



# CHEMICAL SUICIDE BRIEFING



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Certified Healthcare Emergency Professional

Special Thanks to the  
NASSAU COUNTY FIRE COMMISSION  
HAZARDOUS MATERIALS COMMITTEE




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### Unresponsive Person in a Vehicle

Photo Sources: St. Lucie County (FL)

When a citizen calls 911 to request medical assistance for a person that is unconscious or "sleeping" inside of a vehicle, it is important to ask questions about the scene to determine if the incident is a possible chemical suicide. It is critical that the caller and citizens stay clear from the vehicle.

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## Emerging Threat

There have been several documented cases in the United States of the use of readily available household chemicals as a method to commit suicide that can expose responders to a significant health and safety risk.

The method involved mixing two readily available, household chemicals to produce a flammable, toxic gas. The resulting gas causes the victims to go unconscious and suffer heart failure.

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## Statistics

- Suicide by hydrogen sulfide exposure is a very popular method overseas
  - Originated in Japan
  - 2000 cases since 2007
- Plagued the U.S. since 2008
  - Info readily available on the Internet
    - 2008 – 3 incidents
    - 2009 – 9 incidents
    - 2010 – >30 incidents

Cases believed to be drastically underreported in U.S.



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## Scenario:

It's Sunday at 0630 hours, your agency responds to an unconscious person in a vehicle. You locate the car in the empty lot of a business. You approach the vehicle and see a male inside that appears to be unconscious. Wearing initial medical PPE (exam gloves), you find the doors locked and knock on the window. Receiving no response it's decided that you will force entry by breaking a window. Once this occurs a rush of warm air comes out of the vehicle and you smell a sharp odor.



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**Chemical Suicides – Emerging Trend**

- Pasadena, California: H<sub>2</sub>S -23 y.o. male in a car w/signs
- Pennsbury, Pennsylvania: H<sub>2</sub>S -male on a remote road w/sign
- Bloomington, Indiana: H<sub>2</sub>S –student in the closet of a sealed & barricaded room w/sign on door. Police smelling a chemical odor in the hallway evacuated hundreds of students for hours.
- Cayuga, California: H<sub>2</sub>S -22 y.o. male in a car w/signs
- Sugar Creek, Missouri: HCN -male in a car –4 FF to hospital

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- Kingston Township, Texas –an MVA into a tree as a result of a successful suicide while driving w/o signs –victim had mixed the chemicals while driving collision left a mustard-colored splash on the interior window
- Calumet City, Illinois: H<sub>2</sub>S-40 y.o. apartment –Jan 2011 «Close-call? PD enters despite indicators & signs
- Calumet City, Illinois: Helium gas with an exit hood in a vehicle –June 2011 w/o signs
- Tinley Park, Illinois: CO produce by charcoal briquettes in a sealed room –September 2011 w/o signs

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**Hydrogen Sulfide Gas**

- Colorless gas – strong odor of rotten eggs or sulfur
- Commonly known as "Sewer Gas"
- Extremely toxic by inhalation
- Large risk to first responders without SCBA
- As little as one breath can cause death in 40-50 seconds
- Chemical formula is H<sub>2</sub>S
- IDLH = concentration of 100 ppm.
- Highly flammable with a wide flammable range of 4% - 44%





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## Hydrogen Sulfide Gas

- H<sub>2</sub>S is heavier than air (VD 1.19)
- Vapors may be knocked down with water vapor
- Runoff is toxic and corrosive
- Acute exposure may require victim decontamination
  - Remove clothing
  - Double bag clothing and belongings
- A diagnostic clue to extreme H<sub>2</sub>S exposure is the discoloration of copper coins in the location of the victim (turn black)

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## The Process

- Involves mixing of a sulfur based material (most commonly "Bonide ®) with hydrochloric acid (Muriatic Acid). Both easily obtainable.
- Results in chemical reaction that releases large quantities of hydrogen sulfide gas (H<sub>2</sub>S)
- ½ cup (120mL) of each product will produce 1000ppm inside a vehicle cabin or confined space (3500 cubic feet)
- Victim quickly rendered unconscious and will subsequently succumb to the exposure


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## Physiological Effects

- Rapidly interrupts aerobic metabolism at the cellular level. Results in rapid unconsciousness and respiratory arrest
- Prognosis of a sufficient exposure is poor
- At low doses H<sub>2</sub>S results in profound CNS effects and altered LOC
- As the dose increases, patient will rapidly lapse into unconsciousness, respiratory arrest, seizures, coma and death

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- *Symptoms associated with hydrogen sulfide exposure include, but are not limited to:*
- **Tachycardia:** abnormally rapid beating of the heart, usually over 100 beats per minute
- **Bradycardia:** slowness of the heartbeat, usually under 60 beats per minute
- **Dyspnea:** difficult, labored breathing
- **Tachypnea:** excessively rapid respiration
- **Cyanosis:** blueness or lividness of the skin, as from imperfectly oxygenated blood
- **Delirium:** a state of violent excitement or emotion
- **Photophobia:** abnormal sensitivity or intolerance of light
- **Chemical Conjunctivitis:** inflammation of the conjunctiva (mucous membrane that covers the exposed portion of the eyeball and the under surface of the eyelid) caused by exposure to chemicals.
- **Headache**
- **Throat Irritation**
- **Taste of garlic in the mouth**

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## Physiological Effects



Cyanide Antidote Kit

- The effects of H<sub>2</sub>S are the same as cyanide poisoning
  - Treatment is similar if antidotes are **RAPIDLY** available
    - Amyl nitrate and sodium nitrate

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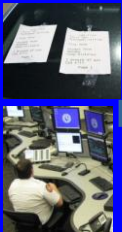
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## Response to Chemical Suicides

- **Awareness**
- These situations commonly occur in:
  - Vehicles
  - Residential bathrooms/dorm rooms
  - Other small spaces where a small amount of gas can quickly reach lethal concentrations
- Dispatchers and call takers should warn callers not to approach, or enter vehicles, rooms or apartments where unresponsive people may have committed chemical suicide




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## Response to Chemical Suicides

- Air sampling equipment can be used to determine the presence, or absence of hydrogen sulfide or hydrogen cyanide
- A small hole may be punched in a car or home window, or a probe, or colorimetric tube inserted in the gap between a door to the room and the floor.
- A hydrocyanic acid tube will detect hydrogen cyanide.

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## Warning Signs

- Apparent unconscious patient located in a locked car or a small enclosed area
- Presence of a large container (e.g. 5 gallon bucket)
- Pungent odor (rotten eggs)
  - Not a reliable indicator due to olfactory paralysis
- Smaller containers (i.e. acid bottles, sulfur compounds)

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## Warning Signs

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## Responder Safety

- First responders can be the first exposed to this hazard.
- Typically, persons committing this act have left hazardous warning signs displayed to anyone approaching the scene.
- This is not always the case.**



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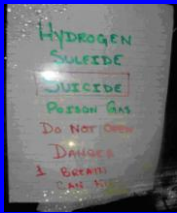
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## Warning Signs



- Some internet outlets encourage posting signs on doors & windows warning responders
- DON'T RELY ON IT BEING THERE**



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## Warnings/Indicators: Vehicle

- Suicide note visible or posted.
- One or more posted "warning signs".
- Buckets, pails, pots or coolers in the vehicle containing a variety of chemicals.
- Empty containers of chemicals in or around the vehicle.
- Smell of rotten eggs or unusual odors.

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## Warnings/Indicators for Structures

- Any exterior visual signs as you approach the residence or apartment.
- "Warning Signs" posted on the front of the house or apartment. Doors may taped or sealed from the inside.
- Other persons from inside the location complaining of difficulty breathing.
- The smell of rotten eggs or other unusual odors in the area that gets stronger as you approach the location.
- Be prepared to evacuate the residence or apartment building.

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## Dispatch Considerations

- Dispatchers and call takers should warn callers not to approach, or enter, vehicles, or rooms where unresponsive people may have attempted chemical suicide.
- The caller may say there are warning signs on the vehicle or location but may not volunteer this information.

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## Dispatch Considerations

- "Warning signs" may be removed, become detached or dislodged, or blow away before responders arrive on scene.
- The caller may not say anything about a strange or unusual smells unless prompted when they call 911.
- Proper initial questioning may yield information vital to the safety of the first responders.
- The information must be immediately passed on to the first responders by the 911 personnel.

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**First On-Scene**

- A chemical assisted suicide becomes an emergency response and a crime scene at the time it is discovered.
- The Public Safety Official who discovers a chemical assisted suicide is considered the "first on-scene"
- This incident is to be considered a CRIME SCENE and should be treated as such!

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**Treatment**

- If victim deemed a potential patient, initial treatment would be supportive in nature
  - Double bag clothing and belongings
  - Decontaminate with copious amounts of water if the patient has been directly contaminated by the acid or sulfur
  - A, B, C's
  - Antidotes if available

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**Treatment**

- Rapid assessment and initial medical practices are a necessity
- High dose oxygen concentration shall be delivered to the patient as soon as practical. (This may be started during decontamination)
- The medical technician in charge shall notify Medical Control to contact the appropriate hospital as soon as practical and advise of the type of exposure and the number of patients involved

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**IMPORTANT**

Never transport a contaminated patient!!  
Remember, leave the contamination at the scene of the emergency, and NEVER take it with you to the hospital!!





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**EMS Scene Ops**  
Field Decon

- Clothing should be removed and double-bagged.
- Contaminated clothing and PPE should be laundered before being re-used.
- If alive, the victim should be immediately stripped and decontaminated with soap and water before being transported from the scene.




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**Field Decon**

- Responders must initially utilize emergency decon for rescue operations.
- Deceased victims should be covered by a sheet and may require decontamination.


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## Transportation

- Use of Body Bag is recommended if patient occupies same space as driver
- Pre-Planning should occur with ME, hospitals & transporting agencies on utilizing "open" vehicles such as official pickup truck
- Recontact Medical Control (on Med Channel assigned)
- Update on treatment provided and any other info received from Poison Control
- Obtain specific instructions regarding entering the hospital
- Protect patient compartment from contaminants
- Air transport is inappropriate for contaminated patients

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## Arriving at Hospital

- Await direction from hospital personnel before entering hospital
- Assist hospital personnel with patient decontamination and treatment as requested
- Arrange for personal decontamination




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## Mineola Incident

- Saturday May 28, 2011
- Pt. Off-Gassed in Winthrop ED
- ED Closed 5:15 PM to 9 PM
- Pt. Survived Attempt




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## Other Suicide Methods

- Cyanide – sodium cyanide & hydrogen cyanide
  - Bitter almond smell
  - Level A Suit
  - Flammable
- Inert Gasses – nitrogen, helium
- Toxins – carbon monoxide

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## Seaford Incident

- Thursday July 28, 2011




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### Fremont woman found dead in car in apparent suicide using hazardous chemicals

A woman died in an apparent suicide in the Central/Downtown neighborhood early Wednesday morning in a car that contained a poisonous substance -- a suicide method that first gained notoriety overseas four years ago,

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11-16-2011

The Southampton Hospital Emergency Department entrance was shut down for several hours early Wednesday morning as hazardous materials crews responded when a man attempted to commit suicide by mixing dangerous chemicals in his car, parked at the ER entrance, to create deadly fumes

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Bridgehampton man, whom police did not identify, created a chemical fog in his closed Volkswagen convertible sometime before 3 a.m., according to Southampton Village Police Chief

"His goal was to commit suicide, but I guess at a certain point he changed his mind and pulled up to the ER and walked in," the chief said, noting that both the emergency entrance on Lewis Street and the man's car were contaminated.

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The chemicals appear to have been sulfuric acid and muriatic acid—the latter a chemical used to clean bricks and Gunite

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## Hydrogen Cyanide

- Colorless gas, or bluish-white liquid with smell of bitter or burnt almonds
- Chemical formula is HCN
- Extremely toxic by inhalation and/or skin contact
  - Concentrations as low as 270 ppm can cause death in 6-8 minutes
- Made by mixing cyanide containing compounds with acids

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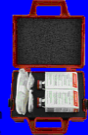
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## Hydrogen Cyanide

- HCN is lighter than air (VD 0.94)
  - Vapors can be knocked down with water vapor
    - Runoff should be contained if possible
- High concentrations (>270ppm) can cause LOC/death
- Exposure to HCN will require victim decontamination
  - Remove clothing, shower with water 3-5 minutes
  - Double bag clothing and belongings
- USE OF BODY BAGS IS RECOMMENDED FOR TRANSPORT ONLY
  - Seek guidance from Medical Examiner




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## Hydrogen Cyanide

- Totally encapsulated chemical protective (TECP) clothing with self contained breathing apparatus is recommended
- Cutaneous absorption must be avoided
  - Readily absorbed through intact skin
  - May cause systemic poisoning with little or no skin irritation




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## Patient Decontamination

**NASSAU COUNTY FIRE COMMISSION  
HAZARDOUS MATERIALS COMMITTEE**

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## REMSCO ADVISORY

**Nassau Regional Emergency Medical Services  
Council**

Advisory	Patient Decontamination	11-08-2
		Issue#: 8/18/2011

All agencies are reminded that patients that are contaminated with any hazardous substance (gases, chemicals, etc.) must be decontaminated, as best as possible, before they are brought into a hospital Emergency Department. At a minimum, all contaminated clothing must be removed and tagged.

An ambulance crew member should alert the ED staff and ascertain where the hospital's decontamination area is and have the patient brought there.

It should be noted that rushing a contaminated patient into the ED will not insure prompt treatment for the patient, in fact just the opposite is true and may result in the evacuation of all patients and staff and necessitate the closing and decontamination of the ED.

Scott Glazer  
Chairman  
Nassau Regional EMS Council

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## For More Information

Drew Fried  
drew.fried@gmail.com

- [www.colofirechiefs.org](http://www.colofirechiefs.org)
- [www.hazmatfc.com](http://www.hazmatfc.com)

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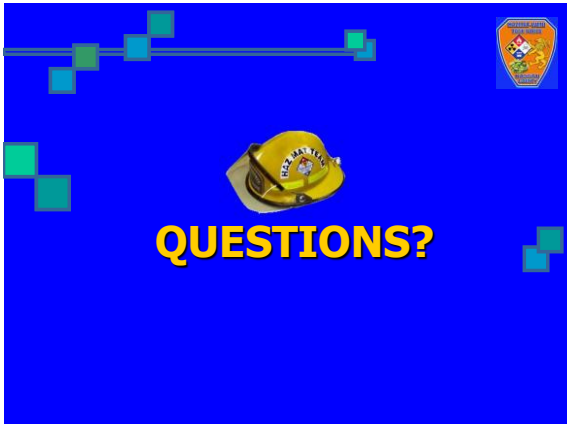
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