

Stanford University Hospital Preliminary Chemical Agent Response Protocol

Preparations

1. Contact the Hazmat Response Team.
2. Break out personal protection equipment, decon supplies, antidotes, etc.
3. Set up hot line (dedicated line. Plan on contacting County, State Health Departments, CDC and Army)
4. Hazmat team will
 - a. coordinate clearing and securing all areas which could become contaminated and secure hospital entrances and grounds.
 - b. Notify local emergency management authorities if needed.
 - c. If chemical is a military agent and Army has not been informed, call them.
5. If an organophosphate (nerve agent) is involved, notify hospital pharmacy that large amounts of atropine and 2-PAM may be needed.

When victim arrives

(Note: A contaminated patient may present at an emergency room without prior warning.)

6. Does chemical hazard exist?

Known release/exposure (including late notification)

Liquid on victim's skin or clothing

Symptoms in victim, EMTs, others

Odor

Mustard gas – garlic, onion or mustard smell

Lewisite - geraniums

Phosgene – freshly cut grass or hay

Chlorine – chlorine odor

Cyanide – bitter almonds

YES: Go to 7.

NO: Handle victim routinely.

7. Hold victim outside until preparations are completed (don personal protective equipment to assist EMT's as necessary).

8. If patient is grossly contaminated (liquid on skin) OR if there is any suspicion of contamination, decontaminate patient before entry into building.

Decontamination (coordinated by Hazmat Team):

provide adequate ventilation and oxygenation

Removal of all exposed clothing – double bag

Extensive water wash in shower (5 minutes for low suspicion or vapor exposure, 10 minutes for liquid or powder exposure). Liquid detergent (Joy) should be applied as well.

Once patient has been decontaminated, there is little risk of injury to HCP's

Note for patients with C-spine precautions or unconscious patients, Hazmat Team will require physician supervision – physicians will need to don Level C PPE and assist with these patients.

Initial Treatment and Identification of the Chemical Agent

1. Establish airway if necessary.
2. Give artificial respiration if not breathing.
3. Control bleeding if hemorrhaging.
4. Symptoms of cholinesterase poisoning?
 - Pinpoint pupils
 - Difficulty breathing (wheezing, gasping, etc)
 - Local or generalized sweating
 - Fasciculations
 - Copious secretions
 - Nausea, vomiting, diarrhea
 - Convulsions
 - Coma

YES: Go to NERVE AGENT PROTOCOL
5. History of chlorine poisoning?

YES: Go to CHLORINE PROTOCOL.
6. Burns that began within minutes of poisoning?

YES: Go to 7.

NO: Go to 8.
7. Thermal burn?

YES: Go to 9.

NO: Go to LEWISITE PROTOCOL
8. Burns or eye irritation beginning 2-12 hours after exposure?

YES: Go to MUSTARD PROTOCOL.

NO: Go to 9.
9. Is phosgene exposure possible?
 - Known exposure to phosgene
 - Known exposure to hot chlorinated hydrocarbons
 - Respiratory discomfort beginning a few hours after exposure

YES: Go to PHOSGENE PROTOCOL.
10. Is cyanide exposure possible?
 - Known exposure to cyanide
 - Smell of bitter almonds (only 50% can detect cyanide by odor)

YES: Go to CYANIDE PROTOCOL
11. Check other possible chemical exposures:
 - Known exposure
 - Decreased level of consciousness without head trauma.
 - Odor on clothes or breath
 - Specific signs or symptoms

NERVE AGENT PROTOCOL

1. Severe respiratory distress?
YES: Intubate and ventilate
ATROPINE
Adults: 6 mg IM or IV
Inf/ped: 0.05 mg/kg IV
2-PAM C1
Adults: 600-1000 mg IM or slow IV
Inf/ped: 15 mg/kg slow IV
2. Major secondary symptoms?
NO: Go to 6.
YES: ATROPINE
Adults: 4 mg IM or IV
Inf/ped: 0.02 - 0.05 mg/kg IV
2-PAM C1
Adults: 600-1000 mg IM or slow IV
Inf/ped: 15 mg/kg
OPEN IV LINE
3. Repeat atropine as needed until secretions decrease and breathing easier
Adults: 2 mg IV or IM
Inf/ped: 0.02 - 0.05 mg/kg IV
4. Repeat 2-PAM C1 as needed
Adults: 1.0 gm IV over 20-30 min Repeat q 1h x 3 prn
Inf/ped: 15 mg/kg slow IV
5. Convulsions?
NO: Go to 6.
YES: DIAZEPAM 10 mg slow IV
Inf/ped: 0.2 mg/kg IV
6. Reevaluate q 3-5 min.
IF SIGNS WORSEN, repeat from 3.

CHLORINE PROTOCOL

1. Dyspnea?
Try bronchodilators
Admit
Oxygen by mask
Chest X-ray
2. Treat other problems and reevaluate (consider phosgene).
3. Respiratory system OK?
YES: Go to 5.
4. Is phosgene poisoning possible?
YES: Go to PHOSGENE PROTOCOL.
5. Give supportive therapy; treat other problems or discharge.

LEWISITE PROTOCOL

1. Survey extent of injury.
2. Treat affected skin with British Anti-Lewisite (BAL) ointment (if available).
3. Treat affected eyes with BAL ophthalmic ointment (if available).
4. Treat pulmonary/severe effects
BAL in oil, 0.5 ml/25 lbs body wt. deep IM to max of 4.0 ml. Repeat q 4 h x 3
(at 4, 8, and 12 hours). Morphine prn
5. Severe poisoning?
YES: Shorten interval for BAL injections to q 2 h.

MUSTARD PROTOCOL

1. Airway obstruction?
YES: Tracheostomy
2. If there are large burns:
Establish IV line - do not push fluids as for thermal burns.
Drain vesicles - unroof large blisters and irrigate area with tropical antibiotics.
3. Treat other symptoms appropriately:
Antibiotic eye ointment/Sterile precautions prn/morphine prn

PHOSGENE PROTOCOL

1. Restrict fluids, chest x-ray, blood gases
Results consistent with phosgene poisoning?
YES: Go to # 4
2. Dyspnea?
YES: OXYGEN, positive end-expiratory pressure
3. Observe closely for at least 6 hours.
IF SEVERE DYSPNEA develops, go to 4.
IF MILD DYSPNEA develops after several hours, go to 1.
4. Severe dyspnea develops or x-ray or blood gases consistent with phosgene poisoning-
Admit/Oxygen under positive end-expiratory pressure/Restrict fluids/Chest x-ray/
Blood gases/Seriously ill list

Cyanide protocol

1. Immediate casualty (within minutes of exposure) with apnea and/or convulsions?
YES
300 mg of sodium nitrite injected IV over 2-4-min.
followed by 12.5 gm Sodium thiosulfate injected IV.
2. Minimal casualty (mild symptoms - dizziness, nausea, vomiting, headache)
YES
Consider treatment for immediate casualty – may alleviate symptoms
Once removed from cyanide source, progression of symptoms unlikely
Generally, a casualty who has had inhalation exposure and survives long enough
to reach medical care will need little care.

Drugs (nerve agents)

Atropine (up to 50 mg/24 hr/patient)
Pralidoxime chloride (1-2 gm/patient)
Scopolamine (2 mg/24 hr/patient)
Benzodiazepines (sedation, seizure control)
Meperidine and morphine (pain management)

Cyanide

300 mg sodium nitrite/patient
12.5 gm sodium thiosulfate/patient

Send samples to the CDC.

No personal identifiers, but they must have unique identifiers.

urine samples: at least 20 mL. Use screw-capped plastic container.

serum samples: the yield from two 10-mL no-anticoagulant (U.S. color code red-top) tubes in plastic screw-capped vials. **Do not use SST tubes.**

whole blood: one 5-mL or 7-mL NaOxalate/NaF anticoagulated tube (U.S. color code gray-top) or one 5-mL or 7-mL heparinized tube (U.S. color code green-top) **unopened**, plus an empty tube to check as a blank.

Secure specimens in cardboard vial storage boxes or Styrofoam-molded tube holders and enclose in large, zipper locking, plastic bags. Place in a Styrofoam-insulated shipper, and surround with absorbent material for cushioning. Ship **refrigerated** using Acool-packs, *not dry ice*. Enclose list with information about specimens and contact person. Each sample container top must be wrapped with waterproof, tamper-proof security tape (available from FBI/Police supply stores).

All samples sent to CDC for chemical analysis should be shipped to this address:

CDC DASH
ATTN: Dr. Richard Meyer
1600 Clifton Road
Atlanta, GA 30333

Helpful Sources

<http://www.cdc.gov/nceh/demil/articles/initialtreat.htm>

http://ccc.apgea.army.mil/products/textbook/HTML_Restricted/contents.htm

<http://www.fas.org/nuke/guide/usa/doctrine/army/mmcch/>

American College of Emergency Physicians

Disaster Response and Biological and Chemical Terrorism Information Packet