

# IDAHO BUREAU OF LABORATORIES CLINICAL FORUM

Volume 1, Issue 2  
September 2008

2220 Old Penitentiary Road, Boise, ID 83712 208-334-2235  
<http://www.statelab.idaho.gov> -or- [statelab@dhw.idaho.gov](mailto:statelab@dhw.idaho.gov)



IDAHO DEPARTMENT OF  
HEALTH & WELFARE

## Healthcare Facilities in Idaho's Chemical-Laboratory Response Network

Ian A. Elder, Ph.D.

Healthcare professionals are the frontline of a Chemical-Laboratory Response Network (LRN) response. In the LRN logo, sentinel (healthcare) laboratories are represented as the foundation of the pyramid for good reason. This article outlines the LRN responsibilities of healthcare facilities in responding to suspected chemical exposure events.

### Chemical-LRN Testing

The Centers for Disease Control and Prevention (CDC) Rapid Toxic Screen is a series of analytical methods that measure 150 chemical agents or metabolites. If CDC agrees to provide this resource-intensive service, interpreted data is reported to the specimen submitter within 36 hours of sample receipt. The Rapid Toxic Screen report details potential clinical health effects and guides the subsequent LRN analysis to be performed.

Chemical-LRN analysis can assist healthcare facilities in documenting the impact of a chemical exposure event on human health. Test results can be used to confirm preliminary diagnoses or identification tests that were performed at the site of event. The testing of human specimens may be the only way to identify agents in certain circumstances.

Analysis can provide information about the extent of victim exposure. This allows long-term health implications to be evaluated and appropriate follow up treatment to be undertaken. Chemical-LRN

### In This Issue

- Healthcare role in the Chemical-LRN
- TB lab services at IBL

analyses may be useful in relieving anxiety by letting the worried-well know that they were not exposed.

Data from human specimens may be used by law enforcement in determining who might have perpetrated the incident and as evidence in proving that a crime was committed. Results from tests can provide information about the geographical extent of the chemical release, allowing people to safely return to areas where no exposure occurred. Specimens collected from first responders may be useful in determining occupational exposure and in evaluating the effectiveness of personal protective equipment.

### Communication

Emergency response efforts may require interactions with other healthcare professionals, law enforcement personnel, and government officials that are outside of routine communications.

Healthcare facilities can initiate an LRN response by contacting the Idaho Bureau of Laboratories (IBL) through the Idaho State EMS Communications Center (1-800-632-8000).

### Web Link

<http://www.bt.cdc.gov/chemical/lab.asp>  
**CDC instructions for collecting,  
packaging, and shipping specimens  
following chemical emergencies**

## Collecting and Packaging Chemical-LRN Specimens



Chemical-LRN emergency response protocols require that healthcare facilities properly collect, package and ship blood and urine specimens according to specific CDC instructions. A variety of packaging materials may be used. It is recommended that healthcare facilities verify in advance that routinely used packaging materials are in compliance with CDC and International Air Transport Association requirements.

The latest CDC instructions and illustrations outlining what specimens must be collected and how they should be packaged can be found at CDC's emergency preparedness and response website (see Web Link on Page 1).

Healthcare facilities will need to manage the collection and shipment of specimens. Emergency room physicians will most likely initiate orders so that clinical specimens can be collected for Chemical-LRN analysis. Phlebotomists, clinical laboratory scientists, emergency room personnel, physicians and nurses should all be prepared to facilitate LRN activities.

### Specimen Identification

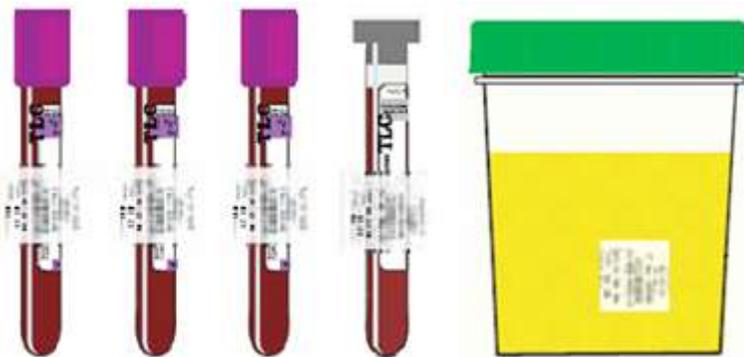
Specimens will need to be labeled using normal procedure for proper sample identification. Suggested label content includes the medical records number, specimen identification number, collector's initials, and date and time of collection. Healthcare facilities must maintain lists of names with corresponding sample identification numbers at the collection site to enable results to be easily reported back to the patient's clinicians.

It is recommended that facilities record additional data for use in the interpretation of results. Additional data may include: time of potential exposure, method of urine collection if other than "clean-catch", indication if sample was collected post-mortem, and antidotes administered prior to sample collection.

### Chain of Custody

LRN specimens have the potential to be used in a criminal investigation and thus must be treated as evidence. The specimens must be handled correctly to avoid later allegations of tampering or misconduct. Evidence seals and collector's initials will allow law enforcement officials to trace the specimens back to the collector should the case go to court and the collector is required to testify. Specimens must be kept in a secure location until they are transported for testing.

The facility that collects specimens is responsible for them while in its control and must create separate chain of custody forms for blood and urine specimens. A single chain of custody can be prepared for all of the samples that are contained in a single shipping container. When specimens are transferred between entities or organizations, each uses and retains their own chain of custody forms.



**Figure 1: The CDC Rapid Toxic Screen requires three 4-mL or larger purple-top (EDTA) blood tubes, one 3-mL or larger green- or gray-top blood tube, and one 25-50 mL urine sample per symptomatic and exposed adult patient.**

## Storing and Transporting Chemical-LRN Specimens

Samples from the first 40 exposed and symptomatic individuals will be analyzed at CDC by the Rapid Toxic Screen. Specimens from additional exposed individuals will be stored for possible testing at a later time.

Blood tubes will need to be refrigerated at 4 degrees Celsius until ready to package and ship. During transport, cooling packs should be used to maintain refrigeration. After collection, urine samples will need to be frozen as soon as possible with a minus 70 degrees Celsius freezer, if one is available. If there is no freezer of any type available, urine specimens may be put on dry ice. Urine specimens should be shipped with dry ice or freezer packs.

Facilities should plan for emergency specimen transport to IBL and CDC, including nights, weekends and holidays. Memorandums of understanding may be available to facilitate specimen transport. CDC staff may come to the collection site to pick up the specimens, depending on the circumstances of the emergency. Communications with state health officials and CDC will provide guidance on the appropriate method for sample transport.

In a chemical emergency, healthcare professionals should follow the steps outlined in their organization's chemical response plan. If employees do not currently have access to the plan, they should contact their supervisor or facility administrator for assistance. Healthcare staff can get further information by contacting IBL. Chemical-LRN trainings and exercises can be developed upon request.



**Figure 2: IBL maintains secure refrigerator and freezer space to temporarily store Rapid Toxic Screen specimens from more than 2,000 patients.**

---

## The Laboratory's Role in TB Control

Vivian M. Lockary, MT (ASCP)



**Figure 3: Steve Gregoire loading samples onto the VersaTREK, IBL's Mycobacterial liquid culture system.**

Clinical labs and public health labs, along with a strong network of state and local public health programs, provide the best defense against the development of drug resistant tuberculosis. The Mycobacteriology Lab at the Idaho Bureau of Laboratories (IBL) provides specimen processing, Mycobacterial identification, and drug susceptibility testing on a 5-day per week basis. IBL strives to meet CDC-recommended turn-around-times by means of timely submission of samples from our clients, identification of *M. tuberculosis*

complex (MTBC) within 21 days from receipt of specimen, and use of a rapid culture system to determine drug susceptibilities of MTBC isolates. Drug susceptibility testing is indicated against first-line drugs (Ethambutol, Isoniazid, Rifampin, and Pyrazinamide) for initial MTBC isolates.

Another test available through IBL is the Nucleic Acid Amplification Test (NAAT). Currently performed by the Montana Public Health laboratory and approved for both AFB smear positive and AFB smear negative specimens, the NAAT is designed for direct detection of *M. tuberculosis* complex in respiratory specimens. The use of this test is reserved for special circumstances where confirmation of TB is time-critical (turn around time  $\leq 48$  hours) and requires prior approval from the Idaho state epidemiologist. Development of IBL's in-house NAAT is underway with the completion of our Biosafety Level 3 lab.

The QuantiFERON Gold In-Tube Test (QFT-G-IT) is currently undergoing validation at IBL for use in diagnosing LTBI and TB disease. This interferon-gamma release assay (IGRA), licensed by the FDA in October 2007, is a blood test that can be used in all circumstances in which the Tuberculin Skin Test (TST) is used. Because QFT-G-IT does not require a

second visit to complete, test results will likely be available from a greater percentage of contacts than would be available using the TST. Moreover, QFT-G-IT eliminates false positive outcomes due to BCG vaccination and most non-tuberculous mycobacteria (NTM). CDC guidelines on QFT-G, a previous version of the same test, are available at: <http://www.cdc.gov/mmwr/preview/mmwrht/ml/rr5415a4.htm>.

IBL participates in a national genotyping program which impacts TB prevention and control practices through early detection of transmission and recognition of unsuspecting relationships between cases, possibly from different jurisdictions or temporally unconnected. Currently, the California and Minnesota State Labs are under contract with CDC to provide genotyping services to TB programs throughout the United States. Genotyping provides a DNA profile for each TB complex isolate which, combined with epidemiological data, improves our understanding of TB transmission.

Feel free to contact IBL's TB lab at 334-2235 ext. 235 for additional information regarding our Mycobacteriology services or how we can facilitate rapid identification, drug susceptibilities, and genotyping on a TB complex isolate from your district.



**Figure 4: Walt Delong and Vivian Lockary cut the ribbon at the Grand Opening of the new Biosafety Level 3 lab. After the ribbon cutting everyone enjoyed a tour and refreshments.**