CHEMICAL TERRORISM PREPAREDNESS, An Overview:

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CDC

Disclaimers & Instructions:

1. These are only guidelines passed down to the SPHLs from the CDC- they are adaptable.
2. We are not SMEs (Subject Matter Experts)- but we ARE the persons to find out the questions to all your answers and to help you in an "event"
3. This is only the first step- in-depth on-site training will occur at a later time

Please hold your questions until the end of each talk

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Objectives:

1. List Agents that could be used in a Chemical Terrorism Event
2. Briefly Review the History of Chemical Warfare
3. Understand what is happening on the National Level to prepare for an Event
4. Know what is happening in Nebraska and at the NPHL to prepare for an Event

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What is Known

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Chemical Agents

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5 Classes of Chemical Agents:
(NATO Codes)

- Lung Damaging Agents (Pulmonary Agents)
  - Chlorine (CL), Phosgene (CG)
- Blood Agents
  - Hydrogen Cyanide (AC), Cyanogen Chloride (CK)
- Blister Agents (Vesicants)
  - Mustard (H), Lewisite (L)
- Nerve Agents (Anticholinesterases)
  - Tabun (GA), Sarin (GB), Soman (GD), VX
- Vomiting Gases
  - Adamsite (DM)

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Toxic Industrial Chemicals:

- More than 6 million chemicals
  - 1.5 million thought to be made more than once
  - 86,100 for sale or in use (EPA)
- Learn from past accidents
  - Seveso, Italy (Dioxin-Toxin Chlorinated Compound), 1976
  - Bhopal, India (Methyl Isocyanate-Pesticide),1984
  - HAZMAT experiences
- Wide variety of sources
  - Chemical plants, petroleum storage sites, university and medical labs, transport vehicles

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Toxic Industrial Chemicals/Materials (TICs/TIMs):

- Flammables: gasoline, propane, acetylene
- Explosives: ammonium nitrate, TNT
- Metabolics: cyanide, dinitrophenol, fluoroacetate, carbon monoxide, arsine, diborane
- Pressurized gases: chlorine, ammonia, phosgene
- Corrosives (oxidants, acids, bases): chromates, nitric acid, hydrofluoric acid
- Pesticides: Organophosphates and precursors (dimethyl methylphosphate, phosphorus oxychloride), metal phosphides

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Lung Damaging Agents: (Pulmonary Agents)

- **Chlorine** (CL)
  - US Industry, >14 million tons produced in 1998
    - Bleaching, plastics and synthetics manufacturing, solvents, disinfection
    - 2x heavier than air
- **Phosgene** (CG)
  - Sources
    - Manufacturing of dyes, resins, and pesticides
    - Produced when chlorinated solvents are burned or by welding metal cleaned with chlorinated solvents
- Gases at STP
  - Heavier than air
- Exposure Effects
  - Metabolic Acidosis
  - Pulmonary Edema
  - Respiratory Distress Syndrome
  - Lacrimation
  - Dermal Burns
- Treatment - Supportive

Blood Agents:

- Hydrogen Cyanide (AC) and Cyanogen Chloride (CK)
  - US Industry, >300 tons per year
    - Electroplating, gold and silver extraction, pest fumigation
    - Generated in fires of wool, nylon, polyurethane
  - Carried by Blood
  - Gas at STP, lighter than air
  - Mechanism
    - Blocks cell utilization of oxygen
    - Asphyxiates the victim at the cellular level
    - Oxygen rich "cherry red" blood
  - Treatment
    - Amyl nitrate (inhalation) or sodium nitrite (IV) for met-hemoglobin formation
      - Cyanide has higher affinity for met-hemoglobin
    - Sodium thiosulfate removes cyanide

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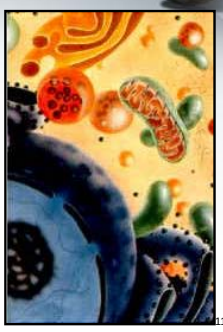
Blood Agents:

- **Hydrogen Cyanide** (AC)
- **Cyanogen Chloride** (CK)
  - Jonestown suicides, 1978
    913 deaths: Rev. Jim Jones
  - tainted Tylenol, Chicago 1982
    7 deaths
  - Bhopal India, 1984 ~2,000 casualties
    100,000 injuries
  - Dr. Chaos, Chicago Subway 2002
  - London, England 2002
  - New Zealand, 2003



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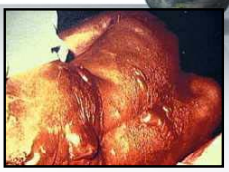
Blister Agents (Vesicants):

Oily liquids-

- Sulfur Mustard (H,HD)
- Nitrogen Mustard (HN_1, HN_2, HN_3)
- Lewisite = (L), Arsenic compound
- Mustard / Lewisite mixtures (HL,HT,TL)
- Phosgene oxime (CX)



Iranian soldier after exposure

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Nerve Agents:
(Anticholinesterases)

- Tabun (GA), Sarin (GB), Soman (GD), Cyclohexhyl Sarin (GF) and VX
  - Very similar structurally except VX
  - All liquids at STP
  - Mechanism
    - Inhibits breakdown of acetylcholine (neurotransmitter) by the enzyme, acetylcholinesterase, in the synaptic cleft
    - Causes massive cholinergic crisis
    - DUMBELS (**D**iarrhea, **U**rination, **M**iosis, **B**ronchoconstriction, **E**mesis, **L**acrimation, **S**alivation)
  - Treatment
    - Atropine (blocks excess acetylcholine), Oxime (removes nerve agent), and Diazepam (anticonvulsant)

3x lethal dose

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Chemical Warfare:
-Examples-

- Pitch and sulfur smoke used by allies of Sparta against Athenians in 423 BC
- "Mad honey" used by Mithridates' allies to poison Pompey's army
- Mustard gas, chlorine, and phosgene used in W W I. Caused many casualties
- Mustard gas used by Iraq against Iran in 1988, against Kurds in 1990's

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Chemical Terrorism:
-Examples-

- Cyanide, Mass Suicide of followers of Rev. Jim Jones in Jonestown, Guyana, 1978
- Cyanide Adulterated Tylenol (Chicago), 1982
- Cyanide, Dr. Chaos "Anarchist" (Hidden in Chicago's Transit System), November 22, 2002
- Adamsite, Powder mailed to Saudi Arabian Embassy, Brussels, Belgium, June 4, 2003
- **Sarin used in Tokyo subway attack 1995**
  - **11 killed; 200-300 w/ documented exposure**
  - **5500 wanted testing performed**

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Chemical Terrorism Concerns

What do we need to prepare for?

Chemical Warfare

vs.

Chemical Terrorism

vs.

Chemical Accident

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Homeland Security Authorities Fear Chemical Terrorism in U.S.

In recent months, federal and state homeland security officials have become increasingly concerned that terrorists and other groups might attempt to imitate the insurgents in Iraq and employ chlorine-bombs and other chemical weapons within the United States.

(World Politics Watch; 09May07; Richard Weitz)

Department of Homeland Security National Planning Scenarios

In their "National Planning Scenarios" , analysts at the Department of Homeland Security identified a dozen possible homeland security incidents the department views as most plausible or devastating. One scenario involved the hypothetical detonation of a large chlorine storage tank that killed 17,500 people and injured more than 100,000.

John Negroponte Statement

In late February 2007, then-Director of National Intelligence John Negroponte stated that U.S. "intelligence reporting indicates that nearly 40 terrorist organizations, insurgencies or cults have used, possessed, or expressed an interest in chemical, biological, radiological, or nuclear agents or weapons."

Annual FBI Threat Assessment

In the annual FBI threat assessment delivered to the Senate Select Committee on Intelligence in January 2007, Director Robert Mueller stated that the acquisition of WMD by terrorist groups "continues to be a growing concern." In Mueller's assessment, while terrorists may not currently possess the capabilities to produce the complex biological and chemical agents necessary to carry out a large-scale attack, "their capability will improve as they pursue enhancing their scientific knowledge base, including recruiting scientists to assist them."

In December 2008, the Commission released its World at Risk report with a unanimous threat assessment: Unless the world community acts decisively and with great urgency, **it is more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013……**There is direct evidence that terrorists are trying to acquire weapons of mass destruction and acquiring WMD fits the tactical profile of terrorists. Terrorists also have global reach and the organizational sophistication to obtain and use WMD….

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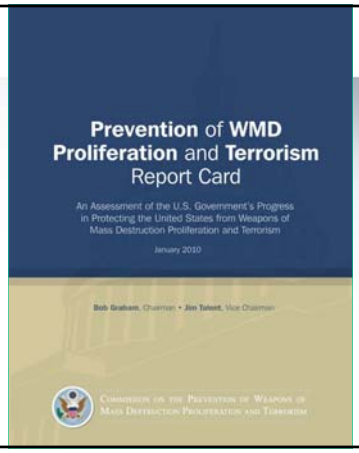

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Report: al Qaeda Dedicated to WMD Quest

Washington Post: New Report from Long-Time CIA Agent Warns Terror Group Patient, Persistent in Nuke Hunt

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But do we really need to worry about this in Nebraska or Iowa "….where there are only cows and Dairy Queens…."

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What is Known about Nebraska:

- "Largest and busiest railroad yard in US in North Platte"
- "Busiest railroad section in US found in Gibbon"
- "One of the only *coast to coast* interstates run through Nebraska"
- "More industrial chemicals are transported through Nebraska (via I-80 and the rail system) than any other state"

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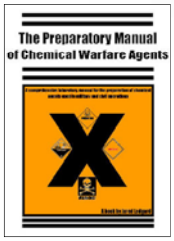
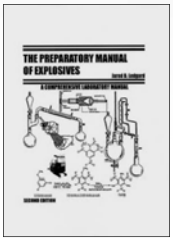
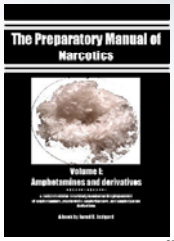
the PARANOIDPUBLICATIONS group







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"Omaha Traffic Accident Takes Toxic Turn"

OWH, 8/23/04

…identified the chemical as cyanuric chloride…

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Ricin Event: 2003

- "Fallen Angel" Ricin letter warned of D.C. wipeout

  –It was addressed to the White House and was discovered in early November at an offsite mail processing facility in Washington.

Ricin "locally"

- Meth lab raided outside of Hastings, NE
  - Note found with several bioterrorist agents listed
    - All crossed off as "too complicated" except Ricin

Hydrogen Cyanide Found In UNL Dorm Room

February 2, 2009 by natural
Filed under Incident Reports

Leave a Comment

One floor of the University of Nebraska-Lincoln's Pound Hall was evacuated and the rest of the dorm put on lockdown for an hour and a half Sunday evening after police discovered a potentially lethal hydrogen cyanide in a student's room.

Just after 6 p.m., UNL police responded to a 911 call alerting them of a possible overdose poisoning, according to Capt. Carl Ortmann.

The call came from a 19-year-old UNL student living on the second floor of Pound Hall who had ingested a small amount of the chemical. Ortmann wouldn't say exactly how much the student ingested or in what form, whether gas or liquid.

Within minutes of the 911 call, UNL police and the Lincoln Fire Department, including the department's hazardous materials unit, were on the scene. Officers evacuated Pound's second floor and put the rest of the dorm on lockdown, not wanting any student coming or going during a potentially dangerous situation, Ortmann said.

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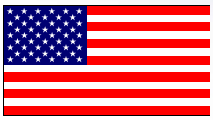
National Preparedness



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Laboratory Preparedness

LRN
LABORATORY RESPONSE NETWORK
PARTNERS IN PREPAREDNESS

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National Preparedness: Background

- In 1999, the CDC's National Center for Environmental Health (NCEH) was tasked with the following:
  - Analyzing clinical specimens from people with suspected exposure to chemicals from:
    - **A domestic terrorist event**
    - **A chemical accident**
    - **An unknown chemical exposure**
- CDC partnered with 5 states (CA, NM, NY, MI, VI) to develop surge testing capability under the Bioterrorism Cooperative Agreement, Focus Area D

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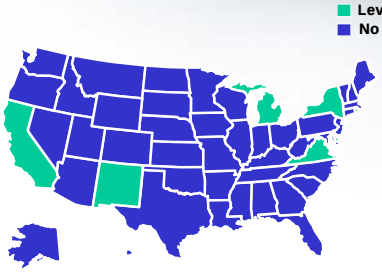
Chemical Lab Preparedness:

1999



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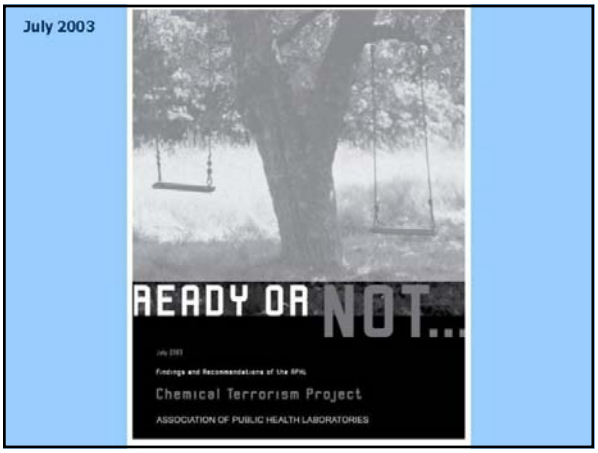

National Preparedness:

- **2003**, CDC funding facilitated the development of **62** Chemical Terrorism Preparedness Laboratories (CTPL's)- Mostly SPHLs
  - **16** Level-1 CTPL's
    - Sample collection, storage, and shipment
  - **41** Level-2 CTPL's including the NPHL
    - Level-1 activities plus
    - Analysis of samples for specific agents
  - **5** Level-3 CTPL's
    - Level-1 and Level-2 activities plus
    - Act as CDC's surge capacity for the analysis of specific agents
      - **California, Michigan, New Mexico, New York, Virginia**

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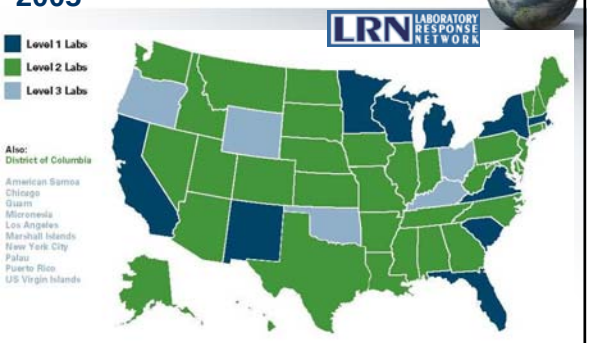
Chemical Lab Preparedness: 2005



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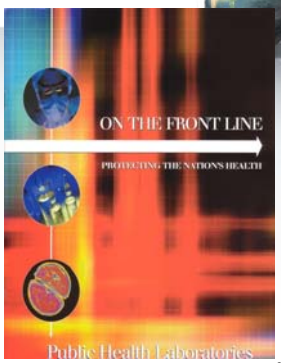
NPHL Specialized Sections:

- Biosecurity Lab:
  - Laboratory preparedness sections:
    - Biological (BT)
    - **Chemical (CT)**
    - Radiological (RAD)



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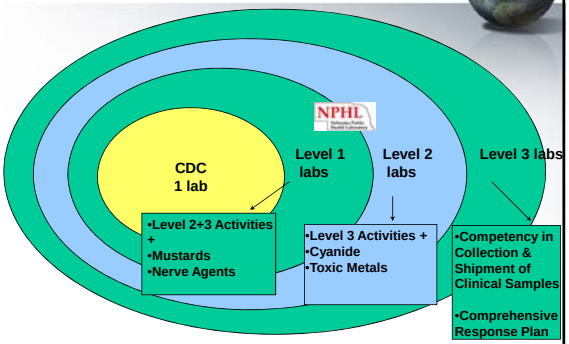
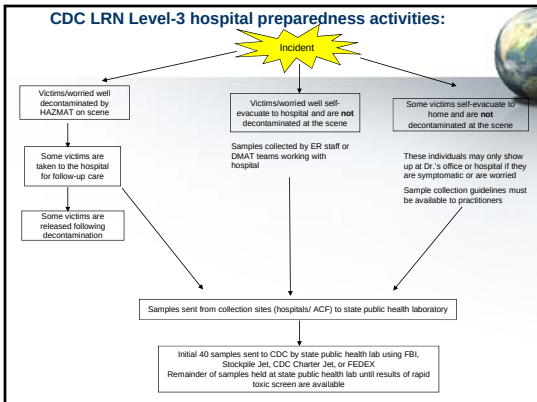
LRN Chemical Testing Capability:



CDC LRN Level-3 hospital preparedness activities:



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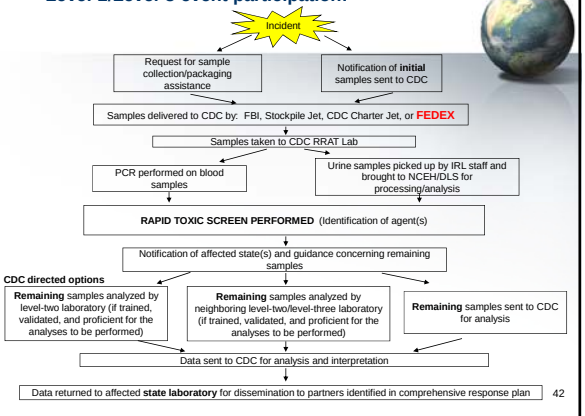
Level-2/Level-3 event participation:



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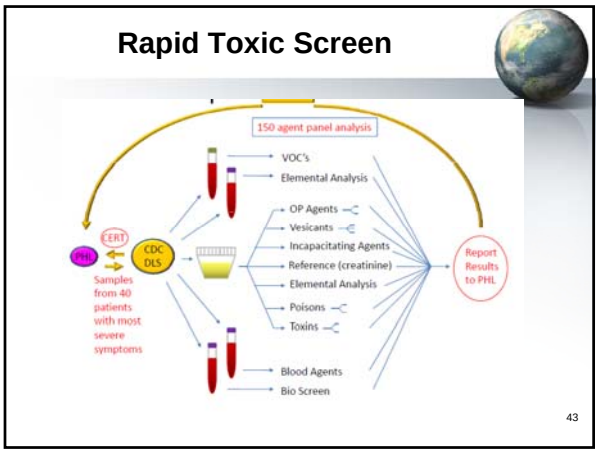
Rapid Toxic Screen
150 agent panel analysis
VOC's
Elemental Analysis
OP Agents
Vesicants
Incapacitating Agents
Reference (creatinine)
Elemental Analysis
Poisons
Toxins
Blood Agents
Bio Screen
EERT
PHL
CDC DLS
Samples from 40 patients with most severe symptoms
Report Results to PHL
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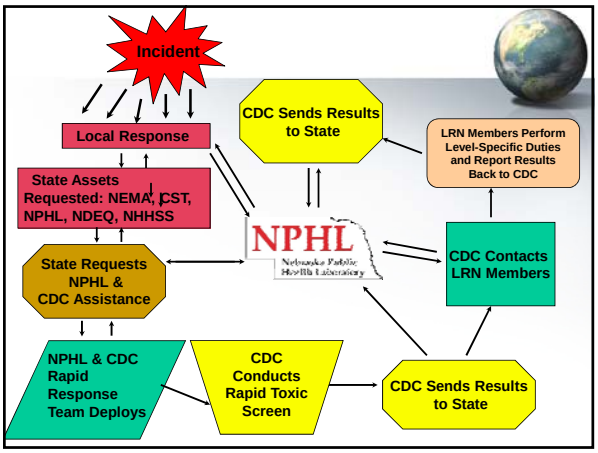
Incident
Local Response
CDC Sends Results to State
LRN Members Perform Level-Specific Duties and Report Results Back to CDC
State Assets Requested: NEMA, CST, NPHL, NDEQ, NHHSS
NPHL
Nebraska Public Health Laboratory
CDC Contacts LRN Members
State Requests NPHL & CDC Assistance
NPHL & CDC Rapid Response Team Deploys
CDC Conducts Rapid Toxic Screen
CDC Sends Results to State


NPHL
Nebraska Public Health Laboratory
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