CDC's Laboratory Response to Radiological Emergencies

Public Health Issue

One example of a radiological emergency is detonation of a "dirty bomb": a conventional explosive device that disperses radionuclides. Following such a radiological emergency, public health officials will immediately attempt to determine

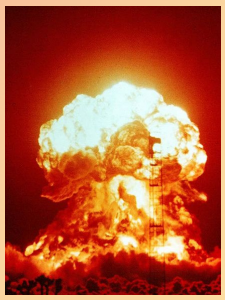
- Who was exposed to radiation?
- What radionuclide(s) were they exposed to?
- How much exposure did each person have?

A critical part of a radiological emergency response is a determination of the number of exposed persons who need medical treatment and the type of medical treatment they require.

For measuring external contamination (outside the body), and to identify potentially exposed persons, handheld radiation detectors (e.g., Geiger counters) are useful. But the decision to provide medical treatment—and the type of medical treatment—requires quick and accurate identification of internal (i.e., inside the body) contamination.

Urine Radionuclide Screen

To determine rapidly whether people have radionuclides in their bodies and, if so, the level of those radionuclides, CDC is developing a unique laboratory method that analyzes urine. The method can identify exposed persons and can determine the level of exposure. Once completed, the Urine Radionuclide Screen (URS) will identify internal contamination rapidly and accurately for more than 20 radionuclides. With the exception of a few radionuclides, it is not possible to determine exposure without the new methods being developed with CDC's URS.



Nuclear Blast. Source: U.S. Department of Energy

The URS is well-suited for emergency response because it

- Uses only a small amount of urine from a single collection,
- Measures thousands of samples each day for some radionuclides and hundreds of samples per day for other radionuclides,
- Provides results within 24 hours for the first 100 samples, and
- Identifies and quantifies radionuclides of public health concern.

These capabilities are not available anywhere else in the federal government.

National Center for Environmental Health
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Future Plans

CDC is planning for a Radiological Laboratory Response Network (LRN-R) comprised of select state public health laboratories with the equipment and trained personnel to provide surge capacity using CDC's URS. The LRN-R will build on the current Laboratory Response Network designed to respond to biological and chemical threats. Having this extra surge capacity will reduce response time significantly. And soon after a radiologic event, LRN-R will provide government decision makers and health providers with timely, high-quality analytical results.

For More Information

Centers for Disease Control and Prevention
Radiation Emergencies
http://emergency.cdc.gov/radiation/

Department of Health and Human Services
Radiation Emergencies & Event Management
http://www.hhs.gov/disasters/emergency/manmadedisasters/radiation/index.html
Radiation Emergency Medical Management
http://www.remm.nlm.gov

Environmental Protection Agency
Radiation Protection: Emergency Preparedness and Response Programs
http://www.epa.gov/rpdweb00/emergency-response-overview.html

Food and Drug Administration
Radiation Emergencies
http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness/ucm063807.htm

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