

Signs of Opioid Use or Processing in the Home



Key Points on Heroin/Fentanyl and Analogues

- Heroin/Fentanyl and its Analogues are called opioids that can be effectively used for severe pain control.
- When used illegally, they are powerful, highly addictive depressants that can kill.
- Carfentanil (used as elephant tranquilizer) is 10,000 times more potent than heroin.
- Illicit opioid processing operations can be extremely dangerous to those who do not take precautions.
- Overdoses can be reversed by administering Naloxone but since the effects of Naloxone is limited- person can re-overdose when Naloxone wears off.

Safety Tips to Prevent Heroin/ Fentanyl and Analogues Exposure

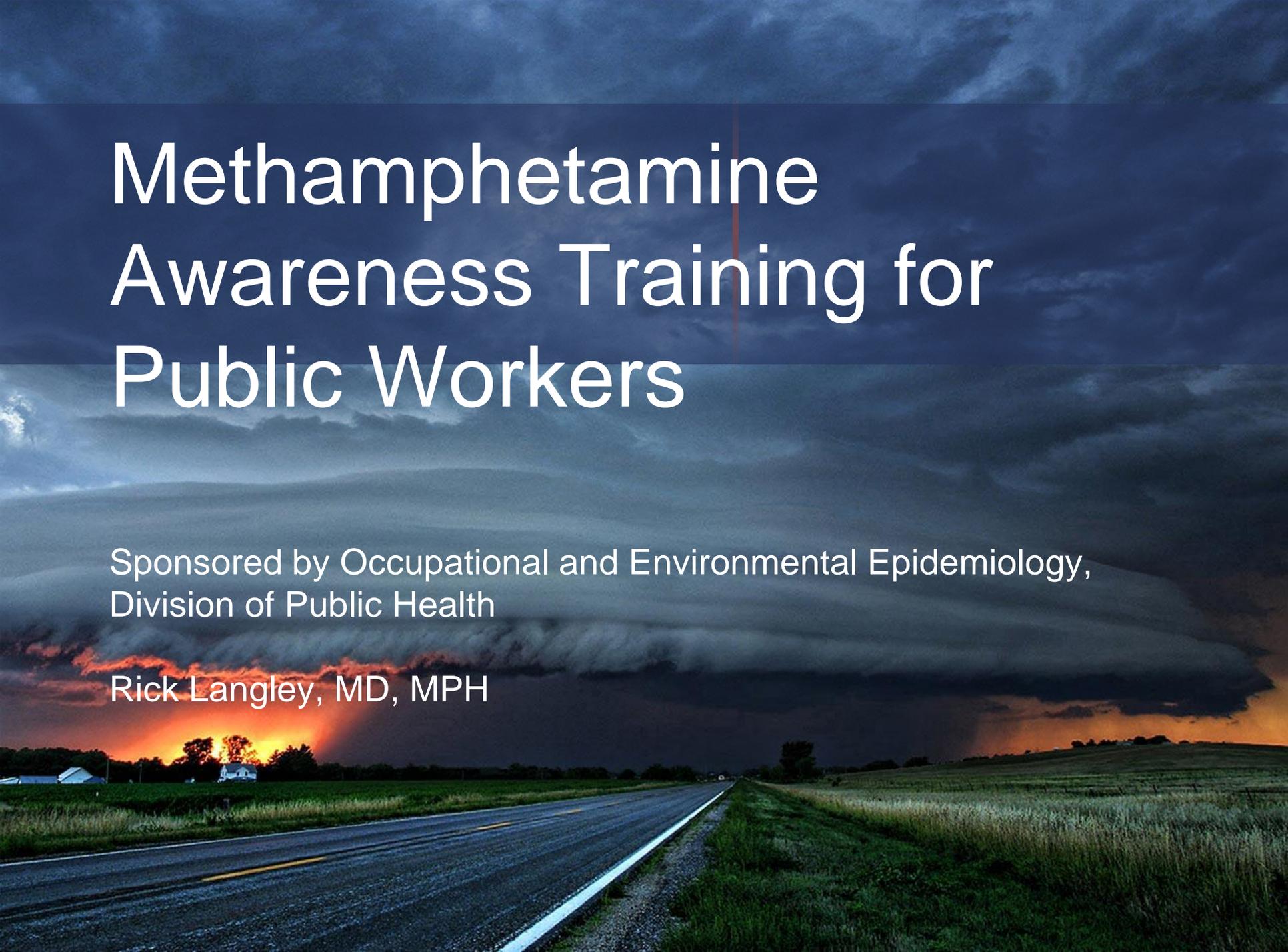
- 1. Observe Surroundings**
- 2. See Issue as an Uncontrolled Hazardous Materials Site**
- 3. Seeing Site as a Crime Scene**
- 4. If you or team members begin to feel ill, STOP and seek care immediately**
- 5. Safety is paramount for public service providers**





Questions?





Methamphetamine Awareness Training for Public Workers

Sponsored by Occupational and Environmental Epidemiology,
Division of Public Health

Rick Langley, MD, MPH

Why are We Conducting this Training?

Methamphetamine Production:

- Involves the use of very toxic chemicals to produce.
- Toxic by-products contaminate sites, posing serious health and environmental hazards to those nearby.
- Children are very susceptible to exposures to these chemicals; and conversely, those who try to intercede on their behalf.



Methamphetamine



Sept 22, 2017 - A couple faces charges after police say they were making methamphetamine in a travel trailer at White Lake. Keith Douglas Transue, 50, and Karen Joan Pham, 42, of Indian Trail, are charged with the following: maintaining a dwelling for a controlled substance, manufacturing methamphetamine, five counts of possession of precursor's chemicals with intent to manufacture meth. According to a news release, a joint investigation between the White Lake Police Department and the Bladen County Sheriff's Office uncovered a meth making operation around 2:00 p.m. on Thursday at 46 Bingman Street. Police contacted the SBI and a Clandestine Laboratory Response Team processed the scene.

Aug 25, 2017- Two Wake County men have been arrested and charged after getting caught with nearly 12 pounds of crystal methamphetamine during a traffic stop in Alamance County, according to the Alamance County Sheriff's Office. The sheriff's office stopped a vehicle on Interstate 40 at N.C. Highway 54 on Monday and soon established probable cause to search the vehicle, authorities said. The search uncovered 5.3 kilos (11.7 pounds) of suspected crystal meth.

July 7, 2017- State and local authorities spent Friday afternoon investigating and cleaning up the largest meth lab found in North Carolina this year, tucked away in a barn in Macclesfield, said Edgecombe County Sheriff Clee Atkinson. The operation was so big that authorities had to call in a hazmat truck from South Carolina to help with the cleanup and disposal of the meth debris located throughout the property. A local fire department has been brought in to provide lighting for the all-night cleanup.

Feb 8, 2017- Authorities in Onslow County say a woman and her boyfriend are accused of running a meth lab in their home with two children living there. Local media outlets say 33-year-old John Baer and 27-year-old Nicole Parker face several charges, including felony manufacturing methamphetamine and misdemeanor contributing to the delinquency of a juvenile.



Methamphetamine

Schedule II Stimulant

Formula C₁₀H₁₅N

**Molecular mass:
149.233 g/mol**

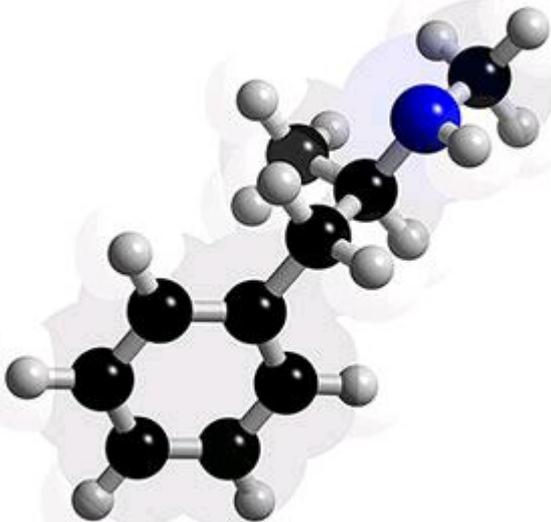
Half life: 9-15 hours

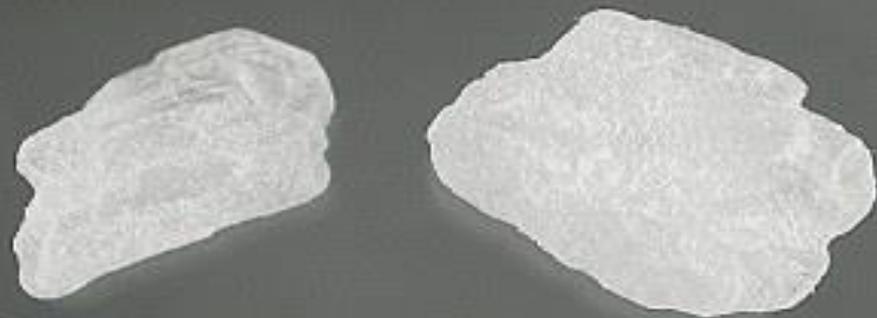
Excretion: renal

**Typically odorless powder
that dissolves quickly in
water**

**Another form of meth is
clear chunky crystals
referred to as crystal meth**

**May be in the form of small
brightly colored tablets,
referred to as YABA**





How Methamphetamines Are Used

Ingestion

Snorted

Smoked

Injected



Meth High

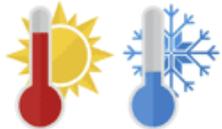
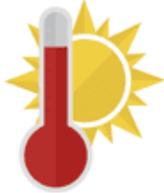
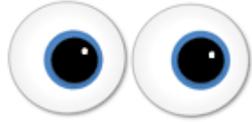
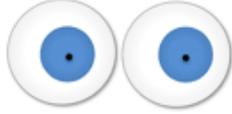
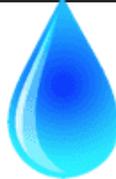
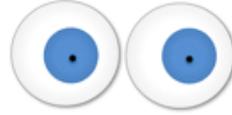
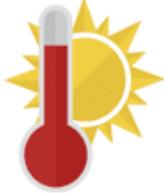
- **Methamphetamine is a stimulant drug**
- **The high lasts considerably longer than cocaine**
- **Euphoria: an marked feeling of being well; beginning with “the flash” then calming to an extreme elation**
- **Decreased need to sleep, loss of appetite, muscle twitching, faster heart rate, faster breathing rate, higher body temperature, paranoia, hyperactivity**
- **Pupil dilation**
- **Crashing or ‘tweaking’ phase**



“Tweaking” Phase

- **Coming down from the high or crashing**
- **2-15 days since the last time they slept**
- **Users want another hit of meth, but cannot regain the original high at this point**
- **Leads to frustration, paranoia, and violence**
- **Marijuana or benzodiazepines are often used to combat the insomnia**
- **Users will crash and sleep continuously for up to 2 days**



	HR & BP 	Resp. 	Temperature 	Pupils 	Bowel Sounds 	Diaphoresis 
Anticholinergic Anticholinergics – Atropine, scopolamine, glycopyrrolate, benzotropine, trihexyphenidyl Antihistamines – Chlorpheniramine, Cyproheptadine, Doxylamine, Hydroxyzine, Dimenhydrinate, Diphenhydramine, Meclizine, Promethazine	 	No change 		Dilated 		
Cholinergic Organic Phosphorous Compounds: Carbamates • Arecholine, Pilocarpine, Urecholine (Betanechol), Carbachol, Choline, Metacholine, Mushrooms	No change 	No change 	No change 	Pinpoint 		
Opioid Morphine • Codeine • Tramadol • Heroin • Meperidine • Diphenoxylate • Hydromorphone • Fentanyl • Methadone • Propoxyphene • Pentazocine • DXM • Oxycodone • Hydrocodone	 			Pinpoint 		
Sympathomimetic Caffeine, cocaine, amphetamines, methamphetamines, Ritalin, LSD, Theophylline, MDMA	 			Dilated 		
Sedative-Hypnotic anti-anxiety agents, muscle relaxants, antiepileptics and preanesthetic medications – Barbituates – Benzodiazepines	 			No change 		

Acute vs. Chronic Effects of Meth

Acute Effects:

- Euphoria, alertness, decreased appetite, increased libido
- Dizziness, headache, metallic taste, irritation of skin, eyes, mucus membranes, elevated HR, BP
- Insomnia, confusion, paranoia, aggression, convulsions

Chronic Effects:

- Emotional and cognitive problems
- Damaged teeth
- Skin lesions
- Stroke, damaged blood vessels, inflammation of heart lining
- Hallucinations
- Violent tendencies

Meth Mouth



Skin Sores



Meth

It'll show youe inner beauty

Skin Sores



Overdosing on Meth

- Present to hospital with same signs and symptoms as a heart attack
- Increased heart rate, increased breathing rate, chest pain, confusion, a coma



Consequences of Use

- Dependence - the experience of withdrawal symptoms when use is stopped
- Increased tolerance - need for increased amounts of these drugs to experience the same effect
- Progression, a result of increased tolerance and dependence, to more use of meth and more dangerous methods of administration



Effects of Amphetamines--Newborns

Behavioral Issues - abnormal sleep patterns, poor feeding, tremors, lower intelligence scores

Malformations - cleft lip, cardiac defects, low birth weight, reduced head circumference, brain hemorrhage, low body fat, undescended testicles



Injuries Sustained in Methamphetamine Chemical Incidents— Hazardous Substances Emergency Events Surveillance System and National Toxic Substance Incidents Program, five states, 2001–2012 (MMWR Aug 2015)

Injury type	Category of persons injured				
	General public	Firefighter	Law enforcement official	Responder not specified/Employee	Overall
Respiratory irritation	36	1	27	8	72
Burns	42	0	0	2	44
Eye irritation	11	1	16	7	35
Dizziness/CNS	3	0	5	1	9
Gastrointestinal	3	2	5	1	11
Skin irritation	7	4	5	1	17
Other	4	1	2	5	12
Headache	1	1	0	9	11
Trauma	7	0	1	0	8
All	114	10	61	34	219

Abbreviation: CNS = central nervous system.



Meth and Fire Responders

The North Carolina Toxic Substance Surveillance program monitors acute chemical releases that occur in the state.

Chemical	Total number of releases	Releases with one or more victim	Total number of victims	Evacuations
Natural gas	138	10	28	120
Sodium Hydroxide	114	4	5	4
Methamphetamine Chemicals NOS	110	32	60	29
Ammonia	86	5	15	13
Sulfuric Acid	57	6	40	9

Chemicals involved in responder injuries by incident count, 2010-2015									
Chemical	Number of responders injured							Total events	Total responders injured
	11	6	5	4	3	2	1		
Carbon Monoxide	1			1		1		3	17
Sulfuric Acid		1						1	6
Methamphetamine Chemicals NOS			1			3	7	11	18

31 events injured 69 first responders; 38 were police officers

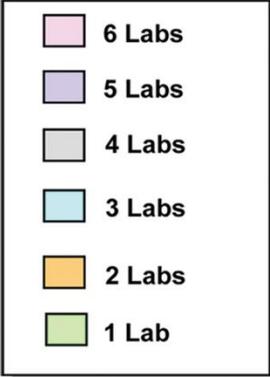
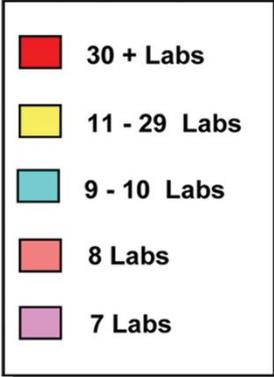
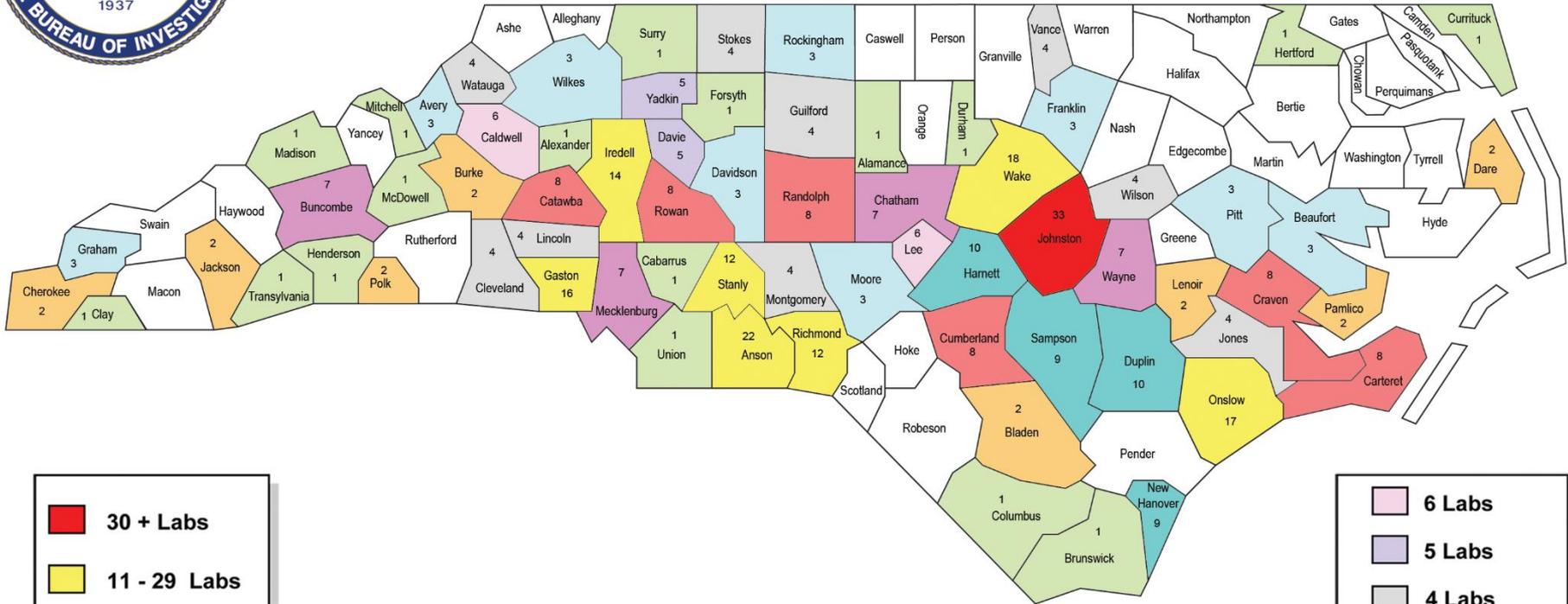
***Almost half of law enforcement injuries (n=15, 42%) were due to methamphetamine production related chemicals**



2016 Clandestine Lab Responses

Total: 376

(As of December 31, 2016)



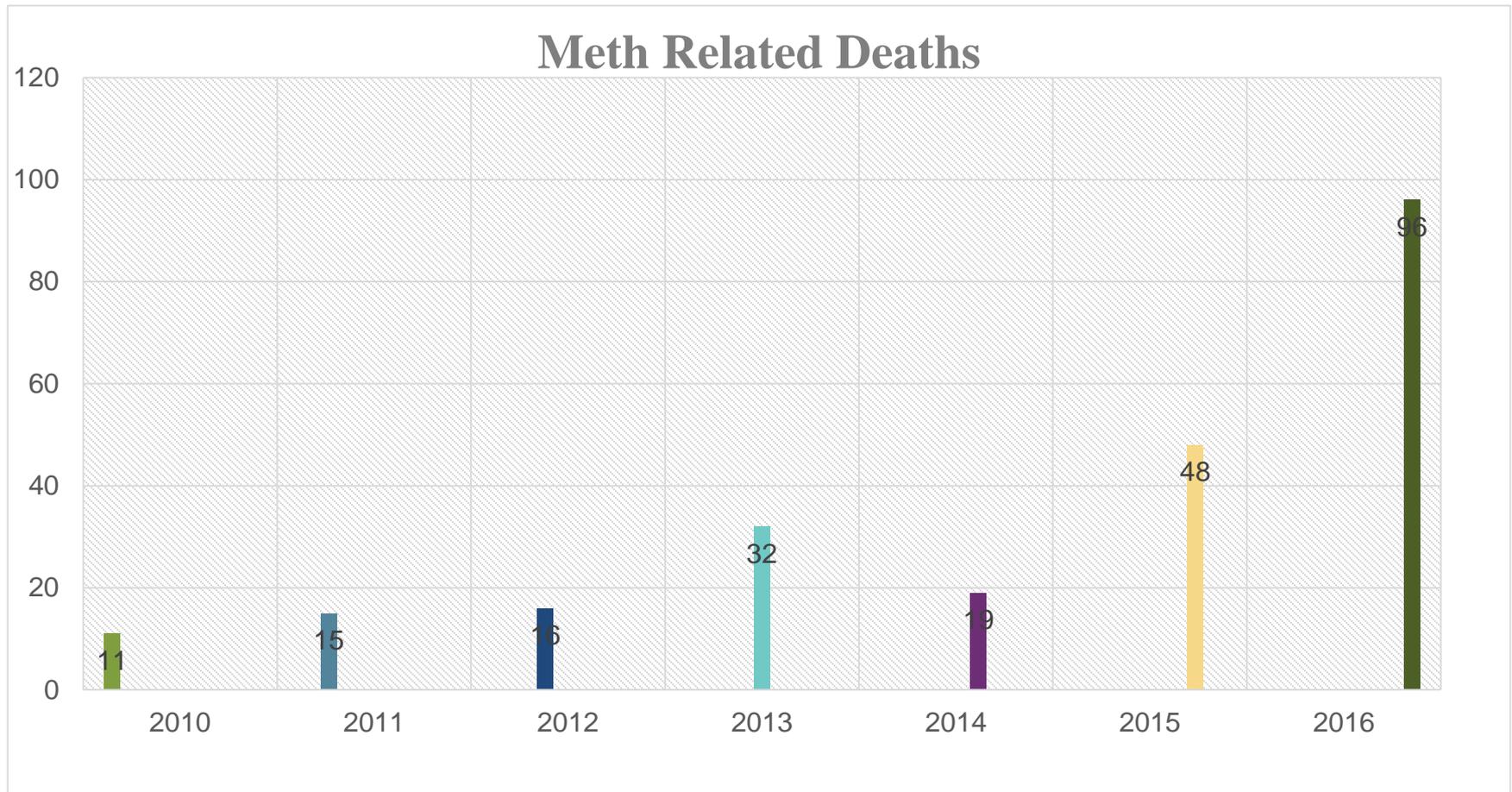
North Carolina State Bureau of Investigation

NC Methamphetamine Lab Seizures

**METH LAB BUSTS BY YEAR,
NORTH CAROLINA, 2003 -2016**



Methamphetamine Related Deaths



Drug Endangered Children

In North Carolina, children have been found living in one out of every four homes where meth is made. In these homes, they are exposed to hazardous chemicals, toxic fumes, and potential fires and explosions. Some addicts even allow their children to help make meth.

One in three children found living in meth labs test positive for traces of the drug. The health risks to children who are exposed to meth labs are especially serious because their immune and nervous systems are not fully developed.

The chemicals used to cook meth contaminate the carpets, furniture, wallpaper and even a child's clothes and toys. Children who are removed from these homes when their parents are arrested have to leave all of their belongings behind.

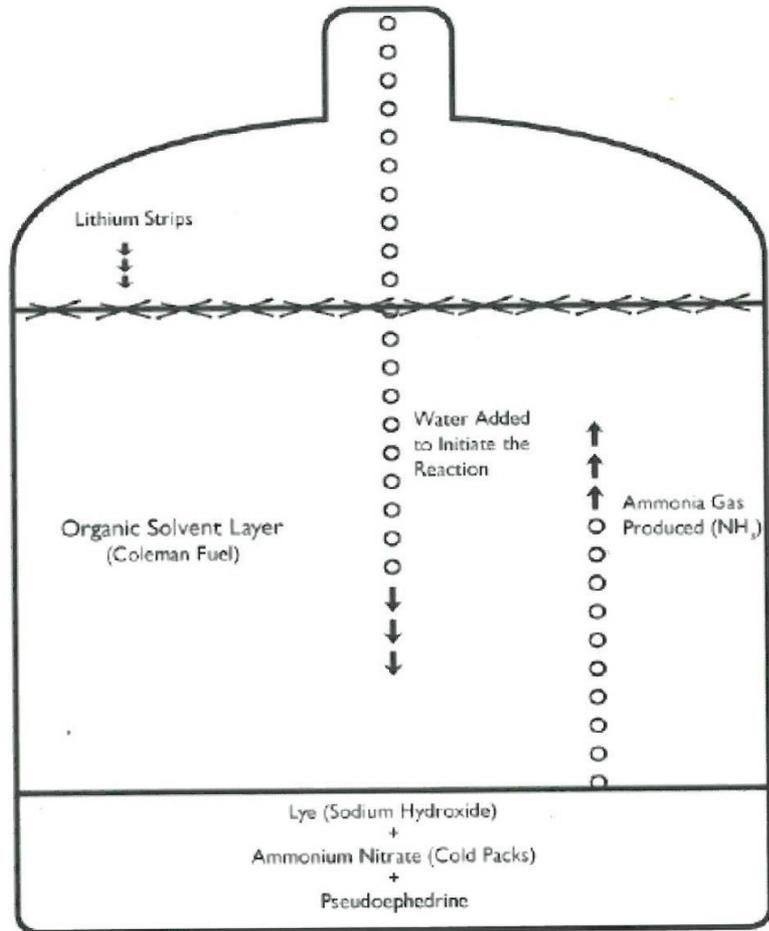


Meth Production

- Days of the large scale meth lab are over.**
- The 'Shake 'n Bake' method...Currently, the meth labs are small scale productions (often produced in a 2 liter bottle)...easily mobile and hard to bust**
- It only takes 45 minutes from start to finish to make crystal meth on a small scale.**
- Nothing fancy is required for a meth lab...meth can be made in a truck!**



One-Pot Method



Hazardous Chemicals Used to Produce Methamphetamine

- Explosive
 - Lithium metal, sodium, ether
- Flammable
 - Acetone, ethyl alcohol, solvents of all kinds
- Toxic
 - Anhydrous ammonia, methamphetamine
- Corrosives/acids
 - Sodium hydroxide, hydrochloric acid, sulfuric acid

Signs of a Meth Lab: Equipment

- Pyrex, glass or Corning containers, mason jars or other kitchen glassware (These may be fitted with hoses, clamps, or duct tape.)
- Plastic soda bottles (This may be the only evidence of meth labs that use the one pot or shake and bake method.)
- Rubber or plastic tubing
- Dust or respiratory masks (PPE) and filters
- Funnels
- Rubber gloves
- Large plastic storage containers or tubs
- Containers of multi-layered liquids
- Coffee filters or other items including bed sheets, used as strainers and stained red
- White powdery residue
- Sheets or other coverings on windows
- Gas cylinders or tanks that may contain anhydrous ammonia (especially if the gas cylinder has a blue top. A chemical reaction causes the brass valve to turn blue when used to store the gas.)



Signs of a Meth Lab: Household Products

Pseudoephedrine

Alcohol

Lantern fuel or camp stove fuel

Drain cleaner

Gasoline additives

Rubbing or denatured alcohol

Paint thinner (xylene)

Starter fluid

Battery Acid

Lithium (from batteries)

Antifreeze

Acetone

Energy boosters

Chloroform

Diet aids

Epsom salts or rock salts

Iodine

Matches (books or boxes)

Kitty litter

Chemicals such as:

sulfuric acid

muriatic acid

toluene

Anhydrous ammonia (a gas often stored in tanks and stolen from farmers who use it for legal purposes)









Chemical Exposures at “Controlled” Cooks

Surface contamination

Airborne exposures

Distribution of contamination

**24 hours after cook – various activity
levels**



Methamphetamine Exposures: Hotel Cook



Teddy Bear: 12” away

Sweater:

3,100 $\mu\text{g}/100 \text{ cm}^2$

Underlying “fur”:

2,100 $\mu\text{g}/100 \text{ cm}^2$

pH: <1



Meth Exposures at a Non-Active Lab

Wipe samples positive for meth on hands, clothing, etc.

Suspects 0.9 – 17.4 $\mu\text{g/wipe}$

Children 0.2 – 1.18 $\mu\text{g/wipe}$

Law Enforcement 0.5 – 0.93 $\mu\text{g/wipe}$

Pet dog 1.89 $\mu\text{g/wipe}$ (fur)



Environmental Effects of Meth

- Meth production leaves behind 5 to 6 pounds of toxic waste per pound of meth produced.
- Toxic by-products contaminate sites where meth is produced, posing serious health and environmental hazards to those nearby.
- Costs to clean up operations.



Assess Waste Disposal



External Clues Indicating an Illegal Lab

- **Blackened out/covered windows/bars on windows**
- **Burn pits in yard**
- **Stained soil**
- **Dead vegetation/trees**
- **Evidence of PPE (gloves, dust mask) in yard/trash**
- **Bottles/jars/rubber hoses/cookware**
- **Chemical odors**
- **Stains on walls/ceilings, corrosion on metal surfaces**
- **Unusual pipes or ducts coming from windows/walls**
- **Portable generators for outdoor sites**
- **Propane tanks with unusual valves/attachments/corrosion**



If entering a suspected clandestine lab

- **Do not touch anything in the lab.**
- **Do not turn on any electrical power switches or light switches.**
- **Do not turn off any electrical power switches or light switches.**
- **Do not eat or drink in or around a lab.**
- **Do not open or move containers with chemicals or suspected chemicals.**
- **Do not smoke anywhere near a lab.**
- **Do not sniff any containers.**
- **Do decontaminate yourself and your clothing.**
- **Do wash your hands and face thoroughly.**
- **Do call your local law enforcement or DEA district office**



N.C. Administrative Rules

Methamphetamine Decontamination

10A NCAC 41D.0101-.0105

effective April 1, 2005

<http://epi.publichealth.nc.gov/oii/pdf/SubchapterDRules72005.pdf>



Key Points on Methamphetamine

- **Methamphetamine is a drug that can be effectively used for several medical conditions**
- **When used illegally, Meth is a powerful, highly addictive stimulant that can be made easily from legally available products.**
- **Shown that up to 90% addicted after just one try.**
- **Meth labs use and produce toxic, explosive chemicals; meth labs are dangerous and expensive to clean up.**
- **Exposure to chemicals used to make meth may cause cancer, damage the brain and other organs, and result in birth defects.**

Spotting an Operation



Spotting an Operation (2)



Spotting an Operation (3)



Spotting an Operation (4)





Questions?





Pierre Lauffer
Industrial Hygiene Supervisor
919-707-5962
pierre.lauffer@dhhs.nc.gov

Rick Langley
MD, MPH
919-707-5913
rick.langley@dhhs.nc.gov

Regulatory-Technical
Support:

David Lipton
Industrial Hygiene Consultant
919-707-5961
david.lipton@dhhs.nc.gov

