CHEMICAL TERRORISM GENERAL GUIDANCE* Pocket Guide

Diagnosis: Be alert to following

- Groups of individuals becoming ill around the same time
- Any sudden increase in illness in previously healthy individuals
- Any sudden increase in the following non-specific syndromes
  - Sudden unexplained weakness in previously healthy individuals
  - Hypersecretion syndromes (like drooling, tearing, and diarrhea)
  - Inhalation syndromes (eye, nose, throat, chest irritation; shortness of breath)
  - Skin-burn-like skin syndromes (redness, blistering, itching, sloughing)
- Unusual temporal or geographic clustering of illness (for example, patients who attended the same public event, live in the same part of town, etc.).

Understanding exposure

- Exposure may occur from vapor or liquid droplets and less likely contamination of food or water
- Chemical effects are dependent on:
  - volatility and amount of a chemical, which infuence exposure
  - water solubility (higher solubility leads to more mucosal and less deep lung deposition and toxicity)
  - increased fat solubility and smaller molecular size increase skin absorption

Continued on Back

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VA access card: http://www.oqp.med.va.gov/cpg/cpg.htm

DoD access card: http://www.cs.amedd.army.mil/qmo

Produced by the Employee Education System for the Office of Public Health and Environmental Hazards, Department of Veterans Affairs.

Confirmation of cases

- Contact your local poison control center
- Contact your local industrial hygienist or safety officer
- Department of Justice Domestic Preparedness National Response Hotline (800-424-8802)
- If you need further help in clinical diagnosis, call CDC hotline (770-488-7100)
- Review US Army Chemical Casualty Care handbook (http://ccc.apgea.army.mil)

Decontamination considerations

- Chemical warfare agents usually require removal of clothing and decontamination of the patient with soap and water
- Treating contaminated patients in the emergency department before decontamination may contaminate the facility

Institutional reporting

- If reasonable suspicion of chemical attack, contact your hospital leadership (Chief of Staff, Hospital Director, etc)
- Immediately discuss hospital emergency planning implications

Public Health Reporting

- Contact your local public health office (city, county, or State)
- If needed, contact the FBI(for location of nearest office, see http://www.fbi.gov/contact/fo/info.htm)

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CHEMICAL TERRORISM AGENTS AND SYNDROMES (INCLUDING BIOLOGIC TOXINS)

Agents	Onset of symptoms	Symptoms	Signs	Clinical Diagnostic Tests	Decon-tamination	Exposure route and treatment	Differential diagnostic considerations
Nerve agents	Vapor: seconds Liquid: minutes to hours	**Moderate exposure**: Diffuse muscle cramping, runny nose, difficulty breathing, eye pain, dimming of vision, sweating, **High exposure**: The above plus sudden loss of consciousness, flaccid paralysis, seizures	Pinpoint pupils (miosis) Hyper-salivation Diarrhea Seizures	Red blood cell or serum cholinesterase (whole blood) **Treat for signs and symptoms; lab tests only for later confirmation** Collect urine for confirmation and dose estimation	Rapid disrobing, Water wash with soap and shampoo	**Inhalation & dermal absorption** Atropine (2mg) iv or im 2-PAMCl 600mg injection or 1.0 g infusion over 20-30 minutes Additional doses of atropine and 2-PAMCl depending on severity, Diazepan or lorazepam to prevent seizures if >4 mg atropine given Ventilation support	Pesticide poisoning from organophosphorous agents and carbamates cause virtually identical syndromes
Cyanide	Seconds to minutes	**Moderate exposure:** Dizziness, nausea, headache, eye irritation **High exposure**: Loss of consciousness	**Moderate exposure:** non-specific findings **High exposure**: convulsions, cessation of respiration	Cyanide (blood) or thiocyanate (blood or urine) levels in lab **Treat for signs and symptoms; lab tests only for later confirmation**	Clothing removal	**Inhalation & dermal absorption** Oxygen (face mask) Amyl nitrite Sodium nitrite (300mg IV) and sodium thiosulfate (12.5g IV)	Similar CNS illness results from: Carbon monoxide (from gas or diesel engine exhaust fumes in closed spaces) H_2S (sewer, waste, industrial sources)
Blister Agents	12-72 hours Range: 2 minutes – 8 days	Burning, itching, or red skin Mucosal irritation (prominent tearing, and burning and redness of eyes) Shortness of breath Nausea and vomiting	Skin erythema Blistering Upper airways sloughing Pulmonary edema Diffuse metabolic failure	Often smell of garlic, horseradish, and mustard on body Oily droplets on skin from ambient sources No specific diagnostic tests	Clothing removal Large amounts of water	**Inhalation &, dermal absorption** Thermal burn type treatment Supportive care For Lewisite and Lewisite/Mustard mixtures: British Anti-Lewisite (BAL or Dimercaprol)	Diffuse skin exposure with irritants, such as caustics, sodium hydroxides, ammonia, etc., may cause similar syndromes. Sodium hydroxide (NaOH) from trucking accidents
Pulmonary agents (phosgene etc.)	1 – 24 (rarely up to 72) hours	Shortness of breath Chest tightness Wheezing Mucosal and dermal irritation and redness	Pulmonary edema with some mucosal irritation (more water solubility = more mucosal irritation)	No tests available but source assessment may help identify exposure characteristics (majority of trucking incidents generating exposures to humans have labels on vehicle)	None usually needed	**Inhalation** Supportive care Specific treatment depends on agents	Inhalation exposures are the single most common form of industrial agent exposure (eg: HCl, Cl_2, NH_3) Mucosal irritation, airways reactions, and deep lung effects depend on the specific agent, especially water-solubility
Ricin (castor bean toxin)	18 – 24 hours	**Ingestion:** Nausea, diarrhea, vomiting, fever, abdominal pain **Inhalation:**, chest tightness, coughing, weakness, nausea, fever	Clusters of acute lung or GI injury; circulatory collapse and shock	ELISA (from commercial laboratories) using respiratory secretions, serum, and direct tissue	Clothing removal Water rinse	**Inhalation & Ingestion** Supportive care For ingestion: charcoal lavage	Tularemia, plague, and Q fever may cause similar syndromes, as may CW agents such as Stapylococcal enterotoxin B and phosgene
T-2 mycotoxin	2-4 hours	Dermal & mucosal irritation; blistering, necrosis Blurred vision, eye irritation Nausea, vomiting, and diarrhea	Mucosal erythema and hemorrhage Red skin, blistering Tearing, salivation	ELISA from commercial laboratories Gas chromatography/Mass spectroscopy in specialized	Clothing removal Water rinse	**Inhalation & dermal contact** Supportive care For ingestion: charcoal lavage	Pulmonary toxins (O_3, NO_x, phosgene, NH_3) may cause similar syndromes though with less mucosal irritation.

Confirmation and technical support

- Alert local diagnostic laboratory
- To confirm cases, contact in-house or consulting infectious disease specialist
- Department of Justice Domestic Preparedness National Response Hotline (800-424-8802)
- If you need further help in clinical diagnosis, call CDC hotline (770-488-7100)
- Refer to the Army Handbook of Medical Management of Biological Casualties (http://www.nbc-med.org/others/).

Decontamination considerations

- Decontamination of patients usually not required for biological agents
- Clothing removal & biosafety bagging is recommended
- Handle equipment used according to standard infection control practices (see infection control practitioner or APIC website at www.APIC.org).

Institutional reporting

- If reasonable suspicion of biological warfare agent exposure, contact hospital leadership (Chief of Staff, Hospital Director, etc)
- Immediately discuss hospital emergency planning implications

Public Health Reporting

- Contact local public health office
- If unable to reach local public health officer, contact CDC: 770-488-7100
- If needed, contact the FBI (for location of nearest office, see http://www.fbi.gov/contact/fo/info.htm)

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BIOLOGICAL TERRORISM GENERAL GUIDANCE Pocket Guide

Diagnosis: Be alert to the following --

- Groups of individuals becoming ill around the same time
- Sudden increase of illness in previously healthy individuals
- Sudden increase in the following non-specific illnesses:
  - Pneumonia, flu-like illness, or fever with atypical features
  - Bleeding disorders
  - Unexplained rashes, and mucosal or dermal irritation
  - Neuromuscular illness
- Simultaneous disease outbreaks in human and animal populations
- Unusual temporal or geographic clustering of illness (for example, patients who attended the same public event, live in the same part of town, etc.).

Continued on Back

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Some Potential Biological Warfare Agents

Disease	Incubation	Symptoms	Signs	Diagnostic tests	Transmission and Precautions	Treatment (Adult dosage)	Prophylaxis
Inhaled Anthrax	2-6 days Range: 2 days to 8 weeks	Flu-like symptoms Respiratory distress (*Cutaneous Anthrax: Initial itching papule, then 1-3 cm painless ulcer, then necrotic center; fever)	Widened mediastinum on chest X-ray (from adenopathy) Atypical pneumonia Flu-like illness followed by abrupt onset of respiratory failure	Gram stain ("boxcar" shape) Gram positive bacilli in blood culture ELISA for toxin antibodies to help confirm	Aerosol inhalation *No person-to-person transmission* Standard precautions	Mechanical ventilation Antibiotic therapy Ciprofloxacin 400 mg iv q 8-12 h Doxycycline 200 mg iv initial, then 100 mg iv q 8-12 h Penicillin 2 mil units iv q 2 h -- possibly add gentamicin	Ciprofloxacin 500 mg or Doxycycline 100 mg po q 12 h ~ 8 weeks (shorter with anthrax vaccine) Amoxicillin in pregnancy and children Vaccine if available
Botulism	12-72 hours Range: 2 hrs – 8 days	Difficulty swallowing or speaking (symmetrical cranial neuropathies) Symmetric descending weakness Respiratory dysfunction No sensory dysfunction No fever	Dilated or un-reactive pupils Drooping eyelids (ptosis) Double vision (diplopia) Slurred speech (dysarthria) Descending flaccid paralysis Intact mental state	Mouse bioassay in public health laboratories (5 – 7 days to conduct) ELISA for toxin	Aerosol inhalation Food ingestion *No person-to-person transmission* Standard precautions	Mechanical ventilation Parenteral nutrition Trivalent botulinum antitoxin available from State Health Departments and CDC	Experimental vaccine has been used in laboratory workers
Plague	1-3 days by inhalation	Sudden onset of fever, chills, headache, myalgia **Pneumonic:** cough, chest pain, hemoptysis **Bubonic**: painful lymph nodes	**Pneumonic:** Hemoptysis; radiographic pneumonia -- patchy, cavities, confluent consolidation **Bubonic:** typically painful, enlarged lymph nodes in groin, axilla, and neck	Gram negative coccobacilli and bacilli in sputum, blood, CSF, or bubo aspirates (bipolar, closed "safety pin" shape on Wright, Wayson's stains) ELISA, DFA, PCR	*Person-to-person transmission in pneumonic forms* Droplet precautions until patient treated for at least three days	Streptomycin 30 mg/kg/day in two divided doses x 10 days Gentamicin 1-1.75 mg/kg iv/im q 8 h Tetracycline 2-4 g per day	Asymptomatic contacts or potentially exposed Doxycycline 100 mg po q 12 h Ciprofloxacin 500 mg po q 12 h Tetracycline 250 mg po q 6 h all x 7 days Vaccine production discontinued
Tularemia "pneumonic"	2-5 days Range: 1-21 days	Fever, cough, chest tightness, pleuritic pain Hemoptysis rare	Community-acquired, atypical pneumonia Radiographic: bilateral patchy pneumonia with hilar adenopathy (pleural effusions like TB) Diffuse, varied skin rash May be rapidly fatal	Gram negative bacilli in blood culture on BYCE (Legionella) cysteine- or S-H-enhanced media Serologic testing to confirm: ELISA, microhemagglutination DFA for sputum or local discharge	Inhalation of agents *No person-to-person transmission but laboratory personnel at risk* Standard precautions	Streptomycin 30 mg/kg/day IM divided q 12 h for 10-14 days Gentamicin 3-5 mg/kg/day iv in equal divided shoulders x 10-14 days Ciprofloxacin possibly effective 400 mg iv q 12 h (change to po after clinical improvement) x 10-14 days	Ciprofloxacin 500 mg po q 12 h Doxycycline 100 mg po q 12 h Tetracycline 250 mg po q 6 h All x 2 wks Experimental live vaccine
Smallpox	12-14 days Range:7-17 days	High fever and myalgia; itching; abdominal pain; delirium Rash on face, extremities, hands, feet; confused with chickenpox which has less uniform rash	Maculopapular then vesicular rash -- first on extremities (face, arms, palms, soles, oral mucosa) Rash is synchronous on various segments of the body	Electron microscopy of pustule content PCR Public health lab for confirmation	*Person-to-person transmission* Airborne precautions Negative pressure Clothing and surface decontamination	Supportive care Vaccinate care givers	Vaccination (vaccine available from CDC)

Source: Department of Verterans Affairs, Washington, DC.