



Roundtable on the Psychosocial Challenges Posed by a Radiological Terrorism Incident

Participants' Comments, Ideas, and Recommendations *A Summary Report*

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

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This report was prepared by Ogilvy Public Relations Worldwide, under contract with CDC, and summarizes the participants' contributions; it represents neither a consensus of the roundtable nor the opinion of CDC and may contain errors in fact.

Table of Contents

Chapter I: Introduction

Chapter II: Summary of Presentations

Chapter III: Key Issues and Considerations

Chapter IV: Recommendations

Appendix A: List of Roundtable Participants

Appendix B: Roundtable Agenda

Appendix C: Resources Identified During Discussions

Appendix D: Additional Sources Provided by Speakers

Chapter I: Introduction

On December 6-7, 2005, the Centers for Disease Control and Prevention (CDC) held a two-day roundtable meeting to examine some of the major psychosocial issues associated with radiological terrorism. The discussion, *Roundtable on the Psychosocial Challenges Posed by a Radiological Terrorism Incident*, explored such difficult and complex problems as planning for and assisting large numbers of people who may self-transport to healthcare facilities, preventing or mitigating contamination-related social stigma, and maintaining public trust following a large-scale incident involving radioactive materials. The aim was to begin to determine where there are major gaps in our current ability to handle these challenges, and then to identify steps that can be taken to help close those gaps.

Nearly 30 U.S. and international experts from academia, government, professional societies, and the healthcare community participated in the program. The event was hosted by CDC's Radiation Studies Branch, Division of Environmental Hazards and Health Effects, National Center for Environmental Health. The roundtable was part of CDC's continuing effort to help prepare the nation's medical and public health community for threats of terrorism.

This report provides a summary of participants' comments, ideas, and recommendations. The findings will inform CDC's work with state and local health departments, hospitals and other key components of the preparedness infrastructure, and will help CDC in the production of guidelines, templates, and informational materials related to radiological terrorism. In addition, the report is intended to stimulate further discussion and consideration of some of the most challenging aspects of the management of terrorist incidents involving radioactive materials.

Verbatim comments are highlighted throughout the report to illustrate key points. These comments are provided without attribution to maintain the confidentiality offered to the roundtable participants. In addition, it should be noted that this was not a consensus development conference, and the ideas and recommendations summarized in this report do not reflect a consensus process or decision on the part of the roundtable participants or CDC.

The first part of the report provides brief summaries of five background presentations given by invited U.S. and international experts at the roundtable. This is followed by a discussion of key issues and considerations that were discussed by participants in the roundtable. Participants' primary recommendations are then presented, as are other ideas and suggestions. A concluding section then highlights key findings of the roundtable and identifies future directions.

A list of roundtable participants, the roundtable's agenda, and a list of resources and references identified during roundtable discussions are also included in appendices to this report.

Chapter II: Summary of Presentations

The two-day roundtable began with a series of presentations on radiological terrorism and psychosocial issues. Given by invited experts from the U.S. and abroad, the presentations were intended to provide the background and context for the roundtable, review previous experience and current research, and help identify key issues for discussion.

Charles Miller, PhD
Chief, Radiation Studies Branch
National Center for Environmental Health
Centers for Disease Control and Prevention

Dr. Miller began by describing CDC's role in a radiological terrorism event. As part of HHS, CDC would be the chief public health entity to respond to a radiological incident. As the chief public health entity, CDC's specific roles and responsibilities would include:

- Assessing the health of people affected by the incident
- Assessing the medical effects of radiological exposures on people in the community, emergency responders and other workers, and high-risk populations (such as children, pregnant women, and those with immune deficiencies)
- Advising state and local health departments on how to protect people, animals, and food and water supplies from contamination by radioactive materials
- Providing technical assistance and consultation to state and local health departments on medical treatment, follow-up, and decontamination of victims exposed to radioactive materials
- Establishing and maintaining a registry of people exposed to or contaminated by radioactive materials

CDC's Radiation Studies Branch has been primarily responsible for radiological and nuclear emergency preparedness in the agency since the September 11, 2001, terrorist attacks.

Citing a survey initiated by U.S. Senator Richard Lugar's office in 2005, Dr. Miller noted that terrorism experts believe that there is about a 70 percent chance terrorists will attack the United States with a weapon of mass destruction (WMD) at some point in the next ten years. The study defined WMD as a radiological, nuclear, biological, or chemical weapon. An attack involving a nuclear weapon, while not out of the question, was viewed as the least likely of those four scenarios. On the other hand, a radiological attack (e.g., a dirty bomb, or radiological dispersal device), was seen as among the most likely of the scenarios.

Dr. Miller said that the psychosocial impacts of a radiological terrorist attack, regardless of the number of deaths, would likely be far-reaching. Contamination-related issues could also make response and recovery much more difficult. He cited the disposal of contaminated bodies as one of several vexing and emotionally charged issues communities would face.

Complicating the problem are common misperceptions about radiation. Some people, for example, believe that any radiation exposure at all inevitably translates into "a death sentence." More generally, radiation is greatly feared and there is a lack of knowledge about protective actions.

Misperceptions among the public, as well as the medical community, include “there is no safe radiation dose” and “safe equals no risk whatsoever.” He said that clinicians and public health workers do not feel sufficiently prepared for a radiological terrorism event. Some research even suggests that there may be a potential unwillingness to report to work in a radiological event because of fear of contamination. “Some hospitals have flat out said that their first response in a radiological event would be to call security and lock down the hospital,” he said.

Miller concluded by explaining that CDC is committed to tackling these issues, and has developed a variety of new training and informational products to help assist clinicians and public health professionals in preparing for a radiological incident. These include satellite broadcasts, web-based content, reports, CDs, videos, DVDs, pocket tools, “just in time” training, fact sheets, and other print materials (visit www.bt.cdc.gov/radiation/). CDC has also held roundtables on critical preparedness issues, including communication, first receiver issues, and population monitoring. The present roundtable on the psychosocial challenges posed by a radiological terrorism incident is an important step in determining additional areas of emphasis for future informational and training efforts.

Steven M. Becker, PhD
Associate Professor of Environmental Health Science, and
Director, Disaster and Emergency Communication Research Unit
The University of Alabama at Birmingham School of Public Health

Dr. Becker discussed the nature of the radiological terrorism threat and its psychosocial dimensions. He noted that even in the aftermath of the 9/11 attacks, relatively little attention was devoted to preparedness for terrorism involving radioactive materials. There were many reasons for this, but perhaps the most important was the pressing need to fill huge preparedness gaps related to chemical, and especially, biological agents.

More recently, however, the threat of radiological terrorism has moved up on the nation’s preparedness agenda. The rapid rise in concern stems from a series of interconnected factors. At the most basic level, sources of radiation are ubiquitous. They have become essential to modern living and are found everywhere: hospitals, medical facilities, research and educational laboratories, industrial manufacturing and commercial facilities, etc. There are today millions of sources of radiation in this country and tens of thousands of sources in developing countries. Many of these sources remain highly vulnerable. As a 2003 federal report noted, many sources – even in a post 9/11 world -- are either unsecured or provided at best with an industrial level of security. One of the biggest concerns: large tele-therapy sources in hospitals. There is also a continuing problem with missing, lost, stolen or abandoned sources. Dr. Becker cited a 19,000-curie source that had been abandoned in Côte d’Ivoire before being recovered by the International Atomic Energy Agency. This was clearly a “success story”; but for every success, there are probably other sources that remain unrecovered and still pose a threat.

Greatly adding to concern about the potential for radiological terrorism is a very robust black market in radioactive sources. Dr. Becker cited numerous recent trafficking examples, including one from Thailand and another from the Czech Republic. Furthermore, there have been various alleged attempts by known terrorist organizations to acquire radioactive materials, and some terrorist organizations have reportedly experimented with radiological weapons. Finally, recent intelligence assessments have concluded that should terrorists succeed in creating a radiological device, they have the determination to use it.

Dr. Becker stated that although radiological terrorist scenarios can vary widely depending on such factors as the radioactive material used, internal vs. external hazard, size and type of device, weather conditions, etc., all radiological terrorism situations have one important thing in common: the capacity to produce high levels of fear and a host of social, psychological, behavioral, and public health impacts. Drawing on previous research and historical experience, Dr. Becker noted that the potential consequences include large-scale spontaneous evacuation, widespread social stigma, and the flooding of healthcare facilities with people who fear that they may have been exposed or contaminated. He cited the well-known example of the 1987 Goiania, Brazil accident involving cesium 137, where 112,000 people – even individuals from locations far away from the accident – sought examinations.

He also spoke about his research on stigma after the 1999 nuclear criticality accident in Tokaimura, Japan. Even though there was no significant off-site contamination, area farmers were unable to sell their produce because the public was afraid the products were tainted. Some stores even posted signs saying their produce was not from Tokai, and people from the Tokai area reported being subjected to subtle forms of discrimination in other parts of the country. For example, when checking into hotels while on vacation, individuals from Tokai were asked not to use the public baths. Such stigma and discrimination, which is common in situations involving invisible toxic agents, can create enormous problems for response and recovery efforts.

Dr. Becker concluded by saying that the social, psychological, and behavioral effects of a radiological terrorism event could be widespread and profound, and in some scenarios, might even be the principal impact. As such, these factors require far more attention in all phases of preparedness and response than they have received to date. "This is a strategic issue ... and it's going to be a major factor in determining whether we are successful in managing a large-scale radiological terrorism event."

Randal Beaton, PhD, EMT
Research Professor
Department of Psychosocial and Community Health
Schools of Nursing and Public Health and Community Medicine
University of Washington

Dr. Beaton discussed lessons learned from the sarin gas attacks on the Tokyo subway system in 1995. In that attack, sarin gas, a very potent neurotoxin, was covertly and simultaneously released on several sections of the Tokyo subway at about 8:00 a.m. He said that 12 people died in the incident and more than 5,500 people sought medical care. Many complained of eye pain, headaches, tearing, and breathing difficulties, and some were seriously ill.

Most of the people who showed up at St. Luke's, the nearby receiving hospital, were "walk-ins." There was a decision to convert the non-medical spaces, such as the chapel, into patient holding areas. Dr. Beaton mentioned calculations by the Defense Department that for every primary casualty of the attack, an additional four people sought treatment. While clearly a very rough estimate, it provides some indication of the scale of the influx of patients that hospitals could experience in a similar incident in this country.

In considering the large numbers in Tokyo, he offered these potential contributing factors:

- A covert, human-caused, malevolent, surprise attack
- Lack of preparedness to respond to such an unconventional mass casualty event
- Lack of diagnostic tests to quickly and accurately differentiate exposure victims from “worried individuals”
- The undetectable nature of the agent (colorless, nearly odorless and tasteless)
- Initial confusion in positively identifying the agent
- The fact that the agent was horrific, dangerous, and potentially lethal
- The crowded conditions in the subway trains
- The enclosed, confined and subterranean nature of Tokyo subway “tubes”
- Media accounts and rumors
- Public lack of familiarity with the agent and, to a lesser extent, health providers’ lack of familiarity, training, and relevant education

All of these factors, suggested Dr. Beaton, could be relevant to a terrorist event involving radioactive materials.

In planning for future events, Dr. Beaton suggested that hospitals try to 1) screen and evaluate incoming patients, 2) conduct decontamination, 3) establish a holding area away from where people are being treated, 4) track people who are thought to be okay in case they display symptoms later on, 5) provide reassurance and information on self-care, and 6) monitor patients for reemergence of symptoms.

Shin-ichi Ishimatsu, MD
Emergency Medical Physician
St. Luke’s International Hospital
Tokyo, Japan

Dr. Ishimatsu, who is an emergency medical physician at St. Luke’s International Hospital, discussed his experience in treating victims of the 1995 sarin gas attacks in Tokyo. As Chief of the Emergency Department at the time, he was directly involved in receiving, evaluating, and providing care to patients.

Dr. Ishimatsu outlined the incident, saying that the terrorists had attacked three lines and five trains with sarin. He identified several factors that greatly complicated the hospital’s emergency response:

- There was initial confusion about the nature of the agent involved, with some at the hospital believing it might be organo-phosphate poisoning. It was not until several hours later that sarin was implicated.
- Large numbers of people showed up on their own (on foot, by taxi, and other means) rather than being processed through the ambulance system. This made overall management difficult.
- “Walk-ins” arrived on their own before those who were more seriously injured.
- The hospital was inundated with people, including members of the press who “without consideration” took photos and made broadcasts.
- There were concerns about secondary contamination of hospital staff.
- There was a lack of resources for caring for the victims.

Dr. Ishimatsu said that no one was turned away from the hospital and that “mild” patients were observed for a half-day, given an information leaflet, and told that there would be a follow-up survey and medical examination. He stressed the importance of providing long-term follow-up and care for all patients, regardless of whether they were physically injured by the incident.

Colonel Yaron Bar Dayan, MD, MHA
Chief Medical Officer
Home Front Command Medical Department
Israel

Major Adi Leiba, MD
Coordinator for Non-Conventional Scenarios
Home Front Command Medical Department
Israel

Dr. Bar Dayan and Dr. Leiba gave a joint presentation on their research and experiences dealing with terrorism and managing mass casualty incidents in Israel. Working with 24 general hospitals, the Medical Department of Israel’s Home Front Command conducts education programs and emergency drills on wartime and peacetime threats. During mass casualty incidents, it serves as the national medical operations center, the coordinating arm between the incident scene and responding hospitals.

Dr. Bar-Dayan said that when people are mildly injured, they often go to the hospital on their own. They do not wait to be transported by emergency services. As a result, people experiencing high levels of anxiety arrive at the hospital before people who are physically injured. To manage the influx of people and the potential drain on hospital resources, the plan is to treat the injured at the hospital, while directing those considered “mildly injured” to nearby facilities called, “mild casualty centers.” Mild casualty diagnoses include mild intoxication (chemical or radiological), iatrogenesis, exacerbation of chronic diseases (pulmonary or cardiac diseases), and stress victims or those described as “worried well.”

A triage medical team stationed at the hospital gate interfaces with people as they arrive, conducts initial triage, and either directs the individuals into the hospital for further assessment or refers them to a mild casualty center. The centers are staffed with emergency physicians as well as psychologists and psychiatrists. In addition, a hospital military unit is assigned to each hospital to support surge operations in wartime scenarios.

Dr. Leiba elaborated that when hospitals are overwhelmed and incoming members of the public are sent elsewhere, it is important to send people to places that are familiar to them. “Simply setting up a tent complex and calling it a military hospital won’t work,” he said.

Dr. Leiba said that the policy for a chemical incident is to instruct mild casualties to change their clothes, but not undergo decontamination. “That would make them more worried and there is no need to do this,” he said. In a radiological incident, the policy is to monitor patients for radiation and conduct decontamination only if there are signs of contamination.

There are three psychological phases: acute stress reaction, permanent anticipatory stress, and Post-Traumatic Stress Disorder (PTSD). Dr. Leiba said manmade toxic hazards cause greater fear than natural disasters because of the uncertainties involved and that radiation-induced anxiety is a long-lasting phenomenon, which was borne out by an Israeli study of

the stress levels of 40 immigrants (ages 25 to 55) from Chernobyl. Furthermore, a radiological terrorist event, he said, could result in contamination-related stigma and loss of trust in societal institutions.

Dr. Leiba stressed the importance of empowering the public to take action for its own health and safety. It is vital to “give the population responsibility, give them knowledge,” he said. “That’s why in Israel we believe in giving the population masks and atropine injectors, and the medications they need.” Providing information before an event, such as conducting preparedness education in the schools, is another aspect of the Israeli program. “Each year we go into every school in all grades and train the students how to respond,” Dr. Bar-Dayana said. He also said that it is important to line up respected opinion leaders to talk to the media in times of crisis as a way of reducing public anxiety about what may happen.

Chapter III: Key Issues and Considerations

Following the five background presentations, roundtable participants began a series of focused discussions of psychosocial issues associated with a radiological terrorism event. The aim was to identify key challenges and their implications for medical and public health preparedness.

Issue 1: Impacts

A radiological terrorist attack could result in widespread and profound psychosocial impacts at all levels of society.

Contamination-related social stigma, chronic anxiety and emotional distress, refusal to return to homes and workplaces because of fear of contamination, long-term disruption due to population evacuation or relocation, a major surge in demand for medical attention, loss of trust and confidence in societal institutions: these were seen as some of the more serious, potential psychosocial impacts that could result from a large-scale radiological terrorist attack.

Avoiding or reducing these potential impacts represents a challenge for emergency planning, emergency management, medical and public health agencies.

“Where does fear go? Fear of contamination, fear that somehow you’ll be labeled and stigmatized? Fear causes some to withdraw and others to become hostile.”

1. Public fear of radiation – A large body of research shows that radiation is among the most dreaded of all hazards. How can healthcare providers and public health professionals deal with the public’s fear and anxiety? What are the implications of public fear for response and recovery efforts?

2. Hospital preparedness – How can hospitals plan for a large-scale radiological attack, including its psychosocial effects? What special plans and resources need to be in place? What are the incentives for increasing hospital preparedness in this area? How can rural medical facilities prepare for psychosocial impacts, considering their limited resources? How could they handle populations self-evacuating from nearby urban areas?

3. Managing a potential flood of “walk-ins” – How can hospitals prepare for the anticipated influx of people that would overwhelm hospital resources in a radiological attack? What should be done to assist the influx of people who are not physically injured but are demanding medical services? What can be done to help people who don’t need to be admitted to the hospital but have clear needs?

4. Lack of training within the healthcare community – What can/should be done to address misperceptions about radiological contamination? What can be done to address the

lack of education and training on these issues within the medical and public health community?

5. Communication, trust, and credibility – How can emergency information be transmitted in a way that enables people to take appropriate self-protective actions and builds a sense of efficacy? What can be done to increase the trust and credibility of agencies and officials who are responsible for public communications?

6. Social stigma – How might stigma play out in a large-scale radiological terrorism incident on the U.S. mainland? How might social stigma affect healthcare utilization, community support, and community recovery? How does the “radiation factor” affect the way that displaced populations are received? How will people and communities respond to the burial of radioactive human remains? What can be done to reduce stigmatization of people, products, and places associated with radiological exposure or contamination?

“How will people and communities respond to the burial of radioactive remains?”

7. The safety benchmark – How should “safe” or “clean” be defined in a post-attack environment? How should healthcare providers respond when public institutions disagree on “what is safe?”

Issue 2: A Need to Replace the Term “Worried Well”

There is a need for a new term (to replace “worried well”) that refers to large numbers of concerned and anxious people, some experiencing stress-related symptoms, who self-report to healthcare facilities, and who may need examinations, care, and attention but do not need to be admitted to a hospital.

“We have to think long and hard about what we call things. The terms we use are very powerful.”

Participants of the roundtable agreed that there is a pressing need for a term that refers to large numbers of worried, concerned, and anxious people who are not physically injured, but who are fearful of potential contamination, and who go to hospitals and medical facilities on their own requesting medical services. Collectively, the large numbers of such individuals can rapidly overwhelm facilities’ resources to respond.

Some participants said that “worried well” is a pejorative, dismissive term that implies that those so-labeled need not be taken seriously. Participants also said that while the term is commonly used for planning purposes, it is non-specific and ambiguous. “Worried well” means different things to different people, and this inconsistency presents a problem.

A medical model, for example, uses the term to refer to anyone who comes to the hospital but does not need to be admitted. In a response, the term has no utility because it is a retrospective diagnosis – people cannot be determined “well” until they’ve been assessed. Hence, these individuals cannot be segregated because they, like those desperately needing medical treatment, are making demands that must be addressed.

Participants noted that everyone seeking medical attention is, in fact, either a patient or a potential patient. Moreover, such individuals may not be “well” at all; they may be symptomatic or emotionally distressed, or they may be exhibiting signs of pre-existing illnesses. Or they may have been exposed to radiation, have a definite need to be assessed, but are not yet showing physical signs of exposure.

One participant said that it is important to distinguish people who are distressed from those who are symptomatic, but not severely. Another said that the term “distressed” connotes a form of disease and implies that the individual needs treatment. Conversely, he said term “well” might convince people that they do not require medical services. Another participant suggested adding a fourth category of triage that is distinct from “critical,” “intermediate,” and “walking wounded.” Otherwise, he said, they’re going to get mixed in with those who need immediate medical help.

It was suggested that this influx of people be defined according to their own goals and behaviors (e.g., people wanting to know whether they’ve been “affected”), and the goals and behaviors that emergency clinicians want to encourage (e.g., people who have been potentially exposed should go home, not to the hospital, shower and change their clothes).

Based on that premise, the group discussed a variety of terms that could potentially replace the term “worried well”:

- Patients and potential patients
- Stress reaction
- Exposure reaction
- Nervous, not yet diagnosed
- Exposed but not yet diagnosed
- Not yet diagnosed, but non-symptomatic
- Mild casualties (everyone who is not moderate or severe)
- Exposure concerned
- Anticipatory exposed concerned
- Non-toxic
- Ambulatory and non-ambulatory
- Reassurance-seeking citizens, diagnosis-seeking citizens, and reassurance- and assessment-seeking citizens
- OMMUS (outbreaks of multiple or medically unexplained symptoms)
- MUPS (multiple unexplained physical symptoms)
- Concerned individuals

No single term was seen to be wholly satisfactory. But participants expressed the view that it was important for the discussion about replacing “worried well” to continue, both among mental health professionals and in the broader preparedness and response community.

Issue 3: Drivers of Behavior and Mental Health

How people respond to radiological incidents is a reflection of psychological drivers of behavior, such as fear, anxiety, and the natural desire to take action to protect one's health. This is not the same thing as addressing the mental health needs of individuals as a result of the incident. Both are important – but distinct – aspects of “psychosocial.”

Once we understand the psychological drivers of behavior specific to radiological terrorism, we can craft a more powerful communication and operational interventions to address them. It is critically important to recognize that addressing psychological drivers of behavior (the emotional reasons why people do the things they do and what triggers them) is distinct from providing mental health services to people who have experienced such an event. When we discuss the “psychosocial impact” we are really talking about two things: how and why people behave the way they do in response to the event, and the mental health needs that emerge as a result of the event.

“The situation at the Superdome (after Hurricane Katrina) was horrific and people were really frightened. These people were not seeking mental health care.... What we're talking about with “psychosocial issues” often is not mental health care services. It's the psychological ramifications that drive behavior, that drive what people are going to do, that drive how they function, and that often begins the downhill spiral.... I think things get confused and thrown aside when we talk about mental health. It needs to be embedded in how people behave.... There's a place for mental health services, but it's downstream.”

Because the concepts of psychological drivers of behavior, psychosocial issues, and mental health services often get mixed together and muddled, they are often discounted or put aside by planners and responders who are more concerned with the immediate response, operational issues, and the provision of medical care to critically injured people.

Unfortunately, there is less understanding that we can more successfully impact the actions people take in an effort to protect themselves if our communication (style, content, tone, messenger) takes into account people's emotional disposition, their likely motivations, and information needs. Ultimately, people are motivated by a desire to protect themselves and their loved ones. In addition, taking actions one believes to be helpful relieves high levels of distress or anxiety. Therefore, we need to help people better understand and trust which actions are truly protective in an effort to encourage people to undertake behaviors that protect their health and wellbeing and support the overall response effort.

Issue 4: Preparing Healthcare Facilities

In the event of a radiological attack, the healthcare system needs to be prepared to triage and assist not only the physically injured, but also a great many people who are not physically injured but are fearful of potential contamination, emotionally distressed, experiencing stress-related symptoms, or demanding care.

Healthcare professionals now generally assume that hospitals will be inundated with “walk-ins” seeking medical assessment after a radiological terrorist attack, and that this influx of people will far exceed hospitals’ medical capacities to respond. But how can hospitals best manage this influx of people? How do they ensure that limited medical resources are directed toward those who need help the most? How can people who are not seriously injured, but who are worried about potential exposure or contamination, be assisted in a way that doesn’t alienate them or exacerbate their fears? What policies, protocols, and guidelines are needed?

Participants rejected any suggestion that people could simply be turned away. “We believe that every one who shows up must be screened,” said a hospital emergency department physician. “I don’t know how else to look at somebody and say you’re not exposed or contaminated.” Once people are “in the door,” hospitals will need to communicate with each of them and conduct medical assessments as well.

There is, at the present time, no single universally accepted approach or template for hospitals to use for triaging and managing the large influx of people expected to arrive during a large radiological terrorism incident. Likewise, there is no widely accepted approach indicating in specific terms how the so-called “worried well” can best be assisted.

“If we’re doing our job right with messaging and information, then we will reduce the number of people showing up in emergency rooms.”

Several approaches and experiences were discussed by roundtable participants. One approach that was frequently mentioned involves establishing a system whereby people who are not physically injured are steered away from the emergency department toward a secondary care facility or other area within or near the hospital. The concept is to conduct a quick visual screening (prior to triage) as soon as people enter the hospital grounds. This would be done in a pre-designated “receiving area,” perhaps outside in the hospital parking lot.

People arriving by ambulance would be triaged in the normal manner, but all “walk-ins” would be directed to the receiving station. A specially trained team of healthcare providers would be responsible for conducting the initial assessment. People who are physically injured would be sent immediately to a medical care area connected to the emergency department for triage. Everyone else would be directed toward other areas, where services and/or information could be provided.

The social service area, staffed by mental health specialists, would serve people exhibiting high levels of emotional stress who are not contaminated, exposed, or physically injured. This area could be located in the hospital cafeteria, for example.

Individuals only needing information about hospital services, assessment, radiation effects, contamination, and self-protective actions might be sent to an adjoining administration building or neighborhood school.

Participants noted that while life-saving medical services should always take precedence, it would be important to integrate mental health expertise and services across the entire triage system. For example, it was suggested that a social worker, psychologist, and psychiatrist be stationed in the emergency department. Similarly, it would be important for medical personnel to be available in the services and information area to make clear to patients that their health concerns are being taken seriously and in case people in those areas were misclassified and sent to the wrong area or took an unanticipated turn for the worse.

Participants saw many benefits to the Israeli approach of creating "mild casualty centers." However, there were concerns about whether the approach could be transferred to the U.S. context. As one roundtable participant remarked, "The fact is that this country is much bigger and some of the strategies simply can't work here."

Overall, preparing to manage and assist a large influx of "walk-ins" was seen as critical to hospital operations and incident management. At the same time, the best approach would be to reduce such problems in the first place through effective information and communication strategies. As one participant commented, "If we're doing our job right with messaging and information, then we will reduce the number of people showing up in emergency departments."

Issue 5: A Need to Reconsider the Term “Secondary Care Facilities”

While hospitals may need to establish special assessment and alternate care areas for handling large influxes of people following a terrorist event, the term “secondary care facility” may need to be reconsidered.

“On September 11, 2001, we utilized the student center... a block and a half away from the hospital. We took our behavioral health counselors, social workers, and pastoral care workers and began on-the-scene psychosocial work right there away from the hospital. It really did help relieve congestion and get the care started. We’re now 4 1/2 years past the event and the needs continue (because the psychological needs of the community persist even today...)”

A key to preventing hospitals from becoming overwhelmed in times of terrorism is to establish adjunct medical facilities sometimes called, “secondary care facilities” that can care for non-injured populations. A hospital that takes in more people than it can handle becomes paralyzed. Nevertheless, participants said people would continue to self-transport to hospitals unless they’re convinced that there’s an advantage to being someplace else.

The term “secondary care facility” may be problematic because it seems to imply care that is not as important or of the same quality as that which is provided in the emergency department or similar care area. Participants said it would be better for service providers and patients alike to think of the facility as an “annex” to the

hospital or an area that has been “deputized” as a medical facility and has medical personnel on-site; otherwise, people may feel their concerns are not being taken seriously. In the words of one participant explained, *“simply setting up a tent complex and calling it a hospital won’t work.”* As another participant said, the facility must be clearly seen to be a serious medical treatment facility where *“people are being cared for in a responsible way and not just being discarded with a label.”*

Various hospitals’ plans call for staffing these facilities with psychologists, psychiatrists, social workers, emergency clinicians, and experts in public health and self-protection. In the event of a radiological incident, Israel’s hospital system would conduct medical assessments at its secondary facilities (“mild casualty centers”) as well.

Participants recommended that hospitals reach out to the media to get the message out about where people should go in times of emergency, and to specifically explain what kind of services can be expected. Advance planning to identify the locations, staff arrangements, partnerships with other organizations that can help, what locations and types of services will be called, and how this will all be explained to the public will facilitate the process in the event of an emergency and enable rapid communication to occur.

It also important that the hospital legal team reviews plans for managing the overflow of people. Laws and regulations mentioned during the discussion included the Emergency Medical Treatment & Labor Act (EMTALA), the Consolidated Omnibus Budget Reconciliation Act (COBRA), and Joint Commission on Accreditation of Healthcare Organizations (JCAHO) regulations.

Issue 6: What is Safe? What is Clean?

There are continuing disagreements regarding radiation health effects and what can be considered “safe” or “clean” after a radiological terrorism event.

Current discussions about when an area can be considered safe to live, work, or visit after a radiological terrorism incident are complicated by scientific disagreements, political and economic pressures, fear stemming from past nuclear disasters (such as Chernobyl), and a lack of understanding of radiation. These issues contribute to a misperception that only “zero is safe” among many segments of society.

It was agreed that these issues could greatly complicate response and recovery efforts after a radiological terrorism event, perhaps generating fear, suspicion, and distrust. It is important, therefore, to develop effective processes for making decisions about these issues before a disaster strikes. To build trust and confidence, these processes will need to be open and inclusive, involving participants from many stakeholder sectors and organizations.

Chapter IV: Recommendations

This section contains recommendations that were discussed during the two-day roundtable. Although they emerged as ideas that many agreed with, they do not represent consensus recommendations and no effort was made to develop consensus recommendations from this project.

Recommendation 1: Work with the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) to identify opportunities for better incorporating psychosocial preparedness into JCAHO standards.

Roundtable participants generally agreed that the psychosocial impacts on individuals and communities would be enormous in a large-scale radiological terrorist attack, and that these impacts can outweigh even the physical consequences of an incident. Hence the need, they said, to better incorporate psychosocial issues into healthcare planning.

What would motivate hospitals to allocate more resources toward preparedness for the psychosocial impacts of a radiological terrorist attack? In response to that question, participants repeatedly referenced two motivating factors: profit and accreditation. As one participant stated, "Hospitals are driven by profit, and anything that takes a half-day away from profit-making is not well received unless it's necessary for JCAHO accreditation."

The group emphasized that JCAHO standards are a major factor in determining how hospitals allocate resources. They said that hospitals are inundated with regulations and requirements, and hence focus on "what's coming next."

"You have to think about what makes people tick. Without certification, people don't train because there's no emergent need."

They said that because current requirements do not speak specifically to psychosocial issues, CDC could work with JCAHO to assess what can be done to enhance preparedness in this area.

For example, a number of participants expressed the view that improved planning for managing "walk-ins" would be helpful. One participant, for example, recommended "that JCAHO develop some plans for coping with the worried well and the walk-ins who will be showing up for treatment of some sort. I was at a presentation where it was suggested that we just send the worried well home. I don't think they will want to go home. And in any event, I think we need to have a hospital plan across this United States."

A related idea on how to build upon hospitals' existing requirements was to incorporate radiological agents in Material Safety Data Sheets (MSDS) management processes. Under the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard, employers are required to identify chemical hazards in the workplace, and make

MSDS's, which contain information on use, handling, storage, and emergency procedures, available.

Recommendation 2: Work to better integrate preparedness for psychosocial impacts into the Nation's planning, training, exercises, and incident management protocols.

Participants suggested that it was important to better integrate psychosocial issues into all of the major components of the Nation's homeland security program.

1. National Response Plan (NRP) – This is the Nation's plan for managing large-scale incidents. The Plan incorporates procedures from incident management disciplines (such as emergency management, law enforcement, firefighting, public health, and emergency medical services) and integrates them into a unified structure. The Plan includes 15 Emergency Support Functions (ESFs), which provide the structure for coordinating federal resources in a national incident. ESF 8 covers public health and medical services and is led by the U.S. Department of Health and Human Services.

“These issues still tend to be overlooked in most exercises.”

It was noted that the NRP is an evolving document and that there could be opportunities for expanding ESF 8 to incorporate psychosocial considerations.

2. National Exercise Program (NEP) – The NEP, managed by the U.S. Department of Homeland Security (DHS), conducts national exercises and training programs to prepare government agencies for large-scale emergencies. The largest exercise in the program is the Congressionally-mandated Top Officials (TOPOFF) exercise series. TOPOFF is a full-scale exercise that plays out over several days, engaging agency leaders and staffs from all levels of government.

TOPOFF was referred to a number of times during the two-day roundtable discussion, including TOPOFF exercises that have focused specifically on radiological terrorism (e.g., the Seattle exercise). Participants said that psychosocial issues tend to be overlooked because they're often seen as too difficult to deal with. Incorporating psychosocial impacts into exercise design, they said, would familiarize everyone connected with the exercise with the issues and the resources for dealing with them. “Exercise planners can't just give lip service to the psychological aspects,” said a participant. “People who are worried need resources, they're going to clog up the system, and we need to prepare.”

3. Homeland Security Exercise and Evaluation Program (HSEEP) – This represents DHS' methodology and language for designing, developing, conducting, and evaluating homeland security exercises (www.hseep.dhs.gov). HSEEP is designed to provide a standardized approach to assessing and improving preparedness across the Nation. Better incorporating psychosocial aspects into HSEEP would represent a significant step forward.

4. National Incident Management System (NIMS) – NIMS establishes standardized processes, protocols, and procedures for responding to emergencies. By using a common

language and approach, responders from all levels of government can more efficiently deploy and coordinate resources across jurisdictions and agencies.

An analysis of NIMS would be a positive step for determining opportunities for incorporating psychosocial issues in agencies' emergency response processes and procedures. "We need to quantify how psychosocial needs are going to be different from other disaster scenarios, and then develop a strategy or doctrine for medical responders related to doing this," said a participant.

More generally, it was suggested that psychosocial preparedness activities be better linked to CDC and other federal grant making. Only by concurrently requiring preparedness and providing funding will many of these issues be addressed.

Recommendation 3: Improve the level of realism of psychosocial issues in radiological terrorism training exercises.

In addition to suggesting that *more* psychosocial content be incorporated into training exercises, participants recommended that psychosocial content be made *better*. In particular, participants called for the level of realism to be increased. "*CDC should inject more reality in terms of psychosocial aspects into national planning, training, and exercises, such as TOPOFF,*" said a participant. "*Perhaps there's a way to run a train-the-trainer course or develop curriculum on how to exercise these capabilities in national programs.*"

Members of the group recommended that several kinds of public behaviors be considered for exercise design:

- People in line not waiting politely for medication, or not willing to wait quietly for information;
- Hospitals being overwhelmed with journalists, walk-ins, and moulaged stress victims;
- Hospitals being inundated with blood donors;
- Masses of people bringing clothing and food.

"I would encourage exercise planners to run the scenario out beyond the first few hours. A radiation event is a long-term event. Fear lasts a long time."

Describing the discrepancy between current exercises and what happens in the real world, one hospital-based participant said: "You can't image the volume of people, it's overwhelming."

Roundtable participants also advised extending the timeframe covered by exercises. "I would encourage exercise planners to run the scenario out beyond the first few hours. A radiation event is a long-term event. Fear lasts a long time."

Recommendation 4: Support education and training programs for hospital staff and health department staff by building coalitions with professional associations and providing tools and materials on radiological terrorism and psychosocial issues.

Throughout the two-day discussion, participants emphasized the need for additional education and training for hospitals and health departments. This training is not only needed for clinicians, but also for administrative personnel, food service staff, and all support staff. Important topics include principles of radiation, health effects, the difference between exposure and contamination, self-protection, psychosocial effects, emergency response, and roles and responsibilities in a radiological terrorism incident.

The group encouraged CDC to work with professional organizations to strengthen public health and hospital training and education programs. They said that if staff members have a better understanding of what to expect in a radiological incident, they're going to be better able to cope with the situation and respond more effectively. It was stated that research shows that the potential no-show rate in a radiological incident is greater than 50 percent among healthcare providers. Among participants' comments:

"There's a clear knowledge or educational deficit in terms of what healthcare providers and their families and the general population need to know about radiological events."

"We have to address the gap in knowledge of many physicians. If the average physician can't explain radiation to a patient we're in big trouble because that's the first place they're going to go for information."

"We really need to demystify a radiological event. The whole problem we have is disinformation and misinformation."

"The deal breaker is the janitor, the laundry person, the one who puts the food out. If you can't keep the bed clean and turn over your services, you can't service any patients."

Specific recommendations based on the discussion and comments regarding training are as follows:

A. Infuse trainings with information about the psychosocial impacts of a radiological incident and how to anticipate, prepare, and manage them.

Participants said that training programs should address the anticipated psychosocial impacts of large-scale terrorism so that employees know what to look for and what they can do to help. They noted that everyone working in a hospital would come in contact with people experiencing psychological impacts, including their fellow employees, incoming patients and their families, and existing patients in the hospital.

“We provide training on the mental health aspects of terrorism and risk communication. The first year we targeted primarily clinical staff and we realized the error of our ways. The second year we included a certain percentage of security guards, receptionists, housekeeping, and all those folks because we realize how important it is.”

“We’re not trying to turn them into clinicians. We’re just giving them a heads-up so lots of people have their eyes peeled (on psychosocial impacts).”

“Whether it’s the pastoral care worker that’s talking to them or the social worker or the emergency room nurse, everyone needs to be prepared to help look for the signs, for those psychosocial effects that may come about.”

“We focus on preparedness to respond, but we don’t focus on preparedness to recover. The recovery end has huge psychosocial ramifications.”

B. Provide materials for hospitals and health departments to use to educate and inform staff and their families. Among participants’ specific recommendations were:

- Develop information and materials for physicians, nurses, mental health specialists, and other hospital workers (cleaning, laundry, administrative, and food services).
- Incorporate family preparedness in communications with staff. Include information about how the hospital will communicate with staff in an emergency. “People won’t come to work until they know their family is okay.”
- Distribute radiation detection cards to healthcare providers. “Radiation is invisible, but you can always take a reading.”
- Develop posters for emergency rooms on radiation response procedures.

C. Develop leadership training. This might include developing leadership skills for hospital administrators and other health professionals so they can effectively lead during a disaster. It might also include providing technical content for leadership guidebooks and materials for formal leaders such as elected officials who have the authority during a crisis but not the science-based information upon which to make decisions.

D. Expand trainings for responder teams to include an understanding of the specific issues related to radiological disasters. Partner with established training sources for responder professionals (such as EMI) to include psychosocial issues in their intensive training exercises.

E. Encourage the use of appropriate professionals to support the responder community. Participants noted that retired firefighters and retired police officers are often recruited for peer counseling during and after disasters. The National Institute for Occupational Safety and Health uses a similar model where miners train other miners about mine safety because “you’re not credible unless ‘you’ve been down in the hole.’”

Recommendation 5: Strengthen national partnerships and communications systems for disseminating “just-in-time” training and information to hospitals immediately following a radiological terrorist event.

Roundtable participants called on CDC to collaborate with other federal agencies and professional associations to develop an improved national capability to provide instantaneous and consistent protocols and information to emergency clinicians across the country during emergencies. The delivery mechanisms need to take into account the fact that phone, Internet, and other usual means of communications may be overloaded or inoperable during a major emergency. Because there are so many organizations that can potentially reach clinicians, communities, and the public, identifying and collaborating with these networks *before* a crisis, and leveraging networks, was seen as critical to success. Some participants thought that distribution networks should extend beyond the medical care community to include the public as well, so that information is provided to local leaders and elected officials to share with their constituents and information is made available to parents who need to address the unique needs of their children.

“You’ve got to make sure that the federal government’s agent expertise gets down to us at the front lines in advance and particularly during the event when the particular agent expertise is needed.”

“After the anthrax incident, we started getting faxes and emails from CDC, HHS, and hospital associations, all with slightly different information on how to deal with anthrax.”

Participants said that hospitals need specific and consistent information about threat agents that has the backing and authority of CDC and other federal agencies. Participants discussed focus group research that shows that many hospital emergency department clinicians would turn directly to CDC for advice during a radiological event, and believe that they would be able to rapidly access whatever information they need to answer specific questions about medical management, contamination, decontamination, care of personnel, and what to communicate to the public.

CDC should also be prepared to provide technical assistance and consultation to affected regions regarding agents and treatments at the time of a disaster. Materials and tools that are needed by local health and public health officials include information on medical countermeasures; recommendations for triage mechanisms and protocols; monitoring and surveillance tools, recommendations, and protocols; and information about and access to diagnostic tools to help hospitals appropriately categorize patients.

Recommendation 6: Recognize the importance of effective communication and information strategies in the prevention of, and response to, the psychosocial impacts of a large-scale radiological terrorism event.

CDC has already conducted a separate roundtable on the communication issues and challenges posed by a large-scale radiological terrorism event. Thus, participants in the present roundtable did not discuss these matters in great detail. However, the participants did recommend that attention be paid to several key issues:

Develop authoritative multimedia products that can be tested, pre-approved, and readied for rapid distribution in a radiological event to state public health personnel, hospitals and emergency clinicians, the media, and the public.

Conduct and share message development and testing research to identify what people want and need to know, and how best to communicate it. Some of this work has already been conducted. It was recommended that this body of work be shared and expanded upon.

Develop a national media campaign to generate messages and coverage about radiological disaster preparedness. The group also acknowledged that this is not a timely or salient issue and that a strong hook would need to be created to generate media interest.

Be ready to handle enormous volume of calls from the public and other sectors in the event of a radiological disaster. It was noted that the outbreak of foot and mouth disease in the United Kingdom in 2001 resulted in a virtual torrent of calls from the public.

Create non-traditional (perhaps) partnerships with organizations that can reach effectively into targeted audiences. Potential partners include the National Association of Poison Control Centers, state public information hotlines, and United Way 2-1-1 hotlines. There was a good deal of discussion on the importance of engaging faith-based organizations, spiritual leaders, and pastors who connect with people in the communities in ways mass media cannot.

Recommendation 7: Conduct an inventory and assessment of federal government and professional association initiatives, research, and tools associated with the psychosocial impacts of a large-scale radiological terrorism event.

The participants expressed concern that there are many disparate efforts underway to address the various aspects of psychosocial impacts of large-scale terrorism, but that these efforts were not tied together in any way. The participants' recommendation to CDC is to identify gaps in knowledge and preparedness, and determine priorities based on a comprehensive needs assessment, beginning with an inventory and analysis of what other government agencies and professional associations are doing in this area.

Another aspect of this recommendation is to collect best practices and lessons from around the world. These could be focused on understanding and managing the psychosocial aspects of a radiological terrorism event, but could also draw more broadly on experience managing the needs of the anxious and worried individuals and other issues that were discussed during this roundtable.

In addition, it was suggested that CDC compile information and develop best practices on incorporating psychosocial issues into radiological terrorism exercise design and publish articles in the public health and medical literatures to disseminate the information.

Appendix A: Roundtable Participants

Roundtable Expert Panel

Mr. Mark Ackermann
Saint Vincent Catholic Medical Centers

Dr. Yaron Bar-Dayan
Israel Home Front Command Medical
Department

Dr. Randal Beaton
University of Washington

Dr. Steven M. Becker
School of Public Health
The University of Alabama at Birmingham

Mr. Sumner Bossler
Health Resources and Services
Administration

Dr. Susan Brandon
MITRE Corporation

Mr. Donald Decker
NYC Department of Health and Mental
Hygiene

Dr. Fun Fong
Emergency Physician

Dr. Thomas Grieger
Uniformed Services University of the
Health Sciences

Dr. Robin Gurwitch
University of Oklahoma Health Sciences
Center

Dr. Shin-ichi Ishimatsu
St. Luke's International Hospital, Japan

Ms. Kathleen Kaufman
Los Angeles County Radiation
Management

Dr. Adi Leiba
Israel Home Front Command Medical
Department

Dr. Ann Norwood
U.S. Department of Health and Human
Services

Dr. Ross Pastel
U.S. Army Medical Research Institute of
Infectious Diseases

Dr. Fran Pilch
U.S. Air Force Academy

Dr. Merritt Schreiber
University of California at Los Angeles

Ms. Viktoria Vibhakar
Los Angeles County Public Health
Department

Dr. Stuart Weiss
Saint Barnabas Health Care System

CDC Representatives Participating in the Roundtable

Mr. Richard Klomp
Dr. Charles Miller
Dr. Dori Reissman
Dr. Daniel Sosin
Dr. Marsha Vanderford
Dr. Robert Whitcomb

Other CDC Representatives in Attendance

Mr. Michael Brooks
Mr. Scott Damon
Ms. Iris Dixon
Ms. Elizabeth Donnelly
Ms. Christine Gray
Mr. Albert Hyancith
Ms. Judy James
Ms. Carol McCurley
Ms. Kelly Sarmiento
Ms. Jane Mitchko
Mr. Eddie Shanley
Ms. Florie Tucker

Ogilvy Public Relations Worldwide

Ms. Trenise Lyons
Ms. Michelle Rios
Mr. Tom Wahle

Ms. Linda Weinberg

Facilitator

Mr. Michael Mills

Appendix B: Roundtable Agenda

CDC Roundtable on the Psychosocial Challenges Posed by a Radiological Terrorism Incident

December 6-7, 2005

Day One

8:00 a.m. – 8:30 a.m.	Roundtable Registration
8:30 a.m. – 8:45 a.m.	Welcome Dr. Michael McGeehin, Director Division of Environmental Hazards and Health Effects National Center for Environmental Health Centers for Disease Control and Prevention Dr. Charles Miller, Chief Radiation Studies Branch Division of Environmental Hazards and Health Effects National Center for Environmental Health Centers for Disease Control and Prevention
8:45 a.m. – 9:00 a.m.	Introduction
9:00 a.m. – 9:15 a.m.	Introduction of Participants
9:15 a.m. – 10:15 a.m.	Opening Presentations “The Radiological Terrorism Threat” Dr. Steven M. Becker Associate Professor of Environmental Health Sciences, and Director, Disaster and Emergency Communication Research Unit The University of Alabama at Birmingham School of Public Health “Learning from the Tokyo Sarin Attacks” Dr. Randal Beaton Research Professor Department of Psychosocial and Community Health Schools of Nursing and Public Health and Community Medicine University of Washington

Dr. Shin-ichi Ishimatsu
Emergency Medical Physician
St. Luke's International Hospital
Tokyo, Japan

"Insights from Israel's Experience with Terrorism"

Colonel Yaron Bar Dayan, MD, MHA
Chief Medical Officer
Home Front Command Medical Department
Israel

Major Adi Leiba, MD
Coordinator for Non-Conventional Scenarios
Home Front Command Medical Department
Israel

Questions and Discussion

10:15 a.m. – 10:30 a.m.

Coffee Break

10:30 a.m. – 10:45 a.m.

Introduction to First Plenary Session

10:45 a.m. – 11:45 a.m.

Plenary Discussion

What are the key psychosocial challenges
associated with a radiological terrorism incident?

How serious are these challenges?

The so-called 'worried well' issue – what should
we call it, what are the challenges that it poses?

11:45 p.m. – 12:45 p.m.

Lunch

12:45 p.m. – 1:45 p.m.

Breakout Session

Hospital Preparedness

1:45 p.m. – 2:30 p.m.

Breakout Reporting and Discussion

2:30 p.m. – 2:45 p.m.

Coffee Break

2:45 p.m. – 3:45 p.m.

Breakout Session

Strategic Level Preparedness

3:45 p.m. – 4:30 p.m.

Breakout Reporting and Discussion

Day Two

8:30 a.m. – 8:45 a.m.	Review and Summary of Day One
8:45 a.m. – 9:00 a.m.	Introduction to Day Two
9:00 a.m. – 10:00 a.m.	Plenary What are the key social impacts and challenges posed by a terrorist incident involving radioactive materials? What steps can be taken to preventing and addressing stigma and other social impacts?
10:00 a.m. – 10:15 a.m.	Break
10:15 a.m. – 11:15 a.m.	Parking Lot – Remaining Issues and Other Topics
11:15 a.m. – 11:30 a.m.	Break
11:30 a.m. – 12:30 a.m.	Final Plenary What Have We Achieved? What Remains to Be Done? What Should the Next Steps Be?
12:30 p.m.	Close and Adjournment

Appendix C: Resources Identified During Discussions

Roundtable participants identified a variety of partnership opportunities, existing training products, and other resources that can help hospitals, health departments, and communities prepare for the psychosocial aspects of a radiological terrorist incident. Some of the resources and sources of information that were mentioned most in the roundtable discussions are listed below:

CDC's Radiation Studies Branch – Provides training and educational products on radiological emergency preparedness for clinicians and hospitals, first responders, and the public (visit www.bt.cdc.gov/radiation/).

CDC's Disaster Mental Health Resources – Provides resources on topics such as coping with disaster, helping kids and teenagers, as well as information for health providers and responders (visit www.bt.cdc.gov/mentalhealth/).

U.S. Department of Health & Human Services' Office of Public Health and Emergency Preparedness (OPHEP) – Serves as the Secretary's principal advisory staff on matters related to bioterrorism and other public health emergencies. Provides resources for stakeholders, such as the Medical Surge Capacity and Capability Handbook (visit www.hhs.gov/ophep/).

U.S. Department of Health & Human Services' Substance Abuse & Mental Health Services Administration (SAMHSA), and Agency for Healthcare Research and Quality (AHRQ) - SAMHSA has a crisis counseling program and numerous resources for various audiences.

American Psychological Association – Provides research and resources on the impact of terrorism and disaster on children, resiliency, post-disaster mental health interventions, and related issues (visit www.apa.org).

National Library of Medicine, National Institutes of Health – The world's largest medical library provides information and research services in biomedicine and health care (visit www.nlm.nih.gov). Information for clinicians about treating people who have been exposed to radiation is forthcoming.

U.S. Department of Health & Human Services' Health Resources Services Association (HRSA) - HRSA funds hospital preparedness grants.

Emergency Public Information and Communications (EPIC) Advisory Board Report - This group of experts was convened by HHS to begin to explore public information and communication needs during disasters. The report offers many solid, actionable ideas and recommendations.

Online training courses - Available from the Department of Defense and the Emergency Management Institute, which is part of FEMA/DHS.

CDC's Health Alert Network - Noted as a resource for clinicians to become aware of medical issues surfacing in their communities.

The Federal Radiological Preparedness Coordinating Committee - Managed by DHS, this group can and should be incorporated into any CDC effort related to radiological disasters.

National Public Health Information Coalition (NPHIC) - A group of public health communicators, affiliated with the Association of State and Territorial Health Officials (ASTHO), serves as a networking mechanism for the exchange of methods, techniques, and information for the enrichment and improvement of public health programs. Members include directors of public health information at the state and local level.

Appendix D: Additional Sources Provided by Speakers

Additional information related to the five roundtable presentations may be found in the following articles:

Bar-Dayan Y, Leiba A, Beard P, Mankuta D, Engelhart D, Beer Y, Lynn M, Weiss Y, Martonovits G, Benedek P, Goldberg A (1999). A multidisciplinary field hospital as a substitute for medical hospital care in the aftermath of an earthquake: the experience of the Israeli Defense Forces Field Hospital in Duzce, Turkey, 1999. *Prehospital and Disaster Medicine* 20(2): 103-6.

Beaton R, Stergachis A, Oberle M, Bridges E, Nemuth M, Thomas T (2005). The sarin gas attacks on the Tokyo subway 10 years later - lessons learned. *Traumatology* 11(2): 103-119.

Becker, SM. (2005). Addressing the psychosocial and communication challenges posed by radiological/nuclear terrorism: key developments since NCRP 138. *Health Physics* 89(5): 521-530.

Becker, SM. (2004). Emergency communication and information issues in terrorism events involving radioactive materials. *Biosecurity and Bioterrorism* 2(3): 195-207.

Becker, SM. (2001). Meeting the threat of weapons of mass destruction terrorism: toward a broader conception of consequence management. *Military Medicine* 166(S2): 13-16.

Leiba A, Halperin P, Priel I, Shamiss A, Koren I, Kotler D, Blumenfeld A, Laor D, Bar-Dayan Y (in press). A terrorist suicide bombing at a nightclub in Tel Aviv: analyzing response to a nighttime, weekend, multi-casualty incident. *Journal of Emergency Nursing* 32(4): 294-8.

Leiba A, Halperin P, Kotler D, Blumenfeld A, Soffer D, Weiss G, Peres M, Laor D, Levi Y, Goldberg A, Bar-Dayan Y (2005). Lessons from a terrorist attack in Tel-Aviv Market: putting all the golden eggs in one basket might save lives. *International Journal of Disaster Medicine* 2(4): 157-160.

Leiba A, Blumenfeld A, Hourvitz A, Weiss G, Peres M, Laor D, Schwartz D, Arad J, Goldberg A, Levi Y, Bar-Dayan Y (2005). Lessons learned from cross-border medical response to the terrorist bombings in Tabba and Ras-el-Satan, Egypt, on 07 October 2004. *Prehospital and Disaster Medicine* 20(4): 253-7.

Okumura T, Hisaoka T, Yamada A, Naito T, Isonuma H, Okumura S, Miura K, Sakurada M, Maekawa H, Ishimatsu S, Takasu N, Suzuki K (2005). The Tokyo subway sarin attack-lessons learned. *Toxicol Appl Pharmacol.* 207(2 Suppl): 471-6.

National Council on Radiation Protection and Measurements. Considerations impacting response: psychosocial issues. In: Management of Terrorist Events

Involving Radioactive Material: Recommendations of the National Council on Radiation Protection and Measurements (Report #138). Bethesda, MD: NCRP, 2001.