RITN
RADIATION INJURY TREATMENT NETWORK

RITN Improvised Nuclear Device (IND) Tabletop Exercise

After-Action Report/Improvement Plan

Exercise Date: July 21, 2014

EXERCISE OVERVIEW

Exercise Name	RITN Improvised Nuclear Device Tabletop Exercise
Exercise Dates	July 21, 2014
Scope	This exercise was a distance-based tabletop exercise planned for 3 ½ hours. Exercise play was limited to RITN facilities and their response partners' collective challenges and considerations for improved and effective response
Mission Area(s)	Response
Capabilities	Medical Surge Healthcare System Preparedness Information Sharing
Objectives	**Objective 1 (Medical Surge):** RITN facilities are able to address the initial actions necessary to prepare for a receipt of victims to include: mobilization of internal radiation response teams; and development of incident objectives. **Objective 2 (Medical Surge):** RITN facilities are able to communicate the procedures necessary to prepare for and perform triage of casualties. **Objective 3 (Healthcare System Preparedness):** RITN facilities are able to describe their involvement and/or awareness of local and regional hospital coalitions as is relates to the coordinated response to a radiation incident. **Objective 4 (Information Sharing):** Facilities are able to conduct internal and external communications to include staff, patients, and visitors as well as the media and other response partners).
Threat or Hazard	Intentional detonation of an improvised nuclear device.
Scenario	Intentional detonation of an improvised nuclear device approximately 500 miles from each participating facility's metropolitan area (or metropolitan statistical area).
Sponsor	Radiation Injury Treatment Network (RITN) U.S. National Marrow Donor Program (NMDP) Office of Naval Research (ONR)

Participating Organizations	Avera McKennan Hospital – Sioux Falls, SD Charter Care – Rhode Island Chicago Department of Public Health Children's Hospital of Wisconsin – Milwaukee, WI City of Hope National Cancer Center – Los Angeles, CA City of Sioux Falls – Sioux Falls, SD Cleveland Clinic – Cleveland, OH Detroit Medical Center – Detroit, MI Federal Emergency Management Agency – Rhode Island Froedtert Hospital – Milwaukee, WI Harborview Medical Center – Seattle, WA Karmanos Cancer Center – Detroit, MI Intermountain Healthcare (LDS Hospital) – Salt Lake City, UT Los Angeles County EMS – Los Angeles, CA Massachusetts General Hospital – Boston, MA Medical College of Wisconsin – Milwaukee, WI Medical University of South Carolina – Charleston, SC Michigan Department of Community Health – Lansing, MI Oklahoma University Medical Center – Oklahoma City, OK Oklahoma Emergency Medical Services Authority Oklahoma City-County Health Department Oklahoma Poison Center – Oklahoma City, OK Orange County EMS – NC Primary Children's Hospital – Salt Lake City, UT Providence Emergency Management Agency Rhode Island Blood Center Rhode Island Department of Health Rhode Island Emergency Management Agency Roger Williams Medical Center – Providence, RI Rush University Medical Center – Chicago, IL State of Michigan, HCC – Detroit, MI

Seattle Cancer Care Alliance – Seattle, WA
Seattle Fire Department – Seattle, WA
Seattle Office of Emergency Management – Seattle, WA
State of South Dakota Health Department – Sioux Falls, SD
U.S. Department of Health and Human Services – Rhode Island
University of Alabama-Birmingham Medical Center
University of Mississippi Medical Center
University of North Carolina Memorial Hospital – Chapel Hill, NC
University of Utah Hospital – Salt Lake City, UT
University of Wisconsin Hospital and Clinics – Madison, WI
RITN Control Center – Minneapolis, MN
Wake Forest Baptist Medical Center - NC
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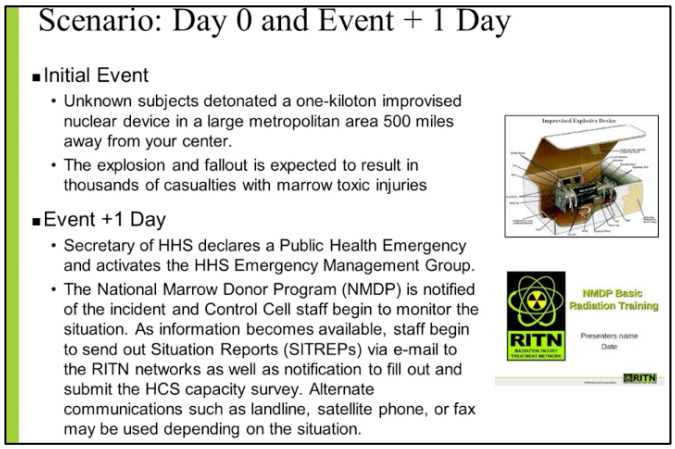
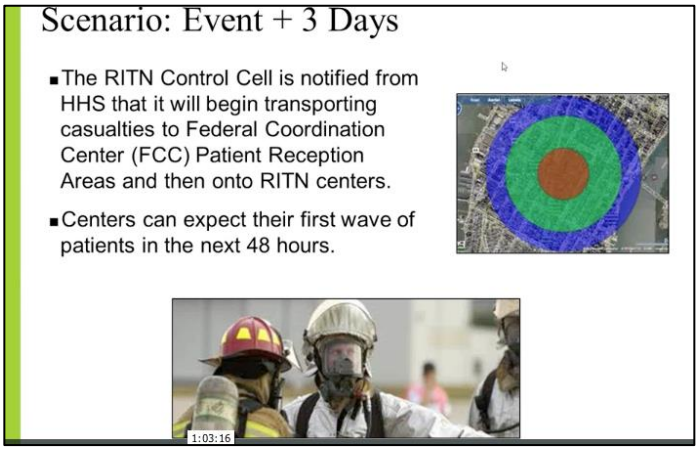
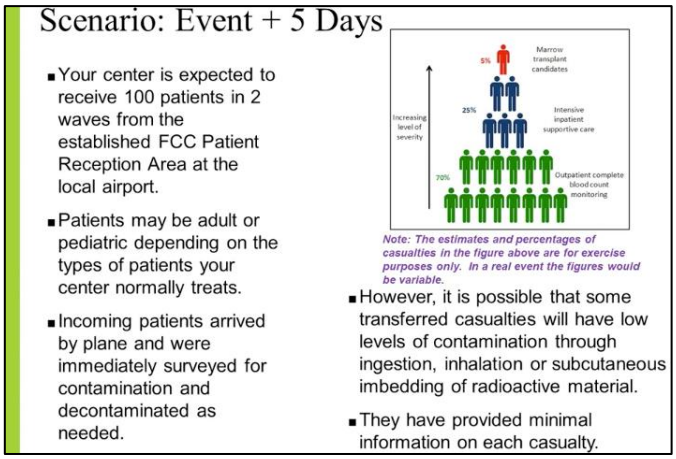
EXERCISE SUMMARY

On July 21, 2014, 20 RITN Centers, multiple response partners in the jurisdictions, and the RITN Control Cell participated in a tabletop exercise to discuss medical surge, resource coordination, public messaging, and healthcare coalition coordination in the receipt of victims following an IND detonation 500 miles from the RITN facility metropolitan area. A facilitated series of exercise tasks were provided to participants for their consideration, response, and group discussion organized by the exercise scenario summary below.

Scenario Summary: The following illustrate the scenario events considered for participant discussion:







ANALYSIS OF CAPABILITIES

Task Set 1 Observations: Notifications and Communications

Poll: What are the greatest communications challenges for your facility at this stage? Two-thirds of the participating facilities indicated communications with other response agencies are the most significant communication challenge faced followed by 20% of the participating facilities responding to the poll indicating that internal – cross departmental communications is their greatest communications challenge. Seven percent indicated that communication challenges with their BMT and command group or external communications with their Coalition as their greatest challenge, respectively.

Immediate preparatory actions: After receipt of the RITN Control Cell's initial SitRep, participating facilities, in general, indicated that a core group within their incident command would be activated (one facility indicated a full command activation) or that their hospital incident management team would stand up via activation of the EOP (e.g. when a Code Triage is activated) and/or the initiation of their own RITN-specific standard operating procedure (SOP). Additionally, bed availability would be determined for patients that could be transferred, beds available for medical surge, and then an examination of 96-hour resources needed for response and continuity (e.g., pharmaceuticals, staffing levels, and bed availability). More specifically – some hospitals indicated they would need to assess the type of rooms available with the attributes necessary to take care of bone marrow transplant candidates (e.g. those with isolation rooms and positive or negative pressure) and identification of non-BMT beds that can be adapted for use. Facilities primarily indicated notification and the initial coordination efforts with external partners, such as public health (local or state) and emergency management agency would also occur as well as community partners. Additionally, communication and information sharing were extremely important elements of the immediate response and most facilities indicated initial activation of a public information network. All facilities stated the bone marrow transplant team (BMT) representative would be notified, included in the core incident command group, and that the BMT members would be apprised of the situation.

Staff notifications: The limited incident command team (or hospital incident management team) would be activated along with any needed SMEs such as a BMT representative (such as the BMT Unit Nurse Manager). In general, notifications were not described to extend beyond this limited group of BMT staff and other hospital specialists (such as transplant specialists, hematology/oncology experts). Several facilities indicated that psychosocial services/staff would be notified as part of these initial staff notifications to begin preparatory actions for hospital staff, family members, visitors, and worried well anticipated to present at emergency departments.

Coordination with partner agencies: All participating RITN facilities stated initial coordination efforts with partner agencies would occur at this point with initial notification through currently established pathways/channels. Based on the scenario information, all facilities stated that local (and possibly state depending on how public health is organized) public health, emergency management agency, and non-RITN facilities would be contacted and provided the current level of awareness. Multiple facilities anticipated coordination needs with volunteer organizations in their area in order to accommodate potential surge of victims as well as worried well. Hospitals

indicated the Liaison Officer would be the primary coordinator of information sharing. This coordination would also include assessment within the Coalition to determine diversion strategies, non-RITN facilities for decompression, and the utilization/pulling of critical resources to assist in the treatment of radiation-exposed casualties. Cities with other RITN Centers (e.g. Boston) have plans in place to coordinate with one another to ensure they are aligned with response and receipt of NDMS patients. Moreover, the Salt Lake City Centers are well integrated and have conducted joint planning for response to include initial communications and coordination throughout the event.

One Center indicated the coordination with all Coalitions across the state (North Carolina) as a matter of SOP for all emergencies and would be implemented to assist in RITN response as well. Lastly, there would be some direct communications/coordination with the federal coordinating center (FCC) by some facilities to ensure effective exchange of information.

Public Information: All participating facilities stated PIOs and Liaison Officers would coordinate information via joint information centers (JIC) with the primary need to coordinate the development of a press release. As stated above, all participating facilities underscored the importance of information sharing and a common communication strategy/messaging. The initial public message (as well as staffing messaging) would address basic information on radiation, contamination, description of RITN and a RITN facility (i.e. RITN facility is part of a national network that provides care to victims of this kind of an event and that further information would be provided, as it became available), and victims being treated at the RITN facility and community impacts.

RITN Control Cell - Communications: RITN Control Cell's expectation following an improvised nuclear device (IND) event is to disseminate information as it becomes available to them. The Control Cell would develop and distribute SitReps much like protocol during the Fukushima Nuclear Crisis in 2012. In terms of the information provide to ASPR, The RITN Control Cell would provide as much current information on RITN Centers' capabilities to ASPR. Lastly, bed availability information from hospitals would be requested daily and provided to HHS as BMT bed category is not currently one of the data fields in hospital bed availability systems for report.

Strengths

The following strengths were demonstrated:

Strength 1: Recognition by RITN facilities that incremental/scaled activation of a command group was necessitated by the events in the scenario. Additionally, RITN Centers included their BMT as subject matter (e.g. medical-technical expert) experts as part of the initial notification.

Strength 2: Inclusion of an immediate 96-hour resource assessment by RITN command groups in anticipation of the vital supplies needed to support a pending medical surge of radioactive victims or those requiring organ transplant.

Strength 3: Immediate identification that a joint information center (JIC) is the most effective manner to ensure the coordination of public messaging. More specifically, some Centers

indicated the inclusion of messaging regarding their role as a RITN facility to increase public awareness.

Strength 3: Some jurisdictions with multiple RITN Centers (e.g. Boston and Salt Lake City) have existing plans in place to coordinate with the other facility in their jurisdiction to ensure effective alignment with receipt and treatment of patients.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: RITN should consider the development of messaging templates/frequently asked questions that describe what a RITN Center is and how they can be utilized in various radiation emergencies (e.g. industrial, RDD, or IND). These templates could be made available to the RITN Centers and shared within their respective Coalitions.

Area for Improvement 2: RITN should continue evolvement of a common operational platform to share information that leverages some of the capabilities of HC Standard (HCS). While it would be difficult to establish this through independently established systems in many jurisdictions (e.g. WebEOC), this may be something that can be established though a simple information sharing online portal that is specifically designed for RITN Centers for use in both routine/non-event information sharing and when an event occurs for the real-time sharing of situational reports.

Task Set 2 Observations: Preparations for Victim Receipt.

Command Group Decisions: The following are the main decisions considered by the activated command group based on the expectation of patient arrival within 48 hours across the participating RITN facilities:

- Activation of the full incident command group and identify staffing shortages.
- Determination of whether or not to place hospital on by-pass and identify patients for transfer to other facilities per existing agreements.
- Identification of an alternate outpatient clinic locations (i.e., alternate care sites).
- Consideration of the current inpatient census given unknown casualty numbers.
- Expedition of discharges as well as elective surgery cancellations (i.e., activation of the continuity plans).
- Assessment of current resource levels and needs over 96 hours, which include blood supplies, pharmaceuticals, and decontamination supplies and contact vendors for resupply.
- Review and re-prioritization of transplant candidates.
- Dispatch transplant teams to FCC Patient Reception Center.
- Operation of a family assistance center to address concerns of family members whose members have been transported via NDMS to a RITN facility.
- Initiate conversion of available positive pressure rooms to negative pressure rooms.
- Begin coordination with local blood service providers.
- Identify housing and other accommodations for international staff and international family members of patients.
- Identify and mobilize the operation of secondary triage area.
- Activation of decontamination teams to initiate decontamination operations at pre-identified locations.

Inpatient Accommodations: RITN facilities were mainly focused on creating space within their facilities to prepare for the medical surge. Most facilities indicated some level of assessments of their inpatient population to identify those for cohort (i.e. doubling up patients in rooms) and those who could be transferred to other facilities as well as those that could be processed for immediate discharge.

Coordination Efforts: The Liaison Officer's roles and responsibilities included RITN facility coordination with local and state partners as well as the RITN Control Cell. Multiple RITN facilities indicated that a joint information center (JIC) would be activated and coordination of information would flow through the JIC. Though an IND event, existing coordination protocols as part of emergency operations plans would be followed. More specifically, at this point in time they would coordinate decompression needs with other hospitals in the Coalition and with hospitals to help with the needs of outpatient populations (e.g. blood draws for those that require CBC monitoring).

Messaging Content: The main components of staff messaging would be general situational awareness, the number of patients expected, and just in time training expectations. Coordination of staff messaging with that of public messaging was stated to be equally important as provision of basic information on differentiating between radiation poisoning versus radiation

contamination and staff handling/safety measures that would be taken. Videos and other RITN materials would heavily be relied upon. The main message conveyed to the inpatient population would focus largely on their safety and the quality of care would not be impacted by receipt of these victims. More specialized training required and developed by members of the BMT staff and nuclear medicine staff for those non-oncology staff.

One facility provided an example of the information components of the messaging developed for the inpatient population and the hospital staff. For the inpatient population, the emphasis would be on the following:

- Hospital is preparing for the possible receipt of "x-number" of victims from explosion.
- While arriving patients will require medical care, there is no health risk to the current inpatient population.
- Patient movement within the hospital or to an outside facility may be required, but movement will not compromise the quality of care.
- Hospital routinely responds to medical situations of this nature and is well-prepared to provide high quality medical care to the arriving victims and continue provision of high quality care to the current inpatient population.

Another facility indicated that they would disseminate messaging to staff via medical rounds and grand rounds as well as information sessions with the BMT director and RSO. Messaging would also be developed specifically for outpatient populations (i.e., what to expect).

The messaging to the staff would include the elements presented above in addition to alerting the staff that the incident command center has been activated, just-in-time training will be provided though the response is not out of the ordinary, and more information would be forthcoming as the hospital receives it.

RITN Control Cell – HCS Capacity Survey Summary: In review of the HCS Matrix of those RITN facilities that completed the matrix, participating facilities provided the following staffed bed count information for the following:

- Adult Hematology / Oncology
- Pediatric Hematology / Oncology
- Adult PACU – type
- Pediatrics PACU - type

A true indication of the current bed capacity was not able to be determined at the time of the exercise.

Strengths

The following strengths were demonstrated:

Strength 1: RITN facilities provided a comprehensive listing of the primary decisions faced by their command group in preparation for victim receipt.

Strength 2: RITN facilities stressed the importance of providing staff and the patient population (in-patient and outpatient) the basic information and training to alleviate concerns and reinforcing the realistic aspects of radiation poisoning.

Strength 3: RITN facilities demonstrated existing capabilities to rapidly develop staff, patient, and public messaging in the infancy of the event that conveyed the basic information to assure staff, patients, and the public that high quality health care would continue uninterrupted and that the health and safety of all would not be compromised.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: Incorporate the victim referral guidelines into future RITN exercises. Consider the use of various patient indicators necessitating referral in exercise play.

Area for Improvement 2: Consider a functional exercise that incorporates decompression to make room for radiation casualties as well as the real-time development of public messaging.

Task Set 3 Observations: 1st Wave of Medical Surge

Poll: Which statement best describes the level of awareness and training for your healthcare coalition on what's expected to respond to a RITN event? 40% of responding facilities indicated a somewhat low level of awareness/training of their healthcare coalition to respond to a RITN event followed by 27% of responding facilities indicated a moderate level of awareness/training. 13% of responding facilities indicated that training is somewhat at a high level of awareness/training within their healthcare coalition to respond to a RITN event, another 13% indicated an extremely high level of awareness/training, and finally 7% of responding facilities indicated an extremely low level of awareness/training by their healthcare coalition to respond to a RITN event.

Following this second poll, an inject was presented for participant consideration regarding specific information of patients in the first wave of medical surge:

Inject: 1st Wave of Patients Arriving

- The following victims within these 3 categories have arrived at your facility within the last 8 hours.
- Pediatric hospitals assume all victims are pediatric.
- Facilities should assume 6 of the 15 victims requiring intensive inpatient supportive care will become marrow transplant candidates within 3 weeks.

Victims	Outpatient CBC monitoring	Intensive Inpatient Supportive Care	Marrow Transplant Candidates	Totals
0600 – 1000 hours	30	10	1	**41**
1000 – 1400 hours	13	5	3	**21**
Totals	43	15	4	**62**

- **Each RITN facility should expect a second wave of victims over the next 16 hours.**

Coordination with Healthcare Coalitions: Liaison officers at local public health departments would coordinate with the RITN facility liaison officer relating to the medical surge. Information would be exchanged through local EOCs and many facilities indicated use of software platforms, such as WebEOC, as the primary means of coordinating information with healthcare coalitions. Resources were stated as being one of the main coordination items that would be required through healthcare coalitions.

Command and Control: The participating facilities would fully activate their incident command groups based on the anticipated medical surge and their command groups would be expanded to include a BMT subject matter expert, radiation safety representative, HazMat Branch Director if previously not included in the initial activation.

Initial Medical Management: Given the scenario events, most of the RITN centers would be relying on their healthcare coalitions – not in the management of the victims, but to receive patients identified for transport during facility decompression as well as to augment needed resources and staffing. Many facilities indicated that patients would have been identified for transport, as part of the initial response actions taken within the first 24 hours and partner institutions would have been notified.

All victims were stated as being processed through the emergency departments. The triage protocols included blood draws (for blood chemistries), ambulatory assessment, and non-ambulatory patients processed for admission. Several facilities indicated that blood draws would occur at their regional airports and placement of victims determined at that point.

RITN facilities stated activation of their decontamination teams and would conduct tertiary surveys for embedded radiation. Alternate care sites would be quickly identified and set-up in order to separate the 43 outpatient victims from the emergency department. The main challenges discussed were resources (additional equipment and materials for HLA typing) and care and management for the pediatric victims.

Victims Requiring Transplant: For those victims requiring transplant, all facilities stated existing capability to accommodate these numbers of transplantation patients. Facilities indicated that current standards of care would be followed for CBC monitoring and treatment along with HLA typing all transplant candidates immediately. Subsequently, a NMDP search would be conducted along with a resource and pharmaceutical assessment to determine shortages and plans to initiate re-supply. A prioritization of cord blood would also be determined and communicated to necessary staff. The American Red Cross would be contacted to support identification of siblings in the disaster area for blood typing and crossing and all donors would be bought to the RITN facility; though no discussion on transporting donors occurred.

As part of the transplantation considerations, many facilities indicated a challenge with housing families of transplant candidates. Ronald McDonald House was discussed as an example to accommodate these families, but it was unclear whether or not the local Ronald McDonald House would experience similar space and resource challenges as the hospitals.

BMT: For the participating RITN facilities, all members of their BMT are currently internal and their time to respond was stated as being brief (no specific time was provided). Additionally, facilities indicated consultation, if necessary, with other BMT specialists/programs was planned through existing communication channels.

Patient Tracking: RITN facilities indicated use of their existing patient tracking systems for tracking NDMS patients admitted. One RITN Center discussed a regional system currently in use enabling secure access from any remote location, while another RITN Center indicated planned usage of JPATS.

Strengths

The following strengths demonstrated:

Strength 1: RITN facilities demonstrated the coordination necessary as well as the planning needed to medically manage the first wave of victims including those requiring transplantation.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: Follow-up on regional patient tracking systems such as DMS for RITN facilities to determine whether or not their patient tracking systems can be modified/enhanced for regional, online access enabling seamless tracking of NDMS patients.

Area for Improvement 2: As part of continued response planning, determine the level of support community non-profit organizations, such as the Ronald McDonald House, can provide regarding family housing support. Planning components to address may include staffing needs, resource levels and re-supply alternatives, costs (if any back to the hospital) or donation structures, legal parameters, and terms and conditions of the organization.

Task Set 4 Observations: 2nd Wave Medical Surge.

An inject was presented for participant consideration regarding specific information of patients in the second wave of medical surge:

Inject: 2nd Wave of Patients Arriving

Victims	Outpatient CBC monitoring	Intensive Inpatient Supportive Care	Marrow Transplant Candidates	Totals
1400 – 1800 Hours	9	2	3	**14**
1800 – 2100 Hours	10	3	0	**13**
2100 – 2359 Hours	7	4	0	**11**
Totals	26	9	3	**38**

- **Facilities should assume 4 of the 9 victims requiring intensive inpatient supportive care will eventually worsen in condition and become marrow transplant candidates within 3 weeks (4-5 weeks after the IND detonation).**
- **Additionally, your facility is beginning to receive walk-ins who are driving from as far away as 4 hours.**
  - **Several are asking if relatives are in your facility**
  - **Many are claiming to be experiencing "weird symptoms" and looking for treatment**
  - **Casualties arrive with radiation injuries only (i.e. there are no trauma or burn injuries)**

Resource Shortages: With the second wave of victims arriving within hours of the first wave, RITN facilities discussed the following resources (medical and non-medical) as being in short supply or those that will become in short supply:

- Blood and blood products and blood testing supplies. Human growth factors would be a significant concern and would be in very short supply. Expanding collaboration with the ARC to begin regional blood drives.
- Pharmaceuticals. GCSF, GMCSF, cytokines, and antibiotics would quickly be needed. Additionally, IV supplies (tubing, saline) across all regional hospitals would become in short supply as healthcare coalition hospitals in addition to the RITN facilities are impacted by the victim surge – directly (RITN Center) and indirectly (receiving patients from RITN Center decompression and 'Yellow' and 'Green' tag victims).
- Personal protective equipment: In particular, N95 masks, gowns, and gloves were stated as likely being in short supply when the 2nd wave of patients arrives.
- Staffing. Nursing and pharmacy staffing would be in short supply by arrival of the 2nd wave of patients. Additional staffing to support continued inpatient care of those existing patients at the time of arrival of the first wave of patients.
- Transportation assets. Regional movement of patients and/or victims may require a large number of vehicles. Coordination with fire departments, private ambulance companies, para-transit companies, and other transportation assets through local EMA and healthcare coalitions was discussed as the mechanism by which these assets would be requested.

- Border facilities. Several RITN facilities are in close proximity to the Canadian border and have existing agreements in place with Canadian hospitals for resupply and other supportive services. The Canadian facilities would be contacted for their ability to resupply pharmaceuticals, blood and blood products in particular.

Role of Healthcare Coalitions in Patient Discharge: As stated above, the healthcare coalitions would be contacted to provide assistance for patient and/or victim transport to regional facilities. Overall, RITN Center would coordinate emergency department decompression and subsequent patient discharges to local facilities according to existing plans and protocols of the healthcare coalitions.

Cancer Centers and Pediatric Hospitals: Cancer centers and pediatric hospital roles would be as subject matter experts and follow up care in support of the RITN facility response. Specifically, cancer centers would have an integral involvement in performing and managing blood transfusions as well as ongoing patient monitoring.

Consideration was discussed by multiple facilities for those pediatric victims that may be without relatives. Several facilities indicated that this would be a serious issue/challenge for their facility.

Several of the participating RITN Centers are part of larger health systems, such academic medical centers. As such, these larger health systems have affiliations, ownership, or other operating agreements with a pediatric hospital, which in turn, have a complete, staffed pediatric oncology unit. RITN Centers would coordinate medical management as needed with their local pediatric hospital.

Messaging for Relatives: Facilities that are Level 1 trauma centers routinely develop and disseminate worried-well messaging as they are one of the first entities contact by families searching for their loved ones. Additionally, the American Red Cross (ARC) would be coordinating with the RITN Center regarding family reunification.

Worried-Well Messaging: Many RITN Centers indicated an attempt to direct the worried well to neighboring facilities for information and screening. Other facilities stated either a process under development or utilizing an existing process to provide a basic level of screening (even if it is a verbal screening) for the worried-well that do present at the their facility. Overall, current pathways (television, radio, social media, webpage, call centers) would be used to disseminate messaging; though one facility suggested usage of the electronic billboards or department of transportation electronic boards to provide basic routing information for the worried well that may be driving to the hospital.

Strengths

The following strengths demonstrated:

Strength 1: RITN facilities demonstrated a realistic assessment of the resource shortages they would face as the second wave of victims arrives at their facility.

Strength 2: RITN facilities demonstrated effective and novel approaches (e.g., use of electronic message boards on highways and electronic billboards) to widely disseminate messaging for the worried-well in order to prevent a surge of this population at local emergency departments.

Strength 3: Other novel coordination approaches such as the use of a Medical Alert Center (MAC) in Los Angeles County to assist in patient movement, decompression and transport is a key strength to incorporate into existing RITN SOPs. In addition, this MAC concept can help to augment resources (e.g. pharmacy, staffing, and equipment) for RITN Centers.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: RITN Centers representing a variety of U.S. regions should collectively address and strategize for acquisition and allotment of additional pharmaceutical resources expected in an IND incident. While some of these pharmaceuticals could potentially exist in the SNS, distribution to multiple cities receiving NDMS patients could prove problematic. Private sources for these medications may be a good place to start.

Area for Improvement 2: RITN Centers in proximity to international borders should determine the viability of resource sharing/aid agreements with hospitals in Canada (or Mexico) if feasible. One RITN Center in the northwest U.S. has approved resource sharing agreements with neighboring Canadian hospital(s) that may be used as a "best practice" for other U.S. hospitals to develop similar agreements or MOUs.

CONCLUSION

This report augments existing planning/training/exercising programs related to hospital response to two waves of medical surge of victims exposed to harmful levels of radiation following an IND detonation. The strengths validate well-established aspects of the plans while the opportunities for improvement provide information to enhance, refine, or improve existing plans and systems. The exercise planning team developed detailed objectives and evaluation criteria to ensure that the most critical needs to medically manage 100 victims with radiological poisoning across their region. It is anticipated that the improvement plan will be incorporated into the efforts of each participating hospital to strengthen the response of the radiation injury treatment network of hospitals and healthcare systems as it relates to the core capabilities identified in this report. These are not in any particular order and are provided unedited to avoid intent changes.

This exercise included 20 RITN Centers, over 20 partner response agencies and the RITN control cell comprising over 300 total participants.

During the participant hot wash and online feedback (See Appendix C), several strengths were identified, including:

- *RITN Centers utilized novel approaches to augment existing plans for messaging and resource coordination.*
- *RITN Centers demonstrated consistent response actions based on the scenario information and medical surge information regarding incident command, triage, treatment, and placement of victims, and coordination of resources.*
- *Participating Centers demonstrated good working relationships with their Coalition partners.*
- *Participating Centers demonstrated the importance of educating their communities as well as sharing information with them on radiation safety and impacts, the RITN Program, safety and security of both hospital patients as well as the community at-large.*
- *For the most part, Centers agree that their capabilities have greatly increased over the past 3-5 years since becoming a part of RITN. Exercises such as these not only validate these capabilities, but also identify key areas to continue planning for.*

Some immediate recommendations for improvement were identified, including:

- *Future exercises should apply to specific audiences (e.g. clinical and emergency management). One approach might be to have a session regarding clinical considerations and a separate session for emergency management.*
- *Consider the further inclusion of CDC (SNS), HHS ASPR and NDMS in future exercises.*
- *Vendor co-dependency and the strain on the pharmaceutical supply chain is a significant challenge given the specialty medical care and management needed of victims following an IND detonation.*

- *Regarding medical surge, more emphasis on the clinical aspects of the victims/patients is needed to more fully stress the incident command decision-making on the triage, treatment, and placement of victims.*

APPENDIX A: IMPROVEMENT PLAN

This improvement plan template has been developed specifically for the RITN facilities participating in the RITN Improvised Nuclear Device Tabletop Exercise conducted on July 21, 2014. RITN facilities can utilize this table to organize the opportunities for improvement to augment and develop their own corrective actions.

Core Capability	Issue/Area for Improvement	Corrective Action	Capability Element[1]	Primary Responsible Organization	Organization POC	Start Date	Completion Date
Core Capability 1: [Capability Name]	1. [Area for Improvement]	[Corrective Action 1]					
		[Corrective Action 2]					
		[Corrective Action 3]					
	2. [Area for Improvement]	[Corrective Action 1]					
		[Corrective Action 2]					

[1] Capability Elements are: Planning, Organization, Equipment, Training, or Exercise.

APPENDIX B: EXERCISE PARTICIPANTS

Participating Organizations	
Avera McKennan Hospital	Kathy Jacobs
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Avera McKennan Hospital	Mary Anne Urban
Avera McKennan Hospital	Steven Huckabaa
Avera McKennan Hospital	Mary Wolf
Avera McKennan Hospital	Jill Casanova
Avera McKennan Hospital	Bethannie Vermeer
Avera McKennan Hospital	Nicole Nelson
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Avera McKennan Hospital	Tom Bosch
Avera McKennan Hospital	Dawn Tomac
Avera McKennan Hospital	Lindsey Meyers
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Wisconsin Hospital Emergency Preparedness Program	Elizabeth Corneliuson,
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Children's Hospital of Wisconsin	Beth Ehlert
Children's Hospital of Wisconsin	Jackie Gauger
Children's Hospital of Wisconsin	Mary Geoghan
Children's Hospital of Wisconsin	Tricia Geraghty
Wisconsin Poison Center	David Gummin
Blood Center of Wisconsin	Sorelle Jefcik
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Medical College of Wisconsin	David Margolis
Children's Hospital of Wisconsin	Marlene Melzer-Lange
Children's Hospital of Wisconsin	Michelle Seitz
Children's Hospital of Wisconsin	Michael Thiel
City of Hope National Cancer Center	Amber Bill
City of Hope National Cancer Center	Auayporn Nademanee
City of Hope National Cancer Center	Anna Juanitez
City of Hope National Cancer Center	Denise Heady
City of Hope National Cancer Center	Jinha Park
City of Hope National Cancer Center	Chuck Pickering
City of Hope National Cancer Center	Nicole White
City of Hope National Cancer Center	Mike Hogan
City of Hope National Cancer Center	Roxanna Man
City of Sioux Fall Emergency Management	Regan Smith
City of Sioux Fall Health Department	Sandy Frentz
Cleveland Clinic	Gary Nordwig
Cleveland Clinic	Ed Sims
Cleveland Clinic	Andy Miller
Cleveland Clinic	Paul Johnson
Cleveland Clinic	Suzanne Bakdass
Cleveland Clinic	Stuart Kline
Cleveland Clinic	Laura Bernhard
Cleveland Clinic	Narned Majhain
Cleveland Clinic	Robert Dean
Cleveland Clinic	Karissa Kusick
Cleveland Clinic	Frank Colella
Cleveland Clinic	Ron Sobeck
Cleveland Clinic	Heath Koniarh
Cleveland Clinic	Mark Myers
Cleveland Clinic	Beth Gatlin
Cleveland Clinic	James Justice
Cleveland Clinic	James Meola
Cleveland Clinic	Sheila Serafino
Cleveland Clinic	Sharon Caroniti

Participating Organizations	
Dane County Emergency Management	Charles Tubbs
Dane County Emergency Management	Dave Bursak
Detroit Medical Center	Omar Fagoaga
Froedtert Hospital	Timothy Herrick
Froedtert Hospital	Jeffrey Crogan
Froedtert Hospital	Todd Senglaub
Froedtert Hospital	Steve Konings
Froedtert Hospital	Stacie Lahr
Froedtert Hospital	Lisa Hass-Peters
Harborview Medical Center	Tim Fredrickson
Harborview Medical Center	Anne Newcombe
Karmanos Cancer Center	Lynn Mosely
Karmanos Cancer Center	Linda Engles
Karmanos Cancer Center	Toni Clark
Karmanos Cancer Center	Kathleen Fedoronko
Karmanos Cancer Center	Maryann Sparks
Karmanos Cancer Center	Renee LaFata
Karmanos Cancer Center	Jeremy Kittredge
Karmanos Cancer Center	Suanne Dorr
Karmanos Cancer Center	Joe Rakowski
Karmanos Cancer Center	Pam Laszewski
Karmanos Cancer Center	Ahmad Hammoud
Karmanos Cancer Center	Linda Remington
Karmanos Cancer Center	Lawrence Van Belle
Karmanos Cancer Center	Marirose Zeiser
Karmanos Cancer Center	Joseph Uberti
Karmanos Cancer Center	Anne Marie Campbell
Intermountain Healthcare / LDS Hospital	Brenda Spiva
Intermountain Healthcare / LDS Hospital	Karen Armatage
Intermountain Healthcare / LDS Hospital	Rob Dent
Intermountain Healthcare / LDS Hospital	Christopher Chur
Intermountain Healthcare / LDS Hospital	Pete Van Aarle
Intermountain Healthcare / LDS Hospital	Anna Heaps
Intermountain Healthcare / LDS Hospital	Enye Egbuta

Participating Organizations	
Intermountain Healthcare / LDS Hospital	Regan Healy
Intermountain Healthcare / LDS Hospital	Linda Meaux
Intermountain Healthcare / LDS Hospital	Barbara Adams
Los Angeles County EMS	Millicent Wilson
Massachusetts General Hospital	Karen Snow
Massachusetts General Hospital	John Magurn
Massachusetts General Hospital	Robert Krupa
Massachusetts General Hospital	Paul Bidding
Massachusetts General Hospital	Jacquelyn Nally
Massachusetts General Hospital	Ali Parman
Massachusetts General Hospital	Susan Wilcox
Massachusetts General Hospital	David Biyanr
Massachusetts General Hospital	Tom Spitzer
Massachusetts General Hospital	Karen Malikowski
Massachusetts General Hospital	Kohez Haszgawa
Massachusetts General Hospital	Irind Dobreesin
Massachusetts General Hospital	Jane Ritzenthaler
Massachusetts General Hospital	David Resisma
Massachusetts General Hospital	Stuart Harris
Massachusetts General Hospital	Emily Miller
Massachusetts General Hospital	Sayon Dutta
Medical University of South Carolina	Elizabeth Williams
Medical University of South Carolina	Chris Summers
Medical University of South Carolina	Amanda Risema
Medical University of South Carolina	Wayne Brannan
Medical University of South Carolina	Julie Morton
Medical University of South Carolina	Kathy Wanstall
Medical University of South Carolina	Jim Broake
Medical University of South Carolina	Alan Edwards
Medical University of South Carolina	Linda Formby
Medical University of South Carolina	Cindy Kramer
Medical University of South Carolina	Brian Fletcher
Medical University of South Carolina	Elsie Hill
Medical University of South Carolina	Molly Schneider

Participating Organizations	
Medical University of South Carolina	Stacey Warneke
Medical University of South Carolina	Al Nesmith
Medical University of South Carolina	Cory Robinson
Medical University of South Carolina	Kathy Lehman-Huelps
Michigan Department of Community Health	Linda Scott
Oklahoma University Medical Center	Nancy Kohrt
Oklahoma Emergency Medical Services Authority	Mike Curtis
Oklahoma University Medical Center	Eamonn Wheelock
Oklahoma City-County Health Department	Alice Arcury-Quandt
Oklahoma City-County Health Department	Elizabeth Billingsley
Oklahoma University Medical Center	George Selby
Oklahoma University Medical Center	Markita Broyles
Oklahoma University Medical Center	Chris Pratzman
Oklahoma University Medical Center	Susan Weiss
Oklahoma University Medical Center	Alissa Johnson
Oklahoma University Medical Center	Danny Cavett
Oklahoma University Medical Center	Steve Orwig
Oklahoma Poison Center	Scott Schaeffer
Oklahoma University Medical Center	Michelle Bycko
Oklahoma University Medical Center	John Meyer
Oklahoma University Medical Center	Mary J. Barton
Oklahoma University Medical Center	Theresa Steckel
Primary Children's Hospital	Kevin Arthur
Primary Children's Hospital	Emmie Gardner
Primary Children's Hospital	Jo Loter
Primary Children's Hospital	Sarah Gene Hjalmarson
Primary Children's Hospital	Shawnda Ussery
Primary Children's Hospital	Julie Felice
Roger Williams Medical Center	Angell, Beth
CharterCARE Safety	Atkin, Scott
Rhode Island Department of Health	Balbi, David
Providence Emergency Management Agency	Balbi, Felicia
FEMA	Banner, Greg
CharterCARE	Casey, Ryan

Participating Organizations	
FEMA	Chernack, Simon
Roger Williams Medical Center	Conti, Gina
Roger Williams Medical Center	Curtis, Mark
EMA	DAbbraccio, Paul
CharterCARE	Davey, Brett
CharterCARE	DeNinno, Stephen
Roger Williams Medical Center	Ferrara, Elise
Roger Williams Medical Center	Fogarty, Nancy
CharterCARE	Gilmore, Gina
Roger Williams Medical Center	Gitelmaker, Dimitri
EMA	Greenwood, Brian
Roger Williams Medical Center	Greer, Deb
Roger Williams Medical Center	Isaiah, Benjamin
Roger Williams Medical Center	Jodoin, Cindy
US DHHS	Kleinman, Gary or Alt.
Rhode Island Blood Center	Lang, Patricia
Roger Williams Medical Center	Leahey, Lynn
Roger Williams Medical Center	Lee, Stephanie
RI Hospital Association (HARI)	Lewis, Dawn
Roger Williams Medical Center	Loftus, Kimberly
Roger Williams Medical Center	Malik, Mohsin MD
Roger Williams Medical Center	Marandola, Fran
CharterCARE	Marsden, Jason
Roger Williams Medical Center	Martino, Liz
Roger Williams Medical Center	Morgan, Deb
Roger Williams Medical Center	Morin, Susan
Roger Williams Medical Center	Mullaney, Annemarie
Roger Williams Medical Center	O'Connor, Frank
Roger Williams Medical Center	Perry, Kathy
Roger Williams Medical Center	Rabin, Niroula
Roger Williams Medical Center	Richards, Rocco
Roger Williams Medical Center	Roberts, Todd MD
Roger Williams Medical Center	Skowron, Gail MD
DoH, Radiation Control	Waring, Charma

Participating Organizations	
Roger Williams Medical Center	Willsey, Jim
Emergency Department	Wray, Candy
Rush University Medical Center	Miriam Miller
Chicago Department of Public Health	Elisabeth Weber
Seattle Cancer Care Alliance	Rick Nelson
Seattle Cancer Care Alliance	Diane Burton
Seattle Cancer Care Alliance	Suni Elgar
Seattle Cancer Care Alliance	Christy Satterlee
Seattle Cancer Care Alliance	Thomas Chauncey
Seattle Cancer Care Alliance	Lisa Getzendaner
Seattle Cancer Care Alliance	Rosemary Ford
Seattle Cancer Care Alliance	Steve Fijalka
Seattle Cancer Care Alliance	Erica Karlovits
Seattle Cancer Care Alliance	Angie Bach
Seattle Cancer Care Alliance	Ann Woolfrey
Seattle Cancer Care Alliance	Kristie Logan
Seattle Cancer Care Alliance	Martin Minser
Seattle Cancer Care Alliance	Meggan Davis
Seattle Fire Department	Josh Pearson
Seattle Fire Department	J. M. Havner
Seattle Office of Emergency Management	Cathy Wenderoth
State of Michigan	Jenny Atlas
State of South Dakota Department of Health	Sam Hill
University of Alabama-Birmingham	
University of Mississippi Medical Center	Teresita Maria Dupre
University of Mississippi Medical Center	Mike Todao
University of Mississippi Medical Center	Mary Morgan
University of Mississippi Medical Center	Rebecca Dukes
University of Mississippi Medical Center	Dana Delaski
University of Mississippi Medical Center	Jennifer Rouse
University of Mississippi Medical Center	Rebecca Rene Brent
University of Mississippi Medical Center	Carol Landwirth
University of Mississippi Medical Center	Wendy Arinder
University of Mississippi Medical Center	Carolyn Bigelow

Participating Organizations	
University of Mississippi Medical Center	Vincent Herrin
University of Mississippi Medical Center	Pam Ferris
University of Mississippi Medical Center	Robyn Nichols
University of Mississippi Medical Center	Hartman Holliman
University of Mississippi Medical Center	Susan Johnson
University of Mississippi Medical Center	Lynne Smithhart
University of Mississippi Medical Center	Jan Albert
University of Mississippi Medical Center	Angela McHenry
University of Mississippi Medical Center	Janice Simonson
University of Mississippi Medical Center	S. Ellas
University of North Carolina Hospitals	Debbie Covington
University of North Carolina Hospitals	Sam Sharf
University of North Carolina Hospitals	Joanne Lowry
University of North Carolina Hospitals	Gary Talbert
University of North Carolina Hospitals	Kim Wehner
University of North Carolina Hospitals	Dalton Sawyer
University of North Carolina Hospitals	Bruce Cairns
University of North Carolina Hospitals	Judie Bringhurst
University of North Carolina Hospitals	Andrew Sharf
University of North Carolina Hospitals	Caroline Immel
University of North Carolina Hospitals	Kamakisho Rao
University of North Carolina Hospitals	Kathy Roundtree
University of North Carolina Hospitals	Kathy Broach
University of North Carolina Hospitals	Josh Hollingsworth
University of North Carolina Hospitals	Kim Kasow
University of North Carolina Hospitals	Paula Stinson
University of North Carolina Hospitals	Pat Odell
University of North Carolina Hospitals	Ian Buchanan
University of Wisconsin Hospital and Clinics	Marisa Bartlett
University of Wisconsin Hospital and Clinics	Beth Weiler
University of Wisconsin Hospital and Clinics	Sue Rees
University of Wisconsin Hospital and Clinics	Ben Eithun
University of Wisconsin Hospital and Clinics	Kelly Jung
University of Wisconsin Hospital and Clinics	Shawn Arneson

Participating Organizations	
University of Wisconsin Hospital and Clinics	Vicki Hubband
University of Wisconsin Hospital and Clinics	Tim Gaillard
University of Wisconsin Hospital and Clinics	Genalyn Murphy
University of Wisconsin Hospital and Clinics	Kendra O'Connell
University of Wisconsin Hospital and Clinics	Diane Meranda
University of Wisconsin Hospital and Clinics	Cassie Shumway
University of Wisconsin Hospital and Clinics	Lisa Keller
University of Wisconsin Hospital and Clinics	Chris Corrigan
University of Wisconsin Hospital and Clinics	Karen Bartenz
University of Wisconsin Hospital and Clinics	Kristen Avdet
University of Wisconsin Hospital and Clinics	Mickey Kaiser
University of Wisconsin Hospital and Clinics	Ann Steffenhagen
University of Wisconsin Hospital and Clinics	Susan Haraver
University of Wisconsin Hospital and Clinics	Sarah Van Hoof
University of Wisconsin Hospital and Clinics	Kim Brandt
University of Wisconsin Hospital and Clinics	Peiman Hematti
University of Wisconsin Hospital and Clinics	Beth Boyle
University of Wisconsin Hospital and Clinics	James Harrod
University of Wisconsin Hospital and Clinics	Linda Stevens
University of Wisconsin Hospital and Clinics	Dean Lawler
University of Wisconsin Hospital and Clinics	Derek Fuerbringer
University of Wisconsin Hospital and Clinics	Keith Hoerth
University of Wisconsin Hospital and Clinics	Cheryl Jordan
University of Wisconsin Hospital and Clinics	Michelle Lindaas
University of Wisconsin Hospital and Clinics	Jeff Pothof
University of Wisconsin Hospital and Clinics	Jose Macatangay
University of Wisconsin Hospital and Clinics	Lisa Brunette
University of Wisconsin Hospital and Clinics	Denise Cole-Ouzounlan
University of Wisconsin Hospital and Clinics	Walter Lougo
University of Wisconsin Hospital and Clinics	Andrew Lei
University of Wisconsin Hospital and Clinics	Michael Lohmeier
University of Wisconsin Hospital and Clinics	Ralph Turner
Wake Forest Baptist Medical Center	Ken Bishop
Wake Forest Baptist Medical Center	Jackie Teeter

Participating Organizations	
Wake Forest Baptist Medical Center	David C. Howell
Wake Forest Baptist Medical Center	Samantha Ogle
Wake Forest Baptist Medical Center	Christin Siscoe
Wake Forest Baptist Medical Center	Heather Perkins
Wake Forest Baptist Medical Center	Joni Chilson
Wake Forest Baptist Medical Center	Stephanie Butner
Wake Forest Baptist Medical Center	Jennifer Ingle
Wake Forest Baptist Medical Center	Dianna Howard

Positions Activated for the Exercise

Position	Avera Transplant Institute	Children's Hospital of Wisconsin	City of Hope	Cleveland Clinic	Froedtert Hospital	Intermountain Healthcare
RITN Medical Director	X	X	X	X	X	X
RITN Primary Coordinator	X	X	X	X	X	X
RITN Alternate Coordinator	X	X				X
Additional physician(s)	X		X	X		
Nursing staff	X	X	X	X	X	X
Admission process representative	X					
Administrator/hospital executive	X					
Emergency management staff	X	X	X	X		
Pharmacy staff member	X			X	X	X
Radiation safety officer/Health physicist	X	X	X	X	X	X
Social services representative	X					X
Psychiatry/psychology representative	X					
Blood center representative	X	X		X		X
Emergency department representative	X	X				
Quality representative	X	X		X		X
Regulatory representative						X
Infectious disease specialist	X					
Cell processing lab representative	X			X	X	
Environmental health and safety representative	X		X	X		X
Ethicist	X					

Position	Avera Transplant Institute	Children's Hospital of Wisconsin	City of Hope	Cleveland Clinic	Froedtert Hospital	Intermountain Healthcare
Burn center representative						X
Public information representative	X		X			
VA/NDMS representative	X					
Public Health representative	X					
County/city/state emergency manager	X	X	X			
Poison control center representative		X				
Healthcare coalition representative	X	X	X	X		

Position	Karmanos Cancer Center	Massachusetts General	Medical University - South Carolina	Oklahoma University Medical Center	Primary Children's Hospital	Roger Williams Medical Center
RITN Medical Director	X	X	X	X	X	X
RITN Primary Coordinator		X	X	X	X	X
RITN Alternate Coordinator	X		X		X	X
Additional physician(s)	X			X		X
Nursing staff	X	X	X	X	X	X
Admission process representative	X					X
Administrator/hospital executive	X			X	X	X
Emergency management staff	X	X	X	X	X	X
Pharmacy staff member	X			X	X	X
Radiation safety officer/Health physicist					X	X
Social services representative					X	X
Psychiatry/psychology representative					X	X
Blood center representative		X	X	X	X	X
Emergency department representative	X	X	X	X		X
Quality representative	X	X	X	X	X	X
Regulatory representative	X		X			X
Infectious disease specialist	X					X
Cell processing lab representative	X	X	X			X

Position	Karmanos Cancer Center	Massachusetts General	Medical University - South Carolina	Oklahoma University Medical Center	Primary Children's Hospital	Roger Williams Medical Center
Environmental health and safety representative	X		X			X
Ethicist						X
Burn center representative	X				X	
Public information representative	X				X	X
VA/NDMS representative						X
Public Health representative	X				X	X
County/city/state emergency manager	X			X		X
Poison control center representative				X		
Healthcare coalition representative	X			X		X

Position	Rush University Medical Center	Seattle Cancer Care Alliance	University of Utah	University of Mississippi	University of Wisconsin	Wake Forest Baptist
RITN Medical Director	X	X		X	X	X
RITN Primary Coordinator	X	X	X	X	X	X
RITN Alternate Coordinator	X	X		X		
Additional physician(s)	X	X	X	X	X	X
Nursing staff	X	X	X	X	X	X
Admission process representative					X	
Administrator/hospital executive		X	X	X	X	
Emergency management staff	X	X	X		X	X
Pharmacy staff member	X	X	X	X	X	
Radiation safety officer/Health physicist	X		X		X	X
Social services representative		X		X	X	
Psychiatry/psychology representative						
Blood center representative					X	
Emergency department representative	X	X	X		X	X
Quality representative	X		X	X		X

Position	Rush University Medical Center	Seattle Cancer Care Alliance	University of Utah	University of Mississippi	University of Wisconsin	Wake Forest Baptist
Regulatory representative	X		X			
Infectious disease specialist					X	
Cell processing lab representative					X	
Environmental health and safety representative			X		X	
Ethicist						
Burn center representative		X	X			
Public information representative			X		X	
VA/NDMS representative		X				
Public Health representative	X		X			
County/city/state emergency manager	X	X			X	
Poison control center representative						
Healthcare coalition representative	X	X			X	

APPENDIX C: PARTICIPANT FEEDBACK

RITN Centers were asked to provide some brief feedback on an online questionnaire following the exercise. There were four questions asked with related responses are included below.

Based on discussions today, please briefly describe the 1 or 2 strengths demonstrated by your organization's ability to respond to a radiation mass casualty incident as described in this exercise scenario.	
Avera Transplant Institute	*1) Enhancement of policy related to RITN from previous tabletops has helped develop our plan 2) Community partners involvement & public relations commitment to RITN.*
Children's Hospital of Wisconsin	*The hospital has strong relationships with hospital coalitions and state and federal emergency response networks which will be crucial during an actual radiation mass casualty incident.*
City of Hope	*Based on what we have learned from prior scenarios and working with the county we have learned that we are capable of taking on more patients than we thought previously in the past. We also felt confident about what role the county would play in this scenario and where responsibilities lie. The county would like to do a tabletop exercise with other hospitals in our area to make them more aware of this particular response process.*
Cleveland Clinic	*It became much clearer that we have an excellent relationship and understanding with our hospital Emergency Preparedness Team and that they have very established policies and procedures. An "exercise" was carried out at our institution last week in which it became very evident to the EP team that we would be very able to handle the capacity of an event such as this. This meeting also solidified our relationship with Hospital Coalition personnel.*
Froedtert Hospital	*Froedtert, level 3 trauma hospital, runs mass casualty drills several times a year and has developed a very good system of response involving all necessary personnel.*
Intermountain Healthcare	*Reviewed and strengthened commitment between our three BMT transplant centers in Utah.*
Karmanos Cancer Center	*Previous work related to the care plan and order set; we have analyzed 10 aplastic anemia patient's care plan in order to grasp the potential scenario. We have educated our GPO - this is an on-going process. Our Center's*

Based on discussions today, please briefly describe the 1 or 2 strengths demonstrated by your organization's ability to respond to a radiation mass casualty incident as described in this exercise scenario.	
	relationship with the HCC.
Massachusetts General	*We have a very strong Emergency Preparedness Team. They conduct several practice exercises throughout the year, although not specifically for a radiation event. Our team also participates in world -wide disaster response efforts and has a great deal of experience. Our Emergency Preparedness Team also periodically participates in city wide disaster response drills.*
Medical University – South Carolina	*1) Our emergency and risk management team are experienced and extremely knowledgeable, not in small part to their past experience, and future planning for, hurricane and other weather disasters. They are members of local and regional healthcare coalitions and coordinating councils that have extensive experience and conduct continuous exercises in emergency planning. 2) Clinically we provide annual training to all BMT staff regarding radiation mass casualty incidents and would need only provide "Just in Time" training at the time of the incident.*
Oklahoma University Medical Center	*We have a good plan in place and have an excellent relationship with our community partners.*
Primary Children's Hospital	*We have been able to tie in all the hospitals in the state so that we have the availability to house less acute patients in several locations. We have a collaborative effort between the three BMT programs here in the valley.*
Roger Williams Medical Center	*1. Ability to communicate our need for supplies, staff and surge capacity with internal as well as community partners. 2. Decon plan and triage guideline readily available.*
Rush University Medical Center	*1. Ability to identify capabilities on campus and at the outpatient level - these include resources such as staff, pharmaceuticals, radiation detection devices, blood, general med supplies for these patients etc 2. Resources for informing staff and the ability to acquire behavioral health assistance for our patients, visitors, students and staff.*

Based on discussions today, please briefly describe the 1 or 2 strengths demonstrated by your organization's ability to respond to a radiation mass casualty incident as described in this exercise scenario.	
Seattle Cancer Care Alliance	*We have great partner relationships and community linkages. Fairly robust plan.*
University of Utah	*I think that working together, as 3 RITN centers, in such close proximity (LDSH, University of Utah, and PCH.) we have a great amount of resources. Gathering together for this exercise allows us to strategize together to create the best plan without duplication of efforts b/c we take a team approach.*
University of Mississippi	*The strength that was seen in the TEAM at UMMC is the cohesiveness among the different specialties. We rely on one another to help in a time of devastation.*
Wake Forest Baptist	*Action plan in place to deal with family members of the victims, onsite collection center.*

Based on discussions today, please briefly describe 1 or 2 challenges to respond to a radiation mass casualty incident as described in this scenario.	
Avera Transplant Institute	*1. Number of potential victims (transferring existing patients from the hospital to outlying facilities in order to make room for victims), staffing, etc. 2. Resource management (lodging for families, pharmaceuticals, outpatient lodging, supplies, etc). 3. Obtaining medical records for victims to determine existing comorbidities, etc.*
Children's Hospital of Wisconsin	*Bed and staffing availability, managing an influx of pediatric patients without accompanying parents/guardians, and identifying potential related HPC donors for an influx of patients with minimal information.*
City of Hope	*Pharmacy needs will be a challenge (e.g., Neupogen, TPN, and antibiotics). If doses of Prussian blue or other agents of this kind need to be used, the doctors will be hesitant on their administration of them because it is not something they use often. The idea that it might be helpful to have the family transported with the patient in this scenario due to needs for matching up donors. Timing is a concern as you*

Based on discussions today, please briefly describe 1 or 2 challenges to respond to a radiation mass casualty incident as described in this scenario.	
	have to hold patients, prep them for transplant and find a match donor (this could take some time before treatment). can be given. Lots of supportive care for these patients is needed.
Cleveland Clinic	*This made us more acutely aware of supply issues that we might face, this was the first time that we had transfusion medicine personnel involved. Responsibility for patient follow up might be a challenge that has not been thought through, if the victims do not come through the BMT Unit or program. Communication with external agencies is a weakness.*
Froedtert Hospital	*Challenges for us are physically being able to take a large influx of patients who need this specialized care. Froedtert has to close due to ED overload or no inpatient beds several times a week.*
Intermountain Healthcare	*We are all very comfortable contacting the necessary groups within our own hospital organization to respond. However, the involvement of EMD, PCC, NDMS, and Red Cross during a disaster still raises questions to exactly how the process will work.*
Karmanos Cancer Center	*Resources (e.g. pharmaceuticals).*
Massachusetts General	*Accurate communication to all staff as well as patients, visitors and others during an event is viewed as one possible challenge. It would be imperative to have our public relations department convey accurate information in such a way as to not panic patients, visitors and staff. Organization of supplies and materials, particularly medications and antibiotics could be problematic during or following a mass casualty event.*
Medical University – South Carolina	*1) Although we provide extensive training to BMT staff, we need to provide additional training within the hospital as well as within the community. 2) We need to develop the following: pre-scripted marketing releases as well as pre-scripted patient alerts; an incident command RITN checklist; a "just in time" training manual for staff; a crisis hone line procedure if not already in place; a checklist of the most important supplies that would be needed for supportive care of mass casualties*

Based on discussions today, please briefly describe 1 or 2 challenges to respond to a radiation mass casualty incident as described in this scenario.	
Oklahoma University Medical Center	*Keeping everyone informed of plans or actions as they need to change.*
Primary Children's Hospital	*We need to stream line our connection to the Poison control center and find what resources that they have available. We have many ideas for places to house non-hospitalized families and patients but we need to do the work to figure out if those are really viable solutions.*
Roger Williams Medical Center	*1. Traffic control-plans to divert traffic via public access ways. 2. Possibility of utilizing outpatient programs for patient treatment process.*
Rush University Medical Center	*1. Need basic radiation training for nursing staff and non-clinical staff 2. Develop a radiation triage process - forward triage at ED level 3. Incorporation of medical management of radiation victims in the Coalition Medical Surge Plan*
Seattle Cancer Care Alliance	*Development of local team to send to patient reception site, including procurement of mobile CBC capacity. As with other years, still no good means of communication and tracking of patients housed in other facilities/hospitals.*
University of Utah	*We need to make sure to partner and include our coalitions/city/state official in the future.*
University of Mississippi	*One of the challenges that were seen today was the educational piece for patients, staff and family members.*
Wake Forest Baptist	*How to type people quickly enough locating unrelated donors for transplant priorities.*

What are some of the unique considerations that should be considered for further planning between your RITN facility and Healthcare Coalitions to collectively respond to a radiation mass casualty incident?

What are some of the unique considerations that should be considered for further planning between your RITN facility and Healthcare Coalitions to collectively respond to a radiation mass casualty incident?	
Avera Transplant Institute	*Would continue to work w/ coalition partners regarding inpatient capacity within the city & state and also regarding resource management.*
Children's Hospital of Wisconsin	*Managing an influx of pediatric patients without accompanying parents/guardians.*
City of Hope	*In most scenarios within our county there are some major players in the hospital arena and I think most think of the trauma 1 care centers. However, in this scenario the thinking is different and will require them to bring them to places that can support their injuries. There is a lot to learn about radiation and how it affects the body. The emergency planners throughout the county could benefit from learning these things. County players want to do a tabletop exercise with surrounding hospitals to play this scenario out.*
Froedtert Hospital	*In drill situations we talk about how we would possibly send patients to other local hospitals, we have never had to do this. Doing things on paper is much different than real life.*
Intermountain Healthcare	*It's clear we need to have the representative here during the next tabletop. They have participated in the past, but not this year.*
Karmanos Cancer Center	*The City of Detroit's current fiscal status and the environment.*
Massachusetts General	*Triage prior to entering the facility; Outpatient accommodations; Communications between different parts of the coalition; Transportation to/from the hospital for outpatient monitoring.*
Medical University – South Carolina	*Since we are a pediatric center we are unsure of the responsibility for unaccompanied minors. Would this be taken over by local or federal authorities?*
Oklahoma University Medical Center	*It would be nice to better define the role of NDMS hospitals in area that are not part of RITN facilities.*

What are some of the unique considerations that should be considered for further planning between your RITN facility and Healthcare Coalitions to collectively respond to a radiation mass casualty incident?	
Primary Children's Hospital	*There are three facilities here and although we are separate we do try to work together for this.*
Roger Williams Medical Center	*1. Messaging coordination to general public. 2. Pharmacy supplies/medical supplies that could be available through our ESF8.*
Rush University Medical Center	*1. Incorporation of medical management of radiation victims in the Coalition Medical Surge Plan 2. Process for notification and coordination of events based on RITN subject matter experts*
Seattle Cancer Care Alliance	*Local transportation and housing, There are still questions regarding supplies of necessary drugs and blood products. Need to challenge and address assumptions between SCCA and Coalition partners regarding patient triage and coordination. Who makes the triage decision at the PRA?*
University of Mississippi	*Time constraints and the length of the table top.*
Wake Forest Baptist	*Front line triage-quick labs*

List and briefly describe elements to address for future RITN exercises.	
Children's Hospital of Wisconsin	*Dirty bomb scenario.*
City of Hope	*Financial reimbursement needs for this situation and how to do this. Family reunification needs. Dose requirements of Prussian blue and other agents of this kind.*
Cleveland Clinic	*I felt this was heavy on the Emergency Preparedness side (which was great) and light on the "Clinical" side. It made for an uneven distribution of attentiveness during the exercise. It was difficult to engage the entire room when the questions were so one-sided.*

List and briefly describe elements to address for future RITN exercises.	
Froedtert Hospital	*I think the drill asks all the necessary questions. We had no hospital administrators present so I do wonder about the necessary catastrophic financial relief to assist hospitals in caring for disaster victims and in disaster recovery.*
Intermountain Healthcare	*Internally with our BMT program, we are comfortable with our communication and plan. I would like to have some focus on the local and federal help during the triage process. Also, managing the patients on an outpatient basis. Who would help set up clinics, etc. Could you have something to observe for the whole process where we can get ideas for our local issues?*
Karmanos Cancer Center	*CDC SNS program.*
Massachusetts General	*What happens at the transplant center/health care facility once the patients have arrived and have been triaged, assigned to inpatient bed, outpatient follow up. Concentration on the role of the transplant center staff. Involvement of the transplant coordinators in screening potential stem cell donors, involvement of the processing laboratory and NMDP collection facilities. How many transplants could be done in a specific amount of time? What is the capacity of the processing lab and collection facility? With potentially hundreds, or even thousands of requests for stem cell products how would the NMDP determine what products to send where? There may be several requests for the same donor or products. Would products be transported via an NMDP courier versus FedEx or other professional delivery service? What capacity do the processing laboratories and collection facilities have to meet the need? What amount of staff, supplies, bags, reagents etc are available to these departments?*
Roger Williams Medical Center	*1. Outpatient support including travel for treatment. 2. reimbursement for provided services (beyond 30 days) 3. Social service for worried well. 4. Accommodations for families of victims. 5. Utilizing alternative care site for outpatient services.*
Rush University Medical Center	*1. Consider a functional exercise to test some of the communication capabilities 2. Shorten the exercise to include clinical staff in the beginning and second half of the exercise should focus on the non-clinical staff.*

List and briefly describe elements to address for future RITN exercises.	
Seattle Cancer Care Alliance	*Patient tracking. What to do with patients who just show up/ worried well and walking wounded. How to connect frantic families with patient in system. Do you suspend HPPA laws in those cases? Standardized messages and communication, (especially between centers/ cities). Can we link into the Red Cross for a communication network?*
University of Mississippi	*Length of the table top -maybe the ability for those to remote in from other locations other than the one center i.e. UMMC all present but the mayor would like to remote in.... this may be possible but I was unaware....*
Wake Forest Baptist	*Donor availability. Transplant priority.*

Lastly, the RITN Centers were asked to rate the usefulness of the exercise. 18 Centers provided quantitative feedback on the quality and utility of the exercise. On a scale of 1-5 (1 ranking not useful and all and 5 ranking very useful), the responses rated an average of **4.6** (very useful).

APPENDIX D: ACRONYMS

Acronym	Meaning
AAR	After Action Report
ARC	American Red Cross
BMT	Bone Marrow Transplant
CDC	U.S. Centers for Disease Control
ED	Emergency Department
EMA	Emergency Management Agency
FCC	Federal Coordinating Center
GCSF	Granulite Colony-Stimulating Factor
GMCSF	Granulite Macrophage Colony-Stimulating Factor
HCS	HC-Standard
HHS	U.S. Department of Health and Human Services
HLA	Human Leukocyte Antigen
ICS	Incident Command System
IND	Improvised Nuclear Device
JIC	Joint Information Center
JIS	Joint Information System
JPAT	Joint Patient Assessment and Tracking
mcg	Microgram
MOU	Memorandum of Understanding
NDMS	National Disaster Medical System
NMDP	U.S. National Marrow Donor Program
PCC	Poison Control Center
PPE	Personal Protective Equipment
PIO	Public Information Officer
RITN	Radiation Injury Treatment Network
RUMC	Rush University Medical Center
SNS	Strategic National Stockpile
SitRep	Situational Report
US	United States
USN	United States Navy
VA	Veterans Administration