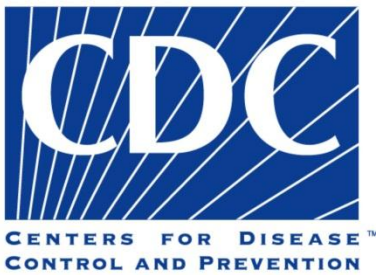
Radiation Emergencies Public Health Roundtable: The Role of Poison Centers

A Roundtable Discussion Group Summary Report



Centers for Disease Control and Prevention
National Center for Environmental Health
Division of Environmental Hazards and Health Effects
Health Studies Branch
Radiation Studies Branch

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EXECUTIVE SUMMARY

Background

On August 27–28, 2012, in Atlanta, Georgia, the Centers for Disease Control and Prevention (CDC) hosted the *Radiation Emergencies Public Health Roundtable: The Role of Poison Centers*. This roundtable brought together professionals who work at poison centers (PCs) across the United States for a training session that was followed by a discussion of the current and potential roles poison centers have in radiation emergency preparedness and response.

Methodology

The roundtable opened with a four-hour session covering basic radiation physics, types of radiation emergencies (both radiological and nuclear), and the public health response to such incidents. The next eight hours were dedicated to the roundtable discussion. A total of 36 people participated in the two-day roundtable; they represented 32 PCs that serve 37 states and the commonwealth of Puerto Rico. Public health officials representing Georgia and Alabama participated in the discussions, and representatives from the American Association of Poison Control Centers attended to observe the proceedings. In addition to on-site participation in Atlanta, the session was available via Webcast to all 57 PCs in the United States.

Findings

Although the nation's PCs have limited experience with managing exposures to ionizing radiation and contamination with radioactive material, they expect to receive calls from the public, health care providers, and the media after a public health radiation emergency. The main role of PCs during a radiation emergency will be to provide accurate, uniform information to callers. PCs can provide nationwide, near real-time situational awareness data through use of the National Poison Data System (NPDS) to help guide public health response and messaging. In addition, PCs can potentially assist in triage and management of callers and act as an information resource for radiation medical countermeasure (MCM) use. Although PC call line surge capacity may be limited, many PCs have surge call distribution capabilities. The current capacity of the aggregate call system is unknown.

Conclusions

The nation's PCs *will* be involved during a public health radiation emergency. If properly engaged, they can be an asset for public health. The primary role of PCs during the response to a public health radiation emergency will be to provide accurate, uniform information to callers. Other important roles may include using NPDS to augment public health messaging and risk communication, assisting with caller triage and management, and supporting follow-up activities. To enhance preparedness, PC personnel need further training on radiation-related health effects and the management of persons with exposure to ionizing radiation or contamination with radioactive material. Improving collaboration and planning between PCs and state and federal agencies is crucial to enhancing radiation emergency preparedness.

BACKGROUND

After the earthquake and tsunami that struck Japan on March 11, 2011, the ensuing Japanese nuclear power plant emergency renewed concerns among officials and citizens of the United States regarding contamination with radioactive material and the need for MCMs to protect the public's health. To assist Poison Centers (PCs) responding to calls, the Centers for Disease Control and Prevention (CDC) reviewed specific FAQs developed by the American Association of Poison Control Centers (AAPCC) and PC toxicologists regarding the Japan radiation incident. The purpose of the CDC review was to ensure uniform messaging. Additionally, radiation experts from CDC and the Radiation Emergency Assistance Center/Training Site (REAC/TS) communicated with PCs to assist with calls related to the Japan incident. The nation's PCs, particularly those in the West Coast states, received numerous calls requesting information about protective actions for contamination with radioactive material and exposure to ionizing radiation. The calls focused on (1) whether there was a need for such pharmaceutical interventions as potassium iodide and (2) food safety issues. CDC analyzed PC call data in order to target communication messages effectively.

Previous audience research has indicated that the public as well as clinicians and public health officials want toll-free "hotlines" that they can use to speak with knowledgeable individuals to obtain factual information about radiation and protective measures, especially information about MCMs for treatment of contamination with radioactive material and exposure to ionizing radiation. PCs are well known as credible resources for information about toxic substances, and they can play a valuable role in providing expertise and information following a radiation emergency, whether of a real or a perceived nature. PCs are already used extensively by medical facilities, individual clinicians, and the general public; they receive more than four million exposure and information calls in a year. All calls are electronically reported to the National Poison Data System (NPDS), a near real-time surveillance system that is monitored by AAPCC and CDC.

PCs' existing capabilities include 24-hour, live health care professional availability; automated regional routing using a single toll-free number; experience with risk communication to the public; medical toxicology consultation expertise; and existing relationships with state health departments. These capabilities can be leveraged for an effective public health communication strategy during a radiation emergency.

As noted by CDC speakers at a March 2010 Public Health Grand Rounds session, there is a lack of sufficient radiation subject matter expertise, as well as education and training, for emergency responders. These shortcomings also apply to PCs. Calls about radiation are not as frequent as calls about other topics; therefore PCs may lack sufficient knowledge of such topics as ionizing radiation, the health effects of radiation exposure, contamination with radioactive materials, and appropriate MCMs to treat each.

CDC's National Center for Environmental Health (NCEH) and its Health Studies Branch (HSB) and Radiation Studies Branch (RSB) proposed to fill identified knowledge gaps by organizing an educational session, followed by a roundtable discussion dedicated to the role of PCs in a radiation emergency.

Organizers envisioned the roundtable as a means of initiating a dialogue about the current and potential roles that PCs can play during a radiation emergency.

METHODOLOGY

A four-hour training session covered material ranging from basic radiation physics to NPDS coding of contamination with radioactive material and exposure to ionizing radiation. This session provided a knowledge refresher and common background for the roundtable participants (see Agenda in Appendix). In addition, a representative from the Council of State and Territorial Epidemiologists provided an overview of the National Alliance for Radiation Readiness. The training session was also available as a Webcast to all 57 PCs across the country. After these presentations, participants were split into seven small groups, with one CDC facilitator per group, for the roundtable discussion using focused discussion questions.

A total of 36 individuals participated in the 2-day roundtable (see Participant List in Appendix). Among the 36 participants were 11 medical toxicologists/medical directors (physicians), 11 clinical toxicologists/PC managers (pharmacists), and 11 Poison Specialists (nurses or pharmacists). They represented 32 PCs that serve 37 states and Puerto Rico. In addition, 3 public health officials representing Georgia and Alabama participated. Including the roundtable participants, 62 people attended the live activity in Atlanta.

FINDINGS

Current status of radiation emergency preparedness of poison centers

The nation's poison centers have limited experience with managing contamination with radioactive material or exposure to ionizing radiation. Currently, few poison centers have guidelines for managing either of these conditions.

This limited experience is mainly attributable to the fact that both contamination with radioactive material and exposure to ionizing radiation are rare events. PCs in states with nuclear power plants tend to have more experience with these events, and may be better prepared than those without such experience to respond to radiation-related questions. However, even the PCs that have responded to radiation-related questions have only limited experience with radiation.

The roundtable discussions identified two factors as useful resources for PCs dealing with radiation emergencies. The first factor is a good relationship between a PC and the state's public health department and state radiation control program. The current status of relationships between PCs and their state public health departments and radiation control programs varies considerably from state to state. The second factor that PCs find helpful is the existence of guidelines and recommendations specific to management of contamination with radioactive material and exposure to ionizing radiation. Such guidelines could include template data collection forms containing important questions to ask and algorithms that assist in triage. At present, most PCs do not have any guidelines for such medical management. Developing new guidelines

and recommendations available to all PCs would be useful, and such development should be collaborative, involving AAPCC and other groups that can provide radiation subject matter expertise. For PCs in states with nuclear power plants, yet another way to increase their preparedness capabilities is to partner with the plant's emergency response planning committees.

PCs are primarily resources for providing information. Responding to questions from a surge of callers will be the main activity of PCs during a radiation emergency. It will be important for PCs to have a consistent message during such an evolving crisis. Toxicologists typically rely on their training, experience, and scientific studies as the basis for making recommendations. However there are limitations in both the knowledge and the experience toxicologists have about radiation. No consistent guidelines are available at all centers about how to respond to questions and incidents as they arise.

Poison centers expect to receive calls from the public and health care providers after a radiation emergency; calls from the media may also occur.

Following a radiation emergency, PCs anticipate receiving phone calls with a volume proportional to the magnitude of the incident. Calls could come from a variety of sources. Primary calls will come from the public seeking information and advice and possibly from media sources seeking information about an incident. PCs will also receive secondary calls from nurse advice lines, emergency departments, hospitals, and other institutions that are not adequately prepared to respond to persons contaminated with radioactive material or exposed to ionizing radiation and therefore will call a PC for recommendations. For example, it is likely that PCs will be called by health care providers about radiation MCMs (e.g., the use of Prussian blue) because such countermeasures are often considered antidotes.

The general consensus among roundtable participants is that answering these calls is in line with the core mission of PCs. While PC personnel are not experts in radiation, they are adept at risk communication, health messaging, and information sharing. They therefore have the potential to assist a public health response after a radiation emergency. One key difficulty PCs anticipate in responding to calls is the staff's general lack of knowledge about radiation-related health effects and consequences. PC staffs in general want to feel confident in the information and recommendations they share. Consequently, PC staffs need to increase their knowledge about radiation. Guidelines and recommendations that have been prepared in advance and in collaboration with other public health response partners would be valuable tools that PC staff could use to respond immediately to phone call inquiries. In terms of risk communications and health messaging, PCs would rely on working with public health officials to develop cohesive informational messages about incidents. PCs could then share and communicate these messages with the public. However, PCs anticipate facing pressure to answer questions independently in real-time before such messages are available from health officials, given the time it can take to craft a message.

Contrary to the majority opinion, some participants had concerns that the public might not think to call PCs during a radiation emergency, given the general impression of the work PCs perform. Therefore, if it is desirable as part of the public health response, increasing the use of PCs can be accomplished by having other organizations (e.g., local or state health departments and federal agencies) send out messages to the public saying that PCs are ready and able to answer questions. As an example of such promotion by other

organizations, during the Deep Water Horizon incident on the Gulf Coast in 2010, the Environmental Protection Agency partnered with Gulf state PCs and released messages instructing the public to call the local PC for more information.

Poison center call line surge capacity is limited; it is based entirely on local resources, and the current capacity of the aggregate system is unknown.

If a public health radiation emergency occurs, the most proximal PC will likely be overwhelmed with calls. Such likelihood suggests a need for procedures by which PCs can route calls to other PCs and assist whatever local PC is most affected by the disaster. A key strength of PCs is that they are a national system. Following a radiation emergency, the most likely calls PCs are going to receive will be from concerned citizens potentially affected by it. An exception is that the PC covering the directly affected area will receive calls from truly exposed or contaminated persons and concerned citizens. Many PCs have capabilities for a call surge, including the use of remote agents to answer calls and mechanisms to forward calls to other centers. However, challenges are associated with PC call surge capacity.

No global strategy exists at this time for using the existing PC toll-free number at the AAPCC level for improving PC surge capacity. Some individual PCs have local surge plans, though this may not be universal. The question of PC surge capacity was previously highlighted as part of the pandemic influenza response; CDC created a tool to help PCs with surge planning. Still, there is a need for more thorough surge capacity planning for PCs.

Surge plans should include provisions for calling in additional PC staff to respond to incidents. Another important planning consideration is to identify partners in multilingual communities who can respond to and assist a PC with translation during an incident.

An automated system capable of delivering just-in-time messages is another strategy to increase caller access to information. Such messages could reduce the need for public callers to speak with a live person. In addition, scripted frequently asked questions (FAQs) can be helpful in scaling the workforce. Such FAQs permit the use of less trained personnel (e.g., pharmacy, nursing, or medical students, members of the medical reserve corps) to answer many callers' questions. Anything that falls outside the script can then be directed to available subject matter experts.

If a PC can reassure concerned citizens and keep them at home, while identifying and referring those people who truly do need further evaluation and management, then doing so will extend the resources of the larger health care system response.

Finally, surge planning should also include considerations for information technology support. Moreover, no surge plan will be of any use if it is not practiced. Surge plans should be exercised routinely.

The National Poison Data System (NPDS), a tool used for surveillance, is better suited for tracking a known radiation emergency than for detecting covert incidents. NPDS can be extremely useful for situational awareness during incidents by helping guide public health response and messaging.

One major point of discussion was whether NPDS could be used as sentinel surveillance for detecting a covert radiation emergency. Because NPDS is a passive system, it relies on caller reports for information, as well as on the case data coded by the Poison Specialists (health care personnel who answer initial calls). Crucial to any surveillance using NPDS is use of the best coding possible. In a recent effort, CDC and AAPCC provided optimized NPDS radiation codes. However, these codes are not yet familiar to the majority of Poison Specialists throughout the PC system. Ways to improve coding include providing more training of Poison Specialists and building radiation-specific pop-up reminders and templates into PC electronic medical record database programs. However, participants raised concerns that these technological improvements can be costly.

If an incident is known or suspected from the outset to involve a release of radioactive material and/or ionizing radiation, then NPDS possibly could be used for detecting such an incident, because Poison Specialists can use appropriate codes to describe the parameters of such an incident and trigger alerts. However, it seems more likely that other agencies would be contacted before PCs. Conversely, if an incident is not known to be radiation-related one must rely on syndromic surveillance, surveillance that is based on the clinical effects that are coded by Poison Specialists. Syndromic surveillance is much less likely to be successful for early detection of a radiation emergency. One way to detect cases involving silent contamination with radioactive material or exposure to ionizing radiation is to identify clusters of patients with common exposures or symptoms possibly associated with radiation. AAPCC and CDC are evaluating surveillance of this type.

The NPDS database has national coverage and it provides near real-time monitoring of reported exposures. This capability was leveraged during the Japan nuclear power plant response when the database was used to identify issues raised by the general public and to create targeted public health messages to address such matters directly. During any future radiation emergency, the situational awareness offered by NPDS can be a crucial tool for public health officials.

Potential role of poison centers during a public health radiation emergency

The main role of poison centers during a radiation emergency is to provide accurate information to callers; however, PCs can also assist in several roles, including dissemination of important coordinated public health messages, caller triage and medical management, and performance of follow-up activities.

PCs are well suited for distributing coordinated public health messages. For example, PCs might publicize information about community reception centers (CRCs) to the public and various local and state agencies (e.g., fire departments, emergency medical services, hospitals). CRCs are locations at which public health agencies and their partners can perform population monitoring (evaluation of people potentially exposed to radiation or contaminated with radioactive material) following a radiation emergency. As soon as health officials have made the determination to establish a CRC, PCs should be notified so that they can distribute such information to the public.

There was widespread agreement among roundtable participants that PCs should be involved with triage and medical management of callers. PCs have always been involved in triage of callers, and they continue to perform triage daily as a matter of their usual business. The triage that PCs typically provide

involves determining what poisoning exposures can be handled at home and which require referral to a hospital emergency department. This PC function plays a crucial role in preventing the imposition of an unnecessary burden on health care facilities. PCs could make preliminary assessments of callers with contamination with radioactive material or exposure to ionizing radiation by using incident-specific algorithms and tools, such as those available on the Radiation Emergency Medical Management (REMM) web portal (http://www.remm.nlm.gov/). In addition, PCs can assist healthcare providers in emergency departments and other clinical settings with guidance about appropriate use of radiation countermeasures and other medically indicated therapy. Typical community physicians may not know how to treat these patients and may need to call PCs for assistance.

PCs also routinely follow-up with callers to monitor outcomes and provide further recommendations if needed. This service could be helpful in the creation of a long-term registry of individuals contaminated with radioactive material or exposed to ionizing radiation. For example, after being evaluated at a CRC, the affected population can participate in follow-up activities via telephone with a PC. PCs also can perform follow–up activities over time and work with allied toxicology clinics that are part of the Association of Occupational and Environmental Clinics. A similar procedure was established for follow-up activities of American Red Cross first responders to the September 11, 2001 attacks. Lastly, it is critical that PC efforts be integrated with the efforts of other response agencies through ongoing communication and advance planning.

Poison centers should be an important partner in unified public health messaging and risk communication after a radiation emergency.

By default, because PCs will be receiving calls from the public, they will become part of the public messaging response during and after a radiation emergency. One dilemma for PCs is the need to respond to callers before coordinated messages are available from local, state, or federal government agencies. In this situation, PCs have two choices: use internal messages or use coordinated messages. Coordination of public messages will most often depend on the PCs' pre-existing relationships with local, state, and federal agencies.

Roundtable participants discussed several important considerations for public health messages:

- Messages should be unified across the entire public health response (local, state, and federal).
- Messages need to be tiered: a public/layperson tier and a health professional tier (e.g., two sets of FAQs) because each group has different needs.
- PCs need to be involved when the messages are being written and delivered. PCs may not drive the message, but they will be receiving the questions. Therefore they can provide important information about what the public is asking and help tailor the messages appropriately during an incident.
- PCs need notification of messages before the media receive them so that PCs can be ready to respond to questions about what public health officials are communicating. Most PCs have a working relationship with local media outlets and are often called upon by the media for comment on poisonings and toxic exposures.

- Multilingual messaging and information should be developed; however, creating materials for multilingual populations is very challenging. If materials are not prepared in advance and made available, specific language lines may be needed. However, such language lines generally are inadequate for handling on-the-spot messaging for multiple reasons, including the fact that translators usually have no medical training.

Poison centers can act as a resource to provide information about radiation MCM use.

Most likely, PCs will receive calls from health care providers with questions about radiation MCMs, often considered antidotes [e.g., Prussian blue, potassium iodide (KI), and Calcium/Zinc diethylene triamine pentaacetic acid (DTPA)]. PCs can serve as information resources about radiation countermeasures, particularly in answering questions related to administration, side effects, dosing, interactions with other medications, and contraindications. Roundtable participants believed that definitive recommendations regarding indications for MCMs will come from sources other than toxicologists at PCs. However, once definitive recommendations are available, PCs could distribute and follow them when assisting medical callers actively managing patients.

From the PC's perspective, active tracking of countermeasure use will be prohibitively difficult because of the passive nature of receiving calls. As an example, in Georgia the state health department asks that all medical providers consider calling the PC before giving the rabies vaccine to ensure that such treatment is warranted. However, the Georgia PC cannot track rabies vaccine stores in the state, partly because hospitals do not report their supplies but also because providers do not always call the PC before administering the vaccine. With a passive reporting system, PCs are called sporadically—only if there are questions about administration or if there are adverse effects. Consequently, PCs will not be able to track effectively the use of federal stores of countermeasures, given the logistical challenges.

CONCLUSIONS

The nation's PCs *will* be involved during a public health radiation emergency. PCs should anticipate receiving phone calls as a consequence of such an incident, and they have many capabilities that can be of benefit during a public health response to an incident. The primary role of PCs during a response to a public health radiation emergency will be to provide accurate, uniform information to callers. However, other important roles may include using the NPDS to augment public health messaging and risk communication, assisting with caller triage and medical management, and supporting long-term follow-up activities.

Currently, PC personnel have limited knowledge and experience regarding health effects and management of contamination with radioactive material and exposure to ionizing radiation. More training on these topics would improve the preparedness level of PC personnel and enhance response readiness. In addition, improving collaboration between PCs and local, state, and federal agencies is crucial to an effective public health response to radiation emergencies.

NEXT STEPS

Improve radiation health training and education among poison center personnel.

The kinds of training desired by PC personnel should be eligible for continuing education credit for physicians, nurses, and pharmacists. It should include the following elements:

- Frequent training on basic radiation knowledge, radiation-related health effects, and radiation risk communication.
- NPDS coding of radiation-related calls, specifically for Poison Specialists. Roundtable participants indicated poor to no awareness of the new NPDS radiation codes. One way to make learning radiation coding a priority is to incorporate it into the continuing education process.
- Online training modules involving persons either contaminated with radioactive material and/or exposed to ionizing radiation, with the purpose of teaching Poison Specialists what symptoms to look for and important questions to ask.
- Disaster drills: PCs should partner with state public health departments to gain a larger role in state or federal drills.
- Hands-on training sessions or simulations: educational offerings should be frequent and repeated. They should involve hands-on training and possibly use medical simulation to maximize retention of the learning material.

Consolidate and share currently available resources across organizations.

- Fact sheets about exposure to ionizing radiation, contamination with radioactive material, their health effects and management
- Frequently Asked Questions (FAQs)
- Educational training modules

Develop a set of recommendations, toolkits, and public messaging FAQs for response to radiation emergencies.

- Develop templates and information for evaluation of radiation-related calls to be used by Poison Specialists.
- Develop tiered messages, including a layperson tier and a health professional tier.

Assess current poison center surge capacity and investigate strategies for expanding such capacity on a national level.

- Assessments should be made at both local and national system levels.

Integrate poison centers with the public health infrastructure across the country at local, state, and federal levels.

- PCs have varying relationships with public health departments, and they would like more collaboration. From the PC perspective, perhaps the biggest challenge is to become viewed as partners in public health. PCs that serve multiple states have added difficulty because they need to develop relationships with multiple state public health departments.
- Efforts toward this goal include CDC's Communities of Practice (http://www.cdc.gov/phcommunities/).
- All PCs should develop relationships with state health departments and state radiation control programs (http://www.crcpd.org/) to establish the PCs' role as a source for information during radiation emergencies.

APPENDIX

Opening Remarks

The roundtable convened with welcoming remarks from Mr. Peter Edwards, Deputy Director of the Division of Environmental Hazards and Health Effects (DEHHE) at the National Center for Environmental Health (NCEH). He acknowledged the partnership of PCs with CDC, highlighting the immense contribution of PCs to public health. He highlighted the ability of PCs to provide near real-time surveillance of exposure and to document trends that help to identify new public health threats.

The next speaker was Dr. Charles W. Miller, Branch Chief of the Radiation Studies Branch (RSB) at DEHHE/NCEH. He emphasized that the people of the United States are very concerned about radiation, and PCs definitely will receive phone calls from the public after a radiological/nuclear incident, regardless of the incident's location.

Ms. Debbie Carr, Executive Director of the American Association of Poison Control Centers (AAPCC), was the final speaker of the introductory session. She noted that this meeting was very important for PCs because it recognizes the larger role PCs can assume in a public health radiation emergency response, and she stressed that AAPCC intends to remain involved in the future.

Agenda

Day 1

08:00a–08:30a	**Arrival and Registration**
08:30a–09:00a	**Welcome and Introduction**
	Peter Edwards, MPA, Deputy Director, Division of Environmental Hazards and Health Effects, National Center for Environmental Health, CDC
	Charles W. Miller, PhD, Branch Chief, Radiation Studies Branch, CDC
	Debbie Carr, MEd, Executive Director, American Association of Poison Control Centers
09:00a–09:45a	**Radiation Basics and Types of Radiation Disasters**
	Armin Ansari, PhD, Health Physicist, Radiation Studies Branch, CDC
09:45a–10:15a	**Injuries after Radiation Exposure**
	Jeffrey Nemhauser, MD, Deputy Associate Director for Science, Office of Public Health Preparedness and Response, CDC
10:15a–10:45a	**Health Effects after Radioactive Contamination**
	Arthur Chang, MD, Medical Officer, Health Studies Branch, CDC
10:45a–11:00a	**Countermeasures in the Strategic National Stockpile**

	Susan Gorman, PharmD, MS, Associate Director for Science, Division of Strategic National Stockpile, OPHPR, CDC
11:00a–11:15a	**BREAK**
11:15a–11:45a	**Epidemiologic Issues in Radiation Response**
	Colleen Martin, MSPH, Epidemiologist, Health Studies Branch, CDC
11:45a–12:00p	**National Alliance for Radiation Readiness**
	Erin Simms, MPH, Associate Research Analyst, Council of State and Territorial Epidemiologists
12:00p–12:30p	**Surveillance Using NPDS and Radiation Related Coding**
	Royal Law, MPH, Epidemiologist, Health Studies Branch, CDC
12:30p–01:00p	**Communication and Psychological Needs in Radiation Emergencies**
	Leeanna Allen, MPH, MCHES, Health Education Specialist, Oak Ridge Institute for Science and Education
01:00p–02:00p	**LUNCH**
02:00p–04:00p	**Small group discussion 1**
04:00p–05:00p	**Large group discussion 1**
	Ron Edmond, MEd, EdS, EdD, Group Manager, Oak Ridge Associated Universities

Day 2

08:00a–08:30a	**Arrival & Registration**
08:30a–10:30a	**Small group discussion 2**
10:30a–11:30a	**Large group discussion 2**
	Ron Edmond, MEd, EdS, EdD, Group Manager, Oak Ridge Associated Universities
11:30a–12:00p	**Roundtable Summary**
	Arthur Chang, MD, Medical Officer, Health Studies Branch, CDC
12:00p–12:30p	**Closing Remarks**
	Charles W. Miller, PhD, Branch Chief, Radiation Studies Branch, CDC
12:30p–01:30p	**LUNCH**
01:30p–04:00p	**CDC Emergency Operations Center Tour (optional)**

Participant List

Fred Aleguas, Northern Ohio Poison Center
Stacey Bangh, Hennepin Regional Poison Control Center
John Benitez, Tennessee Poison Center
Cynthia Bichler, Upstate New York Poison Center
Stephen Borron, West Texas Poison Center
Edward Bottei, Iowa Statewide Poison Control Center
Daniel Brooks, Banner Good Samaritan Poison Center
David Burns, Indiana Poison Center
Jaime Cain, Wisconsin Poison Center
Barbara Crouch, Utah Poison Control Center
Cindy Deutsch, Rocky Mountain Poison and Drug Center
Jose Diaz-Alcala, Puerto Rico Poison Center
Tonya Drayden, Oregon Poison Center
Miguel Fernandez, South Texas Poison Center
John Fisher, Alabama Poison Center
Robert Geller, Georgia Poison Center
Lloyd Herrington, Georgia Poison Center
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Michelle Huffman, Central Ohio Poison Center
Jeanie Jaramillo, Texas Panhandle Poison Center
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Ronald Kirschner, Nebraska Regional Poison Center
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Amanda Ruback, Missouri Poison Center
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Jay Schauben, Florida/USVI Poison Information Center
Farshad Mazda Shirazi, Arizona Poison and Drug Information Center
Henry (Rick) Spiller, Central Ohio Poison Center
Dennis Wigandt, Regional Center for Poison Control and Prevention

Observer List

Molly Boyd, Georgia Poison Center
Loreeta Canton, American Association of Poison Control Centers
Dena Elimam, SciMetrika
Andres Espinosa-Bode, Centers for Disease Control and Prevention
Lynn Evans, Centers for Disease Control and Prevention
Dayne Laskey, Georgia Poison Center
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Susan Gorman, Centers for Disease Control and Prevention
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