Laboratory Response Network

Chemical Terrorism Program
Packaging and Shipping of Blood and Urine Samples

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A Wake Up Call...

Terrorist Attacks – September 11, 2001
Amerithrax Investigation – October 2001

But Even Before 2001...
• Sarin Gas Attack – Tokyo Subway in March 1995
• Aum Shinrikyo Cult ("Supreme Truth")
• Twelve People Were Killed and 5000 People Were Treated
Recent Toxin and Chemical Threats

White House: Syria crosses 'red line' with use of chemical weapons on its people

Toxin substance: ricin is found in LV hotel room

New poison letters put ricin under microscope

Clam Boat Canisters: Fisherman blistered, sickened after crew pulls aboard canisters of mustard agent off Long Island

Greatest Threats to Iowa

- Ricin
- Cyanide
- Chlorine
- Explosives – the other white powder

Photo of Castor Beans
Source: ncfpd.umn.edu

Photo of TATP
Source: www.aiexplosives.com

Chemical Laboratory Response Network

CDC

Level 1
10 Labs

Level 2
34 Labs

Level 3
9 Labs

SHL is a Level 2 Laboratory in the LRN-C
Description of LRN-C Laboratories

- 53 Laboratories participate in the LRN-C program
- Level 1 Labs
  - Function as surge capacity labs for the CDC
  - Can detect mustard agents, nerve agents, etc.
- Level 2 Labs
  - Analysis of clinical specimens for exposure to chemical agents
- Level 3 Labs
  - Sample collection, packaging, and shipping

Chemical Agents

CDC List

- Biotoxins
- Blister Agents/Vesicants
- Blood Agents
- Caustics (Acids)
- Choking/Lung
- Pulmonary Agents
- Incapacitating Agents
- Metals
- Nerve Agents
- Organic Solvents
- Riot Control Agents/Tear Gas
- Toxic Alcohols
- Vomiting Agents
- Metabolites in human tissue

Chemical Terrorism Poster
**CT Instruments**

- Sciex API 4000 Tandem Mass Spectrometer
- Agilent 1100 HPLC
- Agilent 7890/5973 GC/MS with Gerstel MPS2 Preparation Autosampler
- Biotage Rapid Freeze extraction system
- Agilent 7890/7000 GC/Triple Quad MS

**Level 2 Laboratory Methods**

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Test</th>
<th>Matrix</th>
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</thead>
<tbody>
<tr>
<td>LC/MS/MS</td>
<td>Organophosphate Nerve Agent Metabolites (OPNA)</td>
<td>Urine</td>
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<tr>
<td></td>
<td>Metabolites</td>
<td>Urine</td>
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<tr>
<td></td>
<td>Hydroxyaminophenylacetic acid (HPA)</td>
<td>Urine</td>
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<tr>
<td></td>
<td>Abrin/Ricinoc</td>
<td>Urine</td>
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<tr>
<td>GC/MS</td>
<td>Tetramethylenediaminetetramine</td>
<td>Urine</td>
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<tr>
<td></td>
<td>Volatile Organic Compounds (VOCs)</td>
<td>Serum</td>
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<tr>
<td></td>
<td>Cyanide</td>
<td>Blood</td>
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<tr>
<td>ICP/MS</td>
<td>Multiple Toxic Elements</td>
<td>Urine</td>
</tr>
<tr>
<td></td>
<td>Arsenic, Lead and Cadmium</td>
<td>Urine</td>
</tr>
<tr>
<td></td>
<td>Mercury</td>
<td>Blood</td>
</tr>
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**CDC’s Plan**

**Large Chemical Event**

1. Blood and urine samples from the first 40 symptomatic patients are collected and sent to CDC
2. CDC analyzes samples
3. Results and clinical treatment recommendations sent back to submitting labs within 36 hours
4. SHL can then analyze any additional samples
Modification...

- SHL will contact involved hospital labs within 24 hours of event to determine where symptomatic patients have been sent
- SHL will work with each laboratory and local public health agencies to:
  - Get blood and urine samples collected
  - Get documentation correctly completed
  - Arrange for courier
- Samples sent to SHL (Ankeny or Coralville) - whichever is closer
- SHL assures all documentation and packaging is correct and will then send to CDC
- Results will be returned to SHL and forwarded to submitting lab, LPH, and IDPH

Reasons for Sample Analysis

- Identify the agent(s)
  - Confirm a preliminary field agent identification
- Differentiate exposed from worried well
- Determine the extent of exposure
  - Number, geographical, temporal
- Relate internal dose levels to symptoms
- Provide evidentiary information to the law enforcement officials

Packaging and Shipping Instructions

Blood and Urine Specimens
The State Hygienic Laboratory is required to participate in and pass the annual packaging and shipping exercise for the LRN-C program.

• Required performance measure
Changes to the LRN-C Packaging and Shipping Exercise

- Name Change: SCPaS (Sample Collection, Packaging, and Shipping) to SPaSE (Specimen Packaging and Shipping Exercise)
- 40 complete sets of specimens are now required (instead of 10 sets)

Laboratory Information for Chemical Emergencies

http://emergency.cdc.gov/chemical/lab.asp

Thank You for Your Time and Attention!

Questions??