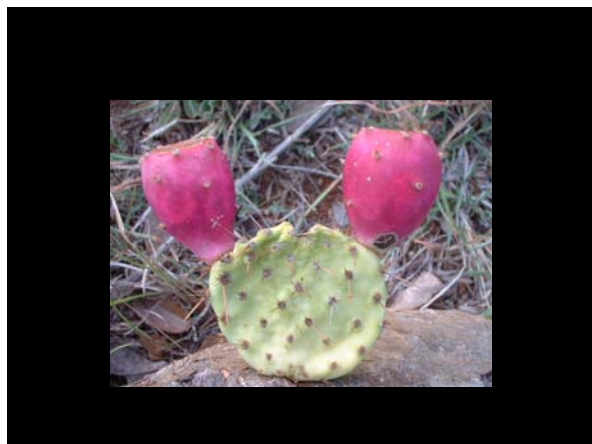





This unique version of Mickey Mouse with his hands pointing to 12 and 7 (creating a miniature silicon clock fixed in time) was found on the Mostek 5017 alarm clock integrated circuit. These chips were useful in table clocks, clock radios, and other appliances that featured clocks in the early 1970s.

<http://www.micro.magnet.fsu.edu/creatures/pages/mickey.html>



## Chemical Threat Response

Texas Department of State Health Services  
David M. Klein, Ph.D  
Chemical Threat Laboratory Leader




## Centers for Disease Control

- Set up and funded the Laboratory Response Network (LRN)
- Currently there are two LRN groups
  - Biological (LRN-B)
  - Chemical (LRN-C)

## Preparing to Respond to a Chemical Event

CDC is assisting LRN Labs by

- Purchasing instrumentation
- Developing training curricula
- Transferring analytical methods
- Implementing a quality assurance program



### LRN Structure – Chemical Terrorism

- Three Laboratory Levels
- Level 1 is the highest level and there are 10 of these labs
- Level 2 is the second highest level lab and there are 41 of these labs
- Level 3 is not really a lab at all, these groups do sample collection and shipping training
- **Texas is a Level 2+ lab**



### Provided to Each LRN Lab

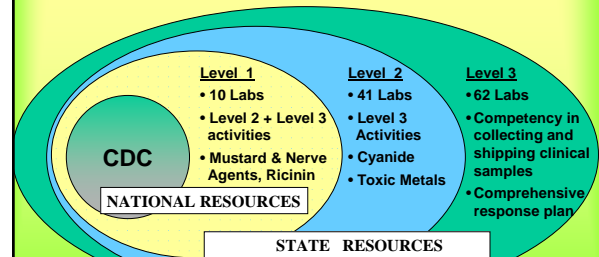
- Standardized Reagents & Controls
- Agent-Specific Protocols
- Lab Referral Directory
- Secure Communications
- Electronic Laboratory Reporting
- Training & Technology Transfer
- Proficiency Testing
- Appropriate Vaccinations for Lab Workers

### LRN Structure – Chemical Terrorism

- Currently, 62 state, territorial, and metropolitan public health laboratories participate in the chemical portion of the LRN. A designation of Level 1, 2, or 3 defines member network participation, and each level builds upon the preceding level.
- Every network member participates in Level 3 activities. These **Level 3 laboratories** work with hospitals in clinical specimen collection, storage, and shipment. They also work to develop a coordinated response plan for their state and geographical regions.



### Chemical Testing Capacity

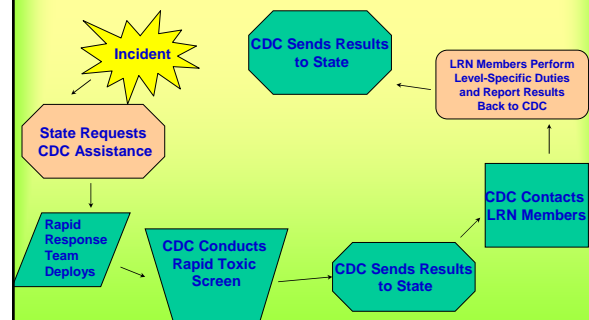


### Rapid Toxic Screen

1. At the onset of an event, a state may request CDC's assistance.
2. CDC will deploy a Rapid Response Team to the affected state to assist with specimen collection, packaging, storage, and shipment.
3. The first 40 samples from people with symptoms are sent to CDC for analysis through the **Rapid Toxic Screen**, which can analyze people's blood and urine for a large number of chemical agents likely to be used by terrorists.
4. Data produced from the Rapid Toxic Screen analysis will be communicated in a secure, electronic manner to the affected state or states.



### Responding to a Chemical Event



### Partners in All Facets of Biological & Chemical Terrorism Preparedness and Response

- The American Association of Veterinary Laboratory Diagnosticians
- The American Society for Microbiology
- The Environmental Protection Agency
- U.S. Department of Agriculture
- U.S. Department of Defense
- U.S. Department of Energy
- U.S. Food and Drug Administration
- The Department of Homeland Security

### Ready to Respond

In the event of a terrorist act or other public health emergency, the LRN is poised to:

- **Test thousands of clinical specimens and environmental samples using its multi-level network of state, food testing, clinical, veterinary, military, and federal labs.**
- Coordinate the laboratory response of CDC, law enforcement agencies, public health, and others.
- Accept and transfer specimens to appropriate facilities, including the CDC where definitive testing can be done.
- Assure a rapid laboratory response to any public health emergency.

### LRN Formula for Success

- Unified operational plan
- Standardized protocols and tests
- Secure communications
- **Molecular diagnostics\*\*\*\***
- Rapid response and reporting
- Safe, secure laboratories
- Trained laboratorians
- **Coverage for human, animal, food, environmental specimens\*\*\*\*\***
- CDC coordinated support and oversight
- Quality laboratory results

\*\*\*\*\* NOT FOR CHEMICAL EVENTS!

### The Texas Department of State Health Services Lab

Here is our view but what do we do?



24/7/365 Responsibility

### Automated Sample Prep



GC-MS Cyanide



GC-MS VOCs



ICP-MS



LC-MS



### Number of Samples Analyzed

1. Cyanide.....0
2. Blood metals.....0
3. Urine metals.....0
4. Organo-phosphorus nerve agent...0
5. Volatiles.....0

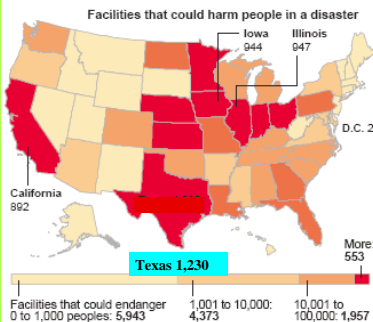


## Future Directions

- CDC supports the use of the LRN-C system to perform bio-monitoring
- CDC has been developing methods to analyze samples for “unknown” substances
- Potential areas for bio-monitoring include exposure to:
  - Metals
  - Organo-phosphate pesticides
  - Toxic Industrial Chemicals

## High number of chemical plants in Texas

There are more than 12,000 chemical plants that produce or use hazardous materials capable of endangering human life in case of accident or attack.



SOURCES: Environmental Protection Agency; Congressional Research Service AP

## Unknown “white powders.”

- Applied for \$250,000 to further develop an All Hazards Receipt Facility (AHRF)
- ICP-OES
- GC-ECD-NP-MS
- UV-Vis
- Chemical tests for:
  - CN
  - Alkaloids
  - Parquat/Diquat

## Acknowledgements

The Lab Rats:

