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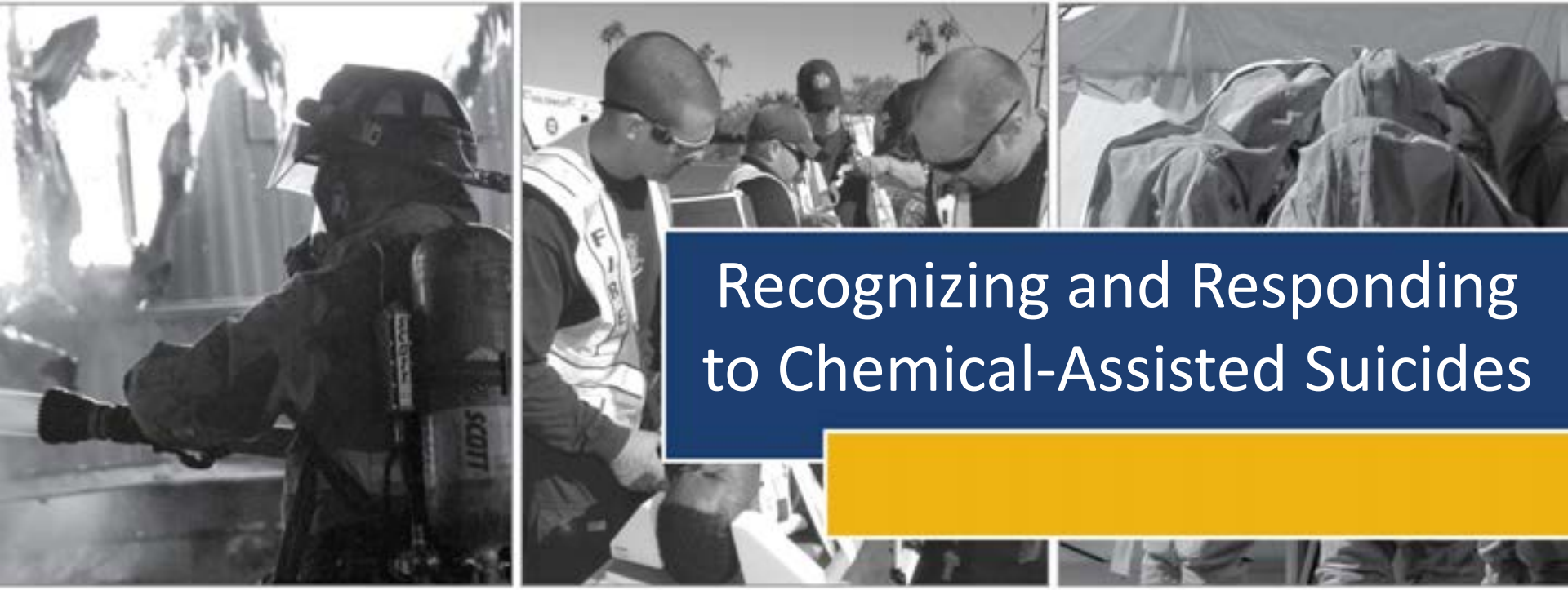

Recognizing and Responding to Chemical-Assisted Suicides

IAFC Webinar

- Live webinar presented by International Association of Fire Chiefs (IAFC) on March 31, 2016
- Webinar material developed by IAFC, National Library of Medicine and AlphaTRAC, Inc.
- Recorded webinar available at:
- https://iafcevents.webex.com/iafcevents/lsr.php?RCID=44f9aaafcbf24c789c58785bc9f71f90

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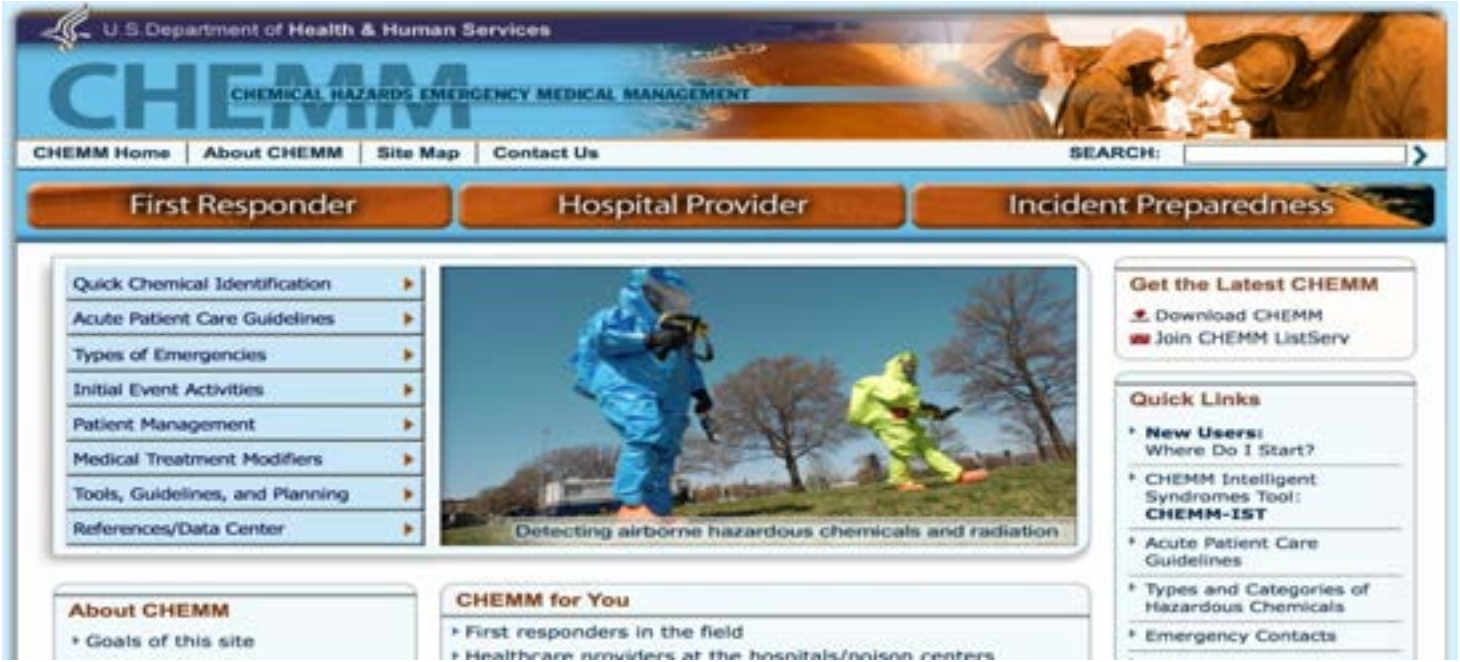
The NIH CHEMM Project

- National Library of Medicine / National Institutes of Health
- Chemical Hazards Emergency Medical Management (CHEMM) Website
- http://chemm.nlm.nih.gov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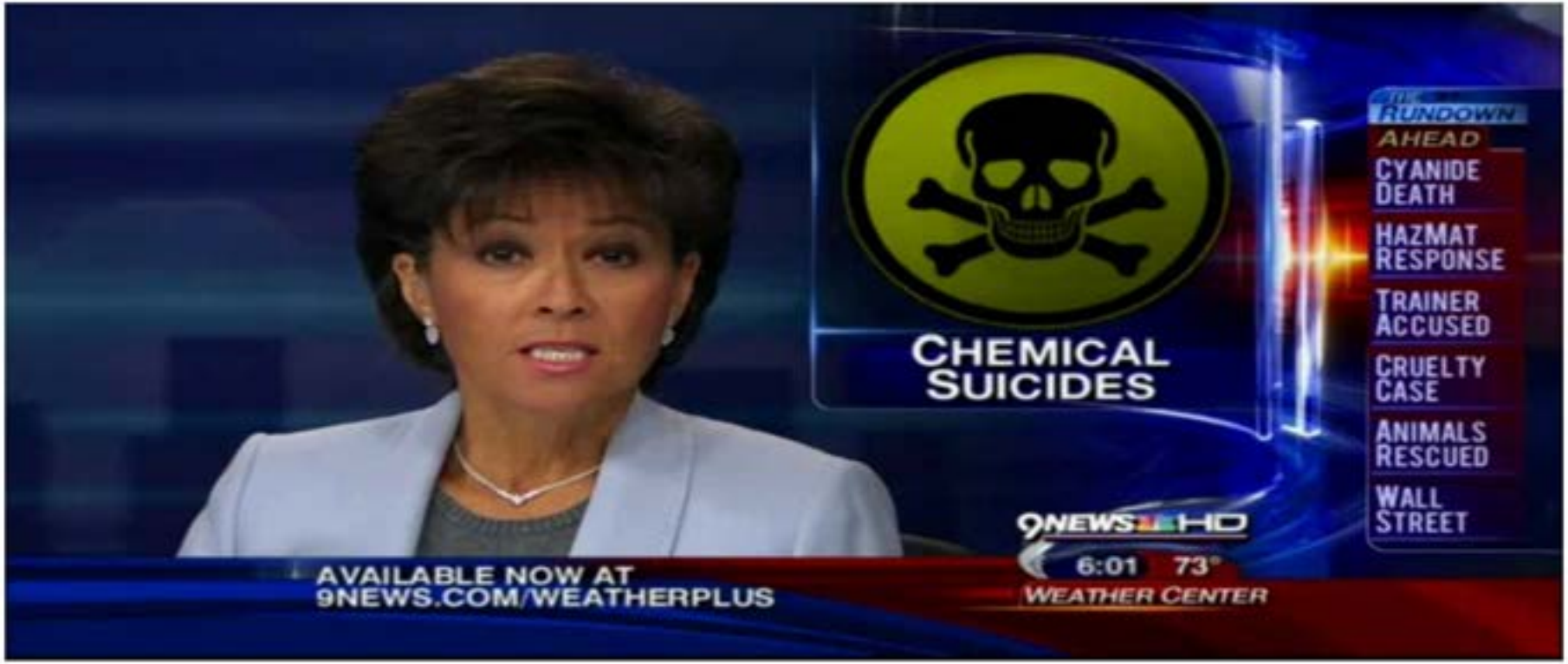


[9 News Denver Story on Chemical Suicides]

Chemically-Assisted Suicides - Overview

- **Combination of common consumer products to commit suicide through toxic exposure**
- Route of exposure may be ingestion or inhalation
- Airborne exposure more hazardous to responders and public
- 80% of responses result in first responder exposure

History

- First used in Japan in 2007
- Rapidly grew to 1000's of cases
- Introduced to U.S. in 2008 through Internet
- Steadily growing incidence in U.S.

Why Is It Popular?

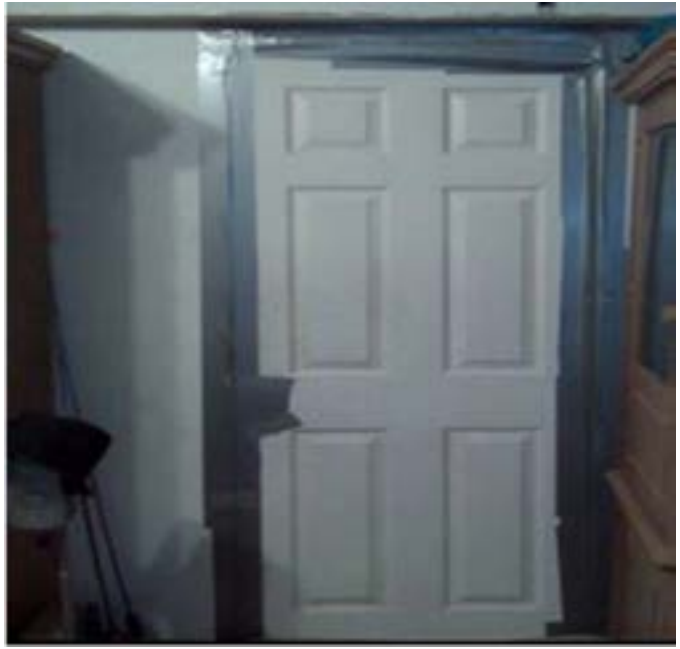
- Instructions are available on Internet
- Components are easily obtained
- Process is easy

Common Approaches

- Most often used in confined spaces
  - Automobiles
  - Closets
  - Bedrooms
  - Bathrooms

Usual MO

- Victim:
  - Obtains components
  - Seals confined space
  - Posts warning signs
  - May call 911
  - Mixes components
  - Expires within 5 – 10 minutes



Chemicals of Choice

- Hydrogen Sulfide
- Hydrogen Cyanide
- Carbon Monoxide
- Pesticides
- Ingested Cyanide (Sodium and Potassium Cyanide)
- Ingested Phosphide (Aluminum or Zinc Phosphide)
- Ingested Azides (Sodium Azide)

Other Chemicals (Less Likely)

- Other varieties of pesticides
- Toxic chemicals in aerosol cans
- Toxic liquids that have been attached to an airborne dispersion device (such as a sprayer)

Hydrogen Sulfide – the Most Common Chemical

- Colorless gas
- Smell of rotten eggs
- Chemical asphyxiate and chemical irritant
- Renders cells unable to use oxygen – suffocation at cellular level

Table 1. Physiological Response to H_2S

PPM	Symptoms
0.05	Odor threshold
10	Threshold Limit Value-Ceiling (TLV-C), eye irritation
50-100	Respiratory irritation
100	Coughing, loss of sense of smell, respiratory distress, drowsiness
320-530	Pulmonary edema
530-1,000	CNS stimulation followed rapidly by CNS depression
800	LC_{50}, less than five minutes (lethal concentration killed 50 percent of test animals in less than five minutes)
>1,000	Immediate collapse with cardiopulmonary arrest, even after only a few breaths

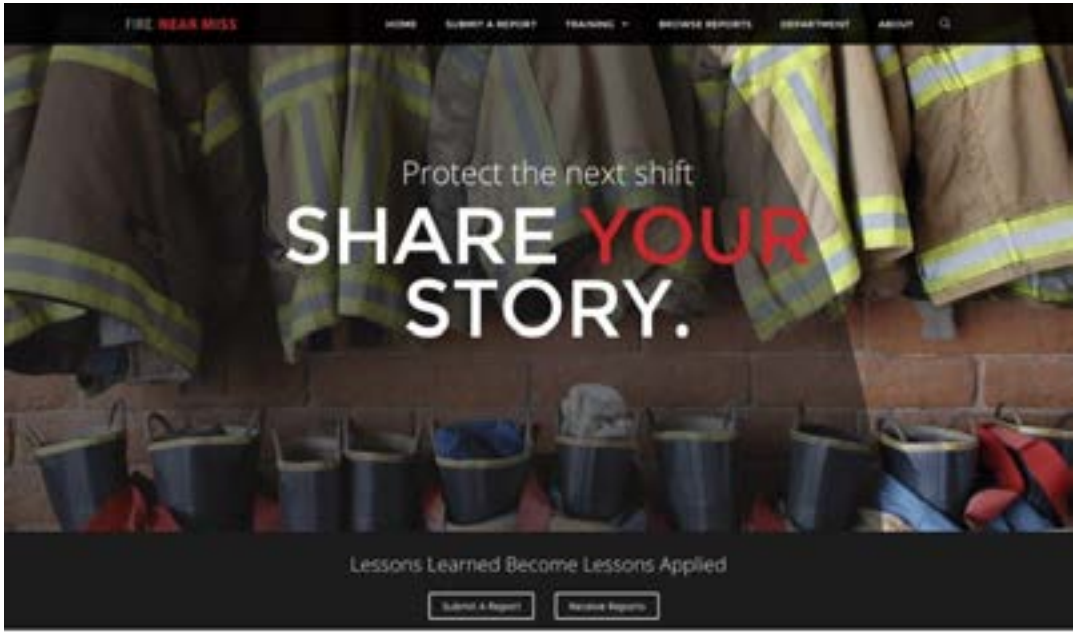
High Risk to Responders!!

- H2S levels can exceed 1,000 ppm in a 4-door sedan

Examples

- 2014: H2S in barricaded room
- 2011: Mixture in car stirs up during response
- 2009 & 2011: Aluminum phosphide in Loudoun County, VA
- 2014: H2S in apartment with victim rescue

IAFC National Near Miss System



http://www.firefighternearmiss.com/

http://www.firefighternearmiss.com/Reports?id=6430

Recognizing a Potential Chemically-Assisted Suicide

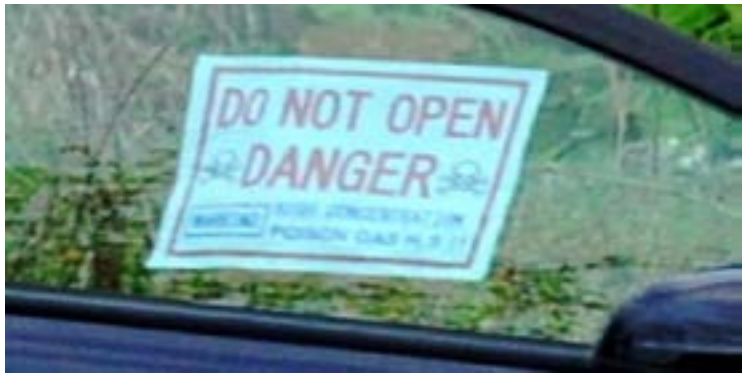
- Reported symptoms
  - 911 caller
  - Bystanders
- Vehicle situation
- “Check the Well Being” situation

Indicators: Reported Symptoms

EXPOSURE LEVELS		
LOW EXPOSURE	0 – 10 ppm	Caller is complaining of minor irritation in eyes, nose, and throat.
MODERATE EXPOSURE	10 – 50 ppm	Caller is complaining of headache, dizziness, nausea and vomiting, coughing and difficulty breathing .
HIGH EXPOSURE	50 – 200 ppm	Caller is complaining of severe respiratory irritation, eye irritation/acute conjunctivitis. Note: This level may also cause shock and convulsions, coma and death.

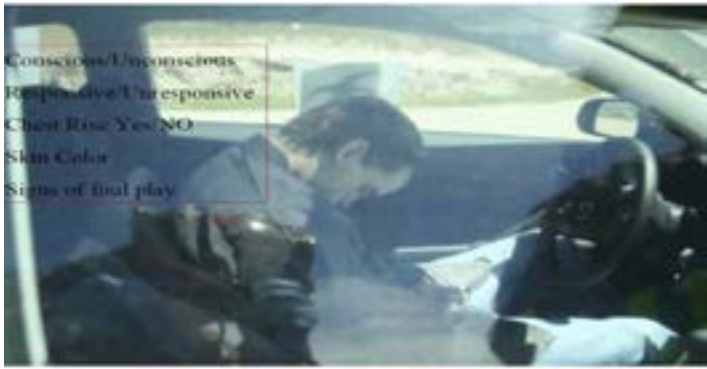
Indicators: Vehicle Situation

- Warning sign(s) taped to the vehicle door or placed inside
- Smell of rotten egg or sulfur
- Smell of bitter or burnt almonds



Indicators: Vehicle Situation

- Unresponsive subject inside the vehicle
- Pennies in the vehicle or console area will be tarnished with residue
- Empty household cleaning containers on the floor board or seat



Indicators: Vehicle Situation

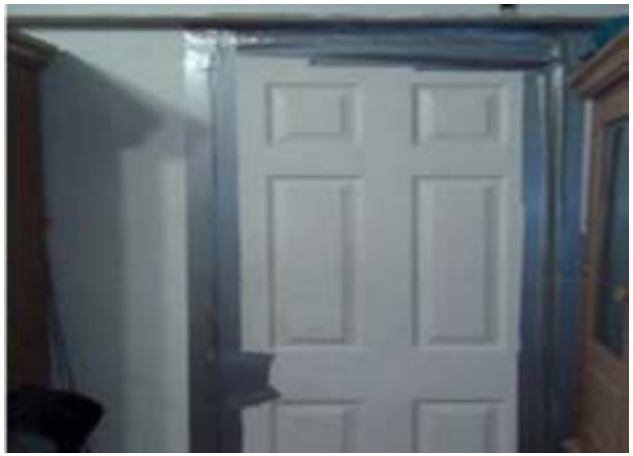
- One or more large buckets for mixing the acid base and sulfur chemical
- Vehicle's inside door handles remove
- Yellow-green or white residue on the seats or on the dashboard

Indicators: Vehicle Situation

- Duct tape to cover air vent
- Tools to mix the chemicals
- Windows fogged or tinted with yellow/green residue

Indicators: Check Well Being Call

- Masking tape or towels sealing a door (may be on inside of door and not visible)
- Smell of rotten egg or sulfur
- Smell of bitter or burnt almonds



Indicators: Check Well Being Call

- Suicide note taped to the door or mirror
- Warning sign(s) taped to the mirror or door

Indicators: Check Well Being Call

- Empty household cleaning containers that contain acid and sulfur
- One or more large buckets to mix the chemicals

Responding to Chemical Suicide

- Treat as high hazard HAZMAT event with contaminated victim(s) requiring rescue
- Use your department protocols for this type of response

Responding – Analyze and REACT

- Look for Indicators
- Recognize potential for chemical suicide
- React immediately – your life may be at risk!
  - Back off
  - Immediately employ SCBA, turnout gear, 4-gas monitor for reconnaissance (at a minimum)

Responding – Plan

- Consider / select strategy
- Approach to vehicle will be different than approach to structure
- Call in the right team
- Select PPE
- Obtain air monitoring equipment
- Select decontamination approach(es)

Responding – Plan

- Implement agency HAZMAT protocols
- Plan for site safety
- Plan for site security
- Use risk-based response approach
- Consider confined space volume and possible contaminant concentrations

Responding – Plan

- Plan to ventilate and enter room / vehicle
- Plan to mitigate HAZMAT spread
- Plan to remove and treat victim
- Evaluate risk to public and plan for protective actions

Responding – Implement

- Secure the scene
- Use hand line as appropriate
- Ventilate / change the environment
- Conduct air monitoring
- Treat the victim (if viable)
- Transport the victim (hospital or morgue)

Responding – Implement

- Decontaminate
  - Victim
  - Responders
  - Others affected
  - Equipment

Responding – Implement

- Coordinate with Police (work out a plan beforehand)
- Treat as crime scene!
  - Minimal disturbance
  - Protect evidence

Responding – Implement

- Maintain situational awareness
  - Might be deliberate instead of suicide
  - May be additional devices
  - Re-release may reoccur
  - Off gassing will occur!

Risks to Responders

- Direct exposure to toxic gas
  - Opening space may not disperse gases!
- Off gassing from site
- Off gassing from victim
- Bodily fluids from victim
- HAZARDS MAY PERSIST FOR HOURS AFTER EVENT

IAFC Resource – San Diego HIRT

- San Diego Hazardous Incident Response Team (HIRT)
- Conducted chemical suicide study
- Goal: determine the risk to the public and first responders
- Available at: IAFC HAZMAT Fusion Center
- www.hazmatfc.com/Resources/Training-Packages/Chemical-Suicide-Package,

San Diego HIRT Recommendations

- Secure a perimeter of 150’
- Use fire fighter turnouts for reconnaissance and monitoring of the vehicle
- Look for secondary devices
- Look for yellow liquids and containers inside the vehicle

San Diego HIRT Recommendations

- Vehicle will not be at flammable limits and cannot catch fire
- Use the combustible gas indicator for perimeter monitoring
- Use photo ionization detector for monitoring cracks and crevices of the vehicle for higher concentrations
- Vehicle can be vented with a 150’ perimeter
- Gas will dissipate in 15 minutes

San Diego HIRT Recommendations

- Once vented ensure the Medical Examiner has provided approval to remove the chemical containers
- Moving the mixing bucket can cause lethal levels of hydrogen sulfide gas to be generated
- Mixing bucket should be handled in full Level “B” chemical protective clothing

San Diego HIRT Recommendations

- Neutralize with fast setting concrete
- Will allow the agency to treat the solidified waste as a non-hazardous waste

IAFC Chemical Suicide Response Card

- Available at: IAFC HAZMAT Fusion Center
- www.hazmatfc.com/Resources/Training-Packages/Chemical-Suicide-Package,

- Addresses 18 response topics for 6 chemicals

Chemicals Addressed

- Detergent (Hydrogen Sulfide)
- Hibachi (Carbon Monoxide)
- Pesticide (Based on Malathion)
- Cyanide (Sodium and Potassium Cyanide ingested)
- Phosphide (Aluminum or Zinc Phosphide ingested)
- Azides (Sodium Azide ingested)

Response Topics

- Dispatch Triage
- First Responder
- Hazmat Teams
- Indicators
- Chemical Description
- Odor
- Odor Threshold
- Evac /Isolation Distance
- Flammability
- PPE First Responders
- PPE HAZMAT Teams
- Instrumentation
- Toxicity
- Deceased Skin Color
- Molecular Weight
- Symptoms
- Emergency Decon
- Transport and ER

Example – Page 1

CHEMICAL SUICIDE GUIDANCE

DISPATCHERS FIRST RESPONDERS HAZ-MAT TEAMS MEDICAL PROFESSIONALS

	DETERGENT (HYDROGEN SULFIDE)	HIBACHI (CARBON MONOXIDE)	PESTICIDE (BASED ON MALATHION)	CYANIDE (SODIUM & POTASSIUM CYANIDE SALTS INGESTED)	PHOSPHIDE (ALUMINUM OR ZINC PHOSPHIDE INGESTED)	AZIDES (SODIUM AZIDE INGESTED)
Dispatch Triage	Q:Do you feel ok? Back out. Q:Warning signs Q:Suicide note Q:Do you smell rotten eggs? Q:Did you see any buckets or containers in the car with yellow liquids? Q:Were you able to read the container labels? Q: Do you see tape over vents, windows, door cracks Q: Wearing goggles or gloves?	Q:Do you feel ok? Back out. Q:Warning signs Q:Suicide note Q:Did you see a small BBQ or Hibachi? Q: Formic or sulfuric acid containers? Q:Chemical burns around the mouth? Q:Where is this occurring? Bathroom? Bedroom? Small space? Q:Gas cylinders in the area?	Q:Do you feel ok? Back out. Q:Warning signs Q:Suicide note Q:Do you smell a pesticide odor? Q:Skunky or garlic? Q: Pesticide containers? Q: Amber jars? Q: Words "Malathion" Q: Victim shaking, twitching, runny nose, vomiting	Q:Do you feel ok? Back out. Q:Warning signs Q:Suicide note Q: Smell of bitter almonds/pungent Q:Did you see any white powders Q:Sodium or potassium cyanide containers Q:Recent trend of CN suicide in courtrooms post guilty verdict	Q:Do you feel ok? Back out. Q:Do you have any eye irritation? Q:Warning signs Q:Suicide note Q: Smell of dead fish Q:Did you see any gray tablets Q:Rodent control containers Q:Pictures of gophers on containers Q:Name Phostoxin	Q:Do you feel ok? Back out. Q:Eye irritation? Q:Warning signs Q:Suicide note Q: Pungent smell Q:Did you see any white powders Q:Sodium azide?
First Responder	-Approach from uphill/upwind -Set a 150' perimeter -Eliminate ignition sources -Interview all witnesses -Secure HVAC at building -If H2S is suspected do no open the vehicle doors, initiate a hazmat call -Use a public address system/sirens to communicate with victim -If odors are being detected down wind issue a shelter in place order -Notify area hospitals of possible self transports from dorm rooms/apt./hotel. -Do not transport containers to ER.	- Approach from uphill/upwind -Evacuate building in FFTO/SCBA -Set a 150' perimeter -Eliminate ignition sources -Secure HVAC -Interview all witnesses -If CO suicide is suspected initiate a hazmat call	- Approach from uphill/upwind -Evacuate building in FFTO/SCBA -Set a 150' perimeter -Eliminate ignition sources -Secure HVAC -Interview all witnesses -Be careful of spilled pesticides and contaminated vomit -These victims are often alive on arrival -If transported. Emergency decon, transport in open vehicle if possible, wear tyvek with APR, be prepared for contaminated vomit. See below. -Do not transport containers to ER.	- Approach from uphill/upwind -Evacuate building in FFTO/SCBA -Set a 300' perimeter -Eliminate ignition sources -Secure HVAC -Interview all witnesses -If CN suicide is suspected initiate a hazmat call -Notify area hospitals of possible self transports-dorm rooms/apt./hotel -If victim is transported do so in an open vehicle with PPE. Ensure they are treated outside or in negative pressure room. DO NOT bring the container into the ER.	- Approach from uphill/upwind -Evacuate building in FFTO/SCBA -Set a 300' perimeter -Eliminate ignition sources -Secure HVAC -Interview all witnesses -If aluminum/zinc phosphide suicide is suspected initiate a hazmat call -Notify area hospitals of possible self transports-dorm rooms/hotel -If victim is transported do so in an open vehicle with PPE. Ensure they are treated outside or in negative pressure room. DO NOT bring the container into the ER.	- Approach from uphill/upwind -Evacuate building in FFTO/SCBA -Set a 300' perimeter -Eliminate ignition sources -Secure HVAC -Interview all witnesses -If sodium azide suicide is suspected initiate a hazmat & bomb squad call -If victim is transported do so in an open vehicle with PPE. Ensure they are treated outside or in negative pressure room. DO NOT bring the container into the ER.
Haz-Mat Teams	-Recon in FFTO & SCBA -Look for secondary devices -Monitor with 4-gas/H2S sensor, PID -Ensure perimeter is suitable for wind conditions -Ventilate vehicle for 15 min. -Ensure the vented gases are not impacting other populated areas -Re-monitor vehicle to ensure safe levels of H2S -Wait for medical examiner to document scene if deceased -Decon body at ME request only -Remove containers in level "B" CPC -Neutralize with fast set concrete -Decontaminate the vehicle -Neutralized acids with concrete can be treated as solid waste according to study data.	-Recon in FFTO & SCBA -Look for secondary devices -Monitor with 4-gas/CO sensor -If high levels of CO still present begin ventilation -Do not use gas powered fans as they will generate more CO -Ensure the vented gases are not impacting other populated areas -Mitigate BBQ/Hibachi -If acids present: check area for spilled acids using pH paper -Wait for medical examiner to document scene if deceased -Neutralize any spilled acids with soda ash -Containerize remaining acids for disposal	-Recon in level "B" CPC -Look for secondary devices -Monitor with 4-gas & PID -Begin ventilation if needed -Do not use gas powered fans as they will generate CO -Ensure the vented gases are not impacting other populated areas -Mitigate any spilled pesticides with absorbent and containerize -Ensure the scene is safe for other personnel to enter in street clothes -Wait for medical examiner to document scene if deceased -If victim is transported ensure they are treated outside or in negative pressure room. DO NOT bring the container into the ER.	-Recon in level "B" CPC-flash suit -Look for secondary devices -Monitor with 4-gas, colorimetric tubes/chips, CN specific sensor -Monitor deceased for continued CN gas production, isolate if off gassing. -Begin ventilation if needed -Do not use gas powered fans as they will generate CO -Ensure the vented gases are not impacting other populated areas -Ensure the scene is safe for other personnel to enter in street clothes -Wait for medical examiner to document scene if deceased -If victim is transported ensure they are treated outside or in negative pressure room. DO NOT bring the container into the ER.	-Recon in FFTO & SCBA -Look for secondary devices -Monitor with phosphine sensor, 4-gas, PID (Can cost PID), tubes/chips -Monitor deceased for continued phosphine production -If high levels of phosphine still present begin ventilation and isolate victim -Do not use gas powered fans as they will generate more CO -Ensure the vented gases are not impacting other populated areas -Containerize aluminum/zinc phosphide to prevent moisture absorption -Wait for medical examiner to document scene if deceased -If victim is transported ensure they are treated outside or in negative pressure room. DO NOT bring the container to the ER.	Combination level "B" CPC/flash suit. -Look for secondary devices -Monitor with standard equip but pH paper will be key for acids generated -Monitor deceased for continued hydrazoic acid production -If acid is present begin ventilation and isolate victim -Do not use gas powered fans as they will generate more CO -Ensure the vented gases are not impacting other populated areas -Containerize sodium azide -Wait for medical examiner to document scene if deceased -If victim is transported ensure they are treated outside or in negative pressure room. DO NOT bring the container to the ER.

Other Training / Information References (CHEMM)

- Chemical Assisted Suicide: Responder Information (PDF – 198 KB) (HAZMAT FC)
- Chemical Suicides: A New Threat for Responders
- Chemical Suicides: Dangers for First Responders (CBRNE Resource Network)
- Chemical Suicides in Automobiles (CDC)
- Chemical Suicides: Identification Guide for 911 Communications (PDF – 1094 KB) (CFIX)
- Coffee Break Training – Hazardous Materials: Chemical Assisted Suicide (PDF – 503 KB) (USFA, FEMA, NFA)
- Hydrogen Cyanide (OPCW)
- Hydrogen Sulfide Suicide Trend: First Responder Safety Update (PDF – 1114 KB) (CFIX)
- The Chemical Suicide Phenomenon: Where Is It Headed? (PDF – 255 KB) (NY State DHSES)

Thank You!

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